

Intellectual Property for Agri-food Small and Medium Enterprises

Guide



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dello Sviluppo Economico*


WIPO
WORLD
INTELLECTUAL PROPERTY
ORGANIZATION

**Intellectual Property
for Agri-food Small and Medium Enterprises**

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ABBREVIATIONS AND ACRONYMS

AAF	African Agriculture Fund
ABS	Access and Benefit Sharing
AD	<i>Anno Domini</i> , (Latin) -Year of the Lord (means the number of years before Jesus Christ)
AEZ	Agro-Ecological Zones
AFIM	African Facility for Inclusive Markets
AfricaRice	Africa Rice Center
AGRA	Alliance for a Green Revolution in Africa
AIA	America Invents Act
AIP	Agricultural Innovation Platform
AKIS	Agricultural Knowledge and Information System
AKST	Agricultural Knowledge, Science and Technology
AM	Agricultural Mechanization
AMAP	<i>Association pour le Maintien d'une Agriculture Paysanne</i> (Community-supported Agriculture Association)
AOC	Controlled Designation of Origin (French Acronym: <i>Appellation d'Origine Contrôlée</i>)
ARARI	Amhara Regional Agricultural Research Institute
ARD	Agricultural Research and/or Development
ASDP	Agribusiness Supplier Development Programme
ASSINSEL	International Association of Plant Breeders for the Protection of Plant Varieties (French acronym: <i>Association Internationale des Sélectionneurs pour la Protection de Obtentions Végétales</i>)
ATL	Above The Line
AU	African Union
B.C.E.	Before the Common Era
BiOS	Biological Innovation for Open Society
BoP	Base of the Pyramid
BPH	Brown PlantHopper
Bt	<i>Bacillus thuringiensis</i> (Latin)

BTL	Below The Line
CAADP	Comprehensive Africa Agriculture Development Programme
CAC	<i>Codex Alimentarius</i> Commission
CAFOs	Concentrated Animal Feeding Operations
CAGR	Compound Annual Growth Rate
CAP	Common Agricultural Policy
CASE	Competitive Agricultural Systems and Enterprises
CBB	Cassava Bacterial Blight
CBD	Convention on Biological Diversity
CBSD	Cassava Brown Streak Disease
ccTLDs	Country Code Top-Level Domains
CEO	Chief Executive Officer
CF	Contract Farming
Cf. or cfr.	<i>Confere</i> (Latin) - Compare, refer (used in footnotes)
CFS	Committee on World Food Security
CG	Choice Genetics SAS (CG)
CGAP	Consultative Group to Assist the Poor
CGIAR	Consultative Group on International Agricultural Research
CIALs	Local Agricultural Research Committees (Spanish acronym: <i>Comités de Investigación Agropecuario Local</i>)
CIAT	International Center for Tropical Agriculture (Spanish acronym: <i>Centro Internacional de Agricultura Tropical</i>)
CIFOR	Center for International Forestry Research
CIGs	Concerted action and Innovation Groups
CIMMYT	International Maize and Wheat Improvement Center (Spanish acronym: <i>Centro Internacional de Mejoramiento de Maiz y Trigo</i>)
CMD	Cassava Mosaic Disease
CO ₂	Carbon Dioxide
COMESA	Common Market for Eastern and Southern Africa
CoP	Code of Practice

CORAF	Conference of the Agricultural Research leaders in West and Central Africa
CoS-SI	Convergence of Sciences: Strengthening agricultural Innovation systems
CPC	Cooperative Patent Classification
CPVR	Community Plant Variety Right
CRISPRs	Clustered, Regularly Interspaced, Short Palindromic Repeats
CSA	Climate-Smart Agriculture
CSA	Consumer/Community Supported Agriculture
CSISA	Cereal Systems Initiative for South Asia
CSOs	Civil Society Organizations
CSR	Corporate Social Responsibility
CPVO	Community Plant Variety Office
CURE	Consortium for Unfavourable Rice Environments
CWR	Crop Wild Relatives
DDA	Doha Development Agenda
DNA	Deoxyribonucleic Acid
DSBs	Double-Strand-Breaks
DUS	Distinct, Uniform and Stable
EBoA	Enlarged Board of Appeal
EC	European Commission
EDV	Essentially Derived Varieties
e.g.	<i>exempli gratia</i> (Latin) – for example
EIAR	Ethiopian Institute of Agricultural Research
EMBRAPA	Brazilian Agricultural Research Corporation (Portuguese acronym: <i>Empresa Brasileira de Pesquisas Agropecuarias</i>)
EPO	European Patent Office
ES	Ecosystem Service
ESA	Eastern and Southern Africa
ESR gene	Estrogen receptor gene
ESTs	Expressed Sequence Tags

EU	European Union
FAO	Food and Agriculture Organization
FARA	Forum for Agricultural Research in Africa
FARMD	Forum for Agricultural Risk Management in Development
F&B	Food and Beverages
FCI	Farm Concern International
FDA	Food and Drug Administration
FDI	Foreign Direct Investment
FFS	Farmer Field Schools
FIS	International Seed Trade Federation (French acronym: <i>Fédération Internationale du Commerce des Semences</i>)
FIS	Farm Input Subsidy Program
FOs	Farmers' Organizations
FOB	Farmer-Owned Brand
FOF	Farmers of the Future
4PL	Fourth-Party Logistics
FPR	Farmer Participatory Research
FSC	Food Supply/Value Chain
FSCN	Food Supply Chain Network
FSMA	Food Safety Modernization Act
FTO	Freedom to Operate
FWRA	Food Waste Reduction Alliance
GAP	Good Agricultural Practices
GAS	Gruppi di Acquisto Solidale
GCC	Gulf Cooperation Council
GDP	Gross Domestic Product
GE	Genetic Engineering
GFSI	Global Food Safety Initiative
GGC	Groupe Grimaud La Corribere
GHG	Greenhouse Gas

GI	Geographical Indication
GLOBALG.A.P.	Global Good Agricultural Practice
GM	Genetically Modified
GMO	Genetically Modified Organism
GMP	Good Manufacturing Practices
GPP	Good Production Practice
GR	Golden Rice
GRAS	Generally Recognized As Safe
GRiSP	Global Rice Science Partnership
gTLD	Generic Top-Level Domain
GVC	Global Value Chain
HACCP	Hazard Analysis and Critical Control Point
HIR	High Immune Response
HYVs	High-yielding crop Varieties
IAASTD	International Assessment of Agricultural Knowledge, Science and Technology for Development
IARCs	International Agricultural Research Centers
IAR4D	Integrated Agricultural Research for Development
ICANN	Internet Corporation for Assigned Names and Numbers
ICAR	Indian Council of Agricultural Research
ICARDA	International Center for Agricultural Research in the Dry Areas
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
ICT	Information and Communication Technology
IDRC	International Development Research Centre
i.e.	<i>Id est</i> (Latin) – That is (Grammatical term)
IFAD	International Fund for Agricultural Development
IFAP	Industrial Farm Animal Production
IFDC	International Fertilizer Development Center
IFTN	International agro-Food Trade Network
IITA	International Institute of Tropical Agriculture

ILCs	Indigenous and Local Communities
IMD	Inclusive Market Development
INRA	The French National Institute for Agricultural Research (French acronym: <i>Institut national de la recherche agronomique</i>)
INSARD	Including Smallholders in Agriculture Research for Development
IP	Intellectual Property
IPHC	IP Holding Company
IPM	Integrated Pest Management
IPPC	International Plant Protection Convention
IPTO	Italian Patent and Trademark Office
IPR	Intellectual Property Right
IRA	Irish Republican Army
IRRC	Irrigated Rice Research Consortium
IRRI	International Rice Research Institute
ISF	International Seed Federation
ISTA	International Seed Testing Association
IT	Information Technology
ITC	International Trade Centre
ITPGRFA	International Treaty on Plant Genetic Resources for Food and Agriculture
IUFoST	International Union of Food Science and Technology
IYFF	International Year of Family Farming
KNM	Knowledge Networks and Markets
LAC	Latin America and the Caribbean
LDCs	Least Developed Countries
LFS	Local Food Systems
LHE	LAGLIDADG Homing Endonucleases
LINSA	Learning and Innovation Networks for Sustainable Agriculture
LMO	Living Modified Organisms
LRP	Local and Regional Procurement

LSPs	Logistics Service Providers
MAP	Modified Atmosphere Packaging
MAS	Marker Assisted Selection
MDGs	Millennium Development Goals
mg	milligrams
MLS	Multilateral System
MMB	Mahyco Monsanto Biotech
MNCs	Multinational Corporations
NAARM	National Academy of Agricultural Research Management
NARI	National Agricultural Research Institute
NARO	National Agricultural Research Organization
NARS	National Agricultural Research System
NASA	National Aeronautics and Space Administration
NEPAD	New Partnership for Africa's Development
NFF	Nutraceuticals and Functional Foods
NGO	Non-Governmental Organization
NGS	Next-Generation Sequencing
NHEJ	Non-Homologous End-Joining
NLP	Nanolipidic Particle
NM-AIST	Nelson Mandela African Institute for Science and Technology
NPBTs	New Plant Breeding Techniques
NRA	National Restaurant Association
NTBs	Non-tariff Barriers
NTMs	Non-tariff Measures
ODM	Oligonucleotide Directed Mutagenesis
OECD	Organisation for Economic Co-operation and Development
OFA	Open-Field Agriculture
OMF	Oscillating Magnetic Fields
OHIM	Office for Harmonization in the Internal Market

OPV	Open Pollinated Variety
OSSI	Open Source Seed Initiative
PACSUN	Pan-African Cassava Surveillance Network
PbP	Product-by-Process
PBRs	Plant Breeders' Rights
PCR	Polymerase Chain Reaction
PCT	Patent Cooperation Treaty
PDO	Protected Designation of Origin
PEF	Pulsed Electric Fields
P4P	Purchase for Progress
PGI	Protected Geographical Indication
PGR	Plant Genetic Resources
PGRFA	Plant Genetic Resources for Food and Agriculture
PGS	Participatory Guarantee Systems
PhilRice	Philippine Rice Research Institute
PIPRA	Public Intellectual Property Resource for Agriculture
POO	Place-of-Origin
PPA	Provisional Patent Application
PPP	Public-Private-Partnership
PVP	Plant Variety Protection
PVRs	Plant Variety Rights
R&D	Research and Development
RdDM	RNA-dependent DNA Methylation
rDNA	recombinant DNA
RESMISA	Revalorizing Small Millets in South Asia
RF	Rockefeller Foundation
RNA	Ribonucleic Acid
RNAi	RNA interference
RTB	Roots, Tubers and Bananas

RUMARK	Rural Market Development Trust
SBG	Sequence-Based Genotyping
SC	Shifting Cultivation
SCNT	Somatic Cell Nuclear Transfer
SDG	Sustainable Development Goals
SEA	South and East Asia
SEARICE	Southeast Asia Regional Initiatives for Community Empowerment
SIDA	Swedish International Development Agency
SME	Small and Medium-Sized Enterprise
SMSF	Small- and Medium-Sized Family
SPC	Supplementary Protection Certificate
SPS	Sanitary and Phyto-Sanitary
SPT	Seed Production Technology
SPV	Special Purpose Vehicle
SSA	Sub-Saharan Africa
2SCALE	Towards Strategic Clusters in Agribusiness through Learning in Entrepreneurship
TAF	Technical Assistance Facility
TALENs	Transcription activator-like effector nucleases
TBT	Technical Barriers to Trade
TFP	Total Factor Productivity
TPRs	Technical Property Rights
TRIPS	Trade-Related Aspects of Intellectual Property Rights
TSG	Traditional Specialty Guaranteed
UDP	Urea Deep Placement
UIBM	Italian Patent and Trademark Office (Italian acronym: <i>Ufficio Italiano Brevetti e Marchi</i>)
UK	United Kingdom
UN	United Nations
UNCTAD	United Nations Conference on Trade and Development

UNESCO	United Nations Educational, Scientific and Cultural Organization
UNDP	United Nations Development Programme
UNIDO	United Nations Industrial Development Organization
UPOV	International Union for the Protection of New Varieties of Plants
U.S.	United States
USA	United States of America
USAID	United States Agency for International Development
USDA	United States Department of Agriculture
VAD	Vitamin A Deficiency
WB	World Bank
WECARD	West and Central African Council for Agricultural Research and Development
WFO	World Farmers' Organisation
WFP	World Food Programme
WFRs	Wine and Food Routes
WHO	World Health Organization
WIPO	World Intellectual Property Organization
WTO	World Trade Organization
ZFN	Zinc Finger Nuclease

Foreword

The 2014 International Year of Family Farming (IYFF) had sought to raise the profile of family farming and smallholder farming by focusing world attention on its significant role in eradicating hunger and poverty, providing food security and nutrition, improving livelihoods, managing natural resources, protecting the environment and achieving sustainable development, particularly in rural areas. The goal of the 2014 IYFF was to reposition family farming at the center of agricultural, environmental and social policies in national agendas by identifying gaps and opportunities to promote a shift towards a more equal and balanced development.¹

For the sake of simplicity, hereafter in this guide, the phrase “agri-food SMEs,” unless a particular context prevents it, also includes “family farming and smallholder farming”. While the guide is focused on intellectual property (IP) for agri-food SMEs, it inevitably analyzes the role of and/or use of IP by all stakeholders in the agri-food sector; this is absolutely essential given the competitive dynamics of the global agri-food economy.

The extremely diverse types of stakeholders in the agri-food sector collaborate and compete, often at the same time, to produce and make available a diverse range of food for humankind and all its domesticated plants and animals. While doing so, they seek to ensure that they meet the basic food needs of everyone, even people who do not have the means to buy the food put on the market. In the agri-food system, the diversity of enterprises spanning the complex value chains/networks from the “farm to the fork” range from R&D-based input companies to commodity producers/suppliers; subsistence farmers to large-scale high-tech agri-food producers/processors/manufacturers; and start-up biotech SMEs to multinational corporations (MNCs).

For ease of grappling with this diversity, the worldwide agri-food sector may be seen as composed of three distinct conceptual sets. In reality, however, it is often difficult to unambiguously assign a particular agri-food SME or an agri-food chain/network to one of the three sets.

From a “market power”² perspective, the dominant set is composed of global³ food supply/value chains (FSCs). These dynamic, collaborative chains/networks have different degrees of vertical integration of independent enterprises/entities. The lead players (mostly MNCs) in the FSCs are legal entities, mostly controlled by the private sector of the economy. The FSCs are highly coordinated/integrated and capital-intensive global industrial/business operations. In the 21st century, the real-time bi-directional information-sharing and collaboration among the chain/network participants is mediated by cloud-based ICT systems. Most of the MNCs are headquartered in

¹ <http://www.fao.org/family-farming-2014/home/what-is-family-farming/en/>.

² “Market power” refers to the idea that one firm in the market may be able to exert significant influence over the goods and services traded or the price at which they are sold.

³ In this guide, for the sake of simplicity, the word “global” encompasses the concepts “multi-domestic” and “regional”, although multi-domestic or regional and global firms/chains often compete with one another.

developed countries. They are also largely controlled directly by nationals and indirectly by the national governments of these countries. Maximizing return on shareholders' investment seems to be the primary focus of the lead MNCs controlling the global FSCs. The global FSCs seek to serve the demands of all sections of society, but from a health and safety perspective they are especially suited to the needs and wants of consumers who belong to the better-off sections of society (the middle class and above), as these consumers, in addition to *experience attributes* of agri-food products,⁴ are increasingly demanding a range of *credence attributes* of agri-food products that, apart from alleviating their health and safety concerns, often relate to a wider range of concerns such as those pertaining to animal welfare, child labor, fair trade, free-range, halal, kosher, organic, etc. The only practical option for a consumer of agri-food product provided by global FSCs is to trust the claims made by the global FSCs or rely on their reputations, symbolized by their brands, built over a period of time by establishing systems that ensure consistency of the agri-food products and enable end-to-end traceability of these products and/or their ingredients, that is, throughout the chain/network from the farm to the point of retail.

Compared with the first set, the second set is composed of a far more heterogeneous set of agri-food SMEs which operate in “alternative agri-food chains/networks” or “alternate food markets” and which often rely on localized, specialized production processes and foods. These agri-food SMEs operate mostly in local or national markets (for example, the Slow Food movement) but sometimes also in boutique international (fair trade, organic) markets. These alternate networks/markets generally rely on production processes which may be distinguished in several ways, notably by traditional artisanal or labor intensive methods. When they do rely on modern technologies, it is generally not to the same degree as the global FSCs do. Some of these networks/markets have connected, or strive to connect, to the FSCs; most of them operate in alternative, mostly niche, local, national or regional markets. In terms of their association characteristics, they are relational, trust-based, and local or regionally-grounded. This second set of agri-food SMEs/chains/networks exists in most countries (be they developed, countries in transition to a market economy, or developing countries, including most of the LDCs). This set serves the needs of highly enlightened consumers found in every country who value the following:

- (a) local/traditional foods and traditional cooking;
- (b) equity in profit sharing in the value chain;
- (c) preservation of ecology/environment; and
- (d) healthy eating choices, etc.

While the global FSCs often emulate the differentiating practices of the second set, the second set considers itself to be more sustainable and, therefore, capable of replacing the global FSCs in the long run. So far, however, while hybrid versions of the first two

⁴ The term “products” refers to “goods and/or services”.

sets have emerged, especially in developed countries, the two sets seem to be largely on parallel tracks, each catering to its respective market segments.

Compared with the first and the second set, the third set is composed of an even more heterogeneous set of “subsistence farms, micro-enterprises and agri-food SMEs”, which are essentially a private source of livelihood or self-employment. The subsistence farmers are essentially consumers of their own produce. The subsistence micro-enterprises and agri-food SMEs span the whole supply chain from independent processors, manufacturers, wholesalers, distributors, retailers and restaurants. This set is found in all countries but is predominant in developing countries, including the LDCs. Given their extreme resource constraints, the economics of this set is entirely driven by risk aversion and keeping the cost of production as low as possible; on the whole, these are the least profitable set of enterprises, which are essentially small players in the market with small turnovers and small profits, if any.

This guide provides a bird’s-eye view of all of these and the interactions of the wide range of international, regional and national institutional frameworks that impinge, positively and negatively, on the performance of agri-food players in all of the three sets listed above. Therefore, it retains a business-centric perspective while looking at the role of intellectual property rights (IPRs) system in business strategy. Thus, the tools of the IPR system are seen as potentially playing a key role in designing the business models and business strategies of agri-food enterprises to become and remain competitive in the marketplace.

Given the overall length of the guide, however, much of the business-centric perspective has been dealt with in chapters marked as the Annexes to this guide, are available online only on the websites of the World Intellectual Property Organization⁵ and of the Italian Patent and Trademark Office (UIBM).⁶

Continuous innovation improves productivity, which is one of the essential requirements for creating a sustainable agri-food system. The history of the IPR system illustrates the cardinal importance of a time-limited proprietary paradigm based on exclusive private property rights over human creative and inventive outputs to prevent free-riding and to incentivize and reward innovation, given the inherent risks and often significant costs in creating and taking successfully to market an innovative product, including an agri-food product. In the private-sector led economic paradigm, a well-functioning global IPR system is considered to be an essential enabling requirement for the agri-food system to become and remain fit for purpose, which, amongst other things, means becoming and remaining competitive in an international trade context, as competitiveness is considered to be a necessary condition for guaranteeing sustainable growth, more and better jobs and respect for the environment. This guide seeks to show that effective use of the IPR system underpins successful innovation in the global agri-food system in all the three sets; it is virtually impossible to harness new knowledge for business success without efficient and effective management of IPRs by the diverse stakeholders in the agri-food system, including by the agri-food SMEs.

⁵ <http://www.wipo.int/portal/en/index.html>.

⁶ <http://www.uibm.gov.it/index.php/inglese>.

No enterprise works in isolation. It collaborates with many others for competing in the market with producers and providers of similar products. In this collaboration context, the “open innovation” paradigm is seen by many informed observers to be a new model for managing collaborative R&D and resultant IPRs, while others consider “open innovation” to be inherently antagonistic to the IPR system and to be a diametrically opposed model of collaboration that permits free sharing of the results of collaborative R&D *ad infinitum* by others, thereby preventing the results of R&D from entering the “private enclosure” created by the exercise of IPRs. This guide presents both these paradigms; needless to say, they have both evolved over time and will continue to do so. While it is impossible to forecast the future, it seems likely and reasonable to presume that both of these paradigms will coexist in most, if not all, countries; any of these two paradigms may dominate in various countries and contexts.

This guide can be read in two ways. Those who are familiar with the agri-food system should read the guide chapter by chapter, preferably in order. However, those who wish to obtain a broad overview of the agri-food sector, from a worldwide non-IPR perspective, should first go through the annexes which are available online only, but may be downloaded or printed free of charge. The list of annexes is available at the end of this guide.

The second chapter of the guide provides a snapshot of the Intellectual Property system in a worldwide and broad historical context.

The third chapter, which is the longest chapter of the guide, introduces the different types of IPRs and explains, in easy-to-understand language, their relevance to the market success of small- and medium-sized farm-holders and agri-food SMEs in particular and of the agri-food sector in general. It includes many practical examples of how different types of IPRs are used by small- and medium-sized farm holders and agri-food SMEs in their competitive strategies.

Many types of innovations can and should be protected by one or more types of IPRs. The guide assumes that the primary justification for the establishment of IPR systems is to stimulate innovation so as to increase the welfare of all segments of society. While it takes the concept and rationale of the need for IPRs to be a given, it does not assume or suggest that strengthening the IPR system would automatically result in enhanced welfare for all segments of society. It provides a business-oriented overview of the different types of IPRs and how these could and should be used in practice by most of the stakeholders in the agri-food sector.

Next, this guide looks at the growing importance of strategic management of IPRs as a key determinant of success of small- and medium-sized farms and agri-food SMEs in the marketplace. It illustrates how small- and medium-sized farms and agri-food SMEs have actually relied on strategic use of IP assets for:

- (i) conceiving new ideas and transforming these into marketable products and services;
- (ii) successfully marketing agri-food products and services efficiently and cost-effectively; and

(iii) gaining, maintaining and sustaining their competitive advantage⁷ in markets, whether these are local, national, regional or international.

Annex 1 provides the historical context of food and agriculture for mankind. As with most endeavors of mankind, the agri-food system has been based on specialization, division of labor and cooperation, all of which are products of human ingenuity, enterprise and creativity. Food is essential for survival and growth of living things. But most of us do not produce what we eat and drink; we buy it in the market. In the 21st century, for most of us this market is a very complex system. At any level of analysis – local, national, regional or global – a dynamic interplay of forces shapes the agri-food system. For example, it is shaped, among others, by the following factors:

- globalization; temporal and spatial trends of human population growth and structure;
- rural and urban poverty; rural to urban migration as well as South to North migration;
- ownership of, or access to, type of agricultural land, water (rainfall, irrigation), technology, energy and modern agricultural inputs;
- means of transport and storage; impact of pollution, weather, diseases of plants, illnesses of animals/birds/fish/sea food, and climate changes; loss of agro-biodiversity⁸ (in domesticated plants, birds, animals, fish);
- heavy government regulation⁹ (in the name of food security, food safety, food fraud, food defense and/or food sovereignty), including complex multilateral and regional trade regulations;

⁷ A competitive advantage is an advantage over competitors gained by offering consumers greater value, either by means of lower prices or by providing greater benefits and service that justifies higher prices.

⁸ Biological diversity (biodiversity) is the number, variety and variability of all living organisms in terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are parts (UNCED, 1992). Conceptually, it encompasses both the number (stock and information contained therein) and variability dimensions (Wale, 2004). Agro-biodiversity is a subset of biodiversity relevant for agriculture and it covers the variability of plants, animals and microorganisms. It can be considered at three levels, i.e. genetic, species and agro-ecosystems (Upreti and Upreti, 2002). It encompasses various biological resources tied to agriculture including edible plants and crops, livestock and fish, naturally occurring insects, bacteria and fungi, agro-ecosystem components, wild resources of natural habitats and landscapes, and the genetic resources contained therein (Thrupp, 2000). Crop diversity is a subset of agro-biodiversity relevant for crop production.; refer p. 18 of publication entitled, “The Economics of Managing Crop Diversity On-farm case studies from the genetic resources policy initiative,” edited by Edilegnaw Wale, Adam G. Drucker and Kerstin K. Zander at <http://www.cbd.int/financial/values/several-agrogenetic.pdf> (157 pages; Copyright © Bioversity International, 2011).

⁹ A regulation may be defined as any instrument by which governments, their subsidiary bodies, and supranational bodies (such as the EU or the WTO) set requirements on citizens and businesses that have legal force. The term may thus encompass a wide range of instruments: from primary laws and secondary regulations to implement primary laws, subordinate rules, administrative formalities and decisions that give effect to higher-level regulations (for example, the allocation of permits) and standards. Regulations may emanate from non-governmental or self-regulatory bodies to which governments have delegated regulatory powers; see Box 1.1 on p. 10 of draft OECD report of 2010 entitled, “Regulatory Policy and the Road to Sustainable Growth,” at <http://www.oecd.org/regreform/policyconference/46270065.pdf>.

- diversity of ever-evolving consumer needs; health issues (such as obesity, malnutrition, food allergies, other illnesses);
- substantial agri-food wastage in all countries; access to and type of agri-food storage, transport and packaging;
- type of and access to results of public and private R&D;
- risks and benefits of modern high-tech innovation (especially genetic engineering and nanotechnologies), including ICT innovation;
- impacts of advertising, labeling, branding and marketing of agri-foods on food habits;
- creation and management of IPRs;
- individual or collective entrepreneurship;
- type and role of public-private-civil society partnerships; and
- attitudes towards GM foods, culture, religion, food allergies.

In the 21st century in a market-oriented economy, bargaining power is essential for extracting value from a market transaction. Where new and improved knowledge underpins the value created by an enterprise, which is increasingly the case in the economy of the 21st century, it has become essential for all market-oriented industrial enterprises/businesses, especially successful ones, to make effective use of one or more types of IPRs to gain and maintain their competitive advantage. Most large businesses (especially MNCs), including those in the agri-food sector, have always done much better than the agri-food SMEs in leveraging IP assets for business success. Despite the growing importance and value of intangibles, including IP assets, to their competitive strategies, most SMEs, including agri-food SMEs, do not use the different types of IPRs at all or effectively. This often results from (a) lack of awareness or inadequate understanding, (b) absence of access to expertise, or (c) undue concern about the costs and/or complexity of using the IPRs system. The ability to extract the maximum value from IP assets varies considerably amongst companies, though SMEs, including agri-food SMEs, lag far behind the large companies in this regard. It is essential for agri-food SMEs, their business advisors and agri-food SME support institutions to understand that legal protection of IPRs in itself is never sufficient and that a successful IP asset management strategy must be tailored to and integrated into an agri-food SME's competitiveness strategy in a given business context.

This guide explores the complexity of the systemic contexts in which the agri-food SMEs compete. It emphasizes the role of innovation, marketing and entrepreneurship in the competitiveness of enterprises in the agri-food sector, as in any other sector.

Branding plays a crucial role in developing durable partnerships based on relationships of trust. These partnerships may be business-to-business or business-to consumer. In both situations, trademarks and geographical indications (two related types of IP) undergird successful branding strategies, especially when hidden or imperceptible (that is, credence) characteristics play a key role in the buying behavior of consumers. Industrial designs and copyright also play an important role in marketing, branding and advertising strategies. Surprisingly, even trade secrets and patents can, and sometimes

do, play an important role in the marketing, branding and advertising strategies of enterprises, including those of agri-food SMEs.

The guide illustrates how the growth and competitiveness of a national agri-food sector depends on the institutional and social capital generated by public-private-civil society collaborations and other partnerships and agreements at international, regional, national and local levels. This enabling environment includes (a) a suitable enabling legislative, administrative and institutional framework, and (b) tailored technical, managerial and financial support for agri-food SMEs, as such, or as part of collective entities, chains, networks, etc., so as to encourage and accelerate the creation, adoption and use of a diverse set of innovations and branding/marketing strategies to overcome the multifarious challenges faced by entrepreneurs in creating a profitable and sustainable business.

To prevent further marginalization in the globalized agri-food environment of commercial small-¹⁰ and medium-size¹¹ land-holding farmers (many of whom are often mere subsistence¹² farmers) as well as informal and formal agri-food SMEs in developing countries and LDCs, they, like the large companies, must create, adopt or use innovations in all aspects of their livelihood and entrepreneurial endeavors to (i) ensure their survival and/or (ii) develop their competitive business strategies in cooperation with other players in the agri-food chain/network in mutually beneficial horizontal and/or vertical relationships. This requires external inputs and support for equipping them with new knowledge, competencies and business skills for enabling them to think of themselves as not mere framers but as entrepreneurs who are in a highly competitive landscape and therefore must make better business decisions about their agri-food products to effectively avail themselves of market opportunities, locally, nationally and globally, while managing or overcoming the risks inherent in an entrepreneurial venture. Invariably, this support and guidance is provided by the public sector, the enlightened private sector (in the name of corporate social responsibility) and the civil society.

¹⁰ Commercial smallholders are farmers with some marketable surpluses in a particular crop. Land holdings may range from 2-20 hectares, and crop production often includes at least one cash crop. The annual farm net income after costs may range between 0.3x and 0.8x the annual earnings of a skilled laborer in that country or region.

¹¹ Medium-sized farmers generate meaningful income from farming, often with land under production totaling more than 20 hectares and up to 500 hectares (also referred to as emerging farmers). The smaller farmers of this segment are likely producing cash crops, while the larger land holdings are more likely to be used for commercial farming of staple crops. Annual farm net income after costs is generally more than 0.8x but less than 2.0x the annual earnings of a skilled laborer in that country or region. (Large farmers produce and market their output in a professional manner, employ staff, and often have access to a full range of financial services. These farmers are often producing on land holdings in excess of 500 hectares, though this may be smaller if farming only cash crops. In general, the annual farm net income after costs of large farmers is in excess of 2.0x the annual earnings of a skilled laborer in that country to region.); see p. 17 of a publication entitled, 'Scaling Up Access to Finance for Agricultural SMEs Policy Review and Recommendations October 2011; © International Finance Corporation;
http://www.ifc.org/wps/wcm/connect/04da89804a02e2e19ce0fdd1a5d13d27/G20_Agrifinance_Report.pdf?MOD=AJPERES.

¹² Semi-commercial smallholders (also referred to as "subsistence farmers") generally exhibit no or very small marketable surpluses. They are generally not active in agriculture for economic reasons but farm to survive, because of the lack of alternative opportunities. In some literature, semi-commercial smallholders are considered to have a land size smaller than 2 hectares. Other literature holds that it is typical for agriculture to account for less than 60% of the income of these households. The annual farm net income after costs is generally less than 0.3x the annual earnings of a skilled laborer in that country or region.

Amongst other things, such as the basics of setting up and running small- and medium sized farms and other agri-food SMEs as sustainable businesses, this also requires providing the small and medium sized farms and other agri-food SMEs with support and guidance about what IPRs are and how to make practical use of IPR assets in developing business models and business strategies for leveraging different types of innovations in their local, national, regional and international business strategies, as the case may be.

To improve understanding and communication, this guide relies on examples and case studies to show how different stakeholders in the three sets described above are responding and adapting to the ongoing changes in this dynamic and highly competitive sector. The dominant players in the FSCs (mostly MNCs) are able to look after themselves on all fronts, including effective management of IPR assets. They are avid and effective users of the IPR system, whether seen from an innovation management perspective or from a branding/marketing perspective. Therefore, though meant for agri-food SMEs, the guide often relies on examples and case studies from MNCs as illustrations.

It is hoped that the guide will stimulate thinking and action that will lead to greater coherence and more cooperation amongst the different stakeholders about the role of the IPRs system in the competitiveness of the agri-food system. Amongst other things, there is a dire need to consider the agri-food system from an IP system centric perspective and, just as importantly, at the IPR system from an agri-food perspective. When this is done by all the concerned stakeholders, it will be appreciated that, warts and all, the modern IP system is one of the key tools for managing old and new knowledge in the knowledge-driven economy of our times. This appreciation is central to finding solutions through a greater shared understanding of the way forward through cooperation, coherence, collaboration, transparency, traceability and trusted relationships. These are the avenues for innovation and delivering value to improve the quality of life of all human beings in our eternal quest to improve the human condition, for greater happiness of all mankind and without inadvertently causing lasting damage to the planet. Otherwise, our quest for betterment of the human condition might end up annihilating life on earth.

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1 Purpose, Intended Audience and Structure of the Guide

1.1 Purpose of the guide

In dynamic and highly competitive markets, two key strategic requirements for becoming and remaining competitive are (1) continuous innovation¹³ and (2) effective marketing.¹⁴ Both should be “fit-for-purpose” and executed efficiently and effectively by an enterprise or by a horizontally or vertically coordinated/integrated group of enterprises.

However, most small and medium-sized enterprises (SMEs), including small- and medium-sized farms and other agri-food SMEs, are not aware of the importance of innovation, effective marketing or the links of innovation and/or marketing to the different types of intangible assets that may be protected and leveraged in business by the efficient and effective use of one or more types of IPRs.¹⁵ In fact, most SMEs, including small- and medium-sized farms and other agri-food SMEs, know practically nothing about IPRs and their potential contribution to their success in the marketplace.

Successful innovation requires the continuous integration of old knowledge with new knowledge. New knowledge is often obtained and assimilated through interaction, exchange and development of cooperative partnerships with other farmers, agri-food research and development (R&D) institutions, and, in fact, many other agri-food stakeholders in the local, national, regional and/or international agri-food ecosystems. Small- and medium-holder farms and agri-food SMEs face numerous constraints in developing trust and cooperative partnerships for participating in knowledge exchange networks,¹⁶ be they informal or formal. Similarly, successful innovation and marketing require an entrepreneurial mindset, relevant knowledge, relevant skills and relevant managerial and technological competencies as well as the development of relationships based on mutual trust and/or cooperative partnerships for participation in horizontal or vertical chains, webs or networks; SMEs, including small- and medium-sized farms and agri-food SMEs, have numerous constraints on their ability to do so.

Most small- and medium-sized farms and other types of agri-food SMEs are neither part of chains, webs or networks, nor have they benefitted from formal teaching and/or training pertaining to modern methods of agriculture, innovation, marketing or IP. Therefore, it is hardly surprising that worldwide, especially in developing

¹³ Innovation can be defined as an ongoing process of learning, searching and exploring that results in new products, new techniques, new forms of organization and new markets. (LUNDVALL B., National systems of innovation: towards a theory of innovation and interactive learning, London, 1992).

¹⁴ Marketing is the activity, set of institutions, and processes for creating, communicating, delivering, and exchanging offerings that have value for customers, clients, partners, and society at large; American Marketing Association, Approved July 2013; <https://www.ama.org/AboutAMA/Pages/Definition-of-Marketing.aspx>.

¹⁵ Intellectual property (IP) refers to creations of the mind, such as inventions; literary and artistic works; designs; and symbols, names and images used in commerce; <http://www.wipo.int/about-ip/en/>.

¹⁶ Two main types of networks exist. Vertical networks relate to cooperation of partners belonging to the same chain. Horizontal networks refer to cooperation among firms which are primarily competitors. Gellynck X. and Kühne B. Horizontal and Vertical Networks for Innovation in the Traditional Food Sector, Int. J. Food System Dynamics 2 (2010) 123-132; http://ageconsearch.umn.edu/bitstream/97229/2/P4b_Gellynck_K%C3%BChne_Issue2_rev.pdf.

countries, owners, managers and employees of most small- and medium-size farms and other agri-food SMEs have no idea or have misconceived notions about entrepreneurship, innovation or marketing or about the role of IP in shaping their entrepreneurial, innovation or marketing strategies.

All in all, most small- and medium-sized farms and other types of agri-food SMEs consider innovation, marketing and IPRs to be relevant only to the needs of big businesses, especially the MNCs, which have deep pockets. Even when these are perceived to be relevant to the needs of small- and medium-sized farms and other agri-food SMEs, these issues are still not as important in their hierarchy of needs as are some other issues, such as (a) timely access to finance or markets, (b) overcoming excessive regulatory burdens, etc. so as to justify any investment of time or other resources by their owners or managers on IPR matters. This may be due to a variety of reasons, such as a lack of time; lack of awareness; absence of, or inability to access, innovation, branding and marketing and/or IPR management services; inadequate managerial experience; and lack of strategic vision.

This guide seeks to place innovation, marketing and their link with IP asset management at a much higher level in the list of business priorities of a market-oriented small- and medium-sized farm or another agri-food SME, given that new or improved knowledge has become the essential input for creating or adding value to a new or improved product, because only such a new or improved product can provide a consumer greater value at a lower cost than competing products (goods and/or services). Preventing free-riding by unscrupulous competitors by protecting, leveraging and, if need be, enforcing proprietary rights over different types of knowledge assets through smart use of different types of IPRs has, therefore, become an absolute necessity for all enterprises, including small- and medium-sized farms and other types of agri-food SMEs.

The food and beverage (F&B) industry is under unprecedented scrutiny with a growing population of diligent, health-conscious consumers. Competition is intense due to changing trends and low barriers of entry, which make protecting brand image and market share of the utmost importance. F&B companies are under constant pressure to unveil innovative products, adopt green operations and improve thin margins. At the same time, most governments strictly regulate the format and content of product labels and monitor nutritional and health claims along with consumer lawyers, requiring vigilance in providing information to distinguish agri-food products in the marketplace.

The primary objective of this guide is to highlight the importance of effective IP asset management by owners, managers and employees of small- and medium-sized farms and other agri-food SMEs in order to become and remain competitive. It relies on numerous illustrations and case studies of innovative farms and other agri-food enterprises. These farms and enterprises have successfully branded and marketed the goods and/or services they produce, thereby accessing, creating, identifying, protecting, using, leveraging and otherwise exploiting one or more of the same or different types of duly protected IP assets, and thus building essential business partnerships and/or gaining customer trust and loyalty for the production, distribution and sale of their products at prices that fully justified the resources invested and the risks taken in creating and marketing a new or improved product. The illustrations and case studies also seek to highlight how, invariably, one or more types of IP

assets play a central and often critical role in the entrepreneurial, innovation and/or marketing and branding strategies of these successful agri-food enterprises, including small- and medium-sized farms and other types of agri-food SMEs.

1.2 Intended audience

A conscious effort has been made to provide in simple, jargon-free language, a practical and commonsensical perspective on economic, societal and business aspects of the links between agriculture/agri-foods and the IPR system. Whenever the use of a technical term or jargon has been unavoidable it has been defined or explained in the text or in a footnote.

A key objective of the guide is to create awareness about the importance of effective IP asset management in the success of business strategies of small- and medium-sized land-holding farmers, breeders and growers; small and medium-sized input suppliers to the agri-food sector; small and medium-sized agri-food processors; small and medium-sized agri-food packaging manufacturers and suppliers; small and medium-sized agri-food traders (wholesalers, distributors, exporters, importers); small and medium-sized agri-food retailers; other small and medium-sized agri-food supply/value chain/network participants such as agri-food input suppliers; agri-food machinery suppliers, agri-food logistics providers; and others.

This guide provides an overview of the agri-food sector and the IPR system and their interrelationship. Directly or indirectly, it seeks to address the basic IP-related awareness-raising and capacity-building needs of all small and medium sized stakeholders in the agri-food supply, value chain, web or network, irrespective of whether they operate in the informal or formal markets or in the local, domestic, regional or international and global markets, whether they are in the government, private, university, R&D or Non-Governmental Organizations (NGOs), civil society, and whether they are in the traditional, alternative or modern agri-food sector. Most of them, however, may not have access to this publication or the time required to read and understand it.

This guide could serve as the basis for a course module for introducing basics of IP asset management to university undergraduate and graduate degree programs. This could be done in courses on agricultural marketing, agricultural innovation and new product development, agricultural economics, agribusiness management and business studies, including the strategic management of farms and other agri-food enterprises.

The guide provides a high-level overview of the role of effective management of assets protectable by IPRs in enhancing the effectiveness of marketing, innovation, entrepreneurship and new product introductions for improving the competitiveness¹⁷ of small- and medium-sized farms and other types of agri-food SMEs. For this reason, it will also be very useful for the following:

- policymakers, managers, teachers and trainers in agribusiness extension, training and R&D institutions;

¹⁷ Competitiveness is the ability to achieve and maintain a competitive edge over market rivals through an optimal combination of efficiency, product differentiation and access to new or niche markets.

- food science and technology institutions;
- agri-food incubators;
- agri-food marketing/branding consultancy organizations;
- agri-food business advisory services;
- agri-food innovation brokers/intermediaries;
- agribusiness development service providers;
- development aid providers who provide funds and services to build capacity, provide training or otherwise build knowledge, skills and expertise in different aspects of managing a farm or an agribusiness;
- other agri-food support institutions such as agri-food technopoles, clusters and inter-professional bodies;
- agri-food financing institutions;
- not for profit agri-food institutions; and
- farmers' organizations (such as agri-food cooperatives), and other NGOs/interest groups and lobbies in the agri-food chain and networks.

In fact, any one in government, the private sector and civil society promoting the growth of the agri-food sector should be able to make use of the guide to develop a meaningful and practical understanding of the importance of IP asset management in (1) safeguarding the fruits of innovation, marketing or branding and entrepreneurship from free-riders; and (2) extracting added value through innovation, marketing or branding and entrepreneurship by earning well-deserved profits in the agri-food markets, which are essentially called upon to reinvest in further endeavors of innovation, marketing or branding and/or entrepreneurship.

1.3 Structure of the guide

The guide has four chapters and seven annexes as outlined below; for detailed structure the reader should consult the sub-headings in the Table of Contents that covers the four chapters in the main guide plus its seven annexes.

Chapter 1 explains the purpose, defines the target audience and outlines the structure of the guide.

Chapter 2 provides some salient snapshots of the historical context of the different types of IPRs with particular reference to agriculture and germplasm or seeds. This chapter introduces the different types of IPRs with examples from the agri-food sector. To the extent possible, examples from agri-food SMEs have been chosen. For more case studies, which are updated frequently, visit the WIPO website IP Advantage at <http://www.wipo.int/ipadvantage/en/> and do an advanced search under Industry for the key words "Beverages", "Farming and Fishing" and "Food Products". It also analyses plant breeding, access to seeds, control of breeders over plant varieties, farmer's right to save, use, exchange and sell versus farmer's privilege to save and reuse seeds.

Chapter 3, the bulk of the guide, describes the different types of IPRs of relevance to the agri-food SMEs.

Chapter 4 focuses on some of the key issues in leveraging and managing IPRs. It devotes particular attention to licensing, franchising and enforcing IPRs and on using IP assets as an instrument for raising capital. It describes how IPRs may be

effectively exploited by small- and medium-sized farms and agri-food SMEs while entering into diverse types of commercial agreements with third parties, such as licensing and franchising contracts. It also explains how the ICT environment (internet and e-commerce) may be exploited individually or collectively by small- and medium-sized farms and other agri-food SMEs for direct marketing and/or finding new distribution channels. Finally, it provides an overview of the different ways in which small- and medium-holder farmers and agri-food SMEs can use IPRs as an instrument for raising capital (e.g., securitization, collateralization) and for private funding through business angel networks and venture capitals.

Annex 1 provides the historical context of food and agriculture. It paints a broad-brush picture of the historical evolution of agriculture and food in a worldwide context. While doing so it touches upon the history of settled agricultural communities, the domestication of plants and animals, the industrial revolution, factors of production, industrial agriculture, the green revolution, population growth, trends in dietary shifts with urbanization, the impact of modern GE, the evolution of markets, the role of the modern ICT environment, the consequences of globalization, poverty, subsistence agriculture and access to food, the importance of biodiversity and sustainability of agriculture. It also defines and explains the basic terms, concepts and issues. Those interested in worldwide food and agriculture prospects, including fisheries and forestry from 2015 to 2030 should visit the FAO publication at the link. It presents the global long-term prospects for trade and sustainable development and discusses the issues at stake in these areas for the next 30 years.¹⁸ The 2012 revision of this document can also be found at the linked page.¹⁹ For a World Bank focus on agriculture, see the documents at the linked page.²⁰

Annex 2 outlines the remit of the agri-food sector and, in particular defines F&B supply chains and value chains. Overall, the thrust of the chapter is definitional.

Annex 3 provides snapshots of diverse facets of the agri-food sector in a global context. It especially looks at the multiple dimensions of complexity, risk, and the regulatory environment, including the international trade environment.

Annex 4 focuses on the different types of innovations that undergird the competitiveness of different components and stakeholders in agri-food value chains.

Annex 5 deals with the evolution of modern global FSCs and the alternatives that seek to address the negative fallout of these chains.

Annex 6 brings out the key elements of the enabling environment needed for the success of the agri-food SMEs in the era of global FSCs. It also analyses the role of the IP system as a factor of the enabling environment, including the management of IPRs by NAROs/NARIs.

¹⁸ World Agriculture: Towards 2015/2030, An FAO Perspective; Edited by Jelle Bruinsma; http://www.fao.org/fileadmin/user_upload/esag/docs/y4252e.pdf.

¹⁹ World Agriculture: Towards 2030/2050, The 2012 Revision, Nikos Alexandratos and Jelle Bruinsma, Global Perspective Studies Team, ESA Working Paper No. 12-03, June 2012, Agricultural Development Economics Division, FAO, Rome; www.fao.org/economic/esa and <http://www.fao.org/docrep/016/ap106e/ap106e.pdf>.

²⁰ Agriculture, The World Bank, IBRD-IDA, Working for a World Free of Poverty; <http://www.worldbank.org/en/topic/agriculture>.

Annex 7 considers the challenges posed by a highly competitive business environment, the nature of competitive advantage and the importance of innovation in marketing. It analyses some of the key aspects of marketing and branding and how these are linked to different types of IPRs, with examples and case studies from the agri-food sector.

Each of the Annexes also has a number of examples and case studies that dwell, where relevant, on different innovations and their relationship with one or more types of IPRs.

2. Historical Context of the Intellectual Property (IP) System

Compared with the historical timeline of the evolution of the agri-food sector of some 10,000 years, the history and evolution of the IP system spans a much shorter period, of about 500 years. The focus of this chapter is on the needs and concerns of the agri-food sector.

At the outset, it should be noted that even in developed countries the IP system is at most six centuries old and that not much is known about it in the period prior to the industrial revolution.²¹ The modern IP system is based on the western conception of private property, where the creator is the owner of what he or she creates, which is considered valuable by virtue of it being considered to be new, original, unique, special or innovative in a particular temporal or geographical context. It presupposes division of labor in a private-sector oriented market economy. Its historical roots are firmly planted in the industrial revolution in Europe, the United States and a few other developed countries. Since then, driven mainly by technological advancements, the IP system has evolved considerably in its local, national, regional or international contexts.

Throughout its history, the IP system has been an institutional mechanism to provide incentives and rewards to risk-takers and entrepreneurs who benefit from the temporary exclusivity provide by IPRs, while society in turn benefits from new and improved products. The design of the IP system is such that it does not consider, evaluate or differentiate the protected creations in terms of their likely impact being incremental, revolutionary or disruptive in their respective markets.

IPRs are property rights in general. The owner of an IPR has the following type of rights: the right to use it in her/his own business, to let others use it for a defined purpose for an agreed monetary or non-monetary consideration, to sell it, otherwise transfer, gift, mortgage, license, to lease or rent it, to abandon or to destroy it.

Any of these enumerated means can be used by IP rightholders to provide these rights simultaneously to many people, because IPRs are intangible.

Most types of IPRs can be parceled, subdivided, or shared in part or whole in multiple ways in time, place and person. This provides, at least in theory, a very large number of options for simultaneous use by their owners or others, thereby generating multiple streams of revenue at a given point in time. At the same time, theft or loss of an IPR may be difficult to ascertain as an IPR is not lost by any physical dispossession; given its intangible nature, an IPR can be stolen without necessarily taking the physical object that it may be attached to, whether it is a living thing or an inanimate object.

Today, the IP system is essentially a formal legal system which seeks to promote creativity and innovation by human beings working individually or in teams. This has

²¹ A period of major industrialization that took place during the late 1700s and early 1800s. The Industrial Revolution, beginning in Great Britain, quickly spread throughout the world. It saw the mechanization of agriculture and textile manufacturing and a revolution in power (i.e., steam ships and railroads) and had a massive effect on social, cultural and economic conditions; <http://www.investopedia.com/terms/i/industrial-revolution.asp>.

been done mostly by enacting national IP laws for protecting the fruits of human intellectual labor. This legal protection is limited in time and geography and the legal rights attached to an IPR can be enforced by their holder in a local, national or regional law court. The IPR system simultaneously seeks to balance the rights of the individual or team that has created something new and useful with the right of others who may benefit from the original, creative or innovative output of the human mind.

In most developing countries, the IP system is generally less than 100 years old; in quite a few LDCs, it is only 50 years old or less. In a historical context, despite continuing concerns regarding enforcement, the most impressive national progress in development and use of the national IP system has been that of China, which has covered a huge distance over a period of some 40 years, beginning in the early 1980s.

Worldwide, the IP system has been evolving rapidly, especially in the last 20 years. In developing countries, the pace of evolution picked up after the TRIPS Agreement of the WTO came into force in 1994. Evolution continues, willy-nilly, in the wake of a significant number of regional or bilateral Free Trade Agreements (actually Preferential Trade Agreements) among and between developed and developing countries containing IP provisions which seek to make the IP system of the developing country partner(s) as strong as that of the developed countries, by requiring changes beyond those required by the TRIPS Agreement. These additional changes are labeled "TRIPS-Plus".²² Some of these provisions pertain to the protection of new plant varieties and modern biotechnology and, therefore, affect on-farm agri-biodiversity preservation, food security and R&D/innovation in the agri-food sector. The first type of TRIPS-plus terms make otherwise voluntary accession to international IP conventions mandatory. More precisely, in relation to food and agriculture, such TRIPS-plus provisions include the elimination of an option for Members under the TRIPS Agreement (such as an obligation to protect plant varieties "only" through the UPOV system 1978/91).^{23,24}

²² The Agreement on Trade-Related Aspects of Intellectual Property Rights of the World Trade Organisation (WTO). (TRIPS) substantially changed the international intellectual property regime by introducing the principle of minimum intellectual property standards. In effect, this principle means that any intellectual property agreement negotiated subsequent to TRIPS among and/or involving WTO members can only create higher standards – commonly known as "TRIPS-plus". The TRIPS-plus concept covers both those activities aimed at increasing the level of protection for rightholders beyond that afforded by the TRIPS Agreement and those measures aimed at reducing the scope or effectiveness of limitations on rights and exceptions. Such intellectual property rules and practices have the effect of reducing the ability of developing countries to protect the public interest and may be adopted at the multilateral, plurilateral, regional and/or national level; see p. 4 of "Multilateral agreements and a TRIPS-plus world: The World Intellectual Property Organization (WIPO)" by Sisule F Musungu and Graham Dutfield at http://www.iprsonline.org/ictsd/docs/WIPO_Musungu_Dutfield.pdf and "Regional and bilateral agreements and a TRIPS-plus world. The Free Trade Area of the Americas" (FTAA) by David Vivas-Eugui at <http://www.quno.org/resource/2003/8/regional-bilateral-agreements-and-trips-plus-world-free-trade-area-americas-ftaa>.

²³ http://www.wto.org/english/tratop_e/region_e/sem_nov03_e/vivas_eugui_paper_e.pdf.

²⁴ Prior to the enactment of the TRIPS Agreement in 1994, the international intellectual property framework consisted of a variety of international treaties and organizations governing numerous areas of intellectual property. WIPO, a specialized agency of the UN, facilitates international protection through the administration of 24 treaties, including the Paris Convention for the Protection of Industrial Property (the Paris Convention) and the Berne Convention for the Protection of Literary and Artistic Works (the Berne Convention). These principal agreements formed the foundation for TRIPS

At the international level, the history of the multilateral IP system goes back a little over 125 years.²⁵ The core international system of IP protection, linked to WIPO, UPOV and the WTO does not have provisions for rewarding farmers, local communities and indigenous peoples for their roles in conserving and providing the genetic resources used by scientists and breeders to develop the new IP-protected varieties and other products using agricultural biotechnologies or other means. Neither do they protect farmer-bred varieties (i.e., “traditional” and more informal communal systems of innovation by farmers and indigenous communities). These concepts are covered under some multilateral biodiversity agreements (the CBD, particularly Articles 12 and 16, and the ITPGRFA). The countries concerned must address these concepts in their national legal systems in ways that are both consistent with international trade agreements and between different pieces of legislation. How they do this – through biodiversity or PVP laws or other instruments – is also a matter of some controversy, but is outside the scope of this Chapter and also of this Guide.²⁶

Enforcement of IPRs at the international level remains the responsibility of the rightholders concerned; only disputes between countries concerning implementation of their international obligations under the TRIPS Agreement can be adjudicated in the WTO’s dispute settlement system. The dispute settlement system covers, of course, the subject matter under the whole range of WTO agreements, including disputes concerning agri-food products (such as alcoholic beverages, bananas, butter, canned fruits, dairy products, dessert apples, meat and meat products, oil seeds, salmon, sardines, scallops, shrimps, starch and potato flour, wheat gluten, and so on).²⁷

In all countries, over time, the nature, scope and duration of different types of IPRs have evolved markedly. New types of IP rights have been created (such as PBRs over new varieties of plants) or new rights have been created under existing types of IPRs. The type of subject matter protectable by different types of IPRs has also undergone expansion. In the agri-food sector, it is important to note that even in the developed countries, the history of patenting of biotechnological inventions is much shorter than that of patenting physical, chemical, electrical, electronic inventions; this is directly linked to technological progress in genetic engineering techniques at the genome level. Even today, for moral, ethical or safety reasons, patents for

negotiations. The text of the TRIPS Agreement incorporates certain substantive provisions found in the Paris Convention and the Berne Convention and makes these provisions enforceable under the WTO Dispute Settlement Mechanism. Hence, WTO members are obliged to comply with the standards found in these conventions regardless of accession to the particular conventions. WIPO classifies intellectual property conventions into three categories. First are those agreements that contain substantive intellectual property standards; these include the WIPO Copyright Treaty, the WIPO Performances and Phonograms Treaty, and the International Convention for the Protection of New Varieties of Plants (the UPOV Convention). Accession to the WIPO treaties is less consequential since the TRIPS Agreement builds on many of the treaties’ substantive provisions, whereas accession to the UPOV Convention entails conforming national plant variety protection (PVP) laws to a specific system; see pp. 20 and 21 of <http://nyujilp.org/wp-content/uploads/2012/04/42.3-Lindstrom.pdf>.

²⁵ WIPO – A Brief History at <http://www.wipo.int/about-wipo/en/history.html>.

²⁶ See pp. 10-11 of *Biotechnologies for Agriculture Development*, FAO, 2011, <http://www.fao.org/docrep/014/i2300e/i2300e09.pdf>.

²⁷ Bruce Wilson, *Dispute Settlement System Training Module*, Legal Affairs Division, World Trade Organization, November (2003), http://www.wto.org/english/tratop_e/dispu_e/dispu_settlement_cbt_e/intro1_e.htm.

inventions pertaining to plants or animals are available in very few developed countries.

Despite divergent national needs and concerns, there has been progressive harmonization and standardization of the basic features of all types of IPRs across countries internationally as well as in geographical or economic regions. Despite this harmonization, many uncertainties persist at the operational level. For example, research and experimental use exemptions are extremely varied in different national patent and plant variety laws.

In developed countries, the national system for protection of new plant varieties is fairly recent, about 50 years old, while in developing countries it has been mostly created in the last 20 years. At the international level, therefore, it is the least harmonized of all the different types of international IPR systems.²⁸

Logically, the evolution of the IPR system at the national, regional and international levels should continue unabated as, with technological advances and increasingly closer social, cultural and economic linkages across national boundaries, new needs, new concerns and new stakeholders will continue to arise and also because, for political reasons, there would be an ever-evolving need to rebalance conflicting interests within and across countries. Establishing a new or modifying an existing national IP law or a regional or international IP treaty and putting it into practice are separate but interrelated challenges. These challenges have been made more complex as all three – agriculture, industry and IP – have been heavily impacted by the ongoing ICT-driven information and service revolution. As a result the concepts of “value” and “value” creation has undergone a paradigm shift in the so-called service-led economy, information-led economy, digital-led economy or the knowledge-led economy of the 21st century.²⁹

From an integrated perspective encompassing the agri-food sector and the IP system, the interests of the small holder farmer and agri-food SMEs seem to be most easily served when they are able to leverage the local/regional geographically driven tool in the IP toolbox, namely, the system of Geographical Indications (GIs) in their business, marketing and branding strategies. Unlike other types of IPRs, GIs,

²⁸ Philippe Cullet, *Ibid.*, <http://www.ielrc.org/content/a0101.pdf>.

²⁹ After the very long cycle (about 10,000 years) of societal and economic development based on agriculture, followed by a short cycle in which the industrial revolution became the prime mover (for less than 3 centuries), the world has entered a phase marked by the growing and determining importance of service activities (both monetarized and non-monetarized). This transition is a key to understanding many of the current “crises” confronting humanity and to benefitting from and promoting emergence of a new era in human development. The right starting point is to redefine the notion of value on which the Wealth of Nations is now more and more based. This is not simply a technical issue concerning the growth of services over purely industrialization processes. It implies a fundamental change. In a modern service economy, the production of value starts long before the actual point of manufacturing with fundamental research, continues through numerous stages of technological and social process, and extends beyond the time of sale through a prolonged period of utilization of products and systems – the true basis for measuring added value), and finally ends with waste disposal (a negative value). All this happens during a period of time largely based on uncertainty and management of all sort of risks (foreseeable and unforeseeable). From this perspective, all the pretensions of classical economics to generate and measure value based on the idea of static equilibrium appear more and more antiquated and inadequate. Prices and costs must be estimated based on hypotheses including the future; Abstract of article entitled, “New Paradigm in the Service Economy The Search of Economics for Scientific Credibility: In between Hard and Soft Sciences” by October 19, 2014 by Orio Giarini at <http://www.cadmusjournal.org/node/433>

for all practical purposes, are owned only in a collective manner. Collective organization of farmers and the link of GIs to geography enable branding based on territory of origin. The growing importance of local, regional or organic agri-food products makes this especially interesting in the context of encouraging rural development through such value-added agri-food products for the cities.

2.1 Nature of IP and its different types

Nowadays, IP is usually divided into two branches; (i) “industrial property” and (ii) “copyright and the rights related to, or which neighbor upon, copyright”. The principal categories of industrial property are: *patents, trademarks, geographical indications, industrial designs and trade secrets*.

According to the *Paris Convention for the Protection of Industrial Property*,³⁰³¹ industrial property is to be understood “in the broadest sense” and to apply “not only to industry and commerce proper” but also to “*agricultural and extractive industries and to all manufactured or natural products*” including “*wines, grain, tobacco, leaf, fruit, cattle, minerals, mineral waters, beer, flowers and flour*”. In the 19th century, the legal framework of copyright, patents and trademarks evolved to take its modern form. This happened mostly in a number of developed countries, at a time when Europe and North America were in the midst of rapid industrialization. This indicates its close link to the industrialization process, of which a key feature was the mass industrial production of identical manufactured items. Industrial agriculture has many of the features of this *mass industrial production paradigm* of identical items produced by agricultural means.

³⁰ Summary of the Paris Convention for the Protection of Industrial Property (1883) at http://www.wipo.int/treaties/en/ip/paris/summary_paris.html

³¹ Summary of the Paris Convention for the Protection of Industrial Property (1883) at http://www.wipo.int/treaties/en/ip/paris/summary_paris.html.

Box 2.1: Key basic definitions of different types of IP

Trademarks: A trademark, or simply a mark, is a sign capable of identifying and distinguishing in the marketplace the products and services of one enterprise from those of its competitors.

Geographical Indications: A geographical indication is a sign used on goods that have a specific geographical origin and possess qualities or reputation that are entirely or essentially due to its specific place of origin.

Trade Secrets: In general, a trade secret is any type of information which derives commercial value from the mere fact that it is held confidential. It qualifies for trade secret protection, provided it satisfies the following criteria:

- *Competitive advantage:* the information provides the enterprise with some value contingent on it remaining a secret and/or shared in confidence on a “need to know” basis;
- *Secrecy:* the information is confidential; it is not generally known or ascertainable by proper means; and
- *Reasonable Measures:* the owner/holder of the information has taken all measures or precautions which are considered to be reasonable in the given context for keeping the information secret or confidential.

Patents: A patent is an exclusive right granted by the government for an invention that is new, involves an inventive step and is capable of industrial application. The owner of a patent has the exclusive right to exclude or stop others from making, using, offering for sale, selling or importing a product or a process, based on the patented invention. A patent provides the owner of the patent protection for the invention for a period of 20 years from the date of filing the patent application at the relevant government office.

A utility model or a petty patent is similar to a patent, but the requirements for acquiring protection are less stringent and the protection is much cheaper to obtain and to maintain. On the other hand, the term of protection is much shorter than under a patent (from 5 to 10 years).

Plant Breeders’ Rights (PBRs): PBRs, also known as plant variety rights (PVRs), are rights granted to the breeder of a new variety of a plant if it is new, distinct, uniform and stable.

Copyright: Copyright refers to the bundle of rights of creators over their literary and artistic works. Works covered by copyright range from poems, books, songs, music, paintings, drawings, sculptures, photographs, architecture, plays, advertisements, maps and films, to computer programs, original databases, technical documentation and technical drawings. In most countries, a copyrighted work is protected for the length of the author’s life plus a minimum of another 50 years. Most copyright laws state that the author or rights owner has the right to authorize or prevent certain acts in relation to a work. The rights owner of a work can prohibit or authorize its:

- reproduction in various forms, such as printed publication or sound recording;
- public performance, such as in a play or musical work;
- recording (“fixation”), for example, in the form of compact discs or DVDs;
- broadcasting, by radio, cable or satellite;

- translation into other languages; and
- adaptation, such as a novel into a film screenplay.

A field of rights related to copyright has rapidly developed over the last 50 years. These related rights grew up around copyrighted works, and provide similar, although often more limited and of shorter duration, rights to:

- Performing artists (such as actors and musicians) in their performances;
- Producers of sound recordings (for example, cassette recordings and compact discs) in their recordings; and
- Broadcasting organizations in their radio and television programs.

Industrial designs: An industrial design (or simply a design) is the appearance of the whole or part of a product resulting from the features (in particular, the lines, contours, colors, shape, configuration, texture and/or materials) of the product itself and/or its ornamentation.

Box 2.2: Theoretical basis of IP³²

Utilitarian theorists generally endorsed the creation of IPRs as an appropriate means to foster innovation, subject to the caveat that such rights are limited in duration so as to balance the social welfare loss of monopoly exploitation. Non-utilitarian theorists emphasized creators' moral rights to control their work. With the increasing importance of IP in society and the development of particular new technologies, most notably digital technology and the decoding of genetic structure, the theory of IP has attracted heightened interest. Economists and policy analysts have greatly enriched our understanding of the complex relationship between IP protection and innovation and diffusion of technological advances. Non-utilitarian theories of IP have proliferated in recent years, as philosophers and legal scholars have applied traditional and novel philosophical perspectives to the realm of IP.

When the theoretical domain is expanded beyond utilitarian analysis, as it is in some patent contexts and most other areas of IP, scholars have looked principally for parallel implications and conflict among competing philosophical justifications as a means of assessing justifications for particular IP rules and institutions. This pragmatic approach (Kaplan, 1967) rarely produces intellectual tidiness, but is an essential aspect of justifying governance regimes in diverse social, political and economic cultures. Many factors are at work, which leads to rules that channel protection among modes of protection and varies the thresholds for and nature of protection within particular modes. As technology advances, the system continues to evolve, sometimes by new legislation, more often by the stretching and bending of existing rules. New technology commercialized in the past two decades, most notably the advent and diffusion of digital technology and new advances in the life sciences, portend deepening interest in the IP

³² For a detailed account, see, "Intellectual Property: General Theories" by Peter S. Menell, Professor of Law and Co-Director, Berkeley Center for Law and Technology, University of California at Berkeley, 60 pages, 1999; <http://encyclo.findlaw.com/1600book.pdf>.

system and scrutiny, reconsideration and reconceptualization of the theories justifying IP.

2.2 Snapshots of historical contexts of different types of IPRs

From a global perspective, like many other systems of socio-cultural and economic-technological regulation, the IPR system has a rich history which goes back only some five centuries although the legal framework of IPRs has evolved much faster in the last 130 years, and especially in the last 20 years.

Since their initial “creation”, the different types of IPRs have evolved, based on changing societal needs, although the changes have not always been synchronous with or satisfactory from the point of view of the diverse and often conflicting interests of different segments or members of a society or across societies (for example, in relation to international trade); it has always been challenging, and will remain so, to find a generally acceptable balance amongst competing economic, social, cultural, political and other interests at the national and international levels.

At any point in time, the prevailing socio-technological system is the outcome of the interaction and negotiation between various individuals, groups and countries espousing different, and often competing, preferences in regard to technological design and use. These actors and their behavior vis-à-vis the feasible technological options are shaped and influenced by multiple factors, such as economic interests, institutional roles, political and religious ideologies, social norms and cultural conceptions. Similarly, at any point in time, the prevailing economic-legal system is the outcome of a similar process. Since human beings and their groups are responsible for both systems, one system cannot be created in isolation from the other. Both systems are shaped and co-evolve as part of a common larger system.

Looking, therefore, from today’s perspective at the current form of different types of IP and the IPR system as a whole, it is impossible to imagine how things evolved (or, for that matter, will evolve hereafter) at the national, regional and international levels. To facilitate international trade and foreign direct investment, over the last 20 years in particular, there has been considerable progress in harmonization of different types of IP laws and systems at the regional and international levels. This has happened despite the divergent and often conflicting needs of individuals, groups or countries at different levels of economic development, and despite the awareness that a one-size-fits-all approach *prima facie* will not serve equally well the needs of these individuals, groups or countries. Hereafter, to gain a partial historical context, we look at some relevant facts from some national contexts for each of the major types of IPRs of selected countries from a factual, economic perspective only. But first we will examine some of the current major challenges facing the IPR system from a globalized economy perspective.

Box 2.3: Current challenges to the IP system in today's globalized economy³³

Operating at its best, the IP system brings us the fruits of humanity's limitless creativity and innovation, improving our lives and raising standards of living. But the system does not always function smoothly. In fact, IP is not a single global system, but a patchwork of systems created by each country. This poses a number of challenges in today's globalized economy:

- **Expense** – obtaining IP rights can be costly, particularly across multiple jurisdictions
- **Uncertainty in the law** – understanding what rights one has can be difficult
- **Variations in scope of protection** – jurisdictions differ significantly in the type and strength of protections offered
- **Unfair competition** – free riders exploit lax IP protections in certain jurisdictions or engage in other anti-competitive behaviors
- **Understanding the value of IP rights** – in all parts of the world, people unwittingly disregard or misuse IP rights
- **Inconsistency between IP systems** – differences in the rules for obtaining and enforcing IP creates confusion, contradictions, and economic risk
- **Enforcement challenges across borders** – the international flow of goods and services can thwart enforcement mechanisms
- **Lack of access to IP protection** – barriers such as education, resources, transparency, and legal regimes prevent many from pursuing their creative potential
- **Increasing fragmentation of rights** – global distribution is hampered by ownership differences across jurisdictions
- **Lack of market transparency** – commercialization and use of IP can be inefficient without enough transparency on pricing and availability
- **Slowness of IP laws to adapt** to new technologies and consumer services
- **Risk that IP rules are adapted to protect existing business models at the expense of innovation**
- **Improvidently granted IP rights that impede market development**

2.2.1 Patents

The first patent system was given formal shape in Venice in 1474. The preamble of the Venetian patent statute of 1474 states a governmental policy: encouraging invention by making it unprofitable for infringers to copy the invention “and take the inventor’s honor away”. The concept expressed in the preamble of the Venetian patent statute struck a responsive chord in countries outside of Italy, where many rulers believed that, by attracting or stimulating more invention and innovation, they could “encourage the development of new industries within their realms”. But the first British patent law came into being only in 1623.

³³ “Intellectual Property, Vision 2030, creating the world’s IP system of the future”, World Economic Forum, (2012), pp. 1-6, http://www3.weforum.org/docs/WEF_GAC_IntellectualPropertyVision2030_2012.pdf.

In continental Europe, France was the first country to adopt in 1791 a short-lived patent law which sought to create a true private right as the incentive for encouraging individuals to create new inventions. Most other developed countries established their patent laws between 1790 and 1860. In England, the process of ruling on petitions or applications for patent, which underwent no major changes in substance for three hundred years from about 1550 until 1852 – was first in the hands of the Law Officers and later, after 1852, in the hands of the British Patent Office. Thus, this process was beyond the reach of any English judge until 1932, when the appeal route to the Patent Appeals Tribunal was created.³⁴

On the American continent, legislation and administrative practice – as opposed to royal discretion – dominated the development of patent law from the outset. The Statute of Monopolies was in effect several years before any patent statute was enacted in any American colony and the colonial patent statutes were, in any event, general laws of general availability to individuals. In 1641, the Colony of Massachusetts adopted what many believe to be the first of these general patent statutes and for the rest of the seventeenth and much of the eighteenth centuries, several other colonies followed the example set by Massachusetts. By the time of the drafting of the Articles of Confederation in 1777, patents on new inventions were being granted by several of the state governments with some regularity. Upon adoption of the United States Constitution, the U.S. Congress was authorized to create a national patent law. The First Congress turned its attention to the drafting of the first U.S. Patent Act not long thereafter, and the result was the Act of 1790. Insofar as the delegates to the Constitutional Convention and the First Congress looked to the past, they could not help but find more to guide them in American history (almost 150 years of patent law and practice) than in English history.³⁵³⁶

In the past, many countries excluded food products from the purview of patentability; for example, the Austrian patent law of August 1852 excluded preparations of food, beverages and medicines from patentability. Similarly, under the 1877 German Patent Law, patents could not be obtained for food products, pharmaceuticals or chemical products, although the process through which such items were produced could be protected. The Japanese patent law of 1886 also did not provide for patents for food products. Under the 1921 Japanese patent law, medicines, food and chemical products could not be patented, but protection could be obtained for processes relating to their manufacture.³⁷

Under the Patent Act of 1970 of India, “a method of agriculture or horticulture” is not an invention and, therefore, is not patentable. Furthermore, Section 5 of the law provides that inventions claiming substances intended for use, or capable of being used, as a

³⁴ Thomas M. Meshbeshar, *Ibid.*
<http://www.compilerpress.ca/Library/Meshbeshar%20Role%20of%20History%20in%20Comparative%20Patent%20Law.%20JPTMO.%201996.htm>.

³⁵ Thomas M. Meshbeshar, *op. cit.*

³⁶ Thomas M. Meshbeshar, *op. cit.*

³⁷ B. Zorina Khan, *op. cit.*

food, medicine or drug or relating to substances prepared or produced by chemical processes are not in themselves patentable, but methods or processes for their manufacture are. Under Section 2(1)(l)(iv) of the 1970 Patent Law of India, the term “medicine or drug” includes insecticides, germicides, fungicides, weedicides and all other substances intended to be used for the protection or preservation of plants. Nowadays, however, in most national patent laws, processes for production of food and food products *per se* are patentable subject matter.

In the agri-food sector, patents are important for not only R&D institutions and innovations in seeds, plants and animals, but also for manufacturers of innovative agrochemicals, innovative agricultural equipment and machinery, innovative food processing machinery and equipment, innovative equipment, tools and kitchen appliances for baking, cooking, etc.

In the United States, the European Union, Japan, the Commonwealth of Australia and New Zealand and most other developed countries, inventions pertaining to plants and animals can generally be protected *per se* by patents, as can their various uses and methods of treatment. However, national laws governing the patentability of plants and animals vary significantly among countries.³⁸

According to a recent study, major concentrations of patent protection in food and agriculture include.³⁹

- biocides and insecticides;
- genetic modifications of both plants and animals;
- farming machinery;
- food topics;;
- irrigation
- crops and plant *cultivars*; and
- animal husbandry, animal products and pets.

³⁸ Standing Committee on The Law of Patents, Thirteen Session, World Intellectual Property Organization, February (2009); http://www.wipo.int/edocs/mdocs/scp/en/scp_13/scp_13_3.pdf.

³⁹ See p. 30 of KACST, “Strategic Review of the Agriculture Technology Landscape”, Thomas Reuters, October (2013); <http://www.kacst.edu.sa/en/about/publications/Other%20Publications/STRATEGIC%20REVIEW%20OF%20THE%20AGRICULTURE%20TECHNOLOGY%20LANDSCAPE.pdf>.

Box 2.4: Shaping the future⁴⁰

While the impact of patents on traditional plant breeders is currently limited, it is fair to assume that the progress of science in breeding will lead to an increasing number of patents, which in turn may decrease breeders' *freedom to operate*⁴¹ (FTO). *Under PVP, infringement is essentially caused by what a breeder does, whereas under patent law, it is caused by what a breeder uses.* In contrast to the PVP regime, a patent infringement can occur "accidentally" and even unintentionally without using a competitor's variety.

While FTO diligence is common in all areas of technology, it requires a change in the ways breeders work. For example, breeders will need to place greater emphasis on building legal and IP capabilities, monitoring FTO and *IP landscapes*^{42,43,44} filing for oppositions and negotiating licenses. Avoiding these changes by calling for the abandonment of patents in this area is a short-sighted solution that will have unintended consequences for innovation. Abandoning patents is akin to "killing the goose that lays the golden egg." Current technology may become freely available, but there will be no incentive for future innovation.

⁴⁰ Refer p. 3 of Dr. Michael A. Kock, *Adapting IP in an evolving Agricultural Innovation Landscape*, WIPO, (2013),

<https://www.syngenta.com/global/corporate/SiteCollectionDocuments/pdf/publications/media/inthedia/wipo-article-april-2013.pdf>

⁴¹ Freedom to operate (FTO), a simple and straightforward concept, means that for a given product or service, at a given point in time, with respect to a given market or geography, no IP from any third party is infringed. But to translate this concept into a productive strategy for companies and for public sector institutions alike is not so straightforward. One of the underlying "technologies" for conducting an FTO analysis is the patent search. Although FTO is often viewed as simply a legal issue, when approached from a more practical product-development perspective, FTO is a strategic risk-management tool; it relies on a synthesis of scientific and legal expertise, business development, and strategic planning. FTO for a given product in a given market is difficult to achieve because it can never conclusively be established. Obtaining FTO, therefore, becomes a strategy, or even a position, mindset, or culture. This is because the patent landscape is dynamic: new patents issue; old patents expire; some patents are abandoned. Therefore, freedom to operate does not imply absolute freedom from the risk of infringing another party's IP. Whether or not FTO exists is an assessment based on the analysis and knowledge of IP landscapes for a given product, in a given jurisdiction, at a given point in time. This statement underscores a critically important principle: there can be no risk-free decision; <http://www.iphandbook.org/handbook/ch14/>.

⁴² A patent landscape is a survey of patent and non-patent literature that seeks to answer one or more business objectives. The parameters of the patent landscape are really defined by the individual objectives of the patent landscape study/project. The patent landscape study also includes a report that can vary in length and content, but an average report will likely include an executive summary of results and recommendations, a description of the search strings used to locate the data, and visualizations of statistical trends in charts and graphs. Patent landscape studies can be used for competitive intelligence gathering (as to what type of R&D competitors are doing) and to identify new areas for R&D as a patent landscape study can help identify the "white space" in a technology field; <http://intellogist.wordpress.com/2011/08/23/interview-with-matthew-luby-how-to-define-a-patent-landscape/>.

⁴³ As CRISPR-Cas9 Technology Sets to Take Off, Uncertainty Swirls Around IP Landscape at <https://www.genomeweb.com/rnai/crispr-cas9-technology-sets-take-uncertainty-swirls-around-ip-landscape> and

http://www.wipo.int/patentscope/en/programs/patent_landscapes/published_reports.html.

⁴⁴ As CRISPR-Cas9 Technology Sets to Take Off, Uncertainty Swirls Around IP Landscape at <https://www.genomeweb.com/rnai/crispr-cas9-technology-sets-take-uncertainty-swirls-around-ip-landscape> and

http://www.wipo.int/patentscope/en/programs/patent_landscapes/published_reports.html.

Moving towards inclusion

Thus, the plant breeding industry and legislators face a dilemma: without IP, companies lack the incentive to take the risks necessary for successful innovation; without broader access to technology, the innovation life cycle and development of integrated solutions will be hampered.

IP is a tool developed by society to foster innovation. In and of itself, it is neither good nor bad. It is the way in which it is used that determines whether it has a constructive or a destructive impact. The current negative perception of the patent system arises primarily from its use to exclude others. However, patents can also be used in a positive, constructive way, for example, to foster licensing and technology exchange. The key challenge is in re-calibrating the use of the patent system to maximize its benefits (by preserving incentives for innovation and knowledge sharing) while minimizing any limitations in terms of access. Such change will only be possible by adopting an approach that moves away from using IP as a means for exclusion towards its use as a means for inclusion.

2.2.2 Safeguarding the interests of plant breeders; role of patent law and of *sui-generis* law for protection of new plant varieties

Until a few decades ago, plant breeding was an empirical science based on trial and error. Today's plant innovations are developed using sophisticated science and technology, including cell biology, genome and proteome research, gene mapping, marker-assisted breeding and hybridization. Developing new crop varieties is a lengthy and costly process, with plant science companies investing approximately 15 per cent of their annual turnover in seed-related R&D activities. The development of beneficial traits is expensive, time-consuming and risky: even for non-GM traits, it can take 8-10 years and many millions of euros to bring them to market. Since the resulting seed products can be easily reproduced by farmers and "copied" by competitors, some form of enforceable commercial protection is required – otherwise, private companies would have no incentive to make such investments.⁴⁵

In the first half of the 20th century in Europe and the United States in particular, there was widespread debate as to how to protect the interests of plant breeders, as at that point in time it was not possible to apply the criteria of the patent system to plants. The 1930 Plant Patent Act (United States) was the first patent act for plants internationally but it covered only asexually⁴⁶ reproduced *cultivars* (except tubers); thus, for example, it covered plant breeding based on vegetative propagation (division, cuttings, grafting,

⁴⁵ Dr. Michael A. Kock, "Adapting IP in an evolving Agricultural Innovation Landscape", WIPO (2013); <https://www.syngenta.com/global/corporate/SiteCollectionDocuments/pdf/publications/media/inthemedial/wipo-article-april-2013.pdf>.

⁴⁶ Asexual propagation is the production of plants using the vegetative parts of a plant. Vegetative parts include stems, leaves, roots, bulbs, corms, tubers, tuberous roots, rhizomes, and undifferentiated tissue often used in micropropagation. Propagation by division, cuttings, layering and grafting are all forms of asexual propagation. Although many plants can be propagated by at least one asexual method, there are some that cannot, for one reason or another.

budding), hybridization, spore or mutation. This supported increased investment in R&D in various hybrid crops such as corn, soft-fruits and trees.

During the 1940s and 1950s, in Europe a number of states developed PBRs that accommodated and protected varieties of plants that reproduced sexually. Case law in Italy (1948-1950) established new plant varieties as “industrial results” enabling their protection through patents. *Until 1958, there was no internationally agreed definition of a “plant variety”; in 1958, the International Code of Nomenclature for Cultivated Plants agreed on an acceptable definition for a cultivar:*

*“an assemblage of cultivated individual which is distinguished by any character (morphological, physiological, cytological, chemical or other) significant for the purpose of agriculture, forestry, or horticulture, and which, when reproduced (sexually or asexually), retains its distinguishing feature”.*⁴⁷

Modern plant breeding is a long-term and expensive activity. In general, the period from first cross to obtaining commercial seed is around 8-12 years. The aim of PBR legislation is to encourage investment in plant breeding by facilitating the control of, and the collection of royalties from, new *cultivars*. In most countries, under national legislation for protection of new plant varieties, royalties are paid for the use of cultivar/seed, on certified seed supplied by seed multipliers (agricultural merchants) and on farm-saved seed (seed that is saved by a farmer from his own harvest to be re-sown on his own holding).

The late emergence of PVP in the IPR arena is probably attributable to the nature of institutional arrangements required for the application of IPRs to a self-reproducing biological invention/innovation. Given the “public good” characteristics of plant variety inventions and innovations and the difficulties faced by plant breeders in appropriating returns from their inventions and innovations, the public sector dominated plant breeding for a long period. Increasing private sector participation in plant breeding, initially in the development of hybrid varieties of maize in the United States, provided the impetus for an IPR framework for plant varieties for encouraging innovation and private investment. *The emergence of PVP had also to be preceded by paradigm shifts regarding the applicability of IPRs to living materials.* PVP has become well-established in developed countries, but only over the last five decades or so. Until the early 1960s, PVP remained almost exclusively a feature of developed countries.⁴⁸ While developing

⁴⁷ Dwijen Rangnekar, “Tripping In Front of UPOV: Plant Variety Production in India”, Social Action-48(4) Oct-Dec (1998), pp. 432-451;

http://www.iatp.org/files/Tripping_in_Front_of_UPOV_Plant_Variety_Protec.htm.

⁴⁸ Until the 1960s, international law was silent with respect to PGRs. Subject to a few notable exceptions of national or colonial governments issuing edicts against exporting the planting material of particular species, PGRs were also largely ignored by national law (Fowler 1994). This situation started to change in the 1960s, with the UPOV Convention 1961 (later revised in 1972, 1978, 1991) which sought to harmonize approaches to PVP laws, but for a long time membership was limited to a small number of developed countries, mainly in Europe. In 1983, the FAO Council adopted the non-legally binding International Undertaking on PGRFA which proclaimed the “universally accepted principle that PGRs are a heritage of mankind and consequently should be available without

countries recognized the importance of variety improvement for agricultural productivity growth, they generally relied on research by public sector institutions at the national and international level for the development of new plant varieties. PVP or other forms of IPRs for plant varieties were not seriously considered as policy options for encouraging plant variety inventions and innovations. However, international efforts to harmonize IPR regimes across countries following from the international trade negotiations in the Uruguay Round have accelerated the spread of PVP systems across a whole range of countries.⁴⁹

Early PVP systems were eventually harmonized through the Convention for the Protection of New Varieties of Plants (Paris, 1961), which also established the Union for the Protection of New Varieties of Plants (UPOV). The UPOV system provides technical guidelines for standardized application procedures and specifies the scope and coverage of protection. The UPOV system was revised in 1972, 1978, and 1991, gradually strengthening breeders' rights by adding crop species, restricting farm-saving of seed, and extending the scope of protection. These adjustments were made in reaction to evolving circumstances in seed markets in industrialized countries.⁵⁰

The existing PVP systems largely reflected the economic structure and circumstances of agriculture prevailing in developed countries, particularly the OECD countries. The plant variety rights are still heavily biased to rich-country jurisdictions and heavily biased to higher-valued fruits, vegetables and ornamentals. The extent of formal IP rights pertaining to plants is on the rise in selected developing-country jurisdictions notably Brazil, China and India – but the vast majority of crops in the vast majority of developing countries are still subject to little, if any effective, legally sanctioned forms of IP protection, including PVP.

The Plant Variety Office for consumer plants was founded in Germany in 1949. Laws were passed in 1953 for PBRs and seed regulation of cultivated plants and the Plant Variety Office became an independent federal authority. Today, its functions are

restriction". Unsurprisingly, countries in favor of private appropriation of subsets of PGRFA through PVP laws refused to endorse the International Undertaking. To accommodate the hold-outs, in a remarkable about-face, the FAO Council adopted a resolution in 1989 which recognized the primacy of PVP law over the common heritage principle. Lingering discontent over this compromise, and the further extension of IPRs through the ongoing Uruguay Round of GATT negotiations (among other things), precipitated an additional FAO Council resolution, in 1991, which recognized that "nations have sovereign rights over their genetic resources". The recognition of countries' sovereign rights over genetic resources was amplified in the CBD (1993) and obligations for tracking, reporting and enforcing access and benefit-sharing agreements were recently adopted in the form of the Nagoya Protocol (The Protocol entered into force on 12 October 2014; as at Nov 27, 2014 it has 57 members; <http://www.cbd.int/abs/nagoya-protocol/signatories/>); <http://www.thecommonsjournal.org/index.php/ijc/article/view/412/353>.

⁴⁹ C. S. Srinivasan, "The International Trends in Plant Variety Protection", e JADE, FAO, Vol. 2, no.2, (2005), pp. 182-220; <http://ageconsearch.umn.edu/bitstream/110134/2/af139e00.pdf>.

⁵⁰ See p. 2 of Eaton Derek, Louwaars Niels and Tripp Rob, "Intellectual Property Rights for Agriculture in International Trade and Investment Agreements", issue 11, June (2006); http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2006/08/25/000310607_20060825_095554/Rendered/PDF/370360ARD0Note111IPR1Agri01PUBLIC1.pdf.

regulated by the PBRs Law of 1985 (last amended in 1997), by the German Seed Act (last amended in 2002) and related regulations.⁵¹

In the United States, the Plant Variety Protection (PVP) Act was passed on December 24, 1970. Its purpose is to “encourage the development of novel varieties of sexually reproduced plants” by providing their owners with exclusive marketing rights of the novel varieties in the United States .

On October 1, 1997, the State Council issued the “Regulations of the People’s Republic of China, the Protection of New Varieties of Plants”. The regulations are based on the 1978 version of the Act of the UPOV Convention.

PVP laws contain a statutory breeders’ exemption that allows for the use of a protected variety for breeding other varieties, and also enables competitors to “extract” and use individual characteristics or genes. While PVP protection is necessary and well adapted to protect certain achievements in plant breeding, it is neither suitable for, nor intended to, protect specific genes or traits or improved methods of breeding.⁵²

Whereas PVP was initially designed as the primary (or even exclusive) form of IP protection for seed-grown plants, the advent of plant biotechnology and the dawning acceptance of utility patents for plants have relegated PVP to a secondary role (in those countries where plants can be protected by both patents and PVP laws). Modest statutory amendments to the PVP have shown no real promise of lifting the PVP up from this secondary status.⁵³

While the PVP system was evolving, there was a merging of the sciences, such that patents began to be approved for an increasing array of technologies and components of plant varieties. This was especially true of the United States, where in 1973 the US Patent Office granted Cohen and Boyer a utility patent on gene splicing technology, and thereby started the race to privatize agronomic research. Since 1973, virtually all of the main technologies required for genetic manipulation of a plant or animal have been patented in the United States. Although a patent granted in one country is not automatically accepted in another country, the US patent protection of most of the key technologies has resulted in similar patents for the same technologies in most developed countries. In the 1980s, a number of landmark rulings in the United States relating to patenting living organisms opened the floodgates for patents on living things. In 1980, the US Supreme Court ruled in *Diamond v. Chakrabarty* that the US patent law provides for patenting life-forms. The first patent on a life form was for a GM oil-eating bacterium. In 1985, the first patent for a living plant was issued. Since then, a number of plants have been patented. *Plant patents provide additional protection to inventors*

⁵¹ “Federal Plant Variety Office, Plant Breeders’ Rights and National Listing”, May 2014); http://www.bundessortenamt.de/internet30/fileadmin/Files/PDF/BroschuereBSA_engl.pdf.

⁵² Dr. Kock A. Michael, Adapting IP in an evolving Agricultural Innovation Landscape, WIPO (2013); <https://www.syngenta.com/global/corporate/SiteCollectionDocuments/pdf/publications/media/inthemedia/wipo-article-april-2013.pdf>.

⁵³ Janis, Mark D. and Kesan Jay P., “U.S. Plant Variety Protection: Sound and Fury?”, (2002), Faculty Publication, paper 430; <http://www.repository.law.indiana.edu/facpub/430/>.

*and innovators in addition to those in UPOV⁵⁴ in that plant patents do not provide for either a **research exemption** or **farmers' privilege**.⁵⁵*

As a consequence of these moves in the United States of America, most other major developed countries with indigenous R&D capabilities in Europe, Japan and the Commonwealth of Australia, for example, developed comparable plant variety systems (consistent with UPOV 1991) and, through judicial review, extended patents to single and multicellular organisms, as in the United States of America. Many developing countries, in contrast, have been slower to develop indigenous PVP systems or grant PVP protection.

It is important to note that for the purposes of patent law, the notion of a “plant” is wider than that of a “plant variety”. Generally, a plant refers to “a living organism that belongs to the plant kingdom”. In different countries, the patent law has adopted diverse notions of what a plant is. For instance, in China, the concept of plants – in the context of the Patent Law – “refers to the life form which maintains its life by synthesizing carbohydrate and protein from the inorganics, such as water, carbon dioxide, and inorganic salt, through photosynthesis, and usually is immovable”. The Japanese Patent Office, in its Examination Guidelines, specifies that the term “plants” means one of the three groups into which organisms are classified, namely, microorganisms, plants and animals. Undifferentiated plant cells, as well as plant tissue cultures, are treated in several jurisdictions from the patent law point of view as microorganisms.⁵⁶

A “plant variety”, on the other hand, represents a more precisely defined group of plants with a common set of characteristics selected from within a species; the term “species” is a familiar unit of botanical classification within the plant kingdom.

For new traits derived from highly technical processes such as genetic modification or complex marker-assisted breeding, the patent system is an essential protection tool. It has higher requirements for protection, such as novelty and inventiveness. An important benefit of the patent system is the disclosure requirement, which enables other breeders to work with, and further improve upon, prior inventions. Together, PVP and patents form a synergistic and complementary IP system. Each protects different facets of plant innovation: PVP protects a new plant as a whole but cannot protect a

⁵⁴ Under the United States, the Plant Variety Protection (PVP) Act and the UPOV 1978 instrument, farmers were deemed to have the privilege to save and reuse seed from protected crops (but not to resell it to other farmers for sowing) and researchers were allowed to use protected germplasm for R&D purposes.

⁵⁵ See Peter W.B. Phillips, *Farmers' Privilege and Patented Seeds*, Chapter 3, p. 52; http://download.bioon.com.cn/upload/month_0809/20080923_6a61ce36d1a5352ccab9lx4PZ9dQ6z_attach.pdf.

⁵⁶ See para. 9, p. 4 of Committee on Development and Intellectual Property, Thirteenth Session, WIPO, World Intellectual Property Organization, Geneva, May 19 to 23, 2014; http://www.wipo.int/edocs/mdocs/mdocs/en/cdip_13/cdip_13_10.pdf.

single part, such as a specific gene, and patents protect the part, but (in general) not the whole.⁵⁷

The number of patents in many areas of basic agricultural research is growing exponentially. For example, in the United States of America, patents related to rice remained well below 100 per year through 1995. But in 1999 and 2000, more than 600 patents were issued annually. There will be many more for crops, such as maize, which enjoy greater commercial interest in the West. Further evidence of the rapid patenting of basic agriculture comes from a recent survey published in the magazine *Nature*, which found that about three-quarters of plant DNA patents are in the hands of private firms, with nearly half held by 14 multinational companies; virtually no such patents existed before 1985.⁵⁸

One of the consequences of the increasing influence of patent law is that it is limiting the free availability of and access to biological material for plant breeding. In The Netherlands, according to Plantum⁵⁹ *et al.*, the increasing influence of patent law is impeding innovation in plant breeding as a whole and limiting biodiversity, and this is leading to a situation whereby the plant breeding companies with the largest patent portfolios determine what varieties come onto the market, thus paving the way for dominant market positions.

The generality of the criteria and the vagueness regarding the scope and nature of exceptions in national patent laws for using other peoples' proprietary technologies often make it very difficult to interpret rights and obligations. For example, defining the scope of a "research tool" or the cut-off between "basic" and "applied" research or between "research" and "development" is fraught with difficulties. A rice line with resistance to a bacterial pathogen is a research tool. It can be used as a breeding tool by some, but to biotechnologists it is source material for mapping, sequencing and cloning the gene coding for the resistance trait, and subsequently for the grant of a patent on the gene sequence. Through an exclusive license negotiated with the patent owner, to a company it then becomes a research tool for a commercial company to develop pest-resistant GM crops (and to gain access to the gene, the developers of the original rice-resistant line must negotiate conditions for using the gene sequence for furthering their own applied research).

In some jurisdictions, the present position is that experimental use exception to patent rights is very narrow and that even projects undertaken without direct commercial application may be perceived in law as furthering an institute's legitimate business interests through undertaking projects that, by using proprietary IP, serve to increase its status and thereby attract research grants and students. Most national laws permit

⁵⁷ Dr. Kock A. Michael, "Adapting IP in an evolving Agricultural Innovation Landscape", WIPO (2013); <https://www.syngenta.com/global/corporate/SiteCollectionDocuments/pdf/publications/media/inthemedial/wipo-article-april-2013.pdf>.

⁵⁸ Barton H. John and Berger, Peter, "Patenting Agriculture, An intense drive to patent agricultural biotechnologies may hurt those who would benefit most: people in developing countries" (2013); <http://issues.org/17-4/barton/>.

⁵⁹ Plantum is the Dutch association for the plant reproduction material sector. The members of Plantum are active in breeding, propagation, production and trade of seeds, bulbs, tubers, cuttings and young plants; <https://www.plantum.nl/english>.

private, noncommercial/industry and experimental uses, although there is lack of clarity about whether experimental uses include work done for commercial and industrial purposes. In short, the situation with respect to the experimental use exemption within both national and regional arenas is far from clear. Researchers and breeders, therefore, tend to assume that they need not worry about the IPR of others when carrying out research with no direct commercial goal, because research done for purely academic or experimental purposes or under a government contract is thought to be protected from infringement due to an experimental use exemption.⁶⁰

The TRIPS Agreement requires Member States to provide protection for plant varieties either by patents or by an effective *sui generis* (stand-alone) system, or a combination of the two. Most countries meet this requirement through UPOV Convention-compliant legislation, even though the requirement set out in Article 27.3 of the TRIPS Agreement does not make direct reference to the UPOV system. WTO Member countries, numbering more than 150, about two thirds of them developing countries, are obliged under TRIPS Article 27.3(b) to provide IP protection to plant varieties.

Box 2.5: TRIPS, UPOV and developing countries⁶¹

Although not specifically mentioned in the TRIPS Agreement, UPOV is the main existing system for protecting new plant varieties and it is seen by many as the most straightforward choice to comply with the TRIPS Agreement. Countries that now wish to join UPOV need to comply with the rules and standards of the UPOV 1991 Convention, which provides broader protection for the breeder than the UPOV 1978 Convention.

However, several developing countries have designed protection systems based on the UPOV 1978 Convention because they consider its greater flexibility more appropriate for their agricultural conditions. Even though they are then not eligible to join the UPOV Union, they need this flexibility to sustain the dynamic farmers' seed systems that provide more than 80 per cent of the seed used by farmers in most countries.

Although the decision to join the UPOV Union may be problematic for many developing countries, the use of the UPOV guidelines for testing new varieties against DUS⁶² criteria offers clear advantages. The further adoption of such a harmonized approach opens the door to acceptance of test reports from other countries and to regional collaboration on testing. This can lower costs for PVP agencies and applicants, shorten the approval process and facilitate seed trade.

However, the harmonization of criteria for granting protection must go hand in hand with uniform scope or coverage of protection. Countries can base their PVP system on UPOV testing guidelines but maintain a broader farmers' privilege. Similarly, countries can choose to offer stronger protection for more commercialized crops and relatively

⁶⁰ "Biotechnologies for Agriculture Development", FAO, 2011, p. 16;

<http://www.fao.org/docrep/014/i2300e/i2300e09.pdf>.

⁶¹ See p. 3 of Eaton Derek, Louwaars Niels and Tripp Rob, op. cit.; http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2006/08/25/000310607_20060825_095554/Rendered/PDF/370360ARD0Note111IPR1Agri01PUBLIC1.pdf.

⁶² Distinct, Uniform and Stable.

little for subsistence crops, maintaining the option to adjust the system as the seed sector develops.

The European Union has established a system of PBRs for new plant varieties, which is called Community plant variety right (CPVR) and is based on the EU Regulation 2100/94. Both under the UPOV Convention and the European Patent Convention, overlapping protection of plant varieties by patent law and PBRs is prohibited. Since the emergence of biotechnology, there has been an increase in patent protection for plant-related inventions, both with regard to gene technological processes and products with genetically determined characteristics. EU Directive 98/44/EC has harmonized patent law for biotechnological inventions, particularly with regard to the patentability of biotechnological inventions and the scope of protection provided. EU Directive 98/44/EC stipulates that an invention concerning plants is patentable if the technical feasibility of this invention is not confined to a particular plant variety. Directive 98/44/EC also stipulates that plant varieties and essentially biological processes for the production of plants are excluded from patentability. Processes are “essentially biological” if they consist entirely of natural phenomena such as crossing or selection.

The Enlarged Board of Appeal at the European Patent Office (EPO) in the precedent-setting *Broccoli* (G2/07) case has recently found that a breeding process “is, in principle, excluded from patentability,” if it “contains or consists of the steps of sexually crossing the whole genomes of plants and of subsequently selecting plants.” It does not matter how technical or inventive a breeding process is. This lack of patent protection for methods of marker-assisted (smart) breeding may cause innovators to protect their innovations as trade secrets. This would negatively affect the speed of innovation insofar as there would be no public disclosure of such innovations as is required under the patent system.⁶³

The CPVR enables applicants, on the basis of one application to the Community Plant Variety Office (CPVO) in Angers, France, to be granted a single industrial property right, which is valid throughout the European Union. A CPVR has a uniform effect throughout the Community territory and can only be granted, transferred or terminated within this territory on a uniform basis. The new community-wide system exists alongside national systems as an alternative. It is not possible to hold Community and national plant variety rights simultaneously for the same variety. Furthermore, the CPVR cannot coexist with a patent. If a CPVR is granted in relation to a variety for which a national right or patent has already been granted, the national right or patent is suspended for the duration of the CPVR. A CPVR can be granted only if the variety is novel. The variety will not be novel if it has been sold or otherwise disposed of to others by or with the breeder’s consent:

- within the European Union earlier than one year before the date of application;

⁶³ See Dr. Kock A. Michael, op. cit., p. 3;
<https://www.syngenta.com/global/corporate/SiteCollectionDocuments/pdf/publications/media/inthemedia/wipo-article-april-2013.pdf>.

- outside the European Union earlier than four (4) years or, in the case of trees and vines, six (6) years prior to the date of application.

The procedure for approval of a *variety denomination*⁶⁴ at the CPVO follows different steps. When the Office receives a proposal for a variety denomination, this denomination is checked. If there is an impediment against this denomination, the applicant is informed and may comment or submit a new proposal for a variety denomination. In case there is no impediment, it will be published in the Official Gazette. According to Article 59(4)(b) of Council Regulation 2100/94, objections to the proposed variety denominations may be made within three months of their application. If neither an objection is received nor an observation from other examination authorities, the variety denomination is ready to be approved. This approval takes place at the same time as the decision to grant the title of protection. Once the denomination is approved and the variety is granted a right, this variety denomination has to be used obligatorily for all commercial purposes. *If a trademark is associated with the denomination, the variety denomination must be easily recognizable as such.*

All developed countries have national PVP laws that fully comply with the requirements of the UPOV 1991 Convention. Most of these countries also provide for patent protection for plant inventions (even though dual protection is prohibited in the EU, as explained above). Several developing countries, however, have drafted laws or enacted *sui-generis* legislation for protection for plant varieties which do not meet all the requirements of the UPOV 1991 or, for that matter, even the UPOV 1978 Convention. Almost all developing countries exclude plants, and, therefore, plant varieties, from the purview of patent protection. However, when going into detailed provisions of a national patent law the picture that emerges is often quite nuanced, as may be seen in the case of Brazil in the footnote.⁶⁵ A major difference between the PVP legislations of developed

⁶⁴ UPOV recommendations on variety denominations may be seen at http://www.upov.int/meetings/en/doc_details.jsp?meeting_id=1387&doc_id=286491 and at <http://www.iponz.govt.nz/cms/pvr/maintain-a-pvr/upov-recommendations-for-variety-denominations>

⁶⁵ Brazil: Plants, plant cells and seeds are not patentable in Brazil. According to Article 10(IX) of the Brazilian IP Law, natural living beings, in whole or in part, and biological material, including the genome or germplasm of any natural living beings, when found in nature or isolated therefrom, and natural biological process are not regarded as inventions. The Brazilian IP Law also defines what is not patentable in Article 18(III). Briefly, Article 18 prohibits the patenting of living beings, in whole or in part. An exception is made, however, for transgenic micro-organisms, which are defined as organisms, except the whole or part of plants or animals, that exhibit, due to direct human intervention in their genetic composition, a characteristic that cannot normally be attained by the species under natural conditions. Although Brazil's IP Law foresees that transgenic microorganisms can be afforded patent protection, the definition of transgenic microorganism (bacteria, mildews, yeasts, fungi, virus, etc.) does not extend to transgenic plants, cells or even seeds. In fact, plant cells and plant parts are not entitled to patent protection, even if genetically modified. Proteins, genes, nucleotide and polypeptide sequences: proteins, genes, nucleotide and polypeptide sequences may be afforded patent protection, provided that they: (1) fulfill the patentability requirements of Brazilian IP Law; and (2) are not identical to sequences isolated from nature, which as such are not considered as inventions in face of the patentability restrictions established by Article 10(IX) of Brazilian IP Law. Notwithstanding that a protein, gene, nucleotide or polypeptide sequence is obtained by synthetic or recombinant means, it will not be deemed to constitute an invention if it has a corresponding compound of natural origin and there are no other means to differentiate it from the natural compound.

countries versus developing countries pertains to farmer's exemption, privileges and rights. While farmer's exemption and privilege in PVP laws of developed countries are well articulated, the concept of farmer's rights is somewhat fuzzy. Farmer's rights are often seen from a human rights and/or food security perspective; in this regard, the discussions and comments in the linked documents and articles are illuminating.⁶⁶

Box 2.6: A brief history of IP protection for plant varieties in the United States⁶⁷

The United States was the first country in the world to explicitly offer IP protection for plant varieties. Beginning in 1930, asexually reproduced plants were afforded plant patent protection, in 1970 sexually propagated plants could be awarded PVP certificates, and beginning in 1985, courts confirmed that varieties of all types of plants were eligible for utility patents. From 1930 to 2008, a total of 34,340 varietal rights applications were lodged. The number of rights being sought continues to grow, with 42 per cent of all the varietal rights claimed since 2000. Contrary to popular perception, most of these rights are for horticultural crops (69 per cent), with ornamentals accounting for the lion's share of the horticulture-related rights (73 per cent, or 50 per cent of all plant rights). Food and feed crops constitute only 24 per cent of the rights sought, although just two crops (corn and soybean) made up 84 per cent of the 3,719

Plant extracts: pursuant to Article 10, extracts obtained from plants are not regarded as inventions and therefore cannot be patented. However, it is possible to obtain indirect patent protection for plant extracts by claiming protection in the form of a composition. The claimed composition should define at least one component in addition to the extract and the component may not represent a mere dilution of the extract (e.g. water).

Biological Processes: processes for manufacturing, isolating, obtaining and modifying plants are entitled to receive patent protection if they comply with the patentability requirements established by the Brazilian IP Law and do not consist of an essentially natural biological process. Natural biological processes are understood to constitute any process that does not make use of artificial means to obtain biological products or that, although using an artificial means, might occur in the nature without human intervention, consisting entirely in natural phenomena. On the other hand, if the process involves the direct manipulation of the plant genome, and such manipulation results in the expression of a trait not obtainable by natural means, such process would not fall within the statutory prohibitions of the quoted Article 10(IX) of Brazilian Patent Law. As explained above, the scope of protection of the Brazilian IP Law does not extend to the obtained plant itself. Nonetheless, the plant itself should be indirectly protectable in face of the provisions of article 42(II) of the Brazilian IP Law, which grants the patentee the right to prevent a third party from producing, using, offering for sale, selling or importing a product directly obtained by a patented process.

Plant Variety Protection: plant varieties, while not patentable according to Brazilian IP law, may nevertheless be protected under the Brazilian PVP Law, enacted in 1997 and incorporated the provisions of the 1978 Act of the UPOV Convention.;
http://www.aipla.org/committees/committee_pages/Biotechnology/plant/Shared%20Documents/Plant_Buzz_201312.pdf.

⁶⁶ "Food Security and IPRs in Developing Countries" by Dr. Philippe Cullet; IELRC Working Paper 2003-3; <http://www.ielrc.org/content/w0303.pdf>; Food Security and IPRs: Finding the Linkage; http://www.piipa.org/files/Book_Content/Chapter%203%20-%20IP%20and%20Human%20Development.pdf; <http://www.scidev.net/global/policy-brief/what-impact-do-ipr-rules-have-on-food-security-.html>.

⁶⁷ "The Evolving Landscape of IPRs for Plant Varieties in the United States, 1930-2008", Philip G. Pardey, Bonwoo Koo, Jennifer Drew, and Carol Nottenburg at <http://ageconsearch.umn.edu/bitstream/119346/2/Staff%20Paper%20P12-1--InStePP%2012-01-1.pdf>.

varietal rights claimed via utility patents. The structure of these rights has changed dramatically over the years. During the 1930s, when the only rights on offer were plant patents, 72 per cent of the rights sought were for ornamental crops and individual innovators played a substantial role (50 per cent of the rights). By 2004-2008, the annual applications for plant patents had increased in number but fallen to a 60 per cent share of the total rights claimed. During this recent period, utility patents were as popular as PVP certificates and ornamentals made up a large but much-reduced share of the total (52 per cent). Individual innovators accounted for only 12 per cent of the rights, whereas the corporate sector sought the dominant share of varietal rights (82 per cent in 2004-2008). These IP markets are complex, with corporations, universities and other agencies seeking different types of rights for different crops.

Twenty-nine per cent of the estimated 42 billion USD of global commercial seed sales in 2010 (ISF 2011) occurred in the United States and the country spent 9.6 billion USD on agricultural R&D: about 20 per cent of the world's total spending on agricultural research (Pardey and Chan-Kang, 2012; Pardey and Alston, 2011), which has substantive consequences for the rates of varietal innovation in the United States and elsewhere.⁶⁸

Yet, some 80 per cent to 90 per cent of the world's seed stocks are provided through an "informal" system, according to CIAT. Such systems are locally organized and based on the ways farmers produce, disseminate and procure seeds through on-farm saving and exchange with other farmers. It is integrated in the local food system, where a large number of farmer-selected species and varieties are being developed, are known, and used in fields, gardens and households.⁶⁹

The seed sector in Sub-Saharan Africa is dominated by informal supply systems with farm-saved seeds accounting for approximately 80 per cent of planted seeds, compared with a worldwide average of 35 per cent (Bay, 1998; Scowcroft and Scowcroft, 1999). This informal seed supply system is characterized by on-farm production of self-pollinated non-hybrid crops and a distribution system limited to barter trade and sales in local markets. Improving smallholder farmers' access to new high-yielding varieties and hybrid crops requires better coordinated marketing efforts and expanded distribution systems.⁷⁰

The formal seed system can be characterized by a clear chain of activities. It usually starts with plant breeding and promotes materials for formal variety release and

⁶⁸ "The Evolving Landscape of IP Rights for Plant Varieties in the United States", Philip G. Pardey, Bonwoo Koo, Jennifer Drew, and Carol Nottenburg, Staff Paper P12-1, InSTePP Paper 12-01, January 2, 2012; <http://ageconsearch.umn.edu/bitstream/119346/2/Staff%20Paper%20P12-1--InSTePP%2012-01-1.pdf>.

⁶⁹ "Farmers' Seed Systems", Association for Plant Breeding for the Benefit of Society, APBEBES; <http://www.apbrebes.org/content/farmers-seed-systems>.

⁷⁰ See da Silva, A. Carlos and Mhlanga Nomathemba, "Innovative Policies and institutions to support Agro Industries Development", FAO, (2011) p. 25; <http://commdev.org/userfiles/Innovative%20Policies%20and%20Institutions%20to%20Support%20Agri-Industry%20Development.pdf>.

maintenance. Regulations exist in this system to maintain variety identity and purity as well as to guarantee physical, physiological and sanitary quality. The central premise of the formal system is that there is a clear distinction between seed and grain.⁷¹

The formal and the informal seed systems are not integrated. The formal seed system has not shown interest in orphan crops or in the open-pollinated varieties, as the profits are not sufficient.

Seed companies tend to take advantage of PVP and patents when it helps protect them against competitors gaining access to their materials. In Colombia and Kenya, protection is commonly not sought for hybrids. On the other hand, where hybrids are used in a competitive seed sector, such as India and China, they attract the majority of interest for PVP.⁷²

The establishment of PVP regimes comes at a time when National Agricultural Research Institutes (NARIs) are being asked to take on much more responsibility for revenue generation. Research administrators see the possibility of earning income by licensing public varieties and other inventions, but the degree to which such royalties can fulfill that promise depends on farmer demand for public varieties, and on the ability of the institutions to manage and enforce their rights. In the case study countries (China, Colombia, India, Kenya and Uganda), there is little evidence so far of actual revenue generation from public breeding through IPRs, with the exception of institutions in China. Potential limitations, such as competition with the emerging private sector for human resources and lack of freedom to operate with third-party IPR, are rarely taken into account in the IP strategies of NARIs. A major problem with revenue generation from PVP is that the potential opportunities are patchy. There is a danger that this heterogeneity may be translated into inequitable and questionable public research resource allocations, further reducing research on orphan crops and a smallholder farmer focus in favor of breeding objectives and methodologies directed at large-scale commercial production. Mechanisms to share income with the individual researchers and research groups are under development in some institutions. The capacity of NARIs to market their own IP and to negotiate access to third party IP is currently very limited.⁷³

The IP issue is central in the balancing of relationships between private seed companies and public research. As IARCs focus on poverty alleviation and smallholder farmers, and NARIs place increased emphasis on earning royalties from their germplasm with

⁷¹ "Understanding Seed Systems Used by Small Farmers in Africa: Focus on Markets Seed Aid for Seed Security, Advice for Practitioners, 6 Practice Brief"; http://www.crsprogramquality.org/storage/pubs/agenv/seedaid_practicebrief6.pdf.

⁷² See p. 3 of a study commissioned by the World Bank, executed in 2004, "Impacts of Strengthened Intellectual Property Rights Regimes on the Plant Breeding Industry in Developing Countries; A Synthesis of Five Case Studies", 2005, by N.P. Louwaars, R. Tripp, D. Eaton, V. Henson-Apollonio, R. Hu, M. Mendoza, F. Muhhuku, S. Pal & J. Wekundah at http://www.iprsonline.org/resources/docs/LouwaarsCGN_Plants_05.pdf.

⁷³ N.P. Louwaars, R. Tripp, D. Eaton, V. Henson-Apollonio, R. Hu, M. Mendoza, F. Muhhuku, S. Pal & J. Wekundah, op. cit., p. 4, http://www.iprsonline.org/resources/docs/LouwaarsCGN_Plants_05.pdf.

commercial potential, IARCs must rethink their relationships with NARIs. When IARCs can earn royalties on their materials from domestic seed producers, they find themselves in the same position as NARIs with regard to possibilities that opportunities for revenue generation may affect priorities.⁷⁴

The growth of the private seed industry would seem to provide a more effective link between public plant breeding and farmers' fields. However, many public varieties do not attract the interest of commercial seed enterprises, and this encourages many NARIs to organize their own seed production and marketing. In addition, many NARIs still find themselves with obligations to public seed production efforts. The establishment of IPR systems does little to resolve these challenges for public plant breeding.⁷⁵

Box 2.7: Challenges in use of farm-saved seed⁷⁶

Farmers' practice of saving, using, exchanging and selling seeds and propagating material from their own harvest is increasingly affected by three forms of legislation: (1) IPRs (PBRs and patents), (2) seed laws, and (3) access laws.

Seed laws cover exchange and sales of seeds and propagating material – regardless of whether they are protected through IPRs – for plant-health reasons. Their certification rules are normally based on criteria that are relevant for genetically homogeneous plant varieties from professional plant breeders, but not for farmers' varieties. The result is that farmers' varieties are excluded from the formal market in many countries – in Europe, it is even prohibited for farmers to exchange seeds or to give them away.

Access laws, often adopted with reference to the CBD, tend to restrict access to genetic resources for companies and entities other than farmers and indigenous peoples. However, in some cases, the acts also cover gene-bank conservation activities and these are vital for farmers' continued access to agro-biodiversity. In Peru, for example, access-related legislation on the protection of traditional knowledge has proven a barrier to conservation and has discouraged the sharing of seed potatoes among farmers.

As can be seen, current developments tend to disenable farmers from accessing, using, exchanging and selling seed and propagating material in their customary ways, thus preventing them from conserving and sustainably using crop genetic diversity. This is among the greatest threats to genetic diversity in agriculture today, and thus to present and future food security.

Plant improvement faces a complex conundrum. On the one hand, there is an essential need to grant artificial lead time for research efforts through the recognition of IPRs, in

⁷⁴ N.P. Louwaars, R. Tripp, D. Eaton, V. Henson-Apollonio, R. Hu, M. Mendoza, F. Muhhuku, S. Pal & J. Wekundah op. cit., p. 4, http://www.iprsonline.org/resources/docs/LouwaarsCGN_Plants_05.pdf.

⁷⁵ P. Louwaars, R. Tripp, D. Eaton, V. Henson-Apollonio, R. Hu, M. Mendoza, F. Muhhuku, S. Pal & J. Wekundah, op. cit., p. 4, http://www.iprsonline.org/resources/docs/LouwaarsCGN_Plants_05.pdf

⁷⁶ Andersen Regine, "State of Farmer's Rights: Barriers to upholding and developing legal space for Farmer's Rights" (2008) at http://www.farmersrights.org/state/barriers_2.html.

order to foster investment for the development of innovations that are easily reverse-engineered and costly to develop. On the other hand, for follow-on innovators and cultivators, the prospects for using material from the protected pool of improved varieties have become increasingly conditional, with important detrimental effects, especially in a highly incremental innovation sphere such as plant improvement (Maskus and Reichman 2005).

Follow-on uses of plant material or plant breeding techniques by farmers, breeders and scientists alike have become remarkably complex on account of the growing number of IPRs bestowed upon biological material or breeding techniques, especially following the adoption of the TRIPS Agreement, which lays out the foundations of the strong IP paradigm in its Article 27.3(b)⁷⁷

Furthermore, additional regulation on seed certification and market regulation, defining the conditions of use and distribution of both protected and non-protected improved varieties, has accentuated the shrinking room for maneuver left to those who operate or are pushed outside of such formal seed markets. The absence of apparent reward for local actors, who conserve and at times upgrade the genetic resources upon which improved varieties are built on, further stresses the lack of regard for certain informal innovation systems.

These detrimental aspects have led to growing criticisms of the dominant IP paradigm in plant improvement without, however, having much effect. Due to the piecemeal nature of their criticisms, critics highlighting genuine insufficiencies related to various areas, such as *in situ* agri-biodiversity, platform technologies and research tools or ex-situ pools of improved seed varieties have not yet produced a major shift in the paradigm; nor have the proposed alternative institutional tools been able to gain currency as valid and viable institutional mechanisms.⁷⁸

Box 2.8: Shift of breeding new plant varieties from public to private sector⁷⁹

⁷⁷ As a whole, Article 27 of the TRIPS Agreement defines which inventions governments are obliged to make eligible for patenting and what they can exclude from patenting. Inventions that can be patented include both products and processes, and should generally cover all fields of technology. Broadly speaking, Article 27.3(b) allows governments to exclude some kinds of inventions from patenting, i.e. plants, animals and “essentially” biological processes (but micro-organisms, and non-biological and microbiological processes must be eligible for patents). However, plant varieties must be eligible for protection either through patent protection or through a system created specifically for the purpose (“*sui generis*”), or a combination of the two; Intellectual Property (TRIPS) – Reviews Article 27.3(b) and related issues, Background and the current situation, WTO, (2008) at http://www.wto.org/english/tratop_e/trips_e/art27_3b_background_e.htm.

⁷⁸ Batur Fulya and Dedeurwaerdere Tom, “The use of agrobiodiversity for plant improvement and the intellectual property paradigm: institutional fit and legal tools for mass selection, conventional and molecular plant breeding”, *Life Science, Society and Policy* (2014) at <http://www.lsspjournal.com/content/pdf/s40504-014-0014-7.pdf>.

⁷⁹ Murphy, Denis, “The Demise of Public Plant Breeding, Plant Breeding and Biotechnology: Societal Context and the Future of Agriculture”, Cambridge University press (2007), pp. 441-443; <http://bioscience.oxfordjournals.org/content/59/5/441.full>.

In 1987, the year in which the Plant Breeding Institute (PBI) was sold to Unilever, almost 90 per cent of Britain's cereal area was planted in PBI varieties. While the United Kingdom remains innovative in plant science, it has lost its former capacity in practical crop breeding. The tragedy is that crop breeding is jeopardized at a time when it is sorely needed to help feed the growing world population, to meet changing diets, and to cope with environmental protection and change. Meanwhile, the commercial agbiotech sector has profited from two traits—insect resistance and herbicide tolerance—but it has not been technically innovative or quick to address more pressing needs of farmers and consumers.

The sale of the PBI and the National Seed Development Organization was part of the then Prime Minister Thatcher's strategy to privatize many government-owned companies and institutions. The PBI was the country's major institute for research on plant breeding and the NSDO had earned nearly 7 million USD in 1986 by marketing seeds from varieties bred at the PBI.⁸⁰

Murphy's history of scientific plant breeding shows how new crops were developed by induced mutation and through wide crossbreeding of species and genus lines, belying the argument by both proponents and the opposition that transgenesis is a radical departure from previous practices. A serious issue is the emergence of a four-company oligopoly that controls a large portion of commercial breeding and patents relating to transgene technology. Companies are stymied by the public's hostile attitude toward plant breeding, but they have not signed onto such popular causes as reducing GHG emissions or increasing agricultural sustainability.

The irony is that the plagues of privatization and anti-transgenesis have most affected the United Kingdom and Europe. Despite its association with the economists of the University of Chicago and the political rhetoric of Ronald Reagan, privatization has not affected public plant breeding at US universities as much as it has in the United Kingdom, Europe, and developing countries that were subjected to structural adjustment.

The PBI Director, Peter Day, has since become the head of a new Center for Agricultural Molecular Biology at Rutgers University.⁸¹

2.2.3 IPRs, animals and animal breeders

As in the case of plants, technological improvements are a big contributor to creating, as it were, a better "seed" or embryo through traditional or modern breeding methods, for farm animals. GE techniques play a big role here too. The search for technological solutions is based on the same reasons as for improvements in plant breeding. Just like transgenic plants, transgenic animals have commercial value in agriculture, biomedical

⁸⁰ Stewart Alison, "Sale of Lab to Unilever Endorsed", *The Scientist* (1987); <http://www.the-scientist.com/?articles.view/articleNo/8971/title/Sale-of-Lab-To-Unilever-Endorsed/>.

⁸¹ *Ibid.*, 77; <http://www.the-scientist.com/?articles.view/articleNo/8971/title/Sale-of-Lab-To-Unilever-Endorsed/>.

research, medicine, and the pharmaceutical industry. Like transgenic plants, transgenic animals are also capable of improving food sources and disease resistance in animals.

There are, however, additional reasons, such as animal welfare concerns, reducing the much higher GHG emissions and water consumption,⁸² finding alternatives to animal-derived foods or creating animal-less milk or meat. In the future, creating livestock that grows faster, consumes less feed, produces less waste, and yields leaner, healthier meat may seem a less “extreme” approach to meeting humanity’s food requirements than it does today. Meat production may even bypass animals, if public opinion shifts to favor lab-grown food as a more ethical approach.⁸³

For the results of R&D for such purposes, despite a fairly widespread concern about moral and ethical issues, all developed countries undertake such R&D and most of them provide for the possibility of patent protection, whereas most developing countries exclude from patent protection processes and products of all such inventions pertaining to animals. It is recalled that Article 27.3(b) of the TRIPs Agreement provides that Members may also exclude from patentability: plants and animals other than micro-organisms, and essentially biological processes for the production of plants or animals other than non-biological and microbiological processes.

In developed countries, following a surge of patent activity in the late 1990s patent filings involving animal genetic resources of relevance to food and agriculture have tended to fall. This reflects a combination of factors external and internal to the patent system. Emerging developments in synthetic biology, metabolic engineering, genome engineering and genome editing have potentially important implications for food and agriculture. Trends could change following the completion of major genome sequencing projects and the rise of new technologies such as synthetic biology, genome engineering and genome editing.⁸⁴ It might therefore be not unreasonable to expect that, sooner or later, in the 21st century sequenced genomes, transgenic livestock and cloned animals will become the norm, at least in developed countries, notwithstanding a number of ethical, moral and food safety concerns that still need to be overcome or addressed satisfactorily.

There are still no Animal Breeders’ Rights similar to PBRs in the UPOV system. There are, however, international processes looking at such possibilities. The difficult question is how such a system can be designed. The major danger is that such a system would borrow or use experiences from the plant sector without taking sufficiently into account the special features of the fish-breeding and farming sector. Most fish-breeding systems

⁸² But because half of the grain currently produced worldwide is fed to animals, five to ten times as much water is consumed to produce a kilogram of meat as is required to produce a kilogram of grain. See p. of Ammann Klaus and Potrykus Ingo, “New Biotechnology, Transgenic plants for food security in the context of development”, European Federation of Biotechnology, vol. 27, no. 5, (2010); <http://www.casinapioiv.va/content/dam/accademia/pdf/newbiotechnology.pdf>.

⁸³ Jeffrey Scott Coker, “Crossing the Species Boundary: Genetic Engineering as Conscious Evolution,” Jan-Feb 2012, p. 26; http://www.wfs.org/Forecasts_From_The_Futurist_Magazine.

⁸⁴ See p. 6 of “Patent Landscape Report on Animal Genetic Resources”, 2014, WIPO in cooperation with FAO; http://www.wipo.int/edocs/pubdocs/en/wipo_pub_947_3.pdf.

are dependent on heterogeneous populations and hence are unsuited to fulfilling the PBRs rights criteria of *new, distinct, uniform and stable*. Perhaps this reflects a need for a specially adapted type of IP system for aquaculture breeds. In legal terms, this is called a *sui generis* system, which should address such issues as what can be protected, the criteria for obtaining protection and the extent of exclusive rights that can be obtained.⁸⁵

In the United States, perhaps the best known and largest single royalty-generating patent in animal breeding was patent 5,358,649 involving HAL 1843 . There was some debate in the scientific community as to the validity of the HAL patent, since the result seemed quite obvious once the gene became a candidate (Fujii *et al.*, 1991). Indeed, the HAL invention was even predicted in publications where the strategy for finding the mutation was developed (e.g., MacLennan *et al.*, 1990).

However, this opinion was based, at least in part, on a misunderstanding of the term obviousness as required for patentability. Patent 5,374,526, which was a method to use *Estrogen receptor gene* (ESR gene) polymorphisms to improve litter size (Rothschild *et al.*, 1994) stirred considerable debate, not only on the scientific merit of the method, as it was the first to claim use of a marker for a quantitative trait, but also because the patent had been exclusively licensed to one breeding company. In addition, some confusion existed early in the development of patents in animal breeding as to whether the genes were patented or whether a process or method involving genes and markers was being patented. This was particularly evident in the discussions that followed the ESR patent application (Rothschild and Plastow, 2002).

Nonetheless, the issue of patenting gene sequences has raised both legal and commercial concerns. This issue came to the forefront when C. Venter, then from NIH, and colleagues applied for a patent on discovered *expressed sequence tags* (ESTs). In the first review of the application the patent office rejected all the claims for failure to meet the criteria of utility, novelty, and non-obviousness. The ESTs do not specifically define gene function, but they provide information for isolation of the entire gene and for determining the gene location in relation to previously mapped QTL. There is currently a considerable body of patent case law which relates to their utility, non-obviousness, and enablement (Nebel *et al.*, 2002). The USPTO has decided ESTs are patentable if it can be shown that they are useful, but if the patent does not claim the entire gene sequence, it has limited economic value. Companies, like Incyte Pharmaceuticals, have protected these ESTs by creating proprietary databases that are useful in predicting gene function and in the development of medical and veterinary technologies.⁸⁶

⁸⁵ See p. 8 of Halvorsen T.S. and Hagen I.J., "Global Privatization and Its Impact", Nova Science Publishers, (2008); <http://www.nofima.no/filearchive/bokkapittel-i-global-privatization-and-its-impact.pdf>.

⁸⁶ M.F. Rothschild, "Patenting of Genetic Innovations in Animal Breeding" Department of Animal Science, Iowa State University, Ames, Iowa 50011 United States; http://www.card.iastate.edu/research/stp/papers/Max-patent_paper_for_france-final.doc.

In the United States, patent coverage is not just confined to genetic markers. Lines of pigs or chickens have been patented and can be viewed as a specialized extension of early breed development or trademarking for protection of this IP. Other patents exist for methods involving cellular and animal manipulation and involve processes like *stem cell*⁸⁷ development, transgenic production (i.e., U.S. 6,271,436) and *cloning*⁸⁸ (i.e., U.S. 6,215,041 or U.S. 6,258,998). Several advances related to mechanical or electronic devices have been made and include new A.I. or embryo transfer tools, advanced ultrasound equipment, formulas and methods to measure backfat and other traits in livestock (i.e., see early patent U.S. 4,359,055 and more recent U.S. 5,717,142). The increasing need for traceability of animals and animal products has spawned a number of inventions, including electronic ID tags and retinal scanning methods and devices.⁸⁹

Considerable discussion has ensued recently from a patent entitled “Method of Bovine Herd Management” granted in the United States in 1994 and later in Canada (Schaeffer, 2002). The invention is for the “test-day model” and includes the gathering, mathematical treatment, and the use of the modified data by dairy producers. The novelty and non-obviousness of the patent has been seriously questioned. It was pointed out that the practices of gathering, manipulating and using data by dairy producers have existed for nearly 100 years. The patent, therefore, claims rights to a practice that has been public knowledge for a long time. The novel idea within the patent was the specific mathematical model and procedures that Everett and co-workers developed for the analysis of test day yields. Everett was also not the first researcher to apply a model to test day records and, as has been demonstrated, the model as described in the patent is not necessarily the best model that could be applied (Schaeffer, 2002). The following question has been posed: “What would the field of animal breeding be if the selection index or Henderson’s BLUP⁹⁰ had been patented?” Yet, while quantitative geneticists see the thought of such protection as sacrilege, molecular scientists accept (but may not like) that in a similar way the foundation patent for PCR⁹¹ exists and royalties must be paid for its use.⁹²

⁸⁷ Stem cells have the remarkable potential to develop into many different cell types in the body during early life and growth. In addition, in many tissues they serve as a sort of internal repair system, dividing essentially without limit to replenish other cells as long as the person or animal is still alive. When a stem cell divides, each new cell has the potential either to remain a stem cell or become another type of cell with a more specialized function, such as a muscle cell, a red blood cell, or a brain cell. “Stem Cell Basics: Introduction”, In Stem Cell Information, Bethesda, MD: National Institutes of Health, U.S. Department of Health and Human Services, (2002); <http://stemcells.nih.gov/info/basics/pages/basics1.aspx>.

⁸⁸ The term cloning describes a number of different processes that can be used to produce genetically identical copies of a biological entity. The copied material, which has the same genetic makeup as the original, is referred to as a clone. “Cloning, National Human Genome Research Institute: Advancing human health through genomics research”, MD: National Institutes of Health, U.S. Department of Health and Human Services (2014); <http://www.genome.gov/25020028>.

⁸⁹ M.F. Rothschild, op. cit.

⁹⁰ Best linear unbiased prediction, Wikipedia; http://en.wikipedia.org/wiki/Best_linear_unbiased_prediction.

⁹¹ Polymerase chain reaction; <http://www.dnalc.org/resources/animations/pcr.html>.

⁹² M.F. Rothschild, op. cit.

The creation of *induced pluripotent stem cells* has opened up new avenues for research into animal breeding with far-reaching implications such as the potential for producing *in vitro* meat.⁹³ For example, skeletal muscle induced pluripotent stem cells from food-producing animals are of interest to agricultural life scientists seeking to develop a better understanding of the molecular regulation of lean tissue (skeletal muscle protein hypertrophy) and intramuscular fat (marbling) development. Enhanced understanding of muscle stem cell biology and function is essential for developing technologies and strategies to augment the metabolic efficiency and muscle hypertrophy of growing animals, potentially leading to greater efficiency and reduced environmental impacts of animal production, while concomitantly improving product uniformity and consumer acceptance and enjoyment of muscle foods.⁹⁴

Both the United States and Japan⁹⁵ recognize patents for animals. Under United Kingdom and European patent laws, it is not possible to file a valid patent claim for an essentially biological process as such (e.g., a method comprising mating a bull from one cattle breed with a cow from another cattle breed to produce a cross-bred calf). Nor, as with plant variety, is it possible to have a valid patent claim with a scope so narrow as to cover only a group of animals comprising an “animal variety” as such. An “animal variety” is not legally defined in European patent law, but may be taken to be a group of animals of the same species which have been selected to constitute a breed having at least one significant and identifiable characteristic. The meaning of the term “breed” is well defined and understood within the farming industry. Patents should not be granted for inventions which are judged morally offensive or against “*ordre public*”. There is no absolute criterion of moral offensiveness: the decision rests with the patent offices and courts in each country and, ultimately, with public opinion.⁹⁶⁹⁷

⁹³ In vitro meat, Wikipedia; http://en.wikipedia.org/wiki/In_vitro_meat.

⁹⁴ Dodson MV, Hausman GJ, Guan L, Du M Rasmussen TP, Poulos SP, Mir P, Bergen WG, Fernyhough ME, McFarland DC, Rhoads RP, Soret B, Reedy JM, Velleman SG, Jiang Z. Skeletal Muscle Stem Cells from Animals I. Basic Cell Biology. *Int J Biol Sci* 2010; 6(5):465-474. Doi:10.7150/ijbs.6.465; <http://www.ijbs.com/v06p0465.htm>

⁹⁵ The JPO requires that the invention be a non-natural occurring substance; that the invention have substantial human intervention; that the claim language be limited to claims, and that the human body not be an essential element. The Japanese patent system limits the scope of patentable subject matter to exclude processes in the field of medicine, diagnosis, therapy, and pharmacology. As a result, an inventor cannot receive Japanese patent protection for biotechnology inventions of products falling within these areas where the human body is an essential element. Furthermore, the Japanese patent statute contains a morality provision. Article 32 excludes the patentability of inventions that are “liable to contravene public order, morality or public health; <http://www.law.washington.edu/Casrip/Newsletter/default.aspx?year=2007&article=newsv14i1Campbell>.

⁹⁶ “Patentability of Animals”, The Chartered Institute of Patent Attorneys, (2008); <http://www.cipa.org.uk/pages/info-papers-animals>.

⁹⁷ “European patents shall not be granted in respect of:

(a) inventions the publication or exploitation of which would be contrary to “*ordre public*” or morality, provided that the exploitation shall not be deemed to be so contrary merely because it is prohibited by law or regulation in some or all of the Contracting States;

(b) plant or animal varieties or essentially biological processes for the production of plants or animals; this provision does not apply to microbiological processes or the products thereof.

EPC Article 53(a): *Ordre Public and Morality*

Box 2.9: Braasch Biotech⁹⁸ Bolsters IP with Patent Acceptances in Australia and Japan.⁹⁹

GARRETSON, SD--(Marketwired – Mar 3, 2014) – Braasch Biotech LLC, a biopharmaceutical company developing and commercializing anti-somatostatin vaccines, today announced that it has received a Notices of Acceptance from the Australian and Japanese Patent Offices for a patent covering the use of Braasch’s product candidate, JH14-Somatovac. The vaccine is indicated for use in livestock and safely enhances the target animal’s own ability to produce more protein, without non-desirable side events as in current pharmaceuticals.

The global demand for animal protein (such as meat and milk proteins) continues to increase rapidly and is expected to double by 2050 (FAO). Increasing world population, emerging economies, increasing urbanization and other lesser factors, drives this demand. New initiatives will be required to enhance the sustainability of animal protein production.

Braasch’s endogenous approach to protein enhancement has proven effective in dairy cows and pigs, without negative safety or health issues. Unlike exogenous enhancement methods, such as recombinant growth hormone (rBst), beta agonists or sub-therapeutic antibiotics, immunological control methods are based on innate systems and do not pose a negative impact to the animal, environment or consumers.

Braasch Biotech’s current livestock enhancement portfolio already includes patents in the United States, Europe, United Mexican States, New Zealand, Russian Federation, the State of Israel and South Africa. Braasch is also pursuing patent applications in multiple jurisdictions in Latin America and Asia.

About Braasch Biotech

Braasch Biotech is pioneering a new field of metabolic and therapeutic vaccine approaches utilizing its Somatovac antibiotics, . The company has received numerous

EPC Article 53(a) strictly excludes patentability of inventions that are contrary to “ordre public” or morality. The EPC does not define the meaning of ordre public and morality, nor does it define what subject matter is contrary to public morality. However, in decision T 356/93, Plant Genetic Systems/Glutamine Synthetase Inhibitors, the EPO Technical Board of Appeal (“TBA”) extensively analyzed the ordre public exclusion. The TBA interpreted ordre public as covering “the protection of public security and the physical integrity of individuals as part of society.” Hence, inventions must be excluded from patentability as contrary to ordre public if their exploitation is “likely to breach public peace or social order (for example, through acts of terrorism) or seriously to prejudice the environment.” If the exploitation of an invention is contrary to ordre public or morality, then the invention will not be patented. The EPC provides an opportunity for any concerned public citizen (no commercial or other interest need be shown) to challenge a pending or previously issued European patent if the citizen believes that the patent is contrary to ordre public;
<http://www.law.washington.edu/Casrip/Newsletter/default.aspx?year=2007&article=newsv14i1Campbell>.

⁹⁸ Braasch Biotech LLC, (2012); <http://www.braaschbiotech.com/>.

⁹⁹ Braasch Biotech Bolsters Intellectual Property with Patent Acceptances in Australia and Japan, Braasch Biotech LLC, (2014); <http://www.marketwired.com/press-release/braasch-biotech-bolsters-intellectual-property-with-patent-acceptances-australia-japan-1884870.htm>.

US and International patents for vaccine usage in obesity and livestock productivity. Braasch Biotech is a privately held biopharmaceutical company with corporate offices in South Dakota, the United States.

Recent advances in animal husbandry and biotechnology mean that new organisms can be bred which differ from previous organisms of the same type by virtue of a modification caused by human technical intervention. Hence the production of GMOs, while possibly being for the most part an essentially biological process, may now involve a critical process step which is essentially non-biological (e.g., the insertion of a segment of a foreign gene into the animal's DNA). Such processes (being a combination of essentially biological steps in combination with other steps), taken as a whole, fall outside the specific exclusion clauses and are therefore patentable, provided they meet all other requirements for patentability. Furthermore, the new techniques and new products for which patent protection is sought are generally applicable or obtainable over a whole range of species or even genera. The inventor of a useful and advantageous modification should, in principle, be able to obtain patent claims of broad scope which would cover any animal from a broadly defined group (larger than a breed or variety) within which all group members embody the invention. Claims to such a group fall outside the specific exclusion of claims to animal varieties.¹⁰⁰

The patent law of India excludes essentially biological processes for the production of plants and animals from patent protection.¹⁰¹ However, in India, no statutory provision defines the term "essentially biological process". Some guidance could be drawn from a decision of the Calcutta High Court in *Dimminaco AG v. Controller of Patents and Designs* (2002). The Calcutta High Court decided that a process for the preparation of a live vaccine to combat bursitis, an infectious poultry disease, was patentable. The significance of this case law is that it was "the first time in the history of the Indian patent system that the patenting of a process for the production of a product containing living

¹⁰⁰ Ibid. 93; <http://www.cipa.org.uk/pages/info-papers-animals>.

¹⁰¹ In India, Section 3(j) of the Patents Act 1970, as amended in June 2002 excludes from patentability "plants and animals in whole or any part thereof other than micro-organisms but including seeds, varieties and species and essentially biological processes for production or propagation of plants and animals." Furthermore, Sub-Section 3(i) excludes from patentability any process for the medicinal, surgical, curative, prophylactic diagnostic, therapeutic or other treatment of human beings or any process for a similar treatment of animals to render them free of disease or to increase their economic value or that of their products. In India, in *Ciba-Geigy AG's Application*, (BL 0/30/85) the objection was raised to certain claims for a method of controlling parasitic helminthes (worms which may develop in the animal body, for example, in the intestinal tract of animals such as sheep) by the use of a particular (novel and inventive) anti-helminthic composition. The applicants contended that when administered to an animal, the composition would prevent the reproduction of the helminthes and kill them should they infest the animal, but without affecting the animal's body, and that its use was, therefore, not "therapy". However, the applicants' specification made it clear that an infestation of helminthes worms can result in restricted growth, damage to the animals and even death, if not properly treated. Moreover, the application made no mention of controlling helminthes by the use of the composition in any environment other than the animal body. The hearing officer considered that such an infestation was, therefore, a disease requiring medical treatment of the animal and that such treatment, whether curative or preventative, constituted therapy practiced on the animal body and consequently held that the claims in question were not allowable; http://www.aipla.org/committees/committee_pages/Biotechnology/biowiki/International%20Biowiki/india.aspx.

organisms was considered legitimate”. This decision is aligned with the position of the United States, EU member states, and Japan, among others, where on the whole, biotechnological processes are patentable, regardless of whether the end product is living or inanimate.¹⁰²

2.2.4 Trade Secrets

While confidential business information is as old as business itself, trade secret law is a more recent phenomenon and is essentially of Anglo-American origin. In Roman times, the law afforded relief against a person who induced another’s employee (slave) to divulge secrets relating to the master’s commercial affairs. Trade secrecy was practiced extensively in the European guilds in the Middle Ages and beyond. Modern trade secret law evolved in England in the early 19th century—in response to the growing accumulation of technology and know-how and the increased mobility of employees. It was recognized in the United States by the middle of the 19th century: The Peabody v. Norfolk (98 Mass. 452 (Mass. 1868)) decision held that a secret manufacturing process is property, protectable against misappropriation; secrecy obligation for an employee outlasts the term of employment; a trade secret can be disclosed confidentially to others who need to practice it and a recipient can be enjoined from using a misappropriated trade secret. This decision anticipates the characteristics of our present trade secret system and by the end of the 19th century, the principal features of contemporary trade secret law were well established.¹⁰³

The legal basis and the form of protection of trade (business) secrets, including know-how, and the treatment of acts of unfair competition is very different in different countries around the world. From a global perspective, compared with Patents, Trademarks, Copyright and Industrial Design, the law concerning protection of trade secrets is the least harmonized.

For example, within the European Union, the only Member State with specific legislation on trade secrets is Sweden. Italy and Portugal have specific provisions on the protection of trade secrets included in their respective Industrial Property Codes. However, while in the Italy, trade secrets are expressly considered to be IPRs and enjoy protection as such (although protection is granted only if the acquisition, disclosure and use of the secret took place in an unlawful manner), Portugal does not attach the status of IP right

¹⁰² “Patent Related Flexibilities In The Multilateral Legal Framework and Their Legislatives Implementation at The National and Regional Levels evels Nati”, paras. 37 and 38, p. 11, Committee on Development and Intellectual Property, Secretariat (2014); http://www.wipo.int/edocs/mdocs/mdocs/en/cdip_13/cdip_13_10.pdf.

¹⁰³ Karl Jorda (Professor Emeritus): “Trade Secrets Have a Long History, The interface between Patents and Trade Secrets: , http://www.jordasecrets.com/2007/10/jorda_on_trade_secrets_have_a.html.

to trade secrets and the violation of a trade secret amounts to an act of unfair competition punished according to the general principles of the civil code.¹⁰⁴

Starting from the 19th century, the industrial revolution urged law makers to shape the notion of trade secrets as a specific asset deserving legal protection. Over the decades and until the emergence of the new economy, the different sensitivities of legislators determined a heterogeneous and patchy evolutionary path mirroring the local economic context. Not surprisingly, the rise of the global information society has given a new boost to the role of trade secrets and has generated the demand for a uniform standard of protection across national boundaries.¹⁰⁵

By 1910, in the United States, the courts had rapidly expanded the trade secret doctrine in *four ways*. *Firstly*, the courts turned the focus of trade secret litigation from a breach of trust to misappropriation of property. *Secondly*, the courts began implying the duty to protect trade secrets for all employees, holding that employees voluntarily assumed and were compensated for whatever loss of mobility that was imposed by trade secret protection. *Thirdly*, the courts finally allowed intangible goods to be protected, even extending to information such as negative knowledge (knowing what doesn't work) and compilations of publicly available facts. *Fourthly* and finally, courts began granting injunctive relief based on the theory of inevitable disclosure.¹⁰⁶

Prior to 1991, Japan effectively had no trade secret protection. In China, the anti-unfair competition law provides the main framework for trade secret protection, along with other protections grounded in contract, company and labor laws.

The OECD's background paper¹⁰⁷ of January 2014 provides a wealth of information on the approaches adopted in a large number of important countries for protection of undisclosed information (Trade Secrets).

2.2.5 Copyright¹⁰⁸

The beginnings of copyright in the common law world can be traced back to William Caxton's founding of the first printing establishment in England in 1476. The initial impetus came from the British Crown to bring this revolutionary new technology under its control. In the middle of the 16th century, the control of book publishing was ceded

¹⁰⁴ Study on Trade Secrets and Confidential Business Information in the Internal Market, Final Study April 2013; Prepared for the European Commission Contract number: MARKT/2011/128/D; http://ec.europa.eu/internal_market/iprenforcement/docs/trade-secrets/130711_final-study_en.pdf

¹⁰⁵ *Ibid.* 101; http://ec.europa.eu/internal_market/iprenforcement/docs/trade-secrets/130711_final-study_en.pdf.

¹⁰⁶ Dominick Severance, "A General History of Western Trade Secret Law from the Time of Preliterate Society to Today - Pt. 1", , Jan 22, 2013, KINGHALL, IP Law Association; http://students.law.ucdavis.edu/ip/ip_news/posts/tradesecretlawpt1.html.

¹⁰⁷ Mark F. Schultz and Douglas C. Lippoldt "Approaches to Protection of Undisclosed Information (Trade Secrets) – background paper", OECD Trade Policy Paper No. 162, Working Party of the Trade Committee, Trade and Agriculture Directorate Trade Committee; <http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=TAD/TC/WP%282013%2921/FINAL&docLanguage=En>.

¹⁰⁸ "History of Copyright, What are Copyrights?" at <http://historyofcopyright.org/>.

by the Crown to the Stationer's Company, a London guild of printers, bookbinders, and booksellers, through a printing patent that gave the company a monopoly over the English publishing trade. The world's first copyright law, the Statute of Anne, was enacted in England in 1710.

Exercising its power under the newly adopted Constitution to secure the rights of authors and inventors, the US Congress passed an act almost identical to the Statute of Anne as the first American copyright law in 1790.

As in England, sovereign printing privileges preceded the emergence of authors' rights in France, Germany, and elsewhere on the European continent. In France, the printing monopolies ended with the revolution. A 1791 law laid the foundation for French copyright by giving authors an exclusive right to perform their works and a 1793 law gave authors generally a broad-based right against unauthorized reproduction of their works. Until passage of the 1957 Copyright Act, only minor amendments were made to these laws, and for more than a century and a half the accommodation of French copyright law to new reproduction and performance technologies was left almost exclusively to the courts. The 1985 Act, amending the 1957 Act, confronted newer technologies, such as computer programs, and the 1992 IP Code codified both copyright and neighboring rights legislation. The Code has been amended to implement relevant European Union directives and other treaty obligations.¹⁰⁹

In the German territorial states, the system of sovereign printing privileges lasted well into the 19th century. Prussia, then by far Germany's biggest state, introduced a copyright law in 1837, but Germany's continued division into small states meant that it was hardly possible to enforce the law throughout the empire. The 1837 Prussian act provided protection for 30 years after the author's death against the reproduction of works of science and art. With the establishment of the Second German Reich in 1871, a national Copyright Act was passed granting copyright to literary works, illustrations, musical compositions, and dramatic works. Following the 1871 Copyright Act, an Act of 1876 extended copyright to graphic and three-dimensional works of art. Acts of 1901 and 1907 respectively added provisions on copyright in literary and musical works and artistic works and photography. The 1965 Act comprehensively revised the copyright law in Germany.¹¹⁰

The first few articles on authors' rights in what is now the Russian Federation were enacted within the framework of public law, as part of the Censorship Act in 1828. In

¹⁰⁹ Paul Goldstein Lillick, "International Copyright: Principles, Law, and Practice" Professor of Law, Stanford University, 2001;

http://www.ameconomist.com/lecture/wto/08trips/International_Copyright.pdf.

¹¹⁰ *Ibid.*, 106; http://www.ameconomist.com/lecture/wto/08trips/International_Copyright.pdf.

1911, the Copyright Act of the Russian Empire, one of the most modern acts in Europe at the time, was adopted.¹¹¹

Copyright legislation entered India through the Copyright Act of 1847, enacted pursuant to the copyright law reform in England, passed in 1842. Three issues motivated the enactment of Indian copyright law. First was the enforcement of copyrights under English common law as introduced into India under the East India Company. Second was the enforcement of copyright under principle of equity in Indian courts. Third was the jurisdiction of English copyright law in India. Legislation in India was necessary to clarify these three issues and allow for protection of United Kingdom copyrights in India. Under the terms of the Copyright Acts of 1842 and 1847, works published anywhere in the colonies would be subject to protection under English copyright law. Indian copyright law governed infringement within India of works first published in the United Kingdom. The Indian Copyright Act of 1847 followed the details of English copyright law as far as duration of rights, but copyright extended only to literary and artistic works, and not to musical or dramatic works.

Furthermore, registration of copyright was with the Secretary of State's Office in India, rather than the Copyright Office in the United Kingdom. Most importantly, the Indian Copyright Act did not treat unauthorized importation of works copyrighted under United Kingdom law as infringement. It thereby created a ready market for what was deemed to be pirated literary works from the United Kingdom. The Imperial Copyright Act of 1911 and the subsequent Indian Copyright Act of 1914 were the next set of copyright legislation during the colonial period. The reforms responded to three challenges in the international environment. First was the need for uniformity of copyright laws across the colonies in order to deal with the unauthorized importation of copyrighted works into the local colonial marketplace. The second challenge came from unauthorized translations of United Kingdom copyrighted works in the colonies. The third challenge came from the Berne Convention for the Protection of Literary and Artistic Works¹¹² of 1896 and the 1908 Berlin Act of that Convention, each of which required revisions of copyright law to conform to international standards.¹¹³

As books continued to be easier, faster, and cheaper to produce and distribute, domestically and internationally, in Europe and North America, it became clear that enhanced protection of authors and uniform international copyright standards were required. One such movement for international uniformity led to the *Berne Convention for the Protection of Literary and Artistic Works* and its 1887 adoption of certain

¹¹¹ Heiki Pisuke "Building a National Intellectual Property Protection System: Some Issues Concerning Copyright and Related Rights in Estonia", in *Estoniaal Intellectual Property Protection Syst* <http://www.scandinavianlaw.se/pdf/42-9.pdf>.

¹¹² Berne Convention for the Protection of Literary and Artistic Works, WIPO Handbook on Intellectual Property, 1979, <http://www.wipo.int/treaties/en/ip/berne>.

¹¹³ The WIPO Journal: Analysis of Intellectual Property Issues, General Editor: Professor Peter K. YU Volume 4 Issue 1, 2012, p. 30, http://www.wipo.int/edocs/pubdocs/en/intproperty/wipo_journal/wipo_journal_4_1.pdf.

standard, minimum levels of copyright protection and their enforcement in the member countries across Europe and elsewhere in the world.¹¹⁴

In Japan, the first legislation on copyright was the Publishing Ordinance, which was enacted in 1869. This Ordinance provided for both the protection of copyright and the regulation governing publishers. In 1887, the copyright part of this ordinance became independent as newly established legislation called the Copyright Ordinance, which is said to be the first copyright legislation in Japan in substance. Japan acceded to the Berne Convention in 1899. As a new set of provisions was required to comply with the Berne Convention, the Copyright Ordinance was changed as a whole into the Copyright Law in 1899. This Copyright Law of 1899 (the old Copyright Law) is referred to as the first modern copyright law of Japan consistent with the international standard of copyright protection.¹¹⁵

Over time, the objects, or subject matter, of copyright protection has undergone a gradual expansion, with the latest addition being that of computer programs and software. In addition, the duration and scope of rights under copyright have also been very considerably expanded. The current challenges of copyright relate mostly to those created by the technologies of computerization, networking and digitalization. Computer networks, including the Internet, fundamentally depend on copying to successfully operate.

Digital technologies, online communications and electronic commerce have destabilized the global copyright system. The 1996 WIPO Internet Treaties were an early response to this sea change, which subsequently triggered a wave of further-reaching domestic implementation actions, whose higher levels of protection were often tied into bilateral and regional preferential trade agreements (PTAs), in particular where industrialized countries were partners to the deal.¹¹⁶

All in all, from an economic perspective, copyright is about the proper industrial policy for the so-called creative industries.

¹¹⁴ History of Copyright, What are copyrights? at <http://historyofcopyright.org/>.

¹¹⁵ "Copyright System in Japan", Japan Copyright Office (JCO) Agency for Cultural Affairs Government of Japan, October 2014; <http://www.cric.or.jp/english/csj/csj2.html>.

¹¹⁶ Jeremy de Beer & Mira Burri, "Transatlantic Copyright Comparisons: Making Available via Hyperlinks in the European Union and Canada", Working Paper No 2013/22, August 2013, p. 2; http://www.wti.org/fileadmin/user_upload/nccr-trade.ch/wp3/Making_Available_via_Hyperlinking.pdf.

Box: 2.10 Establishing a software ecosystem of users and developers enhancing B2B collaboration for smart farming¹¹⁷

The SmartAgriFood accelerator wants to fund web entrepreneurs and SMEs with new or innovative ideas for applications and services to address the lack of smart ICT tools suited for farm and wider agricultural use. New or existing applications should use FIWARE technologies (an innovative, open cloud-based infrastructure for cost-effective creation and delivery of future internet applications and services) and ideally be delivered through the FIspace platform (an integrated collaboration system). Projects are expected to address one or more of three representative farming subsectors:

- Arable Farming - large-scale, annual crop production in the open air
- Horticulture - flowers, fruits and vegetables production in greenhouses or, at a small scale, similar crops in the open air. In addition, orchards can be included.
- Livestock Farming – animal production in the open-air closed housing systems or a mix between these.

Projects are expected to provide smart solutions for specific farm operations or farm management activities. Projects may develop and implement new solutions or modify existing solutions towards use within the Future Internet framework.

€4 million in funding is available for SMEs and web entrepreneurs to develop a large number of smart agriculture services and applications. Grants of up to €100K are available which will be distributed over 3 stages:

- Stage 1 Prototype development (Up to €40,000 in EU funding, 100% funded, no matched funding required)
- Stage 2 End user trials (Up to €40,000 in EU funding funded at 75%; 25% matched funding required)
- Stage 3 Business Development (Up to €20,000 in EU funding funded at 50%; 50% matched funding required).

SmartAgriFood has joined forces with the Europe-wide ICT-AGRI network to provide SMEs and web entrepreneurs with an additional €2M in funding to pay for expert advice and support services for the successful SMEs.

2.2.6 Rights related to or neighboring to copyright

In the 20th century, at the same time as philosophies of authorial personality and case law on moral right were forging a doctrine of author's right, technologies were beginning

¹¹⁷ "Supporting SMEs in the Development of Smart Services and Apps for the Agri-food Sector", Smart Agri-food webp. at <http://www.smartagrifood.com/>.

to emerge that challenged the doctrine's assumptions respecting authorship. Photographs, it might be thought, were the products of a mechanical process, not of an artist's creative vision; motion pictures were the product of corporate organizations, not the labors of individual authors. After some agonizing, civil law countries brought photographs and films within author's right, but they drew the line there and rejected author's right protection for performers in their performances, phonogram producer's rights in their sound recordings or phonograms, and of broadcasters in their broadcasts. Instead, many European countries created for these and other new technological productions a regime of neighboring rights (*droits voisins* in France, *Leistungsschutzrechte* in Germany, and *diritti connessi* in Italy).¹¹⁸ Protection for performances, sound recordings, and broadcasts is the mainstay of the neighboring or related rights doctrine.

The difference between countries that apportion protection between author's right and neighboring or related rights and countries that bring both classes of subject matter under the rubric of copyright is mainly symbolic. Few sound recordings, performances, or broadcasts that are protected by copyright will in fact enjoy an economic life that begins to approach the copyright term of protection; indeed, their economic value will typically be exhausted even before expiration of the shorter, neighboring rights term of protection.¹¹⁹

In the current ICT environment, a person can become an author, a neighboring rights holder, and user at the same time.

2.2.7 Industrial Designs

In the United Kingdom, designs were originally protected as artistic creations under the auspices of copyright law. As society began to recognize value in different forms of artistry, from books to fabrics to fine arts, and as technological developments facilitated copying of these different art forms, the law responded in a piecemeal fashion, conferring copyright protection upon whichever form of design was under threat at the time.

In the late 1700s, when textile manufacturers in northern England and Scotland started massive copying of the more sought-after patterns of London-based manufacturers to produce calico prints in quantities far exceeding their originators, the London calico manufacturers complained to Parliament. Because contemporary English copyright law protected engravers and authors but not textile pattern makers, Parliament enacted new legislation, the Calico Printers' Act of 1787,¹²⁰ which conferred protection on persons "who shall invent, design, and print [...] any new and original pattern [...] for printing linens, cottons, callicoes, or muslins." By the early 1800s, an active debate in England

¹¹⁸ *Ibid.* p. 106; http://www.arneconomist.com/lecture/wto/08trips/International_Copyright.pdf.

¹¹⁹ *Ibid.* p. 106; http://www.arneconomist.com/lecture/wto/08trips/International_Copyright.pdf.

¹²⁰ "An Act for the Encouragement of the Arts of designing and printing Linens, Cottons, Callicoes, and Muslins, by vesting the Properties thereof, in the Designers, Printers and Proprietors, for a limited time", 1787, 27 Geo.III, c.38 (1787).

about expanding the Act culminated in a radical new design protection system beginning in 1839.¹²¹

It was in the 1830s, for the first time, that manufacturers of cast-iron consumer goods on a commercial scale in the United States started relying on distinctive designs with ornamentation as a distinguishing feature to market their products. At the same time, copying of textile designs by competitors became particularly widespread in the American textile industry. The existing patent law had no solution to these problems. Stove manufacturer Jordan L. Mott set in motion the proposals that eventually grew into the design patent legislation in the United States.

The industrial revolutions of the 19th and 20th Centuries heralded a new era in which designs were applied to utilitarian objects whose mass production was facilitated by new technologies. This presented a challenge to the legislature and the judiciary; while there was a desire to continue to protect creative designs, there was concern about fettering the development of functionality.

In the mid-20th Century, craftsmanship and industrialism gave way to consumerism and the role of modern design law, like all modern IPRs, shifted to regulation of competition and balancing “measurable economic objectives against social goals and potential benefits for rights holders against impacts on consumers and other interests”.¹²²

While design legislation has its roots in patent law in the United States, in the rest of the world it is mostly rooted in copyright law, although it also overlaps with trademark law, especially in the context of the Community Design Right in the European Union. In 2001, the *Community Design Regulation* created a unitary right which provided a minimum level of consistent protection across all 28 European Union member states, but with each having the ability to impose different local or national design right protection.

In Japan, industrial designs are protected primarily under the Design Law but depending on their types, partly under the Copyright Law, the Unfair Competition Prevention Law and the Trademark Law.

Today, designs in the United Kingdom are protected by no fewer than five legal rights: European Union registered design rights, European Union unregistered design rights, United Kingdom registered design rights, United Kingdom unregistered design rights and artistic copyright. However, this web of rights, described by Howe as a “labyrinth” and by Professor Hargreaves as a “patchwork”, seems to exist in a vacuum without a common purpose.¹²³

¹²¹ Jason J. du Mont and Mark D. Janis, “The Origins of American Design Patent Protection”, p. 855 *Indian Law Journal*, Volume 88:837, 2013; <http://ilj.law.indiana.edu/articles/7-Du-Mont-Janis-1.pdf>.

¹²² Alexander Carter-Silk and Michelle Lewiston “The Development of Design Law: Past and Future, From History to Policy”, UK Intellectual Property Office, 24 July 2012; Crown Copyright; <http://www.ipo.gov.uk/ipresearch-designlaw-201207.pdf>.

¹²³ *Ibid.*, p. 119; <http://www.ipo.gov.uk/ipresearch-designlaw-201207.pdf>.

2.2.8 Trademarks

The marking of goods for various purposes, including identifying them from those of other traders, dates back to ancient times. In the same way, the existence of rules governing the use of such marks goes back to the medieval craft guilds.

Around the 10th century, a mark called a “merchants mark” appeared, and symbols among traders and merchants increased significantly. These marks, which can be considered one kind of “proprietary mark”, were essentially used to prove ownership rights of goods whose owners were missing due to shipwrecks, pirates, and other disasters. Even now, in every part of the world, horses, sheep, and other animals are still branded with a mark identifying the owner.

From around 1850 onwards, the contours of modern trademark law gradually evolved in a number of countries, such as France, the United Kingdom, Germany and the United States.

The core of modern trademark law, as it is understood today, is based on what may be called the “information transmission model”, which views a trademark as a symbol for communicating information (a signaling/differentiating function) to the consumers about the goods/services placed on the market to which the trademark pertains, so as to prevent others (producers of goods or providers of goods and services) from using similar marks to deceive or confuse consumers. In this process, the trademark also protects the reputation or goodwill of the producer or provider of goods or services.

In France, the *Factory, Manufacture and Workplace Act* of April 20, 1803, (particularly Article 16) is internationally noted for establishing a system which made it a crime to pass off another’s seal as one’s own. Furthermore, the Criminal Acts of 1810 (Article 142) and 1824 (Article 433) made it a punishable crime to abuse the name of others or wrongly use the names of production areas.¹²⁴

Even this system was not nearly as advanced as the comprehensive trademark legal structure we see today. On June 23, 1857, France established the first comprehensive trademark system in the world with the *Manufacture and Goods Mark Act*, a trademark deposit system that embodied theories of both use-based and examination-based trademark registration systems. Until the passage of that Act, France had employed an exclusively use-based system. In fact, in France’s old colonial territories, the influence of this system continues. This law, partially amended in 1890 and 1944, was repealed in 1964. On December 31, 1964, a registration-based system was established in which the commencement of trademark rights was conditioned on “deposit” (filing) and a loss of rights occurred through failure to use the mark.¹²⁵

¹²⁴ Chapter 2. The History and Development of Trademark Law Section 1: The History of Trademark Law; <http://www.iip.or.jp/translation/ono/ch2.pdf> .

¹²⁵ *Ibid.*, p. 121; <http://www.iip.or.jp/translation/ono/ch2.pdf>.

In the United Kingdom, the first trademark registry was established in 1875. Trademark law was consolidated in 1883 and the trademarks act of 1905 gave the first statutory definition of a “trade mark”. 1938 saw further legal changes, which had major effect on trademark registration.¹²⁶

American trademark law has its origin in English common law, with the earliest pivotal English cases occurring in 1742 and 1824. American courts first granted relief under trademark theories in 1837. Congress enacted the first trademark statutes in 1870 and 1876, although the Supreme Court subsequently declared them unconstitutional. Congress then passed the Trademark Act in 1881.¹²⁷

The modern trademark legislation of China began with the implementation of the Trademark Law on March 1, 1983.

2.2.9 Geographical Indications (GI)¹²⁸¹²⁹

The legal system for the protection of GIs is essentially European in its origin; it concerns economic and consumer protection goals in relation to artisanal food products, especially wines, spirits and cheeses. Unlike most consumer products, wine has been made in more or less its current form not just for decades or centuries, but for millennia. Even in the early days of wine production, GIs were applied to containers as a means of classification. Ancient Egyptians regularly stamped wine jars or painted them with vintage and provenance. The Roman amphora, a pottery container of approximately twenty-six liters, always carried or attached an inscription indicating its place of origin.

Early in the 18th century, law began to protect consumers from fraudulent GIs. In 1716, for example, Medici Grand Duke Cosimo III of Florence issued an edict establishing GIs on Tuscan wine grape-growing regions, most notably Chianti, Carmignano, and Pomino. This decree fixed boundaries for these regions and forbade merchants in other regions from using these geographic names on wines not grown in the delimited areas. Forty years later, in 1756, legal vineyard delimitation was created in the Duoro Valley of Portugal, establishing a specific area in the upper Duoro where growers would receive higher prices for their wines than those produced from grapes grown elsewhere.

By the early 20th century, the wine industry in Europe faced enormous fraud and adulteration problems. In response, national governments formally delimited grape-growing areas used in wine production, beginning with a French law in 1905 designed to combat fraudulent wine labeling that eventually, through subsequent laws in 1919, 1927, and 1935, created the well-known French appellation of origin system for wines,

¹²⁶ Archived webp. of IP Office, UK Government; <http://www.ipo.gov.uk/types/tm/t-about/t-what-is/t-history.htm>.

¹²⁷ David S. Almeling, “Seven Reasons Why Trade Secrets are Increasingly Important”, Berkeley Technology Law Journal, Vol. 27:1091, 2012, http://btlj.org/data/articles/27_2/1091_1118_Almeling_WEB_110612.pdf.

¹²⁸ Michael Maher, “On Vino Veritas – Clarifying the Use of Geographic References on American Wine Labels”, California Law Review, vol. 89, Issue 6, December 2001, <http://scholarship.law.berkeley.edu/cgi/viewcontent.cgi?article=1438&context=californialawreview>.

¹²⁹ “Part II Protection of Geographical Indications in 160 countries around the world”, Insight Consulting, O’Connor and Company, European Lawyers, http://trade.ec.europa.eu/doclib/docs/2007/june/tradoc_135089.pdf.

spirits, cheeses, and various other agricultural products.¹³⁰ Today, every major wine-producing nation has a regulatory regime for wine labeling that incorporates geographic delimitations of grape-growing regions. The particular importance of GIs to the wine trade is underscored by the express protection of such indications in four international agreements.

Nowadays, the term “GI” covers different concepts such as the appellation of origin, a term which has been defined at the international level in the *Lisbon Agreement for the Protection of Appellations of Origin and their International Registration*.¹³¹ “Appellation of origin” is a type of GI which has a strong link between the origin of the product and its characteristics: “the quality and characteristics of which are due exclusively or essentially to the geographical environment, including natural and human factors”.

In 1992, the European Union regulated GIs and designations of origin for agricultural products and foodstuffs (with the exception of wines and spirits), through Council Regulation (EC) No. 2081/92, which was replaced by Council Regulation (EC) No. 510/2006. The protection of agri-food products by geographical origin is done at the European level by the creation of three types of indications called: “Protected Geographical Indication” (PGI), “Protected Designation of Origin” (PDO) and a “Traditional Specialty Guaranteed” (TSG). While PDO and PGI are linked to a specific geographical area, the TSG is not so linked as it focuses on the “traditional”. In 1994, the obligation to recognize and protect GIs as IP rights was included in the WTO’s TRIPS Agreement. As all WTO member countries must sign and implement the TRIPS Agreement, GIs became recognized and legally protected in many countries after this agreement came into effect, in 1996 (under Article 65.1 of the TRIPS Agreement).¹³²

GIs are different from an “indication of source” (e.g., “Made in Italy”) which merely refers to the origin of a product and bears no requirements or expectations regarding specific characteristics linked to the origin of the product. Thus, an “indication of source” can be defined as an indication referring to a country, or to a place in that country, as being the country or place of origin of a product. It is important that the indication of source relates to the geographical origin of a product and not to another kind of origin, for example, an enterprise that manufactures the product. This definition does not imply any special quality or characteristics of the product on which an indication of source is used. Examples of indications of source are the mention, on a product, the name of a country, or indications such as “made in ...”.¹³³

GIs are mostly geographical names, such as Champagne, Parma Ham, Scotch Whisky, Baena, etc. However, GIs may also be non-geographical names that are associated to a specific geographical origin, such as Feta, in the European Union. As with the trade

¹³⁰ In France, the label “Controlled Designation of Origin” (“Appellation d’origine contrôlée” – AOC) protects wine products since 1935 and all agricultural and food products, raw or processed, since 1990.

¹³¹ Lisbon Agreement for the Protection of Appellations of Origin and their International Registration; <http://www.wipo.int/treaties/en/registration/lisbon/>.

¹³² Juliana Santilli, “Geographical Indications for Agrobiodiversity Products? Case studies in France, Mexico, and Brazil”, 2012, http://www.abs-initiative.info/uploads/media/Geographical_Indications_for_Agrobiodiversity_Products_-_Juliana_Santilli.pdf.

¹³³ Standing Committee on the Law of Trademarks, Industrial Designs and Geographical Indications, Sixth Session, SCT/6/3, WIPO, January 2001, http://www.wipo.int/edocs/mdocs/sct/en/sct_6/sct_6_3.pdf.

mark, the main function of the geographical indication is to distinguish goods originating from a certain source. As distinct from trademarks, GIs distinguish the goods for which they are used through a reference to the place where they were made, and not through a reference to their manufacturing source.

GIs are protected in international treaties and national laws under a wide range of concepts which include laws against unfair competition and/or consumer protection laws, passing off, trademark laws (collective or certification marks), and special laws for the protection of GIs or appellations of origin (also known as *sui-generis* GI protection systems). For an overview, see “*The international protection of GIs yesterday, today and tomorrow*”, an article by Gail Evans and Michael Blakeney.¹³⁴

At the conceptual core of GIs is a claim about *authenticity* and *heritage*. In an age of rapid economic integration and, often, consumer abundance, of a “McWorld” that is increasingly similar around the globe, GIs purport to help individuals and groups identify, protect, and at times profit from authentic production. A GI such as champagne distinguishes “true” champagne from other sparkling wines. GI proponents believe that a similar product from a different region of the world necessarily lacks the geographically-determined qualities of champagne. It is, therefore, a kind of fake or impostor. And in their focus on *terroir*, GIs provide a bulwark against homogenization and industrial production of foodstuffs. Given the focus of GIs on heritage, locality and “placeness”, it is unsurprising that GIs are championed by those who oppose aspects of contemporary globalization, especially its despatializing and homogenizing characteristics.¹³⁵

2.3 Plant breeding, access to seeds, control of breeders over plant varieties, farmer’s right to save, use, exchange and sell versus farmer’s privilege to save and reuse seeds

Plant breeding research and seed provision are vital industries that need to be fostered and stimulated. Plant breeding is important for food security at the local and global levels; the ability of adapted varieties to cope with environmental stresses contributes to strategies for sustainable agriculture. Moreover, the provision of productive options for commercial farming is essential for wider economic development.¹³⁶

Until recently, certain concepts were universally accepted among farmers. Firstly, out of economic necessity, farmers had the right to save, replant, and resell seeds to other farmers willing to buy seeds with desirable characteristics. Secondly, the genetic composition of seeds, rather than the seed itself, was considered part of a common heritage and widely shared among farmers. Thirdly, seeds were not seen as a commodity; rather, the right to use and reproduce seeds was inherent in the first

¹³⁴ Gail Evans and Michael Blakeney, “The international protection of geographical indications yesterday, today and tomorrow”, <http://gaileevans.com/EvansEmergingIssuesIPChapter13GIs.pdf>.

¹³⁵ Kal Raustiala and Stephen R. Munzer, “The Global Struggle over Geographic Indications”, *The European Journal of International Law*, Vol. 18, No. 2, 2007; <http://www.ejil.org/pdfs/18/2/227.pdf>.

¹³⁶ See p. xiii of “The intellectual Property Rights, Designing Regimes to Support Plant Breeding in Developing Countries”, The World Bank, Agriculture and Rural Development Department, Report No. 35517-GLB, 2006, http://siteresources.worldbank.org/INTARD/Resources/IPR_ESW.pdf.

purchase of the seed. In the United States, until the 19th century, seeds were seen as a public commons, bred and then freely distributed by the public sector.¹³⁷

Historically, farmers reproduced their seeds time and time again and exchanged best-performing or best-fitting varieties with other farmers. Even today, a large proportion of the seed planted worldwide is either saved by farmers or exchanged on a farmer-to-farmer basis. In the mid-1980s, farmer-saved seed accounted for an estimated 35 per cent (18 billion USD) of the total estimated value of 50 billion USD of all agricultural seed used worldwide, proprietary or not (Groosman *et al.*, 1988). In developing countries, the importance of seed-exchange networks and re-use appears to be even greater, as an estimated 80 per cent of the seed used in the early 1980s was farmer-saved (Pray and Ramaswami, 1991).

In addition to the main vertically integrated innovation chain producing improved varieties, mass selection operated on farms by farmers cannot thus be overlooked as an innovation system contributing to the conservation and sustainable use of agrobiodiversity, while also truly ensuring the subsistence of millions of farmers based on principles of open access and informal exchanges. Mass selection operates on a daily basis even in developed nations, where a number of noteworthy initiatives have emerged. The French network, *AgroBio Périgord, Maison de la Semence*, for instance, disseminates a technical book on the multiplication and selection of maize and sunflower on farms to the 250 growers that are members of the Western France network. In order to conserve nonproprietary agrobiodiversity, they experiment on local populations or “landraces”, selecting those individuals presenting similar characteristics after two or three years of natural local adaptation, without ever falling under a stock of 600 individuals (in order to avoid degeneration and to maintain so-called “security stocks”).

In most developing countries, including LDCs, farmers’ informal seed systems usually operate alongside formal seed systems. Farmers’ systems are characterized by traditional methods of selection within and among varieties, on-farm seed multiplication, and informal diffusion of seed from farmer to farmer (Almekinders and Louwaars 1999). These systems still provide the vast majority of all crop seed used by farmers in most developing countries. Although farmers’ seed systems are built on traditional methods and processes, they often involve modern varieties, some of which may be associated with IPRs.¹³⁸

Until fairly recently in most developing countries, seed was supplied through the public sector. Recent private sector involvement has been a function of policy change. Any assessment of the specific impact of IPR regimes on seed industry performance and investment must be seen in the context of these wider changes in the commercial and policy environment. In the majority of developing countries, most of the plant breeding and some seed production still depend on the public sector, particularly NARIs, often supported by IARCs. Plant breeding and seed production are already subject to a set of

¹³⁷ Haley Stein, “Intellectual property and genetically modified seeds: The United States, Trade and the Developing World”, *Northwestern Journal of Technology and Intellectual Property*, vol. 3, Issue 2 spring, Article 3,

<http://scholarlycommons.law.northwestern.edu/cgi/viewcontent.cgi?article=1033&context=njtjp>.

¹³⁸ See p. 12 of “Intellectual Property Rights: Designing Regimes to Support Plant Breeding in Developing Countries”, The World Bank, Agriculture and Rural Development Department (2006); http://siteresources.worldbank.org/INTARD/Resources/IPR_ESW.pdf.

national regulations on variety release and seed quality control. These regulations have played an important part in determining the current evolution of seed systems in developing countries. Even though developing countries have relatively little experience with PVP, the systems that are in place demonstrate a fairly wide range of approaches to issues such as seed saving; the range of crops and varieties eligible for protection; and the treatment of farmers' rights.

Conventional seed law can provide opportunities for controlling access to plant varieties, even in the absence of IPR legislation. Seed laws usually specify the extent to which seed must be certified and define the types of variety that may be offered for sale. A certification scheme defines seed classes of specified origins, so that any certified seed can be traced back to a seed lot produced by the maintainer of the variety (usually the breeder).

Where seed certification is compulsory, the breeder may determine who is producing seed by controlling access to breeder's (or pre-basic) seed. Any unauthorized multiplication will not be acceptable to the certification agency. These requirements mean that a public or private breeder can establish an exclusive contract with a seed company for the production of specified varieties, even in the absence of IPRs. When a variety is not protected by PVP (for example, after the rights have expired), the authorities can assign one or more maintainers to meet the continued demand for seed. Seed certification requirements can also be used to limit informal seed sales, especially when they occur on a large scale.

Where seed law specifies that a variety must be approved (through a registration process or on the basis of performance tests) before entering commercial seed production, this provision can also prohibit the sale of a released variety under a different name. In this way, the law limits the extent to which a competing company can market seed of a protected or an essentially derived version of a released variety, including the unauthorized use of a transgene.¹³⁹

Box 2.11: Access to quality seed by subsistence farmers¹⁴⁰

Seed is often expensive, placing poor farmers at a disadvantage. Large seed companies concentrate more on countries with big farmers and a large demand for seed, especially hybrid maize and vegetable seed. They often ignore seeds with thin profit margins, such as self-pollinated crops, like wheat, rice and beans, open-pollinated crops like non-hybrid maize or vegetatively propagated crops, because farmers often save the seeds from one harvest to the next and because proprietary laws are missing or not enforced. However, these are the crops still widely grown by most smallholder farmers, providing food and employment for themselves and others. Letting farmers try new varieties and then distributing the seed will be crucial as the world adapts to climate change.

¹³⁹ The World Bank, Agriculture and Rural Development Department, *Ibid.*, p. 8, (2006); http://siteresources.worldbank.org/INTARD/Resources/IPR_ESW.pdf.

¹⁴⁰ Robert G. Guei, Jeffery W. Bentley and Paul van Mele, "African Seed Enterprises, Introduction: A full granary", FAO and AfricaRice (2011); <http://agroinsight.com/downloads/african-seed-enterprises/Chapter1-Introduction-A-full-granary.pdf>.

Box 2.12: Using contract law to restrict the use of a breeder's variety by farmers¹⁴¹

Various types of contracts can be effective in providing legally enforceable agreements that restrict the use of a breeder's variety and offer complements or substitutes to IPRs. Such contracts are effective only if the provider of the genetic materials has exclusive access or established rights to the materials or can offer particular benefits to the other contracting party. The contracts are ineffective if third parties have easy access to the varieties or genes. Some contracts are aimed primarily at preventing seed saving and multiplication, whereas others are aimed at protecting the germplasm from being used in competitors' breeding programs.

One type of contract that is increasingly prevalent in the US seed market is the grower contract, or "bag tag." This simple (unsigned) agreement restricts the farmer from using or disposing of any part of the harvest as seed. Farmers are considered to comply with the provisions of such contracts when they open the seed bag. If it is possible to control the market for the harvested product, then another type of contract can be enforced. The breeder can oblige a grower to use the plant variety in certain ways and can impose restrictions on the saving or multiplication of planting material. For example, in the cut-flower industry, the vast majority of the output is sold in a limited number of wholesale markets in the North.

If a flower variety is protected in the country where a major wholesale market is located, growers in other countries must sign contracts limiting multiplication or unauthorized sale of that variety, or risk being denied further access to the major market. This type of contract can be effective even if the flower-growing country has no IPR system.

Access to germplasm may also be controlled through material transfer agreements (MTAs), which may be seen as another form of contract regulating the use of breeding material. When MTAs are established between genebanks or other public institutions and private breeders, they can establish exclusive access, stipulate the type of benefit-sharing in the case of commercialization, and prohibit legal protection by the recipient of the materials "in the form received". Commercial firms may also use MTAs.

The first semi-formalized acknowledgement of farmers' privilege occurred in the first PBRs programs in a few European countries. In those cases, breeders' rights were specified as relating to commercial sale of seeds, the programs remaining mute on what farmers might do with seed on farms (except to prohibit them from reselling it for seed). This form of undefined farmers' privilege was then incorporated into the UPOV Convention of December 2, 1961. Article 5 [Rights Protected; Scope of Protection] of the agreement stipulated that

The effect of the right granted to the breeder of a new plant variety or his successor in title is that his prior authorization shall be required for the production, for purposes of commercial marketing, of the reproductive or vegetative propagating material, as such, of the new variety, and for the offering for sale or marketing of such material. Vegetative propagating material shall be deemed to include whole plants.

¹⁴¹ The World Bank, Agriculture and Rural Development Department, *Ibid.*, pp. 8-9 (2006), http://siteresources.worldbank.org/INTARD/Resources/IPR_ESW.pdf.

By omission, farmers who simply sowed seeds saved from previous crops and then sold the resulting crop for food (and not seed) were not infringing the rights of PBR holders.¹⁴²

This informal “privilege” remained in force through the 1978 UPOV Convention but in 1979, debate began in the FAO about the “asymmetric benefits derived by the donors of germplasm and the donors of technology”. The FAO concluded that commercial varieties were usually the product of applying breeders’ technologies to farmers’ germplasm and, while the breeders were able to generate returns through PBRs or other property mechanisms, farmers were not compensated. The debates ultimately led to a series of FAO resolutions (4/89, 5/89 and 3/91) which formally recognized the concept of Farmers’ Rights as a “basis of a formal recognition and reward system, intended to encourage and enhance the continued role of farmers and rural communities in the conservation and use of plant genetic resources.” (FAO CPGR-Ex1/94/5, September 1994). The logic was that farmers’ privilege was needed to balance “the rights of traditional breeders and of plant breeders, while allowing the farmers to benefit, in some way, from the value that they have creatively contributed [...] recogniz[ing] the role of farmers as custodians of biodiversity and [...] to call attention to the need to preserve practices that are essential for a sustainable agriculture.” These debates and resolutions led to two outcomes (www.southcentre.org). Within the policy community, it initiated discussions through the FAO, the Agenda 21 process and the CBD to revise the International Undertaking on Plant Genetic Resources (IUPGR), ultimately leading to the ITPGRFA, adopted 3 November 2001. This treaty formalized management of the Consultative Group on International Agricultural Research (CGIAR)¹⁴³ seed banks as “*common heritage of humankind*”.¹⁴⁴¹⁴⁵

The farmer’s privilege should not be confused with the concept of “Farmers’ Rights”, which has been codified in the ITPGRFA¹⁴⁶ (2001) and in some national laws. There is no uniform interpretation of Farmers’ Rights in relation to IPRs on plant varieties.

¹⁴² P.W.B. Phillips and C.B. Onwuekwe, “Accessing and Sharing the Benefits of the Genomics Revolution”, Chapter 3 on ‘Farmers’ Privilege and Patented Seeds’, Springer, pp. 54-55 (2007); http://download.bioon.com.cn/upload/month_0809/20080923_6a61ce36d1a5352ccab9lxyx4PZ9dQ6z_attach.pdf.

¹⁴³ Established in 1971 to support R&D that improves food security and reduces poverty, CGIAR is a global network of agricultural research centers “dedicated to reducing rural poverty, increasing food security, improving human health and nutrition, and ensuring more sustainable management of natural resources”. More specifically, some of the CGIAR centers concentrate their research efforts on improving major food crops such as rice, wheat, maize and potatoes, as well as livestock and fish. To ensure that the centers’ research activities and outputs are freely and globally available for researchers, plant breeders and farmers, they have been, and continue to be, considered international public goods. In March 2012, however, CGIAR introduced “Principles on the Management of Intellectual Assets” that allow, in certain situations, exclusive use of CGIAR centers’ research, including the “prudent and strategic” use of IP protection.

¹⁴⁴ P.W.B Phillips and C.B. Onwuekwe “Accessing and Sharing the Benefits of the Genomics Revolution”, Chapter 3, “Farmers’ Privilege and Patented Seeds”, Springer, p. 55, (2007); http://download.bioon.com.cn/upload/month_0809/20080923_6a61ce36d1a5352ccab9lxyx4PZ9dQ6z_attach.pdf.

¹⁴⁵ Historical Background: FAO Conferences in 1961, 1967 and 1973. Discussions on *ex situ* and *in situ* Conservation of Plant Genetic Resources; http://www.abs-initiative.info/uploads/media/ABS_PGRFA_International_Legal_Regime_-_Juliana_Santilli.pdf.

¹⁴⁶ The Treaty (ITPGRFA) was introduced to harmonize the International Undertaking on Plant Genetic Resources signed in 1983 with the CBD 1993. Article 9.3 of ITPGRFA provides that “Nothing

Meanwhile, this debate within the FAO community helped to inform a renegotiation and revision of the UPOV Convention. Article 5 of the UPOV 1991 Convention further elaborated the rights of breeders and farmer, stating that:

(1) Subject to Articles 15 and 16, the following acts in respect of the propagating material of the protected variety shall require the authorization of the breeder.¹⁴⁷

- (i) production or reproduction (multiplication),
- (ii) conditioning for the purpose of propagation,
- (iii) offering for sale,
- (iv) selling or other marketing,
- (v) exporting,
- (vi) importing,
- (vii) stocking for any of the purposes mentioned in (i) to (vi), above.

This means that activities such as seed cleaning (conditioning)¹⁴⁸ of a protected variety will require the permission of the breeder, unless the seed being cleaned is for planting on the grower's own land (that is, farm-saved seed). Where necessary, seed cleaners will need to be aware of which varieties have been granted rights, so that proper authorization is obtained before cleaning seed of a protected variety.

Article 15 of UPOV 1991 goes on to formalize the exceptions to the breeder's right, stating that:

- (1) the breeder's right shall not extend to
 - (i) acts done privately and for non-commercial purposes,
 - (ii) acts done for experimental purposes and
 - iii) acts done for the purpose of breeding other varieties, and, except where the provisions of Article 14(5) apply, acts referred to in Article 14(1) to (4) in respect of such other varieties.
- (2) Notwithstanding Article 14, each Contracting Party may, within reasonable limits and subject to the safeguarding of the legitimate interests of the breeder, restrict the breeder's right in relation to any variety in order to permit farmers to use for propagating purposes, on their own holdings, the product of the harvest which they have obtained by planting, on their own holdings, the protected variety or a variety covered by Article 14(5)(a)(i) or (ii).

in this Article shall be interpreted to limit any rights that farmers must save, use, exchange and sell farm saved seed/propagating material, subject to national law and as appropriate".

¹⁴⁷ The breeder is defined by the UPOV 1991 Convention as the person who bred, or discovered, and developed a variety. Therefore, protection is not limited to breeders who produce a variety as a result of crossing parent plants and selecting from the progeny. The term breeder also includes a person who discovers a mutation and converts that discovery into a cultivated variety by a process of selective propagation. Discovery itself, however, does not constitute breeding; http://www.farmersrights.org/pdf/ITPGRFA_Policy%20BriefSAWTEE.pdf.

¹⁴⁸ "Processing" or "conditioning" means cleaning to remove chaff, sterile florets, immature seeds, weed seeds, inert matter, and other crop seeds, scarifying, blending to obtain uniform quality, or any other operation that would change the purity or germination of the seed and, therefore, require retesting to determine the quality of the seed. "Processing" or "conditioning" does not include such operations as packaging, labeling, blending uniform lots of the same kind or variety without cleaning, or preparing a mixture without cleaning, any of which would not require retesting to determine the quality of the seed; <http://codes.ohio.gov/orc/907>.

In one way or another, all of the current member states of the UPOV (1961, 1978 or 1991) have incorporated the concept of farmers' privilege into their domestic acts.

Box 2.13: Prison term and fines for the unauthorized preparation and storage of seed of protected varieties of barley in Spain¹⁴⁹

The Spanish PBRs regime and the Community PVR regime create rights that are civil in nature. However, Spain's criminal code also protects those rights with criminal sanctions with a maximum period of incarceration for two years.

On February 22, 2012, in an appeal from a sentence imposed under Penal Code Section 274.3, an appellate court in the Province of Cuenca 11 affirmed a one-year prison term, a fine of €5,475, and restitution awards of €19,506 to GESLIVE and €3,960 to Marisa S.A. (the owner of one of the registered varieties). The defendant had been found in possession of approximately 280,000 kilograms of conditioned and bagged barley seed. Laboratory tests showed that the seed was of several protected varieties, including VOLLEY, HISPANIC, and ESTEREL.

The court of first instance found that the defendant had prepared and stored the seed for distribution and sale to farmers at prices below the cost of legitimate seed for those varieties. The appellate court upheld this finding, observing that the defendant's conduct was not shielded by any applicable exception to the variety owner's exclusive rights. The court held that the defendant could not have been conditioning and saving seed from his own harvest for planting his own fields because the amount of seed seized was 255,970 kilograms more than what he would have needed for planting. The court also rejected the argument that the defendant was merely providing conditioning services to other farmers exercising their right to plant farm-saved seed. According to the court, the defendant's operations complied with none of the legal requirements applicable to such service providers.

The decision of the court in Cuenca illustrates that the farm-saved seed exception to the rights of a plant variety owner provides little cover for an unlawful seller of brown-bagged seed. Where the amount of seed in the defendant's possession greatly exceeds what would be needed to plant one's own field, the court may infer that the defendant intends to commercialize the seed unlawfully. Similarly, Spain's record-keeping requirements for providers of third-party seed conditioning services make it difficult to raise a false defense that one is lawfully conditioning seed for others.

¹⁴⁹ Shawn Sullivan, In Spain, Plant Breeder's Rights Criminal Cases Draw Fines, Jail Terms Acquittal, Sullivanlaw.net, oct 8 (2012); <http://sullivanlaw.net/in-spain-plant-breeders-rights-violations-draw-fines-jail/>

Box 2.14: R&D Expenditure in the Dutch plant breeding and propagation industry¹⁵⁰

The plant breeding and propagation industry spends a lot of money on innovation and R&D: approximately 15 per cent of the turnover. Compared with other sectors, this percentage is still high: the European Union average for R&D expenditure in the seed industry is around 12.5 per cent. The R&D expenditure as a percentage of turnover is also high compared with other knowledge-intensive sectors. For instance, the pharmaceutical industry in The Netherlands spends an average of 10 per cent of its turnover on R&D, while for the 1,000 largest companies in the world, that figure is about 3.75 per cent. The difference compared with other sectors in The Netherlands is huge: the Dutch average in industry is approximately 4.7 per cent. The plant breeding and propagation industry, therefore, makes an above-average contribution to Dutch knowledge infrastructure.

The percentage of R&D expenditure can, however, differ greatly between businesses. While strongly internationally-oriented businesses sometimes devote 30 per cent of their turnover to R&D, smaller businesses and businesses focused on the domestic market sometimes spend only a small fraction of their turnover on R&D. This is because internationally-oriented companies must respond to local consumer preferences in many different markets and are increasingly exposed to greater competition. *The top 25 Dutch companies, with the greatest R&D expenditure, feature as many as **four companies from the plant breeding and propagation industry: Rijk Zwaan, Nunhems, Enza Zaden and KeyGene.***

R&D expenditure is used for the development of new products and processes. Companies active within the plant breeding and propagation industry spend more on product innovation than on process innovation. A rough estimate suggests that around 85 per cent of R&D expenditure goes towards product innovation. Just 15 per cent of the money spent goes towards process innovation. That is not surprising, as new varieties constantly need to be brought onto the market in order to respond to new consumer preferences and innovations by rivals.

The R&D activities do not only take place in The Netherlands; producers of plant reproduction materials also develop new products and processes in other countries. Most of the producers spend around 60 per cent of their R&D budget in Europe. At the same time, producers spend a significant sum on R&D in Asia. Although the producers are active virtually all over the world, new products and processes are still developed in Europe. This primarily concerns fundamental research. *Outside Europe, specific varieties are bred to suit local conditions. Propagation also takes place abroad.*

Producers of plant reproduction materials work with growers, without exception. This is not entirely unexpected, as growers are the buyers of the reproduction materials produced by breeders and propagators. Although producers of plant reproduction materials form the basis of Agro & Food, cooperation also takes place with parties lower down the chain during the development of innovations. Companies within the vegetable subsector, in particular, tend to work alongside foodstuffs manufacturers and retailers.

¹⁵⁰ Tom Bakker, Youri Dijkhoorn and Michiel Van Galen, "Plant Reproduction Materials, A Dutch motor for export and innovation", pp. 12-20, LEI Publication (2012), <http://www.pcdi.nl/images/stories/2014plantum/LEI%20brochure%20Plant%20Reprod%20Mat%20EN.pdf>.

In this way, companies are constantly updated on new market developments and consumer preferences.

Besides cooperation with chain partners in The Netherlands and further afield, the plant breeding and propagation industry also works with research institutes and universities. Dutch research institutes and universities play a leading role in these cooperative arrangements. For instance, Wageningen UR (University & Research Centre) submits the most patent applications in the Netherlands in the breeding subsector. Other organizations submitting numerous patent applications include Technology Foundation STW,¹⁵¹ Leiden University¹⁵² and TNO.¹⁵³ In total, research institutes and universities submit around 28 per cent of all patent applications. Only large companies (with more than 250 employees) have filed more patent applications.

In the plant breeding and propagation industry, IP is protected by PBRs and patent law. Applications relating to these are often seen as an indicator of what R&D expenditure will deliver; in other words, the innovation output. Where applications for PBRs are concerned, The Netherlands has been leading the way internationally for many years. More than 30 per cent of the applications are from Dutch plant reproduction materials producers, which underlines the important position of The Netherlands in this field. Besides The Netherlands, other important countries include France, Germany, the United States and Switzerland.

In total, between 1999 and 2008, 195 patent applications were submitted by Dutch producers of plant reproduction materials and by research institutes and universities. The most applications (48 per cent) were submitted by large companies (with more than 250 employees), followed by research institutes and universities (28 per cent) and SMEs (22 per cent). The remainder of the applications (2 per cent) were submitted by private individuals.

The UPOV 1991 Convention allows breeders to exercise their rights on harvested grain provided they did not have a reasonable opportunity to collect their royalties on seed from which the grain being processed was produced. Grain processors may be liable if the seed of a protected variety, from which grain was produced, was obtained from someone not authorized by the breeder to sell seed of the variety. Grain processors may need to implement verification measures to reduce the chance of liability if they are contracted to process grain that, unknown to them, may be produced from illegitimately obtained seed of a protected variety.

France, Germany and Italy account for more than half of the European Union seed and plant reproductive material market, which is the third biggest in the world. EU seed companies are highly diversified according to their size (turnover, number of employees), crops portfolio, geographical area covered and activities carried out. SMEs still represent a high share of the European Union seed sector (for example, the overwhelming majority of Italy's seed companies are SMEs). Moreover, it seems that the concentration process of the seed industry is less advanced in Europe than in the rest of the world. However, situations may differ in specific markets, as seed markets are highly segmented (e.g., in France, seed markets for sugar beet, vegetables and

¹⁵¹ STW, Nieuwe Technologie Mogelijk Maken; <http://www.stw.nl/en/>.

¹⁵² Universiteit Leiden; <http://www.leiden.edu/>.

¹⁵³ TNO, innovation for life; <https://www.tno.nl/en/>.

oilseed crops are much more concentrated than the national seed market for field crops).¹⁵⁴

In industrialized countries, seed multiplication, marketing, and distribution are almost exclusively commercial operations. The situation in plant breeding is somewhat more complex. Commercial enterprises dominate the market for high-value seed crops like maize, cotton, soybean, vegetables, and grasses, and companies that initially earned most of their revenue from seed multiplication and marketing now invest heavily in plant breeding to maintain their market position. For lower-value seed crops, such as small grains and legumes, public institutions such as universities and government research institutes still have an important position in plant breeding in some countries. Basic research in plant breeding, such as the development of selection methods or research on the genetic control of important characteristics, used to be the task of public institutions. However, with the application of biotechnology to plant breeding and the associated opportunities for patenting, private industry has been very active in these areas since the early 1980s. This activity has been accompanied by a significant consolidation of many conventional seed companies into a few large multinational enterprises. For these companies, research is not only a service unit to maintain the firm's position in the seed market, but is also a profit center in its own right. In some cases, companies may detach themselves from the seed market, leaving operations in seed production and marketing to specialized companies to whom they license the technology.¹⁵⁵

In most developing countries, scientific plant breeding has largely been the responsibility of the public sector, often stimulated by the results of IARCs. Plant breeding has received significant emphasis since the so-called "Green Revolution" in the 1960s and 1970s, and it has been viewed as contributing to rural development and national food security and thus as a public responsibility. Similarly, seed production and distribution have been seen as vehicles for technology transfer rather than as commercial operations. For these reasons, governments have largely been responsible for organizing and funding plant breeding research and seed multiplication. More recently, some countries have stimulated commercial seed supply by privatizing public seed production programs, encouraging the development of domestic seed enterprises, and opening up their seed markets to foreign investors. Developing countries currently show a wide range of public and private responsibilities in the seed sector, although basic research and breeding for most crops remain public responsibilities while a variety of public, parastatal, and private enterprises cater for seed production and marketing.¹⁵⁶

Until recently, seeds were predominantly a public sector business in India and China; the situation has changed dramatically in India but not in China. Until the late 1980s, private firm participation in the seed industry in India was limited by economy-wide policies that restricted foreign investment and licensing and by seed-specific policies that limited the sector to "small scale" participants, also severely restricting imports of research or breeder seeds. With India's implementation of the Seed Policy of 1988, the

¹⁵⁴ Guillaume Ragonnaud, "Executive Summary of The EU Seed and Plant Reproductive Material market in Perspective: A focus on companies and market shares", European Union (2013), [http://www.europarl.europa.eu/RegData/etudes/note/join/2013/513994/IPOL-AGRI_NT\(2013\)513994_EN.pdf](http://www.europarl.europa.eu/RegData/etudes/note/join/2013/513994/IPOL-AGRI_NT(2013)513994_EN.pdf).

¹⁵⁵ The World Bank, Agriculture and Rural Development Department, *Ibid.*, (2006) ., pp. 11-12, http://siteresources.worldbank.org/INTARD/Resources/IPR_ESW.pdf.

¹⁵⁶ *Ibid.* . 152; http://siteresources.worldbank.org/INTARD/Resources/IPR_ESW.pdf.

“small scale” limitation was removed, large domestic and foreign firms were permitted entry, and import restrictions were substantially lifted. An important motivation for private firms’ increased R&D expenditures in India has been the market’s transition away from open pollinated varieties (OPVs), which farmers can save and reuse in subsequent years, to hybrids, which cannot be reused without a significant reduction in yield and quality. Farmers’ need to purchase seeds each year enables firms to recoup their R&D investments.¹⁵⁷

Commercial seed industries have developed in the absence of IPRs (other than trademarks) in several countries, including India and Uganda. In the near future, PVP can be expected to have only a modest impact on the direction of domestic commercial seed markets, given that most PVP systems in developing countries cannot control farmer seed saving and possess very limited enforcement capabilities (because of inadequacies in legal systems, insufficient regulatory staff and insufficient experience in the companies themselves).¹⁵⁸

The U.S.-India Business Council (2009) identifies non-market-based pricing as one of the most significant disincentives to the commercialization of new biotech seeds by global seed firms in India. According to the founder of Rasi Seeds, continued state government interference in pricing also is harming the ability of indigenous companies to develop and commercialize biotech seeds (Suresh and Rao 2009, 299). The state government of Andhra Pradesh was the first to implement price restrictions; its 2006 directive capped prices for biotech cotton seeds at less than one half the prevailing market price. Today, price caps have since spread to states throughout the country including Maharashtra, Gujarat, Tamil Nadu, Karnataka, Madhya Pradesh and West Bengal (Mishra, 2006).¹⁵⁹

2.4 Relevance of different types of IPRs to genetic resources, including seeds

By now, it should be obvious that different types of IPRs are relevant to beneficial features of genetic resources, including microorganisms, plants and animals. We have seen that patents and PBRs play an important role, as do trade secrets,¹⁶⁰ whereas trademarks, GIs, copyright and industrial designs play a role in the branding and marketing of genetic resources by agri-food SMEs. In fact, some or all of the above types of IPRs may be relevant to the business strategy and competitiveness of an agri-

¹⁵⁷ Katherine Linton and Mihir Torsekar, “Innovation in Biotechnology Seeds: Public and Private Initiatives in India and China”, Brookings, Oct 5, 2009, http://www.brookings.edu/~media/events/2009/10/23%20china/ex2_paper3_linton.pdf.

¹⁵⁸ *Ibid.*, 152, p. xv; http://siteresources.worldbank.org/INTARD/Resources/IPR_ESW.pdf.

¹⁵⁹ *Ibid.*, 154; http://www.brookings.edu/~media/events/2009/10/23%20china/ex2_paper3_linton.pdf.

¹⁶⁰ In the field of plant breeding and biotechnology, the following are examples of IP that can be maintained as trade secrets: parental inbred lines of hybrids, breeding records, specific methods that are used in the laboratory, workshop, greenhouse or field; gene-agronomic trait associations and molecular markers used in marker assisted selection. See p. 27 of “ISF View on Intellectual Property”, International Seed Federation (2013); http://www.worldseed.org/cms/medias/file/PositionPapers/OnIntellectualProperty/View_on_Intellectual_Property_2012.pdf.

food SME (including a small and medium sized farm), irrespective of what role(s) it play(s) in the agri-food supply/value chain.

Thus, IP protection for biotech seeds is an important framework condition for innovation because the development and commercialization of new products is characterized by large research expenditures, uncertain outcomes, and lengthy and costly regulatory procedures. Monsanto, for example, estimates R&D investments for new biotech corn products of 5-10 million USD for the proof-of-concept phase, and 10-15 million USD for early product development. To obtain regulatory approval, it has been calculated that global seed firms incurred compliance costs ranging from 7-15 million USD for herbicide-tolerant and insect-resistant corn submitted to regulators in ten countries. These large sunk R&D and regulatory compliance costs would be lost if competitors were permitted to free-ride on the work of initial innovative firm. An additional challenge arises from the “natural appropriation problem” of seeds. OPVs can be reproduced simply by their cultivation and reuse and biotech seeds can be relatively easily copied by competitors through the latest biotechnology techniques. By contrast, hybrid seeds have some built in protection mechanisms: they lose their superior yield potential and other valuable characteristics in subsequent plantings, thus reducing the motivation of farmers to save seed. Moreover, commercial competitors cannot reproduce hybrid seeds without access to the parental lines used to develop them; keeping the parental lines physically secure reduces the appropriation problem. However, these built-in protection mechanisms have their limitations. Seed production in India and China tends to be concentrated in geographic zones with favorable agronomic conditions; the presence of many competing firms working in a relatively small area creates numerous opportunities for misappropriation.¹⁶¹

To fully appreciate the importance of IP protection, it is important to understand that intellectual products are different from physical products in several aspects. A key difference is the so-called “public good” characteristic of information which is non-rivalrous in the sense that its use by one person does not diminish its use by some other person. Furthermore, the production of some intellectual products, in particular those that consist of symbolic information, is subject to returns to scale because the first copy of information is expensive, whereas all additional copies are cheap. The public good characteristic, in combination with low costs of producing copies, affects the ability of producers of IP to recover their costs because any buyer of IP can turn himself into a low-cost seller. With many potential competitors, the producer of the intellectual product is deprived of income from sales and the incentives to produce intellectual products are eroded. IP laws grant monopoly rights to the producers of intellectual products and prevent buyers of the product from turning into sellers. With potential competition eliminated, the owner of the property may charge higher prices than he could without IPR.¹⁶²

Variety development is very important for horticulture and agriculture. A solid system for registering varieties and a strong PBRs system are necessary to ensure that the breeding work is rewarded. PVP in The Netherlands started with the decree on PBRs in

¹⁶¹ Ibid. 154; http://www.brookings.edu/~media/events/2009/10/23%20china/ex2_paper3_linton.pdf

¹⁶² Rolf A.E. Mueller, “The Evolution of Intellectual Property Rights for Digital Information Products – Impact on agroindustry”, raem@agric-econ.uni-kiel.de, Department of Agricultural Economics, Christian-Albrechts-University at Kiel, Germany; EFITA 2003 Conference; 5-9, July 2003, Debrecen, Hungary; <http://www.agric-econ.uni-kiel.de/Abteilungen/II/PDFs/efita03.pdf>.

1941. The Dutch Seed Law, of which the first edition was published in 1967, was renewed in 2005. The implementation was completed on February 1, 2006.¹⁶³

India provides the shortest term of protection for new plant varieties, followed by China and then the United States. China and India are phasing in coverage of the law to include new crops each year; however, because India's law is of recent vintage, relatively few crops are covered. China did not include cotton on the list of crops entitled to PVP until 2005; a delay labeled "strategic" by Keeley to enable the unrestricted spread of the first generation of biotech cotton technologies. The most significant difference in PVP laws in the three countries is the breadth of farmers' privileges under India's law. Indian farmers are permitted to save, use, sow, exchange, share, and even sell protected seed. The only limitation is a prohibition on the sale of "branded seed". China's law permits farmer seed saving and informal exchange but prohibits commercial sales. US law is significantly more restrictive; farmers can only save seed under specific conditions and new varieties cannot be "essentially derived" from protected varieties without a sharing of benefits. Global seed firms note that the broad farmers' privileges and breeders' exemptions render PVP of limited commercial value in both India and China.

Unlike in the United States, the dominant users of the PVP systems in India and China are public research institutions and universities, seeking protection for conventional hybrids and OPVs rather than biotech plants. In India, most applications have been filed by the Indian Council of Agricultural Research (ICAR). The combined share of ICAR and the state agricultural universities equals 54 per cent of all applications. Most of the remaining applications are filed by the private sector, which includes both domestic and foreign firms.¹⁶⁴

Similarly, according to data compiled in China by Hu and others (2006), 66 per cent of PVP applications were filed by government research institutes between 1999 and 2004. This figure actually understates public sector involvement as approximately one half of the applications filed by the private sector were for plants developed by the public research institutions and then licensed to private firms for purposes of the PVP application (Hu *et al.* 2006, 261, 264). Public sector efforts to protect and commercialize IP are not surprising given that government research institutes in China often are expected to generate a significant portion of their own budgets. Some provincial governments motivate researchers to develop new varieties for commercialization by awarding bonuses or other privileges based on the number of PVP applications filed (Hu *et al.* 2006, 265).¹⁶⁵

The public sector dominance of the PVP system in India and China stands in stark contrast to the situation in the United States, where the private sector accounts for 75 per cent of PVP filings, universities and the government only 15 per cent, and foreign applicants the remainder (Strachan 2006, 2). The PVP systems in China and India operate not only to stimulate private sector R&D but, even more importantly based on

¹⁶³ Variety Testing in the Netherlands, Naktuinbouw news, April (2008); <http://www.naktuinbouw.eu/sites/naktuinbouw.eu/files/naktuinbouwnews10.pdf>.

¹⁶⁴ *Ibid.* 154, http://www.brookings.edu/~media/events/2009/10/23%20china/ex2_paper3_linton.pdf.

¹⁶⁵ *Ibid.* 154, http://www.brookings.edu/~media/events/2009/10/23%20china/ex2_paper3_linton.pdf.

user statistics, to stimulate public sector involvement in the development of new plants.¹⁶⁶

Developing the legal system for PVP is step one. Implementing this legal system is step two and has far-reaching legal, institutional, technical, financial and commercial consequences.

3 Protection of Different Types of Intellectual Property Rights with examples from the Agri-Food Sector

3.1 Different Types of IPRs¹⁶⁷

The system of IPRs can play a vital role in the economic growth strategies of countries at all stages of economic development worldwide. In a suitable enabling environment, a well-functioning national IPR system helps to spur innovation and enables the creation of relationships of trust, both of which are crucial for creating and delivering better goods and services to users and consumers which provide better value for money than competing offers. By preventing free-riding on the fruits of intellectual labor of others and thereby fostering fair play in the marketplace, the IPR system benefits producers, consumers and society at large by supporting the creation of innovative, new and improved products and services that improves the quality of life of peoples worldwide.

IP refers to various types of intangible property, created mostly under special national or regional law(s) and covers different categories of outputs of the human intellect that meet the criteria defined in such specialized IP law(s).

Often, the ingenuity, insight, creativity and innovative ideas and concepts generated by the application of human intellectual effort results in clearly demarcated new or original knowledge, creative expression or other useful manifestations. Often, these manifestations have the potential to add, or actually add, a desirable attribute or quality to a marketable product or service. In the absence of IP rights, competitors may free-ride on the desirable attribute resulting from such human intellectual output. This may be to the detriment of its creator's interests as it may deter future intellectual efforts which could otherwise have led to more and better creative and innovative outputs for adding more desirable attributes (functional or aesthetic) or provided unique signaling to attract potential buyers to those desirable attributes that are integral to creating new and improved products and services to better serve existing and new human needs and wants.

IP rights include patents for technological inventions, trade secrets over confidential information that provides competitive advantage to its owner, copyright over literary and artistic works, trademarks or simply "marks" for words, symbols, names, images, and the like which differentiate the goods or services of one producer or provider from those of its competitors, design rights over visually appealing designs that influence the buying

¹⁶⁶ Ibid. 154, http://www.brookings.edu/~media/events/2009/10/23%20china/ex2_paper3_linton.pdf.

¹⁶⁷ "Marketing Crafts and Visual Arts: The Role of Intellectual Property 3_linton.pdf", WIPO, 2003, p. 22, http://www.wipo.int/export/sites/www/sme/en/documents/pdf/marketing_crafts.pdf.

decisions for goods and PBRs over new varieties of plants for visually appealing plants or plants having better functional attributes or other features useful to mankind.

A type of IPR can be attached to products which have a local story to tell or have prestige, quality attributes, recognition and/or reputation which is entirely or essentially or entirely linked to their place of origin. This is mostly true for foods or agri-processed commodities, such as Champagne and Gorgonzola. This right is called a Geographical Indication.

Often, IP is divided into two categories: One is industrial property, which includes inventions (patents), trademarks (marks), industrial designs (designs), trade secrets and geographic indications; and the other is copyright and related/neighborhood rights. Copyright includes literary works such as novels, poems and plays, films, musical compositions; artistic works, such as drawings, paintings, photographs and sculptures, and architectural designs. Related rights/neighborhood rights are rights related to copyright. These include rights of performing artists in their performances, rights of producers of phonograms in their recordings and the rights of broadcasters in their radio and television programs.

3.1.1 How is IP defined and how are IP rights obtained in practice?¹⁶⁸

First and foremost, it is a legal right over an intangible output of the mind which has something new, original or distinctly different about it, such as a new invention (for example, for an agricultural implement or agri-chemical), a visually appealing new or original design (for example, for a food or beverage product), a new film (for example, for promoting a particular food product or restaurant), a new or improved seed (for example, which is pest-, drought- or flood-resistant or has improved shelf-life of harvested seeds or fruits), a new plant variety with desirable quantitative and/or qualitative attributes, etc. Secondly, each type of IP right has its own distinctive definition in law which prescribes the specific conditions to be met for it to be protected under the relevant IP law in the territorial jurisdiction to which that IP law pertains. Most such laws have a national remit, although some laws have a regional scope, as for example, in European Community laws for patents, trademarks and designs. Thirdly, national laws have many basic similarities, as a result of the international and regional harmonization of national IP laws over the last 100 years or so, but more particularly in the last 20 years. This is because most countries are bound by international commitments (bilateral or plurilateral trade agreements, and multilateral treaties of WIPO and the TRIPS Agreement of the WTO) in the interest of facilitating international trade and international investments. Fourthly, many types of IP rights are obtained by making a formal request in the manner prescribed in the regulations and rules under the relevant national or regional law and after formal and substantive examination by a governmental institution created under the relevant IP law. This process is required for obtaining a patent or a utility model and, in most countries, for registration of a

¹⁶⁸ What is Intellectual Property? WIPO Publication No. 450(E). 2003, p. 3, http://www.wipo.int/edocs/pubdocs/en/intproperty/450/wipo_pub_450.pdf.

trademark or an industrial design. There is no such requirement for copyright or related rights and trade secrets. Some countries, however, provide the option of voluntary registration of copyright and related rights.

Despite international and regional harmonization, the procedures for acquiring and maintaining IPRs differ from one country to another, even though the basic principles and features of these procedures (as with the laws) are more or less common to most countries. When certain conditions are met, IPRs may also be acquired at a supranational (regional) level without any action (as in the case of copyright or related rights). There is no international IP right for any type of IP, including copyright and related rights. However, by using an international filing option, the process of obtaining national and/or regional IP rights can be made much simpler and easier to manage; this is true for patents (and utility models), trademarks, designs and appellations of origin (a special kind of Geographical Indication right).

3.1.2 Why is IP protected and who benefits?¹⁶⁹

In the on-going quest to remain ahead of competitors, every smart business strives to create new and improved products (goods and services) to deliver greater value to users and customers than competitors.

To differentiate their products - a prerequisite for success in today's markets – enterprises must rely on innovations¹⁷⁰ that enable creation of better products (in terms of meeting or exceeding user or consumer expectations). They must do so faster and more cheaply than competitors, for example, by making process improvements to improve speed of production, reduce production costs of an existing product, or improve the existing product's quality. In a crowded marketplace, businesses must make an on-going effort to communicate the specific value offered by their products through effective marketing that relies on well thought-out branding strategies.¹⁷¹

All businesses, especially those which are already successful, nowadays rely on the effective use of one or more types of IPRs to gain and maintain a substantial competitive edge in the marketplace. Business leaders and managers, including those in the agri-food sector, therefore require a much better understanding of the tools of the IPR system to protect and exploit the IP assets they own, or wish to use, for improving

¹⁶⁹ "Making Intellectual Property Work for Business: A handbook for chambers of commerce and business associations setting up intellectual property services" ICC-WIPO., 2011, p. 7; http://www.wipo.int/edocs/pubdocs/en/intproperty/956/wipo_pub_956.pdf.

¹⁷⁰ The word innovation can be used to define many other types of innovations which are not necessarily based on patents or technology. Business innovation is far broader in scope than product or technological innovation. It is defined as the creation of substantial new value for customers and the firm by creatively changing one or more dimensions of the business system. Apart from product or technological innovations, it includes innovations within the context of the customers it serves, the processes it uses and where it takes its products to market (The 12 Different Ways for Companies to Innovate, MIT Sloan Management Review, Spring 2006: 75-81), <http://iic.wiki.fgv.br/file/view/The+12+different+ways+for+companies+to+innovate.pdf>. Also see <http://www.iese.edu/research/pdfs/OP-0182-E.pdf>.

¹⁷¹ *Ibid.* 166; p. 1.

their business models or developing new business models so as to hone their competitive strategies for becoming and remaining successful in domestic and international markets.

Despite the growing importance of the value of intangible assets, including IP assets, most businesses, especially agri-food SMEs, do not make effective use, or indeed any use, of the IP system. This is often due to:

- (a) lack of awareness about the importance of the IP system;
- (b) poor understanding of its role in reducing risk;
- (c) poor understanding about how it improves competitive position
- (d) inadequate or no access to expertise for creating and using effectively IP assets; and
- (e) undue concern about the costs and uncertainty of using the IP system, especially in policing their IP rights and in the dispute settlement stage.

As a result, in developing countries, including LDCs, there is not much demand for private sector, fee-based IP services for SMEs, including agri-food SMEs. In this situation, IP-savvy governments in developing countries, including LDCs, have taken on the responsibility of providing free or subsidized information, awareness and capacity-building IP services to SMEs so as to create an IP culture which is crucial for market success in the knowledge-driven economy of the 21st century. Once the basics are understood, it will not take long for these IP-aware SMEs, including agri-food SMEs, to understand that legal protection of IP assets by itself would not suffice; to be successful, every business, large, medium or small, must develop and implement an IP management strategy that it must integrate in its overall business strategy. Only then can an SME, including an agri-food SMEs, be in a position to prevent free-riding by competitors and have a fair opportunity to reap the reward of its IP-related efforts in the marketplace by selling its products or providing its services at a profit margin that justifies the risks it took and the investments it made. Often, the agri-food SME will need financial, technical and other types of support for becoming business-savvy, IP-savvy and managing risks as an informed entrepreneur. This support may come from various quarters; not only from stakeholders in the public sector, but also from the private sector and civil society.

The IPR system not only ensures that an innovation or creation is attributed to its creator or producer, but also allows the creators or producer to secure *ownership* of it and, as a result, provides the owner of an IPR the opportunity to benefit from it commercially. In this way, the IPR system provides an incentive to creators, innovators and SMEs, including agri-food SMEs, to invest their time and resources to foster innovative and creative outputs so that they are better able to meet the needs of users and consumers than their competitors.

IPRs provide a basis for businesses to do the following:

- Prevent others from copying their products or using their innovations (this is particularly relevant in today's competitive markets).
- Create a strong brand identity by product differentiation (through the strategic use of one or more types of IPRs).
- Obtain valuable competitive intelligence. Analyzing commercial and technological information from patent, trademark and design databases can increase a company's understanding of technological fields and trends.
- Identify future research and growth areas and analyze competitors, thereby saving research/development/marketing time and resources.
- Gain revenues through licensing, franchising or other IP transactions.
- Obtain financing or venture capital – IP assets which have legal protection and can be valued can be leveraged to obtain capital.
- Access new markets.
- Engage in different types of business partnerships. IP rights provide a basis for collaborative partnerships, e.g., in research, marketing, open innovation, outsourcing etc.
- Ensure freedom to operate. Owning or licensing key IPR can reduce the risk of businesses infringing IPRs of others when using technologies, trademarks, designs, and copyright works.
- Segment geographical markets. In some countries, IP owners can prevent goods protected by their IPRs which are put on the market in one country or region from being imported into another country in which they also have IPR protection.

3.1.3 How is IP protected?¹⁷²

IPRs are created by national or regional laws and are therefore limited to the territory to which the law applies. Some IPRs arise only when granted by a government authority established under the relevant IPR law of that territory, while others arise automatically when certain conditions prescribed in the relevant IP law are met.

For some, registration is optional but affords better protection. This is true for trademarks and designs in many countries.

In general, an IPR provides its owner an exclusive right to prevent or control its exploitation by others. The relevant national or regional law limits the duration of protection of patents (and utility models), new varieties of plants, designs, and copyright and related rights, but allows unlimited duration for the protection of trade secrets, trademarks and GIs.

Depending on the type of IPR and the territory concerned, the owner of an IPR, may be able to sell, permit others to use, mortgage, abandon, pass onto legal heirs, donate, or otherwise dispose of the IPR, just like the owner of property rights over moveable and immovable property. A notable exception is a Geographical Indication; since it is rooted in geography, its use cannot even be permitted outside of the territory to which it pertains.

¹⁷² "Marketing Crafts and Visual Arts: The Role of Intellectual Property necessarily based on patents or technology", http://www.wipo.int/export/sites/www/sme/en/documents/pdf/marketing_crafts.pdf.

Various regional and international agreements on IP harmonize laws and procedures, or facilitate obtaining IPRs, in a number of countries which are members of the relevant regional or international IP systems.

3.1.4 Key characteristics of IP¹⁷³

A key characteristic of any property, as it is generally understood nowadays, is that the owner of property has the exclusive right to determine what to do with it or how to use it.

As IPRs are property rights over intangible outputs of human intellectual effort, these rights have many characteristics that are different from those of private rights over physical or tangible property, which are also created by man-made laws.

Unlike physical property, which can be used or enjoyed by one or a limited number of persons at any time, IP can potentially be used or enjoyed by an unlimited number of physical or legal persons without depriving its owner of its use or enjoyment (for example, the seeds of a new variety of a plant may be reproduced without any physical limitation, even if the creator of the new variety continues the use of the seeds of that new plant variety).

As a result of protection by an IP law, the owner of an IP asset so protected by law has the right to exclude all those who are not authorized by the owner. Thus, the owner of an IPR may authorize one or many other users to use it, in exchange for a consideration such as a payment (i.e., by the *licensing* of an IPR).

Another important difference is the duration of the value of the assets involved: A Physical asset has value either as long as it is in demand or for as long as it exists, while an IP asset has value at most for the duration set forth by the relevant IP law(s).

Moreover, a physical object is stolen only if its possession changes hands without the authorization of its owner, whereas an IP asset is deemed, by law, to be stolen if – without the permission of its owner – it is copied, imitated, adapted, translated, displayed or used as an input or a starting point for a further inventive or creative endeavor. For some types of IP assets, if certain conditions exist, even independent creation of an identical IP asset would be considered to be theft and, therefore, liable to legal sanction.

¹⁷³ “Making Intellectual Property Work for Business: A handbook for chambers of commerce and business associations setting up intellectual property services” ICC-WIPO., 2011, p. 7, http://www.wipo.int/edocs/pubdocs/en/intproperty/956/wipo_pub_956.pdf.

3.1.5 Overview of IP rights¹⁷⁴

The different types of IPRs are briefly explained below, in alphabetical order. The rest of Chapter 9 will provide a more detailed account of the different types of IPRs and their respective protection systems.

Trademarks: A trademark, or simply a mark, is a sign capable of identifying and distinguishing in the marketplace the products or services of one enterprise from those of other enterprises. The basic requirement is that the trademark must be distinctive, i.e., it must have the capacity for identifying the source of a product and distinguishing it from competing products or services in the marketplace. A trademark may be protected for an unlimited period. Although its registration at the national or regional trademark registry is for a period of time, generally 10 or 20 years, the registration is renewable indefinitely for like periods of time.

Geographical indications:¹⁷⁵ A geographical indication is a sign used on goods that have a specific geographical origin and possess qualities or a reputation entirely or essentially due to their specific place of origin.

Trade secrets: In general, any type of information which derives commercial value from being held confidential may qualify for trade secret protection, provided it satisfies the following criteria:

- (a) competitive advantage: the information must provide the enterprise with some value contingent on the information remaining a secret;
- (b) secrecy: the information is confidential; it is not generally known or ascertainable by proper means; and
- (c) reasonable measures: the owner or holder of the information has taken all measures or precautions considered reasonable in the given context for keeping the information secret or confidential.

Patents and Utility Models: A patent is an exclusive right granted by the government for an invention that is new, involves an inventive step and is capable of industrial application. The owner of a patent has the exclusive right to exclude or stop others from making, using, offering for sale, selling or importing a product or a process, based on the patented invention. A patent provides protection for the invention to the owner of the patent for a limited period (for 20 years in almost all countries).

A utility model or a petty patent is similar to a patent, but the requirements for acquiring protection are less stringent and the protection is much cheaper to obtain and to

¹⁷⁴ "Marketing Crafts and Visual Arts: The Role of Intellectual Property", http://www.wipo.int/export/sites/www/sme/en/documents/pdf/marketing_crafts.pdf.

¹⁷⁵ An appellation of origin is a subset of geographical indications use to that is the geographical name of a country, region or locality, used to designate a product that originates there and that has qualities and characteristics that are due exclusively or essentially to the geographical environment, including human factors.

maintain. On the other hand, the term of protection under a utility model is shorter than under a patent (from 5 to 10 years in most countries).

Plant Breeders' Rights (PBRs): PBRs, also known as plant variety rights (PVRs), are rights granted to the breeder of a new variety of a plant if it is new, distinct, uniform and stable. A PBR gives the breeder, for a limited number of years, the exclusive control over the propagating material of the protected variety (including seed, cuttings, divisions and tissue culture) and harvested material (cut flowers, fruit and foliage). The breeder may be a farmer, a scientist or a company. The breeder must be the one who bred the variety, i.e., created a plant variety by means of plant breeding techniques, which may range from a basic selection by an amateur grower to technically advanced procedures, such as different types of modern biotechnology and genetic engineering (GE) techniques. The variety is designated by an acceptable denomination that conforms to the requirements of the PBR law. A trademark, trade name or other similar indication may be associated with the denomination of a protected plant variety for the purposes of marketing or selling, but the denomination itself must remain easily recognizable. With these rights, a breeder may choose to become the exclusive marketer of the variety or to license the variety to others.

Copyright: Copyright is a legal term used to describe the bundle of rights of creators over their literary and artistic works. Works covered by copyright range from poems, books, songs, music, paintings, drawings, sculptures, photographs, architecture, plays, advertisements, maps and films, to computer programs, original databases, technical documentation and technical drawings. In most countries, a copyrighted work is protected for the length of the author's life plus a minimum of another 50 years. Most copyright laws state that the author or rights owner has the right to authorize or prevent certain acts in relation to a work. The rights owner of a work can prohibit or authorize its:

- reproduction in various forms, such as printed publication or sound recording;
- public performance, such as in a play or musical work;
- recording ("fixation"), for example, in the form of compact discs or DVDs;
- broadcasting, by radio, cable or satellite;
- translation into other languages; and
- adaptation, such as a novel into a film screenplay.

A field of rights related to copyright has rapidly developed over the last 50 years. These related rights grew up around copyrighted works, and provide similar rights, although often more limited and of shorter duration, to:

- Performing artists (such as actors and musicians) in their performances;
- Producers of sound recordings (for example, cassette recordings and compact discs) in their recordings; and
- Broadcasting organizations in their radio and television programs.

Industrial designs: An industrial design (or simply a design) is the appearance of the whole or part of a product resulting from the features (in particular, the lines, contours,

colors, shape, texture and/or materials) of the product itself and/or its ornamentation. Industrial designs, as objects of IP, can usually be protected for up to a maximum of 15 or 25 years.

3.1.6 Relevance of trademarks to the agri-food sector

The term “commodity” is commonly used in reference to basic agricultural products that are either in their original form or have undergone only primary processing. Examples include cereals, coffee beans, sugar, palm oil, eggs, milk, fruits, vegetables, beef, cotton and rubber. A related characteristic is that the production methods, post-harvest treatments and/or primary processing to which they have been subjected, have not imparted any distinguishing characteristics or attributes.

Thus, within a particular grade, and with respect to a given variety, commodities coming from different suppliers, and even from different countries or continents, are ready substitutes for one another. For example, while two varieties of coffee bean, such as *robusta* and *arabica*, do have differing characteristics, two *robustas*, albeit from different continents, will, within the same grade band, have identical characteristics in all important respects. Agricultural commodities are generic, undifferentiated products that, since they have no other distinguishing and marketable characteristics, compete with one another on the basis of price. Commodities contrast sharply with those products which have been given a trademark or branded in order to communicate their marketable differences.¹⁷⁶

The key to success for any business is to understand what matters most to the customers it serves in terms of responding to their individual wants and needs. Beyond the basic need for food as nutrition, food often defines our identity in terms of its use as a sign for class, gender, status, income, age, social or cultural distinctiveness and ethnicity. The value of a food is influenced not only by its nutritional value and safety but also by its price, physical appearance (such as shape, size, color), freshness, taste, smell, texture, sound produced in the act of eating it, the manner in which it was grown (organic, animal welfare), stored, graded/classified, transported, processed/treated/preserved, packaged, distributed, retailed, the place of its purchase, the quality of the experience of purchasing or consuming it, etc. Thus, some aspects of the food we eat differentiate us from others in ways that are meaningful to us and, therefore, food-linked differentiation often defines some aspects of our identity. The concept of differentiation is fundamental to branding. Product differentiation provides a variety of products that are more likely to provide a better fit for the differentiated needs and wants of customers. Customers with identical or similar wants and needs may be grouped in customer segments to ensure targeted promotion and marketing of products relevant to those grouped wants and needs. It is at once the goal, the strategy and the outcome of marketers’ efforts to create unique and relevant places in the hearts and minds of customers. No wonder relevant differentiated foods and their branding

¹⁷⁶ “Agricultural and Food Marketing Management by Agriculture and Consumer Protection”, FAO Document; <http://www.fao.org/docrep/004/w3240e/W3240E06.htm>.

contribute in a big way to the success of agri-food enterprises in a highly competitive marketplace. In perfect competition, the only commodities on offer are those which can be distinguished solely by price; there is no variety to choose from to satisfy the differentiated wants and needs of individuals, families, cultures, religions, etc. Branding based on trademarks helps to capture a bigger proportion of added value by producers by bringing consumers closer to the origins of their food when it is provided to them through alternative food networks.

Trademarks are relevant for the branding strategies of all types of enterprises in the entire agri-food value chain/network. They enable signaling, which enables easier identification for developing relationships of trust in business. The importance of trademarks keeps increasing as the credence attributes of an agri-food product for determining its quality gain more importance in the buying decision and/or the value of the quality of the support services keeps increasing in the final price. Thus, the increasing importance of the services of food distribution, food retail and restaurants attests to the growing role of trademarks in the branding strategies of agri-food enterprises, be they large, medium, small or micro in size. Different food products are recognized at retail shop shelves by company name, trademark/logo and design of/on its packaging. Trademarks are relevant for the advertising, branding and other marketing needs of seed companies; agricultural chemical manufacturers; agricultural equipment and machinery manufacturers; manufacturers of enzymes for the F&B sector; agri-food manufacturers, wholesalers and distributors; fruit and vegetable growers; food retailers and restaurants, to name a few.

3.2 Trademarks

Trademark management should be an integral part of the branding strategy of any agri-food enterprise, since a valuable trademark gives visibility to the proprietor's products or services that are distinguished by the trademark.¹⁷⁷

As we shall see below, businesses must, however, safeguard their rights in a trademark and avoid violating the trademark rights of others.

This part of the guide is intended to help agri-food SMEs and their collectives to understand how to:

- (i) create and/or select new trademarks that attract and appeal to consumers and, at the same time, are easy to enforce against competitors;
- (ii) protect signs, advertising slogans, taglines, logos and other such key components from unauthorized exploitation or use by others;
- (iii) avoid the risk of infringing the trademarks of others;
- (iv) actively monitor the competitors' (existing and new) trademarks; and, above all
- (v) get the best value out of their trademarks for stronger branding strategies.

¹⁷⁷ Burrone E., Koglin L. V., Jaiya G. S., Sudhindra N.J.S., Making a Mark: An Introduction to Trademarks for Small and Medium-sized Enterprises, Intellectual Property for Business Series, WIPO Publication No. 900, 2012, p. iii; http://www.wipo.int/edocs/pubdocs/en/sme/900/wipo_pub_900.pdf

We shall see, instead, in Chapter 4, how the value of a trademark can be enhanced through adequate promotional and marketing strategies aimed at increasing a company's market share.

3.2.1 What is a trademark?¹⁷⁸

A trademark, or simply a mark,¹⁷⁹ is a sign capable of identifying and distinguishing in the marketplace the products¹⁸⁰ of one enterprise from those of other enterprises.

Any sign, such as a personal name, letters and numerals; combinations of colors; figurative elements including drawings and shapes or their combination of these elements capable of distinguishing goods or services, may constitute a trademark. In most countries, taglines, advertising slogans and titles are also considered trademarks. An increasing number of countries also allow for the registration of non-traditional trademarks, such as single colors, three-dimensional signs (shapes of products or packaging), moving images, holograms, sounds, smells, gestures, tactile marks (feeling or touch) and fluid/mutating trademarks. However, non-traditional trademarks are rare and many countries have set limits on what may be registered as a trademark, generally allowing only signs that are visually perceptible or can be represented graphically.

The basic requirement is that the trademark must be distinctive, i.e., it has the capacity for identifying the source of a product and distinguishing it from competing products in the marketplace.

3.2.2 What is the difference between a trademark and a brand?¹⁸¹

Many people conflate the legal concept of a *trademark* with the marketing concept of a *brand*. A trademark is an essential but only one aspect of a strong brand; it acts as a peg in the minds of consumers to which visual images, emotional connections and positive (or negative) associations can be attached by the consumers or customers of the branded product. Thus, a brand connotes the unique and proprietary sensory, emotional, rational and cultural image of a company or its branded product in the minds of customers or consumers. Brand equity is the commercial values of all associations and expectations (positive and negative) that people have of an organization and its products and services due to all experience of, communications with, and perceptions of, the brand over time.¹⁸²

¹⁷⁸ Making a Mark: An Introduction to Trademarks for Small and Medium-sized Enterprises, p. 1; http://www.wipo.int/edocs/pubdocs/en/sme/900/wipo_pub_900.pdf.

¹⁷⁹ The terms trademark and mark are often used for all types of trademarks and are used interchangeably in this guide.

¹⁸⁰ The term "products" encompasses both goods and services.

¹⁸¹ Making a Mark: An Introduction to Trademarks for Small and Medium-sized Enterprises, p. 1; http://www.wipo.int/edocs/pubdocs/en/sme/900/wipo_pub_900.pdf.

¹⁸² Prof. Kavita Tiwari and Rajendra Singh, "Perceived Impact of Ingredient Branding on Host Brand Equity" Journal of Marketing and Management, p. 2, May (2012), <http://www.gsmi-ijgb.com/Documents/V3%20N1%20JMM%20P04%20-%20Kavita%20Tiwari%20-Perceived%20Impact%20of%20Ingredient%20Branding.pdf>.

Example: The word COCA-COLA® and the device trade mark are two of the trademarks



used to identify the carbonated soft drink produced by The Coca-Cola Company of Atlanta, Georgia, the United States. The brand, on the other hand, encompasses the soft drink, bold design, trademarks and the customer’s feeling of associating himself or herself with the simple, universally relevant theme that weaves throughout the brand’s communications: happiness.¹⁸³ “Happiness in a bottle” still retains universal recognition, as was most evident during Coca-Cola’s successful 2014 FIFA World Cup campaign. From unveiling its photomosaic “The Happiness Flag” at the start of the games to launching event-themed music and moving spots across platforms in hundreds of markets, Coca-Cola showed how it effortlessly connects emotionally, both locally and globally.¹⁸⁴

3.2.3 Examples of trademarks¹⁸⁵

- i. A trademark composed of only words, letters, numbers, or a combination of them.

Such a trademark often provides broad protection to its owner because it allows the owner to limit a competitor’s use of any figurative version of the trademark that is confusingly similar for the same type of product. The words and/or letters or numbers themselves are protected.

Example: PEPSI® is registered as a plain word trademark in the name of Pepsico, Inc.

- ii. A stylized version of a word trademark

If the trademark owner not only wants to protect the characters but also the design, color, or some other distinctive element, a special form trademark is required. This type of trademark is commonly referred to as a “design plus words” trademark. However, should that image change in any way, the registration loses its enforceability to a certain extent as it pertains to that exact registration (see also 3.2.39 below on how to use marks registered with a specific design, color or font).

Example: PEPSI® is also registered in a stylized manner.

¹⁸³ See Interbrand – Best Global Brands 2013 - Coca-Cola; <http://www.interbrand.com/it/best-global-brands/2013/Coca-Cola>.

¹⁸⁴ <http://bestglobalbrands.com/2014/cocacola/>.

¹⁸⁵ Making a Mark: An Introduction to Trademarks for Small and Medium-sized Enterprises, cit., p. 1; http://www.wipo.int/edocs/pubdocs/en/sme/900/wipo_pub_900.pdf.

iii. Figurative elements

A trademark registration could also be a logo in and of itself. In such a case, there are no words included as part of the trademark.



The **PEPSI**® logo is a trademark of the PepsiCo Group

iv. Trademarks that include both figurative elements and words

Sometimes, letters, numbers and slogans that lack distinctiveness may be hard to register in themselves (see 3.2.20 below), but may instead be protectable if they are registered together with a distinctive figurative element.



OCEAN SPRAY® and Logo are registered trademarks of Ocean Spray Cranberries, Inc.

MCDONALD'S® Used with permission from McDonald's Corporation.

v. Non-traditional trademarks

Trademarks based on a single color, appearance, shape, sound, smell, taste and texture are often difficult (and in most countries not possible) to register. There are nevertheless a few examples of such trademarks that have been accepted in some countries.

Single color trademark:



***KRAFT**[®] Foods has a registered trademark for the Lilac Color per se for chocolate and chocolate products in numerous countries of the world.*

Three-dimensional trademark (shape of product and packaging):



*The distinctive shape of the **HEINZ**[®] Ketchup bottle is a registered trademark.*

Registered trademark of the H.J. Heinz Company & its affiliates.

Box 3.1: The Color Purple: Cadbury loses battle to register its signature purple shade¹⁸⁶

Cadbury lost its Supreme Court battle to register as a trade mark its iconic color purple (known as Pantone 2685C), ending a 10-year legal battle between Cadbury and its competitor Nestlé. The United Kingdom Supreme Court refused Cadbury's application to appeal against an October 2013 Court of Appeal decision, which ruled in Nestlé's favor, meaning that Cadbury has now exhausted all possible avenues of appeal in the United Kingdom.

Cadbury first filed a United Kingdom trade mark application for the purple shade in 2004. The application was allowed and published in the Trade Marks Journal in 2008 but could not be registered due to opposition raised by Nestlé. This set into motion a chain of lengthy proceedings. First, the United Kingdom's Intellectual Property Office (IPO) dismissed Nestlé's claims that the color was not distinctive to Cadbury. Nestlé then took the case to the High Court. Despite limiting the category of goods covered by the trade mark application to milk chocolate only, the High Court dismissed Nestlé's

¹⁸⁶ The Colour Purple: Cadbury loses battle to register its signature purple shade, by James Tobias, Intellectual Property, April 10, 2014; Reed Smith, **Error! Hyperlink reference not valid.** <http://www.adlawbyrequest.com/2014/04/articles/intellectual-property/the-colour-purple-cadbury-loses-battle-to-register-its-signature-purple-shade>.

claim on the basis that Cadbury was able to show that that mark had acquired a distinctive character over the 100 years it had been using the shade.

Nestlé continued the case through the Court of Appeal where ruling was finally made in its favour. The Court of Appeal considered that Cadbury's application for registration did not sufficiently define its rights to the color and that the application amounted to an attempt to register "multiple signs". Cadbury filed an application to the Supreme Court to appeal the Court of Appeal's ruling, but the court determined that Cadbury's application to appeal did not raise an arguable point of law and would give an unfair competitive advantage to Cadbury without the required clarity, objectivity and precision needed for a trade mark.

Cadbury has confirmed that there are no further avenues for appeal but this is certainly not the end of Cadbury's efforts to protect its brand. Cadbury may choose to file new trade mark applications which more clearly define Cadbury's alleged rights to the color purple in order to overcome the Court of Appeal's concerns about Cadbury's original imprecise definition of rights. Aside from formal trade mark registration, Cadbury may still be able to rely on the common law principle of "passing off" to stop competitors from using the color purple when applied to the packaging of milk chocolate products.

It may sometimes be a challenge for a business to identify their protectable brand assets beyond the name of their business, particularly if it is a tagline, advertising slogan, or product shape (see 3.2.16 below). An agri-food SME may not consider its slogan or the shape of its product to be a trademark but its competitor, which has an identical or confusingly similar slogan or product shape, may think otherwise, and may accuse it of violating the competitor's trademark. This guide will aid agri-food SMEs in identifying the protectable elements of their brand and steps they can take protect these valuable assets from competitors.

3.2.4 What are trademarks for?¹⁸⁷

- Trademarks make it easy for consumers to find your product(s). Trademarks help to distinguish your products (whether goods or services) from those of competitors and help to identify your business as the source of the product bearing the trademark.
- Trademarks are among the most efficient marketing and communication tools. Trademarks are a powerful instrument to capture the consumer's attention and make your products stand out. Trademarks, as a part of your brand, can wrap up in a single element all the intellectual and emotional attributes and messages about your business, reputation, products and consumer's lifestyles, aspirations and desires. They also open the way for effective use of the Internet by your business (see 3.2.41-3.2.42 below).
- Trademarks are the basis for building brand image and reputation. Trademarks allow the consumers to base their purchasing decisions on what they have heard, read or experienced themselves. They create a relationship of trust which is the basis for establishing a loyal clientele and for enhancing the goodwill of your

¹⁸⁷ Making a Mark: An Introduction to Trademarks for Small and Medium-sized Enterprises, p. 4; http://www.wipo.int/edocs/pubdocs/en/sme/900/wipo_pub_900.pdf.

business. Consumers often develop an emotional attachment to certain trademarks, based on a set of desired qualities or features embodied in the products bearing such trademarks. Trademarks also encourage companies to invest in maintaining or improving the quality of their products in order to maintain or further improve their reputation.¹⁸⁸

- Trademarks help prevent consumer confusion. Trademarks protect the consumers by indicating (a) the source of the products and (b) a consistent level of quality. Trademarks help consumers to decide whether to purchase a desirable product again or to avoid an undesirable one.
- Trademarks are one of the most valuable and enduring business assets.



Label for **GUINNESS**[®] Foreign Extra Stout by Diageo Ireland

- Trademarks may last a very long time, and thus provide your business or product with a long-term competitive advantage. They have value beyond your core business and often pave the way for the expansion of your business into other products. They may be licensed or merchandised and provide an additional source of income through royalties; they are a crucial component of franchising agreements; and they may be sold with or separately from your business. Trademarks support a more robust sales volume and stronger margins. In addition, they may be used to provide collateral security for obtaining financing.
- Trademarks are one of the most effective weapons against unfair competition. Trademarks enable your business to prohibit competitors from unauthorized use of your trademark. In addition, they may be used to prevent import of counterfeit products. They may also enable you to stop others from using your trademark as a part of a domain name.

Box 3.2: Trademarks in agriculture¹⁸⁹

Trademarks have helped create value for agricultural products. One example is the Roundup Ready[®] trademark, which designates crops developed by Monsanto that contain transgenes that encode tolerance to the herbicide glyphosate.

Trademarks have been used to emphasize distinctive and attractive attributes of plant varieties (for example, **Pink Ladys** [apples], **Superior Seedlesse** [grapes] and **Sun-Maid**[®] [raisins]). **Sun-Maid**[®] is a branding success story: its trademark has made an

¹⁸⁸ For more information, see WIPO's IP PANORAMATM Module 02, Learning Point 1 at www.wipo.int/sme/en/multimedia/.

¹⁸⁹ Technology and Product Licensing, Use of Trademarks in a Plant-licensing Program by WILLIAM T. TUCKER and GRAVIN S. ROSS, Sharing the art of IP management (2007); <http://www.iphandbook.org/handbook/ch11/p06/>.

otherwise pedestrian agricultural product so attractive to consumers that the owners of the mark license it for use in association with products that contain their raisins.

It is important to note that plant variety names are not the same as plant variety trademarks. Traditional plant variety names range from descriptive to fanciful, and are often chosen by the plant breeder. The only restriction on a plant variety name is that it cannot have been used before for a plant of the same species. Choosing a trademark, however, requires considerably more care. Firstly, the variety name cannot be trademarked: the variety name is considered “generic” because it is the name for all plants of a particular variety, whereas a trademark serves to identify the source (the grower, marketer, and so on) of a particular plant. Secondly, the trademark office often rejects geographic names, especially if a particular geographic name is associated with the crop in question (for example, “Valencia” for citrus, “Turkey” for figs). Colors associated with the particular crop are usually not acceptable as trademarks, either. Finally, it can be difficult to register a trademark if it is already being used to refer to a related good or service, even if the good or service is different.

Box 3.3: The Value of Brands

A carefully selected and nurtured trademark is a valuable business asset for most businesses. It may even be the most valuable asset a business may own. The brand COCA-COLA[®] was, for example, valued at 81.6 billion USD in 2014, whereas MCDONALD’S[®] at 42.3 billion dollars.¹⁹⁰ This is because consumers value trademarks, their reputation, their image and a set of desired qualities they associate with the brand built around a trademark. Consumers are willing to pay more for a product bearing a trademark that they recognize and which meets their expectations. Therefore, the very ownership of a trademark with a good image and reputation provides a business with a competitive edge.

Box 3.4: A disputes about big sums pertaining to valuable IP: Aunt Jemima Heirs File \$2 Billion Lawsuit against Pepsi and Quaker Oats¹⁹¹

Suit alleges Quaker Oats wrongfully procured Anna Short Harrington a.k.a. Aunt Jemima’s recipes and failed to pay royalties to her family after her death

D.W. Hunter, the great grandson of Anna Short Harrington, the woman known as Aunt Jemima, has filed a class action lawsuit against PepsiCo, The Quaker Oats Company, Pinnacle Foods Group and The Hillshire Brands Company on behalf of all of her great grandchildren. He is seeking \$2 billion, plus punitive damages to be determined at trial.

Hunter alleges that the companies conspired to deny that Harrington had been an employee of Quaker Oats, all the while exploiting her image and recipes for profit, but refusing to pay an “equitable fair share of royalties” to her heirs for more than 60 years.

¹⁹⁰ <http://interbrand.com/test-brands>.

¹⁹¹ Aunt Jemima heirs file \$ 2 Billion lawsuit against Pepsi and Quaker Oats, Jason Hughes, The Wrap (2014), <http://www.thewrap.com/aunt-jemima-heirs-file-2-billion-lawsuit-against-pepsi-and-quaker-oats/>.

The claims come on the heels of the defendants allegedly receiving a certified death certificate for Harrington that listed Quaker Oats as her employer. Hunter further alleges that the companies have lied by claiming they could not find any employment records for Harrington, or images of her, yet they had her image deposited inside the U.S. Patent and Trademark Office, according to the document.

Harrington took on the role of the pre-existing character of Aunt Jemima in 1935. In 1937, the company first registered the trademark for the brand. She was allegedly selected because of her own pancake recipe, which the company recreated for the mass market.

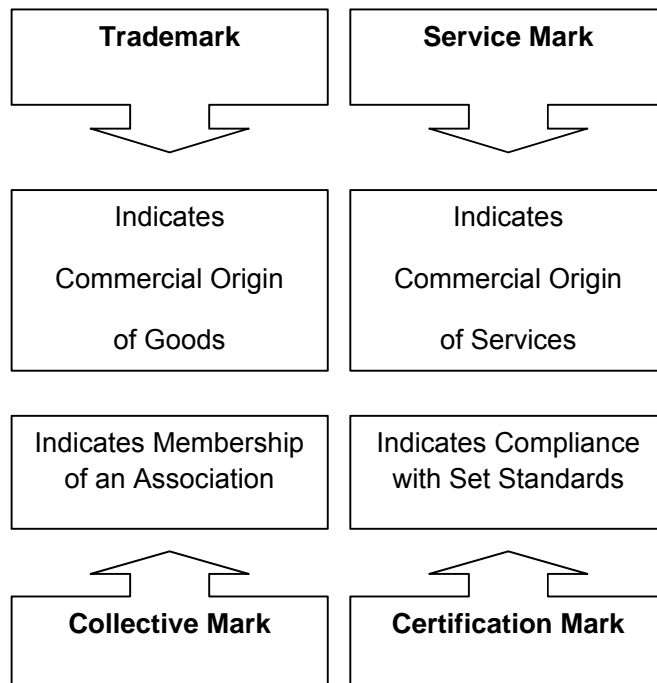
According to the suit, Quaker Oats sought out Harrington's youngest daughter Olivia Hunter in 1989, ultimately using her likeness to update the look of Aunt Jemima. It is this image that is used today on Aunt Jemima-branded products.

The suit further alleges a racial element to the exploitation of Harrington and the other women who portrayed Aunt Jemima, going so far as to accuse the company of theft in procuring 64 original formulas and 22 menus from Harrington. It further alleges that Harrington was dissuaded from using a lawyer, exploiting her lack of education and age, so that the company could not pay her a percentage of sales from her recipes.

The company continued to use Harrington's image for years, as well as licensing it out to other companies for ancillary merchandise like mugs and clothing.

The lawsuit cites Screen Actors Guild residuals and standard policies in the entertainment industry regarding revenue statements, which neither Harrington nor her heirs ever received. It wasn't until they uncovered in 2013 that Quaker Oats had trademarked Harrington's likeness and picture in 1937 that the family determined that they were owed royalties.

3.2.5 Types of Trademarks¹⁹²



3.2.6 What are service marks?¹⁹³

A service mark is very similar in nature to a trademark. Both are distinctive signs; trademarks distinguish the *goods* of one enterprise from those of others, while service marks fulfil the same function in relation to *services*. Services may be of any kind, such as, for example, restaurant or catering services, to name just two. Legally there is no difference between the two terms: service marks can be registered, renewed, cancelled, assigned and licensed under the same conditions as trademarks.

3.2.7 What are well-known marks?¹⁹⁴

Well-known marks are trademarks that are considered to be well-known by the competent authority of the country where protection for the trademark is sought. Any type of trademark can become “well-known” over time. Well-known marks generally benefit from additional protection. For example, well-known marks may be protected even if they are not registered (or have not even been used) in a given territory. In addition, while trademarks are generally protected against confusingly similar trademarks only if used for *identical* or *similar* products, well-known marks are protected against confusingly similar trademarks even for *dissimilar* products, if certain conditions are met. The main purpose of this additional protection is to prevent businesses from

¹⁹² Making a Mark: An Introduction to Trademarks for Small and Medium-sized Enterprises, p. 6; http://www.wipo.int/edocs/pubdocs/en/sme/900/wipo_pub_900.pdf.

¹⁹³ Making a Mark: An Introduction to Trademarks for Small and Medium-sized Enterprises, p. 6; http://www.wipo.int/edocs/pubdocs/en/sme/900/wipo_pub_900.pdf.

¹⁹⁴ Making a Mark: An Introduction to Trademarks for Small and Medium-sized Enterprises, p. 7; http://www.wipo.int/edocs/pubdocs/en/sme/900/wipo_pub_900.pdf.

free-riding on the reputation of a well-known mark and/or causing damage to its reputation or goodwill.

Usually, the burden rests upon the trademark owner to prove that his trademark is well known by the consuming public in a particular territory. There are some countries that provide for the possibility to seek recognition of well-known trademark status via either administrative means or judicial procedures. It is advisable (a) to register your well-known marks, at least, in relation to the most relevant goods or services; (b) to oppose registrations by competitors of the trademark; and (c) to keep evidence of use and reputation of your trademarks, such as numbers of sales, advertising campaigns, annual reports and third-party mentions.

Example: Let us assume that WONDERCOLA is the famous trademark of a soft drink. Wondercola Inc. would then benefit from the right to prevent others from using an identical or confusingly similar trademark in those countries where well-known marks enjoy a stronger protection and where the trademark is well-known for soft drinks. The protection would also be available for unrelated goods and services. That is to say that if another business decides to market computers or sunglasses, using the WONDERCOLA trademark, it will must seek the authorization from Wondercola Inc. or risk being sued for infringement of trademark rights.

3.2.8 What are collective marks?¹⁹⁵

A collective mark is generally owned by an association or cooperative whose members may use the collective mark to market their products. The association generally establishes a set of criteria for using the collective mark (e.g., quality standards) and permits individual businesses to use the trademark if they comply with such standards. Collective marks may be an effective way of jointly marketing the products of a group of enterprises which may find it more difficult for their individual trademarks to be recognized by consumers and/or handled by the main distributors.

Box 3.5: Apples of the Melinda Consortium, Italy¹⁹⁶¹⁹⁷



¹⁹⁵ Making a Mark: An Introduction to Trademarks for Small and Medium-sized Enterprises, p. 7; http://www.wipo.int/edocs/pubdocs/en/sme/900/wipo_pub_900.pdf.

¹⁹⁶ <http://www.melinda.it/en>.

¹⁹⁷ Melinda: The First Italian Designer Apple, WIPO, www.wipo.int/ipadvantage/en/details.jsp?id=908.

In Trentino, although the cooperative movement boasts a century-long tradition, the need to certify the origin of apples is much more recent. The idea of giving apples a brand name matured at the end of the 1980s, as a response of Trentino orchard fruit growers to the presence on the Italian market of large quantities of apples marketed under the name Val di Non, which were at least three times the amount of apples actually produced there.

In 1989, 16 cooperatives producing apples in the Val di Non and Val di Sole valleys established the Melinda Consortium. The Melinda collective mark is used by the 5,200 members of the 16 apple-producing cooperatives working in Valle di Non and Valle di Sole (Italy); the purpose of coming together under a common brand name is to enable consumers to easily recognize authentic *Val di Non* apples. This coming together in a Consortium was facilitated by the fact that the fruit growers were mainly small-scale local producers who were practicing the same production techniques, were organized in agricultural cooperatives and were employing advanced packaging techniques. An analysis of the characteristics of the apple-growers of the Melinda Consortium revealed particularly interesting figures regarding the size and commercial features of each business:

- of the 5,200 members of the 16 Cooperatives that make up the Melinda Consortium, just over 4,600 own their own agricultural business and a share in the 6,400 hectares of orchards in Val di Non and Val di Sole;
- over half of them own less than one hectare, while only a tenth owns over 3 hectares.

The Consortium partners apply the “Product specification for integrated fruit production”, which sets out the guidelines for producing quality apples, in accordance with the standards demanded by consumers, envisaging explicit controls for verifying compliance by producers. Integrated production techniques are aimed at drastically reducing or eliminating the use of broad-spectrum chemicals in fruit growing, replaced with more natural and biological cultivation techniques, in order to produce better fruit in an environmentally sensitive way, the environment being the true asset that needs preserving in the interest of both the producers and consumers

The Melinda Production Specification requires that only apples produced in the Noce Valleys (Val di Non and Val di Sole) can use the Melinda brand name. To qualify for collective mark protection, the fruits produced by the members of the Consorzio Melinda must conform to certain quality and aesthetic criteria which differentiate fruits with the Melinda label. Conscious of the need to increase the homogeneity of the quality of Melinda products, the Consortium decided to exclusively produce and market apples. It adopted strict regulation (product specifications) ranging from rules governing producers and growing techniques to quality control and packaging, which all members must respect in order to use the Melinda brand on their apples. The apples are preserved, selected and packaged according to the strictest Italian and European quality control standards (ISO 9001, BRC, IFS certifications).

Registering a collective mark for their apples allowed the Val di Non producers to jointly market their products and enhance product recognition, differentiating them from those of their competitors, while at the same time benefiting from consumers’ confidence in apples offered under the Melinda trademark. Pooling the different cooperatives’

resources helped them overcome the challenges associated with small size and isolation in the market place.

Customers were immediately well disposed towards Melinda Val di Non apples and quickly recognized the quality and environmental care linked to the integrated production process used by the producers of the valley. Research commissioned by A.P.O.T. [the Trentino Fruit and Vegetables Producers Association] revealed that Melinda is the most famous and most often acquired apple brand in Italy.

The policies for development and management of the cooperatives remained in the hands of the fruit growers. The protection of the Melinda trademark, a combination of the Italian words *mela* (apple) and *linda* (clean), was subsequently extended globally via the Madrid system for international registration of trademarks (see Section 9.2.35 below).



Courtesy of Melinda Consortium¹⁹⁸

To give a further guarantee to consumers, the members of the Consorzio Melinda adhere to the disciplinary production protocol created by A.P.O.T. and have agreed to be subject to the control and advice of E.S.A.T. (the Trentino Agricultural Development Authority), as well as of the Agricultural Institute of San Michele all'Adige.

Following European Union legislation establishing a system for the protection of food names on a geographical basis, the Consortium also registered in 2003 *Val di Non apples* as a *Protected Designation of Origin* (PDO) (see Section 9.5 below), based on the features and characteristics that their production method and particular geographical area conferred upon them (outlined in the European Union *Production regulations for Val di Non apples*). Besides providing them legal protection against imitation throughout the European Union, the PDO also helps raise awareness of *Val di Non apples* throughout Europe.



(Picture: European Union).¹⁹⁹

Over the years, Melinda has been able to combine traditional production with modern marketing techniques in order to better compete in the domestic and export markets.

¹⁹⁸ Making a Mark: An Introduction to Trademarks for Small and Medium-sized Enterprises, p. 9; http://www.wipo.int/edocs/pubdocs/en/sme/900/wipo_pub_900.pdf.

¹⁹⁹ Making a Mark: An Introduction to Trademarks for Small and Medium-sized Enterprises, p. 9; http://www.wipo.int/edocs/pubdocs/en/sme/900/wipo_pub_900.pdf.

Every year, more than 300,000 tons of Val di Non apples are harvested, representing over 60 per cent of apple production from the Trentino region, 10 per cent of Italian production, and 5 per cent of European production (around a quarter of the production is exported). The financial turnover of the Consortium has grown to nearly US 200 million USD per annum.

3.2.9 What are certification marks?²⁰⁰

Certification marks are given for compliance with defined standards, but are not confined to any membership. The defined standards may be concerning the character or quality, working conditions of production or performance, classes of persons producing or performing, the area of origin, etc. The owner of a certification mark licenses it to others to identify their products that meet the defined standard. Therefore, a certification mark may be used by anyone whose product meets the established standard. The message conveyed by a certification mark is that the products have been examined, tested, inspected or in some way checked by a person who is not their producer, by methods determined by the certifier or owner. An important requirement for certification marks is that the entity which applies for registration is considered “competent to certify” the products concerned. Logically, the certifier or owner may not apply the certification mark to his goods or services.

In many countries, the main difference between a collective mark and a certification mark is that the former may only be used by a specific group of enterprises, e.g., members of an association, while certification marks may be used by anybody who complies with the standards defined by the owner of the certification mark. Not every country has both the options of collective marks and certification marks. Thus, a collective mark in one country must be registered as a certification mark in another country and vice versa.

Box 3.6: Database for Italian quality certification trademarks

Under Article 81 of the Italian *Legislative Decree on Trademarks and Quality Services Certificates* (59/2010), which implemented the European Union *Internal Market Services Directive* (2006/123/EC), the Italian Ministry of Economic Development has created an official database for Italian quality certification trademarks.

Recital 102 of Directive (2006/123/EC) provides that

In order to increase transparency and promote assessments based on comparable criteria with regard to the quality of the services offered and supplied to recipients, it is important that information on the meaning of quality labels and other distinctive marks relating to these services be easily accessible. That obligation of transparency is particularly important in areas such as tourism, especially the hotel business, in which the use of a system of classification is widespread.

In application of these guidelines, Article 81 of the aforementioned legislative decree states that:

²⁰⁰ Making a Mark: An Introduction to Trademarks for Small and Medium-sized Enterprises, p. 7; http://www.wipo.int/edocs/pubdocs/en/sme/900/wipo_pub_900.pdf.

Public or private entities which establish trademarks and other quality certifications relating to services or are responsible for granting them to other entities, shall make available to the latter, by publication on their websites, information on the meaning of the marks and the criteria for granting such trademarks and other quality certifications, at the same time giving notice to the Italian Ministry of Economic Development and highlighting that they are certificates granted pursuant to the certification system provided for under Regulation (EC) no. 765/2008 dated July 9, 2008 of the European Parliament and Council.²⁰¹

The rule refers to trademarks granted to entities in order to guarantee the origin, nature or quality of certain services. Although the database envisaged by the directive focuses on quality certification trademarks for services, some of the trademarks listed are also used for products, particularly in the F&B sector. These trademarks belong not to those that use them, but to the entity which applied for them and allows their use by parties which possess the necessary prerequisites and respect the conditions of use.

In light of this legislative framework, the Italian Ministry of Economic Development has established a voluntary registration program in order to establish the first Italian quality certification trademark database.

Any entity with a certification trademark that wishes to join the initiative need only contact the aforementioned Ministry, informing of it of the trademark's characteristics. The ministry does not guarantee the accuracy and validity of the data contained in the database – it does not constitute a legal certification. The aim of the tool is to direct the choices made by companies and consumers

The database can be searched using different criteria:

- The nature of the mark (either general for all services or specific for services in a particular commercial field) – nearly 88% of the trademarks included are specific, and most concern touristic and catering service
- Geographical extension (either local or national) (extensions at national level are rare, as around 92 per cent of the signs have only a local extension
- Content – this refers to which quality of the service is guaranteed by the sign, e.g. the fact that the service complies with environmental rules).
- Type of management of the mark (public or private, and an indication of the number of entities adhering to the certification trademark system) – the number of entities adhering to each trademark system varies widely; from just four to five for local trademarks to, for example, more than 5,000 for the trademark ITALIAN HOSPITALITY

In future, the database is expected to be increasingly supported by companies in order to extend the quantity and quality of information at consumers' disposal. This system will increase the value of the trademarks included, since the public will be inclined to rely on services marketed using such signs. In addition, this system will help the strategic use of trademarks by companies

²⁰¹ Palarchi E., Italy creates database for certification trademarks; <http://www.iam-magazine.com/reports/Detail.aspx?q=1d584fab-eff1-4a41-b933-a4dd92e178ae>.

Box 3.7: Darjeeling, India²⁰²

Tea is globally one of the most popular and cheapest beverages, with major production centers in India, China, Kenya, Sri Lanka, Turkey and Vietnam. The tea industry is one of the oldest organized industries in India, with a large network of tea producers, retailers, distributors, auctioneers, exporters and packers. Total tea production in the world has exceeded 4 billion kg with India producing about 1 billion kg of tea. Between 2008 and 2013, black tea production in India increased at a compounded annual growth rate (CAGR) of 1.6 per cent, while consumption rose at a CAGR of 2.3 per cent. India's total annual tea production in 2013 is estimated at 1200 million kg, of which 65 per cent, approximately 850 to 900 million kg, is produced by the big tea gardens while about 250 million kg of tea are produced by small tea growers with land area ranging from 2 to 20 hectares. Tea export has remained flat over the years due to increasing competition in the global market and the declining quality of tea produced in India. Thus, the prices in the industry are expected to be stable with domestic consumption expected to be rising steadily.²⁰³

Among the teas cultivated in India, the most celebrated one is Darjeeling.

The district of Darjeeling is situated in the state of West Bengal. Tea has been cultivated, grown and produced in tea gardens geographically located in this area for the last 150 years. The unique and complex combination of agri-climatic conditions prevailing in the region and the production regulations imposed lends the tea a distinctive and naturally occurring quality and flavor which has won the patronage and recognition of discerning consumers all over the world for well over a century. The tea produced in the region has special characteristics and has for long been known to the trade and the public all over the words as *Darjeeling Tea*.

The **DARJEELING®** tea word and logo, which was created in 1983, has been registered under India's trademark law, as well as in various jurisdictions including UK, USA, Canada, Japan, and Egypt and some European countries as a **Trade mark/Certification Trade Mark/Collective Mark**.



No flavour finer

²⁰² Mengistie, Value Extraction by Strategic Use of Intellectual Property Rights in the Branding and Marketing of Agribusiness Products: Role of Trademarks, Certification Marks, Collective Marks and Geographical Indications at The National Seminar on Intellectual Property and Competitiveness of Agro-Food Industries, Dar es Salaam, December 17 and 18 2009, as well as KUMAR R. and NAIK V., Darjeeling Tea – Challenges in the Protection and Enforcement of Intellectual Property Rights, (http://www.wipo.int/sme/en/case_studies/darjeeling_tea.htm).

²⁰³ "The Indian Tea Industry, Healthy Domestic Demand to keep Tea Prices Firm", ONICRA, February (2014); <http://www.onicra.com/images/pdf/Publications/TeaIndustryRepor3.03.2014.pdf>.

In February 2000, a statutory compulsory system of certifying the authenticity of the Darjeeling tea being exported was put in place under the provisions of the Tea Act, 1953.

The system requires all dealers in Darjeeling tea to compulsorily enter into a license agreement with the Tea Board of India and pay an annual license fee. The terms and conditions of the agreement provide that the licensees must furnish information relating to the production, manufacture and sale of Darjeeling tea through auction or otherwise. The Tea Board is thus able to compute and compile the total volume of Darjeeling tea produced and sold in any given same period (no blending whatsoever with teas of other origin is permitted).

Under this authentication process, 171 companies dealing with Darjeeling tea have been registered with the Tea Board. Out of the 171, 74 are producer companies and 97 are trader/exporter companies. Certificates of origin are then issued for export consignments. This ensures the supply-chain integrity of Darjeeling tea until consignments leave the shores of India. The customs authorities in India have, by officially issued instructions, instructed all customs checkpoints to check for and ensure that certificates of origin accompany all Darjeeling Tea consignments.

Overseas importers are thus assured of 100 per cent authentic Darjeeling tea in all their consignments.

In addition to the above, the Indian Tea Board is also in the process of putting in place additional applications for *Darjeeling* and/or Darjeeling logo as a certification mark/collective mark in the Australia, Canada, Germany and a number of other countries.

The **DARJEELING®** tea word mark and device mark are also registered as GIs under India's separate *sui generis* protection for GIs. The *sui-generis* protection system affords strong protection by blocking competitors from using the name even if the use is not confusing. For example, India's system stops all other businesses from using the name **DARJEELING®** even if it is for a product marked as "Darjeeling-Like Tea". The consumer would understand that it is not real **DARJEELING®** tea but the use in this manner is not allowed as the word **DARJEELING®** can only be used by authorized businesses.

The footnote provides a link to an example of a license agreement for a certification mark.²⁰⁴

3.2.10 What is the relationship between trademarks, collective marks and certification marks?²⁰⁵

While all of these marks indicate the origin of goods, trademarks identify the *commercial*, or business, origin of the goods and collective and certification marks identify *the association or certification* of the goods. In other words, a product can bear

²⁰⁴ Farmers and Growers, San Diego County Farm Bureau;
<https://sdfarmbureau.org/BuyLocal/365ShortLicencingAgreeServersGrowers.pdf>.

²⁰⁵ Making a mark: An introduction to trademarks for small and medium-sized enterprises, p. 10;
http://www.wipo.int/edocs/pubdocs/en/sme/900/wipo_pub_900.pdf.

not only the business' trademark but also a collective mark or certification mark. So, even if your business can take advantage of a collective mark or certification mark, you should ensure the business' trademark remains its highest priority. The trademark is the only mark that connects the product to your business.

3.2.11 Why is it important to have a strong trademark?²⁰⁶

Trademark law grants legal protection to trademarks that are *distinctive*. The distinctiveness of the trademark refers to how easily customers identify a trademark with the associated products. Distinctive trademarks are sometimes referred to as “strong” trademarks. **The stronger the trademark is the higher the likelihood that it will receive registration (see 9.2.20) and the greater protection provided by the courts.** It is, therefore, important to understand the difference between inherently strong and inherently weak trademarks, and to choose yours accordingly. Proposed trademarks can be classified into five categories, from most distinctive (strong) to least distinctive (weak):

- **Coined or fanciful trademarks** are invented words or signs without any real meaning. Because they are entirely the result of your imagination, a competitor selling the same products would have no justification for using the same or a similar trademark. Fanciful trademarks are legally the *strongest* trademarks as they have the greatest chance for receiving registration. The downside, however, is that marketing people generally don't like to use them. At one extreme, fanciful trademarks do not give the consumers any hint as to what product is being sold, and they may find it more difficult to remember the word or associate the word with your product. You may have to put in a greater effort (i.e., incur a higher cost) in advertising them. Once established, however, these trademarks have enormous power. At the other extreme, fanciful marks when successfully used for marketing may become so successful that there is a danger of such marks being used as nouns or verbs, instead of being used as adjectives. In the end, however, most savvy marketing teams will love them.

Example: PEPSI exemplifies a fanciful term for soft drinks/beverages.

- **Arbitrary trademarks** are words or signs that have a meaning but one that has no logical relation to the product they advertise. Although arbitrary trademarks are also very strong and easy to protect, marketing people typically do not like them much more than fanciful trademarks, and for the same reason—they may require heavy advertising to create the association between the trademark and the product in the minds of consumers. But, like coined or fanciful trademarks, they generally receive registration.

Examples: BEEFEATER for gin; QUAKER for oats (trademark owned by a F&B company).

²⁰⁶ Making a mark: An introduction to trademarks for small and medium-sized enterprises, p. 11; http://www.wipo.int/edocs/pubdocs/en/sme/900/wipo_pub_900.pdf. Quaker Oats Company, former (1901/en/sme/900/wipo_pub_900.pdf_pub_900.pdf) erprisemeal and other F&B products. The company changed its name to Quaker Foods and Beverages after being acquired by PepsiCo, Inc., in 2001.

- **Suggestive trademarks** are trademarks that hint at the nature, quality or attributes of the product, but do not describe them. Some imagination on the part of the consumer is required to identify the attributes. However, because they suggest the qualities of the product, they possess a low level of distinctiveness. They are, therefore, given less protection than is reserved for fanciful or arbitrary trademarks. In some countries, a suggestive trademark may be considered to be too descriptive of the product and, therefore, may not be registrable as a trademark (see **3.2.35**). Obviously, suggestive trademarks are attractive for marketing departments, because they act as a form of advertising. The problem is that if your trademark describes your product, or its features, you cannot stop others from using the same words to describe their products.

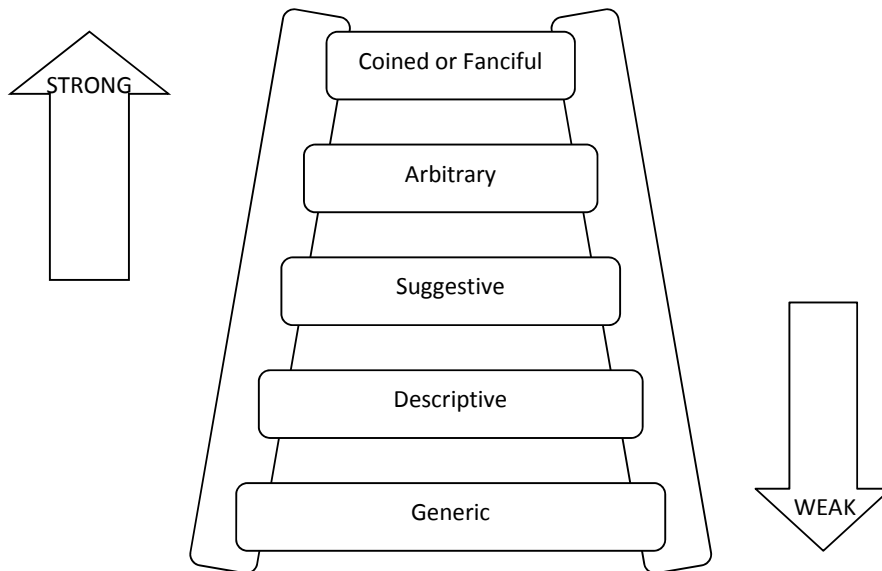
Examples: **BEEF & BREW** for a restaurant; **CHICKEN OF THE SEA** for tuna.

- **Descriptive trademarks** merely describe some feature of the product in question, like its quality, kind, efficacy, use, shape, quantity, intended purpose, value, raw material, origin, place of sale, location of provision of service, time of production, etc. Descriptive terms have little distinctiveness and accordingly are not eligible for protection, unless it can be shown that a distinctive character has been acquired/established through extensive use in the marketplace (see **9.2.20** regarding “secondary meaning”). For marketing purposes it would, of course, be easy to have a trademark that says up front what you are selling. But in general, descriptive trademarks cannot be owned by one company to the exclusion of others. However, descriptive terms are registrable as trademarks once the law deems that the descriptive term has “acquired distinctiveness.”

Examples: The word “sweet” is likely to be rejected registration as a trademark for marketing chocolates on the basis that it is descriptive. In fact, it would be considered unfair to give any single chocolate manufacturer exclusivity over the word “sweet” for marketing its products. Similarly, qualitative or laudatory terms such as “rapid”, “best”, “classic” or “innovative” are likely to give rise to similar objections unless they are part of an otherwise distinctive trademark. “Pretzel Crisps” may be considered descriptive for any crunchy pretzel crackers; similarly, “healthy choice” for nutritious foods, and “honey roast” for roasted nuts.

- **Generic signs** are words or signs that name the species or object to which they apply. These are totally without distinctiveness and can never become *eligible* for protection as trademarks because doing so would deprive competitors of the right to refer to their products by a generic name. When a strong trademark is improperly/incorrectly used in commerce it may lose its distinctive character over time and become a generic term for all goods/services of that kind, and thus lose its distinguishing ability and protection (see **3.2.35**).

Examples: An apple would be a generic symbol for marketing apples, but it is arbitrary for marketing computers. Similarly, “shredded wheat” is a generic term for a category of breakfast cereals. It is important to note that **maintaining a strong trademark requires proper use** of the trademark. You should ensure your business is using the trademark in an appropriate way so as not to unintentionally weaken a strong trademark (see **3.2.39**).



Box 3.8: The importance of strong trademarks

- Strong trademarks are more likely to **receive registration**. They qualify for more legal protection and are better protected from problems with conflicting trademarks or trademarks that have a likelihood of confusion. Weak trademarks, on the other hand, have a lot more competition. It will be easier for your competitors to use a similar trademark, and yours could get lost in the shuffle.
- Strong trademarks clearly **distinguish your products** from those of competitors. They stand out in the crowd.
- Strong trademarks are more effective for use in business to **promote authenticity** and for **expanding** product lines.

3.2.12 How can you increase the distinctiveness of a trademark?²⁰⁷

The more distinctive the trademark, the stronger it is and the greater the protection it enjoys. A trademark can be **inherently distinctive**, or can **acquire distinctiveness**. Fanciful, arbitrary and suggestive trademarks are inherently distinctive and are given a high degree of protection. Descriptive trademarks are not inherently distinctive and are protected only if they have acquired *secondary meaning* (see 3.2.20). There are ways in increase the distinctiveness of your trademark which include:

- Using a special script rather than standard letters;
- Identify and use specific colors; and
- Add a logo or graphical elements to the letters.

²⁰⁷ Making a mark: An introduction to trademarks for small and medium-sized enterprises, p. 13; http://www.wipo.int/edocs/pubdocs/en/sme/900/wipo_pub_900.pdf.

In contrast, strong use over time combined with good marketing can lead to protection being granted to “simple” trademarks based on a secondary meaning.

Remember that distinctive trademarks can also lose their status and become **generic** by improper usage. Hence the need to maintain proper use and utilize enforcement rights (see **3.2.39**).

3.2.13 What should be kept in mind when selecting or creating a trademark?²⁰⁸

How does one select an appropriate trademark for a product? Evidently, there are no hard and fast rules. But the following checklist may be useful for selecting your trademark:

- Check to ensure **no one else has registered** the trademark, or a confusingly similar one. You can start with a simple search on the Internet, followed by a thorough trademark search (see how to carry out a trademark clearance in **3.2.22**). Do this not only in your home country, but also in all relevant export markets.
- Check that the proposed sign **meets all the absolute legal requirements** for registration as a trademark (see **3.2.20** below).
- Do your best to select a **strong trademark**. The legal strength of a trademark is often inversely related to the appeal of the trademark to your marketing team. Remember though that a strong trademark will be a strong long-term marketing tool. Your best bet for broad legal trademark rights is to select a fanciful or arbitrary trademark.
- **Avoid imitating existing trademarks**. Slightly altering a competitor’s trademark or a misspelling a well-known or famous trademark is unlikely to receive registration. For example, **FRESH & EASY**[®] is a registered trademark in the United States for a chain of small grocery stores. It would be unwise to try to open a similar store using the trademark FRESH AND EZ as it would probably be considered confusingly similar to the existing trademark and is unlikely to be registered or, if registered, it may be challenged afterwards.
- Consider possible **limitations** on registering a trademark including **geographic** words or signs (see **3.2.20** below).
- Ensure that the trademark does not have any **undesired connotations** in your own language or in any of the languages of potential export markets.
- Check that the corresponding **domain name** (i.e., Internet address) is available for registration (for more on the relationship between trademarks and domain names see **3.2.41**).
- Make sure the trademark is **easy to read, write, spell and remember** and is suitable to all types of advertising media.
- Protect **figurative trademarks**. When looking for a product, consumers mainly orient themselves by colors and graphical presentations. This is why many businesses decide to use a symbol, logo, design or shape as their trademark or in addition to a word trademark. These elements may also be protected under industrial design or copyright laws. If you commission an artist to produce the logo, you must have a written contract that stipulates you will own the rights to it.

²⁰⁸ Making a mark: An introduction to trademarks for small and medium-sized enterprises, p. 14; http://www.wipo.int/edocs/pubdocs/en/sme/900/wipo_pub_900.pdf.

3.2.14 Managing the Creation of New Trademarks²⁰⁹²¹⁰

It may be beneficial to **outsource** the creation of your trademark. This may mean hiring a designer, along with the advice of an expert in branding. It is important to note that artistic trademarks or logos are likely to be protected by copyright law. When you outsource the creation of a trademark, it is usually best to clarify **issues of copyright ownership** in the original agreement and/or to make sure the copyright of the trademark is formally assigned to your business

3.2.15 How can your business protect its trademark(s)?²¹¹

Legal protection for a trademark is obtained through registration and/or, in some countries, through use. **Registration** is obtained by filing the appropriate application form at the trademark office (some offices allow you to register online). The services of a trademark agent are often very useful, and in some countries compulsory. Many countries also protect trademarks that are **used in the marketplace but are not registered**. However, these countries provide much stronger protection to registered trademarks. Therefore, even in countries where trademarks are protected through use, you are well advised to register the trademarks (see box below and **3.2.17** above).

²⁰⁹ Making a mark: An introduction to trademarks for small and medium-sized enterprises, p. 15; http://www.wipo.int/edocs/pubdocs/en/sme/900/wipo_pub_900.pdf.

²¹⁰ See IP PANORAMA <http://www.wipo.int/edocs/pubdocs/en/sme/900/wi2>; www.wipo.int/sme/en/multimedia.

²¹¹ Making a mark: An introduction to trademarks for small and medium-sized enterprises, p. 15; http://www.wipo.int/edocs/pubdocs/en/sme/900/wipo_pub_900.pdf.

Box 3.9: First to File and First to Use Systems for Trademarks

Countries either adopt the “first to file” or “first to use” registration system. While the systems have different implications for your business, the best strategy for both is to register your trademarks as early as possible in each country in which you intend to do business.

In “**first to file**” countries, the rights to a trademark belong to the business who is the first to file an application for a trademark, even if the trademark was previously used by another business. This is unless the trademark in question is well-known (see **3.2.7**).

The “first to file” system thus encourages earlier trademark registration. However, because the use of a trademark that hasn’t been registered does not generate any rights, it allows rogue competitors to defeat the rights of the *true* trademark owner by filing the trademark application first.

Example: Country XYZ is a *first to file* country. This means that with very few exceptions, legal protection is granted to the trademark registration of the first business or individual to file - not the one who can demonstrate first use of the trademark. So if the name of your business is ABC, and you produce cheese and you have been producing cheese in XYZ for the last three years and another business registers the ABC trademark for cheese products, that other business gets the trademark. And then, armed with the trademark, that business may even be able to stop your ABC cheese products from leaving XYZ. If you cannot demonstrate that the trademark is well-known, it is very hard to overcome the first to file system.

In “**first to use**” countries, the owner of the trademark is the person who is the first to use the trademark in the marketplace, irrespective of whether the trademark has been registered. The rights arising out of such actual use are often referred to as *common law* or *unregistered* trademark rights. Even though registration is not compulsory in these countries it is, in general, a much stronger strategy to register your trademark as you normally will have a wider scope of remedies available.

If you expand your business in first to file countries, then it would be prudent to:

- file a trademark application in those countries, **before the actual importation** of any goods and even **prior to meeting or negotiating** with other businesses there. There are certain businesses that hunt for potentially/actually used but as yet not registered trademarks. They register the trademarks and then approach the legitimate owner with a demand for compensation.
- file a trademark application, **k** the goods in those countries and you are not intending to sell there. If the branding of your products is taking place in such a country, then you are deemed to be *using* the trademark in the relevant country (see **3.2.36** below). There is a risk that other companies, or even your licensee or distributor, will register your trademark. Then, that company may have the right to stop you from manufacturing and exporting products bearing the registered trademark, because

this will amount to trademark infringement. This would be the case even if you did not sell your goods in that country.

3.2.16 What other legal instruments are available for protecting your brand image or other aspects of your products?²¹²

Depending on the nature of your brand image or products, you may use one or more of the following IPRs to protect your business interests:

*The **FERRERO ROCHER**[®] trade-dress is a trademark owned by Ferrero.*

- **Trade Dress/Get-Up.** The commercial image and overall appearance of a business or presentation of goods in some countries is called “trade dress” and in others, “get-up.” The trade dress may be a single or a few elements (e.g., the color, size, and/or shape of packaging); or it may be the total image or concept of a product, packaging and/or decor, which may embrace the full brand of a business including signage, logos, uniforms, merchandising, websites or labels. Thus, trade dress refers to the manner in which a product is “dressed up” to go to market. Examples include the **REALEMON**[®] juice container that looks like a plastic lemon, the shape of the **COCA-COLA**[®] bottle, and the **FERRERO ROCHER**[®] golden-foil wrapped chocolate specialty. In addition, a restaurant may use **a trademark** to protect its name and seek **trade dress** protection for its distinctive look and feel, which includes its decor, menu, layout and style of service. Examples of restaurants with distinctive trade dress include **MCDONALD’S**[®], **WENDY’S**[®], and **FUDDRUCKERS**[®]. Defining and protecting your trade dress are essential elements to creating your unique brand. Because trade dress often serves the same function as a trademark—i.e., the identification of products in the marketplace—in some countries it can generally be protected under the trademark laws and, in a few countries, registered as a trademark. Depending on your country, if trade dress cannot be registered as a trademark, it may nonetheless be protectable under unfair competition laws or actions for passing off.

- **Industrial Designs.** Exclusivity over aesthetic features of a product (such as its shape, ornamentation, patterns, lines or color) that meet certain prescribed criteria may be obtained via industrial design protection, which in some countries are referred to as *design patents*. To be protected under most national laws, an industrial design must be new and/or original but does not protect any technical features of the item to which it is applied and insofar as the shape is not wholly determined by a technical function. An industrial design right is time-limited (generally a maximum of 10 to 25 years, depending on the national law), but provides exclusive rights. It allows you to stop competitors from marketing products that are identical or *look alike* in the eye of the consumers. This means that you may prevent marketing of new products with the same or slightly similar shapes, whether or not copying has taken place, and whether or not the consumers are actually confused. It is important to note that if you wish to protect your industrial

²¹² Making a mark: An introduction to trademarks for small and medium-sized enterprises, p. 15; http://www.wipo.int/edocs/pubdocs/en/sme/900/wipo_pub_900.pdf.

design, it must be kept confidential prior to registration, so this is a strategy that needs to be utilized before putting your product on the market.²¹³

- **Copyright.** Original literary and artistic works may be protected by copyright; for example: advertisements, logos, some types of databases, computer programs, etc. Copyright protection is automatic (i.e., without having to register) and lasts for at least 50 years after the death of the creator/author.²¹⁴
- **Patents.** These may be used to protect inventions that meet the criteria of novelty, inventive step and industrial applicability.²¹⁵
- **Trade secrets.** Confidential business information may benefit from trade secret protection as long as it has commercial value; is not generally known to others; and reasonable steps have been taken by its owner to keep it secret. Make sure to keep new product names or marks that are not yet used/registered confidential.²¹⁶
- **Unfair competition laws, actions for passing off or consumer protection laws** may allow you to take action against the unfair business actions of competitors. These may provide you with some additional protection against those trying to copy different aspects of your products. In practice, however, a legal action based on competition law, passing off or consumer protection is often difficult, expensive and time consuming.
- **Cumulative protection.** Depending on your brand image and products, you may be able to use a **variety of IP rights**, and it is best to seek the advice of an IP attorney to ensure you are properly protecting your IP assets:
 - In a large number of countries, a particular sign may have cumulative protection under the laws of *copyright*, *industrial design* and *trademark*; thus, such a sign may qualify under the respective laws as an artistic work, ornamentation or a logo. The degree and scope of such cumulative protection varies, however, widely amongst countries.
 - In many other countries, *copyright* and *design protection* are mutually exclusive, i.e., a particular artistic work ceases to have copyright protection the moment it is used as an industrial design; even in such countries, a sign may have both *copyright* and *trademark* protection at the same time.
 - Sometimes, it is possible to register a composite *design* that includes, amongst other things, a stylized version of a registered *trademark*.

²¹³ Cf. 3.7 below, as well as Looking Good: An Introduction to Industrial Designs for SMEs. WIPO publication No. 498 and IP PANORAMATM Module 02 at www.wipo.int/sme/en/multimedia for more information.

²¹⁴ Cf. 3.8 and 3.9 below, as well as Creative Expression: An Introduction to Copyright and Related Rights for SMEs, WIPO publication No. 918 and Module 05 of IP PANORAMATM at www.wipo.int/sme/en/multimedia.

²¹⁵ Cf. 3.5 below, as well as refer Inventing the Future: An Introduction to Patents for SMEs. WIPO publications No. 917 and 917.1 and Module 03 of IP PANORAMATM at www.wipo.int/sme/en/multimedia.

²¹⁶ Cf. 3.4 below, as well as In Confidence: An Introduction to Trade Secrets for SMEs. WIPO publication No. 929 (forthcoming) and Module 04 of IP PANORAMATM at www.wipo.int/sme/en/multimedia.

3.2.17 Why should your business register its trademark(s)?²¹⁷

While in many countries registration is not necessary to establish rights, it provides numerous advantages:

- **Nation-wide or region-wide (group of countries) exclusivity.** The registered owner of a trademark has the **exclusive right** to commercially use the trademark **anywhere in the country/region** where registration was obtained (see **3.2.33** below). In contrast, unregistered trademark rights, where available, are limited to the part of the country where the trademark is actually in use and has acquired a reputation through such use.
- **Easier to enforce.** The registration of a trademark usually carries a presumption that you are the owner of the trademark and, therefore, have the right to prevent others from using that trademark. This **reduces the burden of proof** in court proceedings; i.e., you don't have to prove that the trademark is valid, that you are its owner or that there is goodwill associated with the trademark. In some countries, it also allows you to recover more monetary damages when the rights of a registered trademark are infringed.
- **Deterrence.** Firstly, registration enables you **to use the ® symbol after the trademark**, which alerts others to the fact that it is registered (see box after **3.2.37**). Secondly, a registered trademark will most likely appear in the search report conducted by another business that may want to register an identical or deceptively similar trademark; this will discourage the other business from doing so (see **3.2.22** below). Thirdly, some trademark offices will automatically refuse to register a trademark for goods/services which they consider to be confusingly similar to your registered trademark in that same class (see **3.2.31** below).
- **Valuable asset.** It is **easier to sell or license** a registered trademark and usually to do so at a **higher price**. In addition, while in most countries it is not mandatory, registration makes it simpler to use a trademark in a franchising agreement.
- **Funds.** On occasion, a registered trademark with a good reputation may also be used to **obtain funding** from financing institutions that are increasingly aware of the importance of brands for business success.
- **Prevent importation.** Many countries have put in place systems that enable the owner of a registered trademark to enlist the trademark with the customs authorities for a fee. The purpose is to enable the customs authorities to inspect and seize counterfeit goods that infringe your registered trademark. Unregistered trademarks generally do not receive such assistance from the customs authorities.

Given the value of trademarks and the important role that they now play in business branding strategies for defining the success of a product in the marketplace, it is critical to ensure that trademarks are registered in all the relevant markets. Without trademark registration, your investments in marketing a product may not yield the expected results, as rival businesses may use identical or confusingly similar trademarks. Customers

²¹⁷ Making a mark: An introduction to trademarks for small and medium-sized enterprises, p. 19; http://www.wipo.int/edocs/pubdocs/en/sme/900/wipo_pub_900.pdf.

may be misled into buying the competitor's product, thinking it to be the product of your business. This could not only decrease the profits of your business and confuse your customers, but may also damage the reputation and image of your business, particularly if the rival product is of inferior quality.

Box 3.10: Enjoying High Brand Recognition – EAGLE BOYS²¹⁸

Tom Potter opened his first **EAGLE BOYS** restaurant in 1987. Utilizing his bakery skills, he created a unique “bakery in a pizza shop” concept that quickly grew through franchising, and by early 2011, Eagle Boys was making over sixteen million pizzas a year and generating an annual turnover of over 160 million AUD.

From the start, Mr. Potter understood the importance of securing IPRs. The company's trademark, **EAGLE BOYS**, is an arbitrary trademark for a pizza business (the words have a meaning but no logical relation to the product they advertise) and, thus, is a very strong trademark.

In addition, one of the other most important aspects of the company's brand is the “pink glow” that surrounds each store. Each store is adorned with pink colored lights—either on the exterior or interior of the building—and this creates a unique, warm glow that is instantly recognizable. The trademark for its unique “pink glow” was successfully registered in the Commonwealth of Australia in 1992. The trademark is described as a “pink glow created by a row of pink colored lights extending along a fascia of a building or a pink glow created by pink colored lights mounted on the exterior or interior walls of a building.” It is limited to a building that provides the services of Class 42, which include the retail of F&B and restaurant services including the preparation, supply and sale of F&B.

Just as important as securing IPRs is an in-house understanding of how to manage them. To that end, **EAGLE BOYS** works with an IP specialist to educate its employees and franchisees. Its public relations, marketing and design teams all understand that no new product developments, trademarks, slogans or any other valuable information can be divulged to the public before formal IPR applications have been made. The franchisees are educated on how to spot IP infringement and are the company's eyes, ears and first line of defense against those who may wish to illegally ride the coattails of **EAGLE BOYS'** success.²¹⁹

3.2.18 What rights does trademark registration provide?²²⁰

The exclusive rights arising out of a trademark registration allow you to prevent all others from marketing **identical or similar products** under an **identical or a confusingly similar trademark**. So, you will be able to prohibit competitors from (a)

²¹⁸ Making a mark: An introduction to trademarks for small and medium-sized enterprises, cit., p. 20; http://www.wipo.int/edocs/pubdocs/en/sme/900/wipo_pub_900.pdf.

²²⁰ Making a mark: An introduction to trademarks for small and medium-sized enterprises, p. 21; http://www.wipo.int/edocs/pubdocs/en/sme/900/wipo_pub_900.pdf.

affixing the trademark to goods or their packaging; (b) stocking or selling goods bearing the trademark or supplying services under the service mark; (c) importing or exporting goods under the trademark and/or (d) using the trademark on business papers, websites and in advertising.

However, these exclusive rights are limited to:

- The **country** or **countries** in which you have registered the trademark (see **3.2.33** below);
- The **goods/services** for which the trademark is registered (see **3.2.31**).
- Situations in which consumers are **likely be confused** by the infringing trademark (see **3.5**).

3.2.19 Is the registration of the company/trade name of your business the same thing as trademark registration?²²¹

It is a common misconception that by registering a business and its trade name at the business registry, it would also be automatically protected as a trademark. This is not true. It is important to understand the difference between a company name, trade name and trademark.

The **company name**, or corporate name, is the **legal name** that is recorded in the company/commercial register. It is used in the bylaws, contracts, taxes and other administrative activities to identify your business. It often ends with Ltd, Inc. or another similar abbreviation that denotes the legal character of the business. For example: “Blackmark International Ltd.”

A **trade name**, or business name, is the name that you use to **identify** your business when communicating with your clients, which may or may not be the same as the company name. In most countries, you acquire certain exclusive rights in a trade/business name merely by using it in public (i.e., without any legal registration or formality).

A **trademark**, or mark, however, is the sign you use to **distinguish the products** of your business from those of competitors. Even a small business may have more than one trademark. For instance, Blackmark International Ltd. may sell one of its products as BLACKMARK but another as REDMARK. Companies may use a specific trademark to identify all their products, a particular range of products or one specific type of product. When a business uses its trade name, or a part of it, as a trademark, it should register it also as a trademark.

²²⁰ Making a mark: An introduction to trademarks for small and medium-sized enterprises, p. 21; http://www.wipo.int/edocs/pubdocs/en/sme/900/wipo_pub_900.pdf.

²²¹ Making a mark: An introduction to trademarks for small and medium-sized enterprises, p. 21; http://www.wipo.int/edocs/pubdocs/en/sme/900/wipo_pub_900.pdf.

Example:

Gruppo Ferrero SpA is an Italian manufacturer of chocolate and other confectionery products. The company uses the trade name **FERRERO**, and owns trademarks such as **FERRERO ROCHER®**.



Ferrero S.p.A.

3.2.20 What are the main reasons for rejecting an application?²²²

Besides having an understanding of strong trademarks, an entrepreneur should also know which types of trademarks will not be accepted for registration. Applications for trademark registration are usually rejected on what are referred to as “**absolute grounds**” in the following cases:

- **Generic terms** never receive trademark protection (see **3.2.11**).
- **Signs devoid of distinctive character** (in the sense that the sign is not capable of distinguishing the products of one enterprise from those of others) cannot be registered unless you can show that they have acquired secondary meaning (see box below). The following signs are generally devoid of distinctive character:
 - **Descriptive words** or signs (see **3.2.11** and box below).
 - **Geographic words** or signs, if they are **geographically descriptive**. For example, for a whisky coming from Scotland, the mark SCOTCH WHISKY is geographically descriptive and, therefore, not distinctive. Other whisky producers in the country should be able to use SCOTCH to describe the place of origin of their products (see also **3.5** below concerning GIs).
 - **Advertising slogans**, if they consist of highly descriptive and non-distinctive material and are incapable of distinguishing the source. It is often difficult for slogans to achieve distinctiveness and obtain registration as a trademark, because their function is mainly to promote and convey the information of the company and its product. Advertising slogans are often rejected for lack of distinctiveness. For example, the slogan *Nobody knows whisky better* for a whisky producer is likely to be rejected, because it is merely a laudatory statement reflecting the expertise with respect to the advertised goods. Such phrases should be free for use by other businesses. Note also that some countries never allow advertising slogans to be registered as trademarks.

²²² Making a mark: An introduction to trademarks for small and medium-sized enterprises, p. 22; http://www.wipo.int/edocs/pubdocs/en/sme/900/wipo_pub_900.pdf.

Box 3.11: Acquired distinctiveness or secondary meaning

In many countries, you can overcome an objection of devoid of distinctive character if you can prove that your trademark has acquired **secondary meaning** or **distinctiveness through use**. A descriptive trademark acquires secondary meaning if you can prove that the consuming public recognizes that the descriptive name is a trademark that refers to your products. This usually happens as a result of **widespread use over time** or because of a **marketing blitz**. Thus, for example, **HEALTHY CHOICE®** is a “weak” trademark for healthy prepared main dishes that has acquired distinctiveness (in the United States) because the consuming public associates that term with a particular provider of healthy prepared meals, and not with healthy meals in general.

Similarly, if a geographic term is used in such a way as to identify the source of the products and, over time, consumers start to recognize it as identifying a particular business, the geographic term may become protectable as trademark.

To prove that a descriptive trademark or slogan has acquired secondary meaning, all kinds of **evidence** might be taken into account, among others, invoices, delivery slips, order slips, bills, receipts, account books, pamphlets, printed matters carrying advertisement, publicity, photographs showing the use of a trademark, certificates issued by an advertisement agency, trade association or customer, consumer surveys, etc..

TIP - Relying on secondary meaning is a dangerous bet and often expensive and difficult to prove. Besides, there may be local variations in how these issues are legally analyzed. Thus, trademarks which may be considered protectable in some countries may be considered descriptive in others. As a rule of thumb, it is **preferable to avoid choosing descriptive words or signs as trademarks**.

- **Trademarks based on someone’s personal/given/first name or surname** .In some countries this may be an absolute ground for refusal, while in most others it may be a relative ground for refusal (i.e., use of one’s own name is treated in the same way as ordinary word trademarks) if it is primarily just a surname. However, in some countries, a surname can be registered as a trademark if it has gained secondary meaning. In most countries, the name of a natural person or of a legal entity and even a pseudonym may be registered as a trademark.
- **Deceptive signs**. These are signs that are likely to deceive or mislead consumers as to the nature, quality or geographical origin of the product. For example, marketing margarine under a trademark featuring a “cow” would probably be rejected, as it would be considered misleading for consumers, who are likely to associate the sign with dairy products (i.e. butter).
- **Functional features**. The functional elements of a product shape or packaging, as opposed to purely decorative elements, are generally not protectable as a trademark. For example, when the shape of a product has significant functional features—like the shape of the handles and blade assembly for a pair of scissors,

which is necessary for the functioning of the scissors—such a shape cannot be registered as a trademark. Similarly, it is not possible to obtain trademark registration for a handle, such as on a coffee cup, because the handle performs the essential function of holding a hot cup. Competitors' inability to use a handle would, therefore, decrease their ability to effectively compete.

- **Signs which are considered to be contrary to public order or morality.** Words and illustrations that are considered to violate commonly accepted norms of morality and religion are generally not allowed to be registered as trademarks.
- **List of prohibited names or symbols.** Some countries maintain a list of specific signs that are excluded from registration. They may include one or more of the following: **business names; names of famous people; well-known marks** (see 3.2.7); protected **GIs** (see 3.3); **signs of indigenous peoples and foreign words or expressions.**

Applications are rejected on “**relative grounds**” when the proposed trademark conflicts with **prior trademark rights**. Having two identical (or very similar) trademarks for the same type of product could cause confusion among consumers. Some trademark offices check for conflict with existing trademarks, including unregistered trademarks and well-known marks, as a regular part of the registration process, while many others only do so when the trademark is challenged by another business after publication of the trademark. In either case, if your trademark is considered to be identical or confusingly similar to an existing one for identical or similar products, it will be rejected or cancelled.

Finally, in many countries, your trademark can also be refused if it is in conflict with **other prior rights**, for example: industrial design, copyright, personal/company/business names, commercial designation, geographical indication or signs of indigenous peoples.

- **Absolute Grounds for Refusal** are reasons inherent to the trademark itself
- **Relative Grounds for Refusal** arise because of the existence of prior rights, whether in registered marks or otherwise

3.2.21 **Can you get a trademark free of charge or buy it from someone who does not need the trademark anymore?**²²³

Adopting a competitor's trademark (either abandoned or still in use) can provide a marketing boost, giving a sizable advantage over those with competing products. However, this can be a complex legal issue and you should consult a trademark lawyer for advice.

You may want to reuse a competitor's **trademark that is no longer used**, but still fondly remembered from the past. The public's memory of the original trademark can trigger instant demand for your new product, reduce advertising costs and raise profits.

²²³ Making a mark: An introduction to trademarks for small and medium-sized enterprises, p. 25; http://www.wipo.int/edocs/pubdocs/en/sme/900/wipo_pub_900.pdf.

Abandoned marks can be used by anyone, without any permission or payment (see **3.2.37**). However, using abandoned trademarks can be risky, especially if they still enjoy consumer recognition. The reintroduction can confuse and deceive the public. In addition, the original owner may be able to prove use (or intent to resume use) of the trademark and rebut the presumption of abandonment.

If you decide to use an abandoned trademark, it would be prudent to:

- carefully investigate that the original owner no longer uses the trademark, and that the trademark has been abandoned;
- if the trademark is still registered, petition to cancel the registration;
- register the trademark for your purposes; and
- pay a modest sum to the original owner for a quit-claim assignment or covenant not to sue, just to be safe.

You may sometimes buy a trademark still owned and used by another business. When you acquire a trademark from someone else, check the following:

- is the trademark registered? For which countries? For what classes of goods/services?
- who owns the trademark currently? Who were the previous owners, if any?
- are there any existing licenses? If so, what is the extent of these existing license rights? Is the trademark compromised by “naked” licensing (licensing without any control over the quality of the goods/services)?
- are there any liens, encumbrances, lawsuits or other adversarial actions that might jeopardize the trademark?
- has the trademark ever been challenged by competitors?
- does the vendor grant appropriate representations and warranties in the acquisition agreement?

3.2.22 How can you find out if the proposed sign conflicts with the trademark of a competitor?²²⁴

Once a new trademark has been chosen, carry out a proper **trademark clearance**. The purposes of clearing a trademark are manifold and will mitigate major risks saving you valuable time and resources. They are as follows:

- To make sure that you will not infringe the trademark of another business. If you use a trademark which infringes on the trademark rights of someone else, it may make you liable to pay damages and give you bad publicity, but it also may force you to cease the use of the trademark. You will probably have to destroy all packaging, advertising and other materials bearing the infringing trademark. In addition, it will cost your business extra time and money to completely change the trademark and attempt to transfer any developed goodwill to a new brand. The main mistake amateur searchers make is to consider only whether anyone has registered exactly the same trademark and not if there is something *similar*. Remember that trademark

²²⁴ Making a mark: An introduction to trademarks for small and medium-sized enterprises, p. 26; http://www.wipo.int/edocs/pubdocs/en/sme/900/wipo_pub_900.pdf.

infringement occurs if the proposed trademark or a *confusing similar* one is already owned by another business for *identical or similar* products.

- To find out if the proposed trademark can be registered. You can avoid wasteful expenses associated with a trademark application if you can establish ahead of time that the proposed trademark is not free for use.
- If registrable, to know how strong the proposed trademark is in legal terms.
- Others who have a stake in your business may demand a trademark clearance report before doing business with you. For example, the distributor of your products or the insurer of your business may not want have an avoidable risk handed down to it.

How do you clear a trademark? You may start by conducting a **preliminary trademark search** on your own:

- Search for registered trademarks and pending trademark applications. Check whether your national trademark office (or a commercial database company) has a free online trademark database. A list of IP offices by country is available on WIPO's website at: <http://www.wipo.int/directory/en/urls.jsp>
- Search also for possibly conflicting unregistered trademarks that are already in use. This is especially important in countries that protect trademarks through use (see 3.2.15). Search the Internet by using search engines such as **GOOGLE**[®], **YAHOO!**[®], **BING**[®] and **AV ALTAVISTA**[®], and review relevant online stores, product guides, trade publications, etc.
- Look for identical or similar company and domain names, which can be obstacles to the registration of a trademark (see 3.2.22 and 3.2.41).

If your trademark survives this first round of screening, you may then have to hire a trademark agent who will conduct a **comprehensive search** for a fee and, more importantly, be able to **interpret** the search results. Presumably, you are very knowledgeable about trademarks used by competitors and the information contained in trade directories and other sources, and have certain marketing information about your product. Share this information with your trademark agent to enable him/her to make a full assessment of your situation. Thereafter, the agent may do one or more of the following:

- Search for phonetic equivalents, foreign language equivalents, spelling variations and the like;
- Sometimes, cultural linguistic searches or language connotation searches are done in order to ensure that the proposed trademark(s) are not problematic in other languages. A local linguist will provide information on the appropriateness of a trademark, potential meanings and associations and problems with pronunciation;
- Search the company or business names directories; and
- Search phone books and specialized trade directories in your type of industry.

The trademark agent will then give you a **clearance report** that will contain each potential conflict that has been found. Such a professional report is optional but highly recommended. Professional search firms and trademark agents make extensive use of

databases, which means their reports should provide the most comprehensive information that is practically available.

Bear in mind that any such trademark search must be conducted:

- for the relevant **countries** (consider also future plans for the expansion of your business);
- for the relevant **products** (marks are grouped into “classes” according to the goods or services they serve to identify - you may, therefore, begin by familiarizing yourself with the different trademark classes - see **3.2.31**); and
- with respect to **confusingly similar** trademarks (the guidance of a trademark agent may be helpful).

How thorough should the trademark clearance effort be? The scope of your search will be determined by the level of your risk tolerance, budget and time available for getting it done. In the international context, the search may prove to be not only very expensive, but also a hit or miss proposition. Besides, no search can uncover all potential types of unregistered trademark usage, but even a limited search is advisable rather than no search at all.

3.2.23 What are the costs associated with trademark creation and protection?²²⁵

It is important to properly budget the costs related to trademark creation and registration:

- There are costs associated with the creation/selection of a logo, word, slogan or tagline to be used as a trademark, especially if you outsource this task to a brand consultant or a business that creates/designs logos for you.
- There are costs for obtaining a trademark clearance search.
- There are costs associated with the registration process, which will vary depending on the number of countries and the categories of products (or trademark classes). The national trademark office will provide you with the detailed costs of trademark registration and renewal.
- Businesses that choose to use a professional trademark agent to assist in the registration process will face additional costs but will probably save significant time and energy during the registration process.

3.2.24 Who is authorized to apply for trademark registration?²²⁶

In general, any person who intends to use a trademark or to have it used by others may apply for its registration. It may be either an individual or a legal entity. However, in most countries the individual applying for registration must be a resident of that country.

²²⁵ Making a mark: An introduction to trademarks for small and medium-sized enterprises, p. 27; http://www.wipo.int/edocs/pubdocs/en/sme/900/wipo_pub_900.pdf.

²²⁶ Making a mark: An introduction to trademarks for small and medium-sized enterprises, p. 28; http://www.wipo.int/edocs/pubdocs/en/sme/900/wipo_pub_900.pdf.

3.2.25 Do you need a trademark agent to file a trademark application?²²⁷

Most countries do not require you to hire a trademark agent to file an application. If you are a resident of that country, you may file the application yourself. However, the services of an agent skilled in conducting trademark searches and familiar with the detailed procedure for trademark registration may be used to **save time**, ensure that you apply for protection in the appropriate **trademark class(es)** and **avoid refusal** on absolute or relative grounds.

Filing a trademark application should not be considered to be a routine administrative matter. You have to develop an appropriate **strategy** regarding the form of the trademark and how broadly or narrowly to describe the relevant goods or services. You have to take into account the search results and possible disputes down the road. You also have to consider future plans for the trademark to make sure all relevant goods or services are covered by the application. In pursuing an application, you may need practical advice and risk analysis on the best strategy to respond to office actions, particularly, a refusal. For all these reasons, the assistance of a trademark agent is generally recommended. If you apply for trademark registration abroad you may be required to have a trademark agent who is resident in the relevant country. The relevant trademark office will be able to provide you with a list of officially approved trademark agents.

3.2.26 How long does it take to register a trademark?²²⁸

The time required varies significantly from country to country, generally ranging from three months to two years, depending, among other things, on whether the trademark office conducts a partial or full substantive examination and if there are any opposition procedures (see box **3.12 below**). The length of registration has a major influence on the timing of launching a new product. Make sure that you apply for registration of a trademark well in advance so that its registration is secured before you start using it on your products or in advertising.

3.2.27 How do you apply for trademark registration?²²⁹

After a comprehensive trademark search has been performed (see above) and the decision to seek trademark registration has been made, a trademark application has to be prepared and submitted to the relevant national or regional trademark office.

The box below provides a basic overview of the application process. Note that there may be significant variations among countries and that it is always best to check with

²²⁷ Making a mark: An introduction to trademarks for small and medium-sized enterprises, p. 28; http://www.wipo.int/edocs/pubdocs/en/sme/900/wipo_pub_900.pdf.

²²⁸ Making a mark: An introduction to trademarks for small and medium-sized enterprises, p. 28; http://www.wipo.int/edocs/pubdocs/en/sme/900/wipo_pub_900.pdf.

²²⁹ Making a mark: An introduction to trademarks for small and medium-sized enterprises, p. 28; http://www.wipo.int/edocs/pubdocs/en/sme/900/wipo_pub_900.pdf.

the trademark office of the relevant country or a trademark agent in the relevant country to obtain up-to-date information on procedures and applicable fees.

Box 3.12: Registering a Trademark – Step by Step

The Trademark Office

The steps taken by the office to register a trademark vary from country to country but, broadly speaking, follow a similar pattern. Usually, the trademark office has a specific examination manual available online. These manuals can give you a good insight to the application process and review.

1. The Application Form

As the first step, you have to submit a duly completed trademark application form, which will include the contact details of your business, a graphic illustration of the trademark (a specific format may be required), a description of the goods and services and/or class(es) for which your business wishes to obtain trademark registration and pay the required fees. These forms are available at the trademark office or online and, increasingly, in some countries the entire application can be done online.

Note that some trademark offices may also require proof of use or a declaration that your business intends to use the trademark. The relevant trademark office will give you more precise information concerning the application process.

2. Formal Examination

The trademark office examines the application to make sure that it complies with the administrative requirements or formalities (i.e., whether the application fee has been paid and the application form is properly filled in).

3. Substantive Examination

In some countries, the trademark office does only a **partial** substantive examination under which it verifies whether the proposed trademark is liable to be rejected on *absolute grounds* (as explained in **3.2.13** absolute grounds refers to the categories of signs which are excluded from registration by specific provisions of the trademark law). If a **full** substantive examination is done, it also includes examination on *relative grounds*, meaning, the office also examines if the proposed trademark is in conflict with an existing trademark on the register in the relevant class(es).²³⁰

²³⁰ For the agro-food sector, the most relevant classes in the Nice Classification (An international classification of goods and services applied for the registration of marks; refer <http://www.wipo.int/classifications/nice/en/>) are:

Class 1: Chemicals used in industry, science and photography, as well as in agriculture, horticulture and forestry; unprocessed artificial resins, unprocessed plastics; manures; fire extinguishing compositions; tempering and soldering preparations; chemical substances for preserving foodstuffs; tanning substances; adhesives used in industry.

4. Publication and Opposition

In many countries, the trademark is **published** in a journal with a set period of time for others to oppose its registration. In a number of other countries, the trademark is only published once it has been registered, with a subsequent period for petitions to cancel the registration.

5. Registration

Once it has been decided that there are no grounds for refusal, the trademark is registered, and a registration certificate is issued that is generally valid for 10 years.

6. Renewal

The trademark may be renewed indefinitely by paying the required renewal fees, but the registration may be cancelled entirely or for certain goods/services if the trademark has not been used for a certain period of time specified in the relevant trademark law (see **3.2.36**).

3.2.28 For how long is your registered trademark protected?²³¹

While the term of protection may vary, in a large number of countries, registered trademarks are protected for 10 years. Registration may be renewed indefinitely (usually, for consecutive periods of 10 years) provided renewal fees are paid. Make sure that someone in your business is made responsible for ensuring timely renewal of trademark registrations in all countries of continuing interest to your business (see **3.2.35** below).

3.2.29 Can identical trademarks co-exist?²³²

Yes. Identical trademarks used for identical goods or services can co-exist without any risk of infringing another's rights in **different countries**, provided the trademark is not

Class 5: Pharmaceutical, veterinary and sanitary preparations; dietetic substances adapted for medical use, food for babies; plasters, materials for dressings; material for stopping teeth, dental wax; disinfectants; preparations for destroying vermin; fungicides, herbicides.

Class 7: Machines and machine tools; motors and engines (except for land vehicles); machine coupling and transmission components (except for land vehicles); agricultural implements (other than hand-operated); incubators for eggs.

Class 29: Meat, fish, poultry and game; meat extracts; preserved, dried and cooked fruits and vegetables; jellies, jams, fruit sauces; eggs, milk and milk products; edible oils and fats.

Class 30: Coffee, tea, cocoa, sugar, rice, tapioca, sago, artificial coffee; flour and preparations made from cereals, bread, pastry and confectionery, ices; honey, treacle; yeast, baking-powder; salt, mustard; vinegar, sauces (condiments); spices; ice.

Class 31: Agricultural, horticultural and forestry products and grains not included in other classes; live animals; fresh fruits and vegetables; seeds, natural plants and flowers; foodstuffs for animals, malt.

Class 32: Beers; mineral and aerated waters and other non-alcoholic drinks; fruit drinks and fruit juices; syrups and other preparations for making beverages.

Class 33: Alcoholic beverages (except beers).

Class 43: Services for providing food and drink; temporary accommodation.

Class 44: Medical services; veterinary services; hygienic and beauty care for human beings or animals; agriculture, horticulture and forestry services.

²³¹ Making a Mark: An Introduction to Trademarks and Brands for Small and Medium-sized Enterprises, p. 30; http://www.wipo.int/edocs/pubdocs/en/sme/900/wipo_pub_900.pdf.

²³² Making a Mark: An Introduction to Trademarks and Brands for Small and Medium-sized Enterprises, p. 30; http://www.wipo.int/edocs/pubdocs/en/sme/900/wipo_pub_900.pdf.

considered to be a well-known mark. Identical or similar trademarks may also co-exist in the same country, provided that:

- they are used for **different goods or services** that are included in different classes of the Nice classification—except for well-known marks (see **3.2.7**); or
- there is **no likelihood of confusion** in the marketplace; or,
- there is a **coexistence agreement** (see **3.2.35** below).

Having to deal with identical or similar trademarks in the same marketplace is a situation that is best avoided by conducting a timely trademark search. If, despite such efforts, a conflict arises with the same or a confusingly similar trademark, you will need to judge in each case what would be the appropriate response:

- One option is to enter into a coexistence agreement with the owner of the conflicting trademark. The main objective of such an agreement is to achieve peaceful coexistence by spelling out how the parties could exist together in the marketplace.
- In some situations, litigation may be the only appropriate response to settle a conflict with identical or similar trademarks in the same marketplace.
- Other options are buying (or selling) or licensing the conflicting trademark.

3.2.30 Do you need to register all small modifications to your trademark?²³³

Many trademarks have slightly changed or evolved over the years in order to modernize the image of a business or adapt to new advertising media. Trademarks may be changed or adapted, but your business will have to be careful and consult with the trademark office(s) concerned or a trademark agent as to whether a specific change will require the submission of a new application and payment of relevant fees.

3.2.31 What happens if you want to use your trademark for a different product?²³⁴

While filling in your trademark application form, you are required, in most countries, to indicate the goods and services for which you wish to register your trademark and to group them according to **classes**. These refer to the classes in the **trademark classification system**. If you have registered a trademark for a particular product and want to use it on a product in a different class, then you should file a new trademark application.

Box 3.13: Nice and Vienna Classifications

The most widely used classification system is the International Trademark Classification system. The **Nice system** establishes a classification for goods and services for all types of trademarks (it has 34 classes for goods and 11 for services) and the **Vienna system** establishes a classification for marks which consist of, or contain, figurative

²³³ Making a Mark: An Introduction to Trademarks and Brands for Small and Medium-sized Enterprises, p. 30; http://www.wipo.int/edocs/pubdocs/en/sme/900/wipo_pub_900.pdf.

²³⁴ Making a Mark: An Introduction to Trademarks and Brands for Small and Medium-sized Enterprises, p. 31; http://www.wipo.int/edocs/pubdocs/en/sme/900/wipo_pub_900.pdf.

elements (it has 29 categories). More information on the Nice and the Vienna systems is available at www.wipo.int/classifications/en .

Applicants for national or international IP protection are required to determine whether their creation is new or owned/claimed by someone else. To determine this, huge amounts of information must be searched. International classifications facilitate such searches by organizing information concerning inventions, trademarks and industrial designs into indexed, manageable structures for easy retrieval.

The trademark classification systems allow for the storage of data on registered trademarks in an orderly manner in relation to the types of goods or services. This makes it easier to retrieve information from trademark databases. It is critical to register your trademark under all classes for which you intend to use your trademark.

3.2.32 How to protect the shape of your product?²³⁵

The shape of your product can be an important element of your brand and there are a variety of ways to protect this element.

- A shape of a product may usually be protected as an **industrial design** (see 3.2.16 above). Often, a business will register the shape of its product as an *industrial design* and once it acquires distinctive character through use, it will then register it as a *three-dimensional trademark*.



TOBLERONE[®], the **TOBLERONE**[®] packaging shape and the **TOBLERONE**[®] chocolate shape are registered trademarks of Kraft Foods.

- In most countries, you can register the shape of a product as a **three-dimensional trademark** — provided the shape performs the function of a trademark in the marketplace. To qualify, the shape of the product must be *distinctive*. The shape should also *not be dictated by the function* of the product. In general, forms and shapes that are too simple or that have been extensively used are not protected. Some countries go even further and require that the particular shape must be *distinctive by itself* for the consumers. This means that consumers must recognize and connect the particular shaped product only with your business (like the triangular shape of **TOBLERONE**[®]).²³⁶ The advantage of trademark protection, rather than industrial design protection, is that the former may continue indefinitely. It is also usually cheaper to obtain than design protection.

²³⁵ Making a mark: An introduction to trademarks for small and medium-sized enterprises, p. 31; http://www.wipo.int/edocs/pubdocs/en/sme/900/wipo_pub_900.pdf.

²³⁶ Cf. 3.2.32 above.

- Some jurisdictions provide protection for **trade dress/get-up** through trademark or unfair competition laws, which may protect the distinctive packaging or shape of a product (see **3.2.16** above). In some countries, the requirements are the same as for trademark law in that the shape needs to be distinctive and the feature protected cannot serve as a functional element (see **3.2.20**).
- Some original shapes may also qualify for **copyright protection** (see **3.2.16**). It is not as strong as trademark or design protection, but it is very helpful in certain circumstances; for example, in countries where you have not registered a trademark/design, or if your trademark/design has been invalidated.
- Sometimes, the **shape** of your product may be protected by a **variety of IP rights** (see **3.2.16**).

3.2.33 Trademarks Abroad: Is trademark registration in your home country valid internationally?²³⁷

The rights arising out of a trademark registration are normally limited to the territory to which they pertain; so, valid registration of a trademark in your home country gives you rights only in your own country unless your trademark is considered to be a well-known mark (see **3.2.7**).

3.2.34 Should you consider protecting your trademarks abroad?²³⁸

The reasons for registering your trademark in your home country also apply to the commercialization of your products in foreign markets. It is, therefore, highly advisable to register your trademark abroad if you wish to use your trademark or grant a license to use it in other countries.

3.2.35 How and when can you register the trademark of your business abroad?²³⁹

At any time, but bear in mind that you usually have **six months** from the date on which you applied for protection in the first country to claim the right of **priority** for trademark protection in other countries. Hence, it is recommended that you submit your foreign applications within this period if you want to avoid a competitor “stealing” your trademark in other countries. Unlike patent and design rights where missing the priority date could be fatal to your subsequent applications (see **WIPO publications No. 498, Looking good and No. 917, Inventing the future**),²⁴⁰ in the case of trademarks, missing the six-month due date means that an application filed outside of the country will only enjoy its own filing date and will not enjoy the benefit of the filing date of the original trademark application in the home country.

²³⁷ Making a mark: An introduction to trademarks for small and medium-sized enterprises, cit., p. 33; http://www.wipo.int/edocs/pubdocs/en/sme/900/wipo_pub_900.pdf.

²³⁸ Making a Mark: An Introduction to Trademarks and Brands for Small and Medium-sized Enterprises, cit., p. 33; http://www.wipo.int/edocs/pubdocs/en/sme/900/wipo_pub_900.pdf.

²³⁹ Making a mark: An Introduction to Trademarks and Brands for Small and Medium-sized Enterprises, cit., p. 33; http://www.wipo.int/edocs/pubdocs/en/sme/900/wipo_pub_900.pdf.

²⁴⁰ SME Guides and Manuals, Secrets of Intellectual Property, WIPO, <http://www.wipo.int/sme/en/documents/guides/>.

There are three main ways to register your trademark in other countries:

The National Route. You may apply to the trademark office of each country in which you are seeking protection by filing the corresponding application in the required language and paying the required fees. As indicated earlier, a country may require you to use the services of a locally-based trademark agent (see **3.2.25**). It is important to note that some countries do not have a national system and use a regional system instead.

The Regional Route. If you want protection in countries which are members of a regional trademark system you may apply for registration, with effect in the territories of all Member countries, by filing an application at the relevant regional office. The regional trademark offices are:

- The African Regional Intellectual Property Organization (ARIPO) for trademark protection in English-speaking African countries that are Member States of ARIPO (www.aripo.org);
- The Benelux Office for Intellectual Property (BOIP) for protection in Belgium, The Netherlands and Luxembourg (www.boip.int);
- The Office for the Harmonization of the Internal Market (OHIM) for Community Trademarks (CTM) in the 28 Member States of the European Union (www.oami.europa.eu);
- The African Intellectual Property Organization (OAPI) for protection in French-speaking African countries (www.oapi.wipo.int); and
- The Supreme Council of the GCC approved the GCC Trademark Law (regulation), which will provide for a regional trademark system for the six Arab Gulf countries (forthcoming). The reality of a regional trademark law in the Middle East came a step closer with the approval in May 2014, by the Cabinet of Ministers in Saudi Arabia of the revised draft of the Trade Mark Law of the Gulf Cooperation Council States (the GCC Trade Mark Law). The GCC Trade Mark Law is a unifying, not a unitary law in that it sets out a single set of provisions which will apply uniformly across all GCC states with respect to the registrability, registration and enforcement of trademark rights. It does not, however, provide for a single (unitary) registration or enforcement system. The Trade Mark Office of each GCC state will continue to receive applications and register trademarks on a national basis. Registering a trademark in all six GCC states will still require filing six separate national trademark applications. The GCC Trade Mark Law does not envisage setting up a single GCC trade mark office or a single court or enforcement authority for dealing with trademark disputes.²⁴¹

²⁴² WIPO; <http://www.wipo.int/ipadvantage/en/details.jsp?id=2687>.

Box 3.14: Chateau Ksara (Lebanon)²⁴²

Chateau Ksara (Ksara) is a winery that was established in 1857 by French Jesuit monks in the ancient city of Bekaa, thirty kilometers east of Beirut, Lebanon. The monks planted vines and produced wine that they famously labelled *Clos St. Alphonse* and used during religious services.

In 1972, the Vatican encouraged its monasteries to sell off commercial assets and Ksara was bought out by a local consortium of businessmen. Although the years 1975 to 1991 were often bleak for Ksara (due to the Lebanese civil war), the company continued production and its resilience has made it a well-known brand in Lebanon.

In order to revamp the company's old, monkish image (based on the Clos St. Alphonse wines), Ksara managers decided to launch a new range of wines. *Gris de Gris* (white or grey grape), *Ksara's arak*, *Reserve du Couvent* and *Sunset Rose* were now produced with new labels and packaging and to great acclaim. In 1994, Ksara launched its *Cuvee de Printemps*, a Gamay-based (or purple-colored grape) red wine.

Chardonnay, 2002 (Photo: Ksara SAL).



In addition to launching new brands, Ksara began media campaigns and educational seminars to promote its products and corporate image.

Ksara's television advertisement, filmed in Bekaa, is widely considered a trailblazer for advertising in the country. Its young-couple-in-love theme inspired a new generation of consumers and gave the brand a younger, more hopeful image.

In 1997, following the successful domestic-market campaign, an international effort to promote the company began. Ksara targeted Lebanese restaurateurs living abroad and convinced them to stock Ksara wines as the perfect accompaniment to Lebanese cuisine.

Through its strategic marketing and re-branding campaign, Ksara retained its loyal customers' trust, while attracting new consumers and improving its national and international image.

Having invested much time, effort and resources into re-branding, the company is eager to expand into new markets - the European Union especially - while

protecting its IPRs. To that end, in 2003, the company filed a Community Trademark for Chateau Ksara SAL (under class 33) at the Office for Harmonization in the Internal Market (OHIM).

²⁴² WIPO; <http://www.wipo.int/ipadvantage/en/details.jsp?id=2687>.

In 2010, Lebanese wine-producers exported around 2.5 million bottles of wine, a 13% annual increase, and Ksara was responsible for 33% of the output. The *Reserve du Couvent* accounted for 27% of all Ksara's international sales.

As of 2010, Ksara produced 2.7 million bottles of wine per year, harvesting over two thousand eight hundred tons of grapes from three hundred forty hectares.

Local consumption of wines in general has doubled from 2.5 million bottles ten years ago to 5 million in 2010, and Chateau Ksara has benefitted from this increase in wine appreciation.



The company is a multi-award-winner, gaining Gold and Silver Medals for its wines including the Gold Medal for its *Reserve de Couvent* (red, 2008) at the 2010 Berlin Wine Trophy. Ksara sells 14 wines, one *arak* and an *eau de vie* (a fruity, colorless brandy) to over forty-one countries including Egypt, Finland, France, Germany, Jordan, Japan, Syria, the United Kingdom and the United States.

Ksara winery (Photo: Ksara SAL).

The International Route. If your home country, whether itself or as a member country of a regional trademark system, is part of the Madrid system and you have a national or regional registration or application for a trademark, you may be able to use the Madrid system to register that same trademark in the more than 80 members of the Madrid system. If you need to register your trademark in a country that is not a member of the Madrid system, then you should consult with an IP lawyer in that country to file for registration directly through that country's national office. This may mean filing both through the Madrid system and directly with a non-member country.

Box 3.15: Advantages of the Madrid System

The principal advantage of the Madrid system is that the trademark owner can obtain the rights for his/her trademark in one or more members of the system by filing:

- a single international application;
- in one language; and,
- subject to one set of fees and deadlines.

Thereafter, the international registration can be maintained and managed through a single procedure, including further extension of the protection to other members. The Madrid system thus **reduces the administrative burden and costs** involved in registering and maintaining marks in multiple countries.

More information on how to use the Madrid system (who can file and where, a list of members, forms, general filing information, the legal texts, online services, etc.) is available on the WIPO website. See [www.wipo.int/madrid_and http://www.wipo.int/export/sites/www/treaties/en/documents/pdf/madrid_marks.pdf](http://www.wipo.int/madrid_and_http://www.wipo.int/export/sites/www/treaties/en/documents/pdf/madrid_marks.pdf)

Example:

Shakey's USA, Inc., which is the owner of The Shakey's Pizza restaurant chain based in the United States and with about 500 stores globally and about 60 in the United States, has registered the SHAKEY'S trademark under classes 30 (pizzas) and 43 (restaurant services) in the United States, the European Union and internationally in five countries through the Madrid System administered by WIPO.

Box 3.16: Choosing a trademark that works well abroad

Selecting an appropriate brand for a foreign market is often a complex task. The following checklist may serve to improve your chances:

- **Choose a local language trademark and register all variations.** Consult language specialists and be sure to select a strong trademark that has resonance with the local consumers.
- **Monitor carefully for infringing trademarks.** Search properly for foreign trademarks that both *sound* and *look* similar to your trademark, or have the same *meaning*. Search also for prior registered *domain names*.
- **File broadly.** File in all the right and relevant classes; not only for the products you use, but also for the products you might use in the near future. Some countries do not follow the Nice Classification system, or have a unique system of subclasses. A local trademark counsel may assist you to make sure that your registration is correct and complete.
- **Get familiar with the local trademark system.** Do not assume that the law in the foreign country is the same as the law in your home country. Know the pitfalls of the local system and use lawyers that you trust. Is it a "first to file" or a "first to use" country? Does the trademark office perform a relative examination? How is the

system of oppositions? How long does it take before a trademark is registered? Do you need to get approval for trademark assignments or licensing? etc.

Box 3.17: Summary Checklist

- ✓ Territorial rights: Remember that trademarks are territorial rights unless your trademark is considered well-known.
- ✓ Priority period: Make use of the six-month priority period to apply for protection abroad.
- ✓ Where to apply: Consider where you will benefit from protection and take into account the costs of protecting in various countries.
- ✓ How to apply. Consider using the Madrid system to facilitate the application process, which reduces the administrative burden and costs involved in registering and maintaining marks in multiple countries.

3.2.36 Using Trademarks: What is meant by *use* of a trademark? What is its relevance for a trademark owner?²⁴³

There are many legal references to the *use* of a trademark, and the definition changes from country to country. A trademark attorney should be consulted for proper guidelines. However, here follows some of the legal references to the *use* of a trademark as it is relevant to a business owner:

- The owner of a registered trademark can prevent unauthorized *use* of the trademark by others in relation to identical or similar products (see **3.2.18**).
- In many countries, trademarks are protected through *use*, without registration (see **3.2.15** *First to use* countries);
- *Use* in the marketplace is in some countries a requirement for registration (see **3.2.27**);
- In many countries, non-*use* for a number of years is an evidence of abandonment (see **3.2.27**);
- A descriptive trademark may acquire distinctiveness through widespread *use* (see *Secondary meaning*, in **3.2.20**). On the other hand, a distinctive trademark may lose distinctiveness through common *use* (see **3.2.11** and **3.2.39** on *Generic signs*); and
- Certification marks cannot be *used* by their owner (see **3.2.11**).

The *use* of a trademark, in the trademark sense, refers to use of the trademark exactly **as it is registered**. This use should be **in the course of trade** and by the owner or by others but with the consent of the owner. The use of the trademark should be on or in relation to the **products** for which it is registered as a trademark and it should be in the **territory** to which the registration pertains. It will also include use of the trademark in a form differing in elements which do not alter the distinctive character of the trademark as it was registered. Further, its use in a territory includes applying the trademark to goods

²⁴³ Making a mark: An introduction to trademarks for small and medium-sized enterprises, cit., p. 38; http://www.wipo.int/edocs/pubdocs/en/sme/900/wipo_pub_900.pdf.

or to materials for the labelling or packaging of goods in that territory solely for export purposes. Again, the legal requirements for *use* of a trademark vary from country to country but generally they are met if the owner:

- applies the sign to goods or the packaging thereof;
- offers or displays goods for sale, puts them on the market or stocks them for those purposes under the sign, or offers goods or supplies services under the sign;
- imports or exports goods under the sign;
- uses the sign on an invoice, wine list, catalogue, business letter, business paper, price list or other commercial document; or
- uses the sign in advertising.

3.2.37 Can you register a trademark without having used it?²⁴⁴

You may *apply* for registration before you have used the trademark but some countries will not officially *register* it until you have shown **proof of use**. In these countries, the concept of “use” is very important since “use of a trademark in commerce” makes the status of such a trademark superior to the marks of other parties. In such countries, *use* is a **requirement for registration**, or it is a prerequisite for filing an opposition or a court case claiming infringement.

The most important thing to remember is that in all situations it is best to check the local law of your country and register your trademark as soon as possible.

Note also that, in most countries, if you don’t use your trademark for a given period of time (generally three to five years) following its registration, it may be taken off the trademark register for having been deemed to be **abandoned**. This means you could lose your rights in your trademark.

Box 3.18: TM or ®:

The use of ®, TM, SM or equivalent symbols next to a trademark is not a requirement and generally provides no further legal protection. Nevertheless, it may be a convenient way of informing others that a given sign is a trademark, thus warning possible infringers and counterfeiters. The ® symbol is only used once the trademark has been registered, whereas TM is usually used with unregistered trademarks; in many countries the symbol TM can be used only for those proposed marks for which a trademark application has been duly filed for seeking registration of the mark as a trademark. SM is used similarly to TM, for unregistered trademarks, but in connection with services rather than goods.

Using of the ® symbol in connection with unregistered trademarks may be considered unfair business practice or misleading marketing. Be sure not to use the ® symbol, for example, when you export goods in countries where you have not registered the trademark.

²⁴⁴ Making a mark: An introduction to trademarks for small and medium-sized enterprises, p. 38; http://www.wipo.int/edocs/pubdocs/en/sme/900/wipo_pub_900.pdf.

3.2.38 Can your business use the same trademark for different products?²⁴⁵

When you release new products or new variants of your product, you will have to decide how to differentiate these products/variants from your original product and how to brand them in the marketplace. There are various options with their attendant benefits and costs/risks. You can:

- use the **same trademark**: extending an existing brand to new products enables the new product to benefit from the image and reputation of the trademark. Remember that you may have to file a new application to register the trademark for the new use (see **3.2.31**);
- create a **new trademark**: the use of a new trademark, more specific and relevant to the new product, enables your business to target the new product to a specific customer group (e.g., children, teenagers, etc.) or to create a specific image for the new product line;
- use an **additional trademark** in conjunction with the first trademark. Many businesses also choose to use a new brand in conjunction with an existing brand (e.g., **NUTELLA**[®] is generally used with **FERRERO**[®]);
- rely on a new **industrial design** of the product or its packaging (see **9.2.16**);
- use a different **art work** on the label of the product or its packaging, to signal the new product or variant to the consumers; this would mean that you are relying on copyright and/or industrial design (see **3.2.16**).



***NUTELLA**[®] and the relevant devices and indicia are trademarks owned by **FERRERO**.²⁴⁶*

Different businesses adopt different approaches, depending on their branding strategy. Whatever your choice, make sure that your trademark is registered for all classes of goods/services for which it is, or will be, used.

²⁴⁵ Making a mark: An introduction to trademarks for small and medium-sized enterprises, p. 39; http://www.wipo.int/edocs/pubdocs/en/sme/900/wipo_pub_900.pdf.

²⁴⁷ Making a mark: An introduction to trademarks for small and medium-sized enterprises, p. 40; http://www.wipo.int/edocs/pubdocs/en/sme/900/wipo_pub_900.pdf.

3.2.39 How to properly use your trademark?²⁴⁷

It is not enough to achieve protection through a trademark registration. The protection may get lost if your trademark is not properly used. A trademark may become **generic**, if it becomes so widely used so that it has become a common name to designate the relevant good or service. In such instances, the trademark will not be registrable and a previous registration for such a trademark may be cancelled. Some marks retain trademark protection in certain countries despite being declared generic in others (see 9.2.11 on generic signs).

Example: Parmesan has been ruled generic in the United States, so other companies may use that name to describe their cheese products.

Box 3.19: Do's and Don'ts for proper trademark use

The following rules may help to prevent your trademark from becoming generic:

- Use the **® symbol** to denote a registered trademark.
- **Distinguish the trademark from surrounding text** by using CAPS, bold or *italic* fonts, or by placing them within “quotes”.
- **Use your trademark consistently.** If your trademark is registered with a specific spelling, design, color or font, make sure that the trademark is used exactly as it is registered. Don't modify the trademark, for example, through hyphenation, combination or abbreviation (e.g., “**COCA-COLA**® fountain pen” should not appear as COCACOLA).
- **Don't use the trademark as a noun.** Use the trademark only as an adjective.
- **Don't use the trademark as a verb.**
- **Don't use the trademark as a plural** (e.g., say “**TIC TAC**® candies”, not “tic tacs”).
- **Establish clear and cogent trademark best practices and guidelines.** Instruct employees, suppliers, distributors and consumers on how to should use your trademark. Make sure the policies and guidelines are consistently followed by all concerned.

Such efforts may or may not be successful in preventing your trademark from becoming generic. In fact, legally it is more important that you visibly try to prevent your trademark from becoming generic (e.g., by sending emails or notes to authors who wrongfully use your trademark), regardless of the real success.

3.2.40 Can you use a competitor's trademark in your advertising?²⁴⁸

Using a competitor's trademark in the course of advertising is often a dangerous adventure. The law is different in each country and if you think it is necessary to use a

²⁴⁷ Making a mark: An introduction to trademarks for small and medium-sized enterprises, p. 40; http://www.wipo.int/edocs/pubdocs/en/sme/900/wipo_pub_900.pdf.

competitor's trademark in your advertising, you should first consult a local lawyer and keep the following in mind:

- Be cautious if you plan to mention in your advertising that your product is better than the product of your competitor. Doing so may be illegal in some countries. Consult a local lawyer about the laws and regulations applicable to **comparative advertising** in that country.
- If you use a competitor's trademark in your advertising, **do it fairly and properly** as the primary meaning of your advertising should be to inform the consumer and not to discredit or unfairly attack a competitor.
- Avoid using a competitor's trademark in a way that may suggest that the competitor endorses or sponsors your product. Also, **do not take unfair advantage** of the reputation of a competitor's trademark to promote your own business.
- In comparative advertising, be careful **not to alter** a competitor's trademark, especially if the trademark is a logo and use the appropriate trademark symbol. An altered version of a competitor's trademark may "blur" the trademark's ability to identify the product concerned, therefore, the alteration may be considered to be an infringement of the rights in a trademark.
- A competitor's trademark may contain one or more **graphic elements**, such as a logo, label, design or three-dimensional figure. All such elements are likely to be protected also by copyright law. Therefore, obtain authorization of the copyright owner before using the graphic elements in your advertising.

3.2.41 What is a domain name and what does it have to do with trademarks?²⁴⁹

An important problem to be addressed is the conflict between trademarks and domain names. Every computer that accesses the Internet has a unique identifying address, which is a string of numbers called an "IP address" (IP stands for "Internet Protocol"). As IP addresses are often difficult to remember, these numbers are transposed into characters or letters (the "domain name") and are what a user types in when surfing to websites or sending emails. For example, the domain name "wipo.int" is used to locate the WIPO website at www.wipo.int. Until fairly recently, every domain name around the world ended with a top-level domain (TLD); these were the 2 or more letters that come after the dot. There are currently two types of TLDs: generic top-level domain (gTLDs) such as .com, .mobi, and .info, and country code top-level domains (ccTLDs) such as .uk, .br, and .cn. A gTLD or a ccTLD is managed by a registry operator, an organization that maintains the registry database, including the name server information for names registered in the TLD.

²⁴⁸ Introduction- The growing role of advertising in the market economy by Lien Verbauwheide, Intellectual property issues in advertising, WIPO (2005); http://www.wipo.int/export/sites/www/sme/en/documents/pdf/ip_advertising.pdf.

²⁴⁹ Making a mark: An introduction to trademarks for small and medium-sized enterprises, p. 41; http://www.wipo.int/edocs/pubdocs/en/sme/900/wipo_pub_900.pdf.

In late June 2013, the Board of the Internet Corporation for Assigned Names and Numbers (ICANN), the global organization that administers domain names, approved the New gTLD Registry Agreement for its expanded generic top level domain (gTLD) program and the 2013 Registrar Accreditation Agreement. Currently, ICANN is in the process of introducing new top-level domains to the Internet as per its New gTLD Program. This program is expected to add well over 1,000 new TLDs to the handful today (.com, .net, .org, etc.). They will include generic terms as well as brand names; domains open and closed for second-level registration; domains in “Roman” script as well as internationalized domain names such as Arabic, Chinese and Cyrillic. Currently, there are 1,825 active applications for new gTLDs. For trademark owners, the launch of each new gTLD presents a new realm of challenges and level of scrutiny, including increased costs to monitor, register and enforce trademarks across these new domains. As part of this program, a range of Rights Protection Mechanisms (RPMs) notably for trademarks has been established to operate both “pre-delegation” before any new TLDs are approved and also “post-delegation” after they become operational. For details of RPMs, see the link.²⁵⁰

Applying for a new gTLD is not the same as buying a domain name. Organizations and individuals around the world can register second-level and, in some cases, third-level domain names. (In a URL such as maps.google.com, “google” is a second-level name and “maps” is a third-level domain.) They simply need to find an accredited registrar, comply with the registrant terms and conditions and pay registration and renewal fees. The application for a new gTLD is a much more complex process. An applicant for a new gTLD is, in fact, applying to create and operate a registry business supporting the Internet's domain name system. This involves a number of significant responsibilities, as the operator of a new gTLD is running a piece of visible Internet infrastructure.²⁵¹ Unlike in the past when trademark conflicts with domain names were confined to conflicts with second-level and third-level domain names, the New gTLD system has opened the doors also for conflicts between trademarks and the new TLDs.

Box 3.20: Appeal filed in Del Monte gTLD dispute (June 2014)²⁵²

- Canned fruit producer Del Monte International has appealed against a decision that stops it from running the .delmonte generic top-level domain (gTLD).
- Del Monte Foods, which spun off Del Monte International in 1989, blocked the latter's .delmonte application on legal grounds last year.
- In response, the spin-off company filed a US lawsuit requesting an order to overturn the blocking decision. It was filed under the Anticybersquatting Consumer Protection Act (ACPA).

²⁵⁰ Rights Protection Mechanisms for New Top Level Domains(TLDs), WIPO; <http://www.wipo.int/amc/en/domains/rpm/>.

²⁵¹ DOMAINS- New Generic Top-Level, ICANN; <http://newgtlds.icann.org/en/applicants/customer-service/faqs/faqs-en>.

²⁵² Appeal filed in Del Monte gTLD dispute, TBO Trademarks and Brands Online, June 2014; <http://www.trademarksandbrandsonline.com/news/appeal-filed-in-delmonte-gtld-dispute-3965>.

- However, in February, the District Court for the Central District of California rejected that plea, before dismissing Del Monte International's subsequent request that the court reconsider its decision.
- As a result, on June 4, the company filed a notice of appeal to the US Court of Appeals for the Ninth Circuit.
- David Weslow, partner at Wiley Rein LLP, said the Ninth Circuit's response to the appeal could provide further clarification of whether the ACPA applies to new gTLD applications before they are granted by ICANN.
- "If a substantive decision is rendered by the Ninth Circuit, this will be the first appellate court ruling addressing the new gTLD program and the application (or the affirmance of non-application) of the ACPA's cybersquatting and reverse domain name hijacking causes of action to new gTLD applications."
- When the gTLD was blocked last year, a panel at WIPO said there would be an "impermissible likelihood of confusion" between .delmonte and Del Monte Foods' 'Del Monte' trademark if the gTLD were approved.
- But in that 2-1 decision, one panelist backed Del Monte International to run the gTLD.

Generally, domain names are available for registration on a first-come, first-served basis. In this regard, national laws and courts often treat the use, or depending on the circumstances, even a mere registration of the trademark of another business as a domain name as trademark infringement. This practice is commonly referred to as **cybersquatting**. If this happens, then, your business may not only have to transfer or cancel the domain name, but you may also have to pay damages. Therefore, it is important that your proposed domain name is not the trademark or even the dominant part of a trademark of another business.

On the other hand, if the trademark of your business is being used in a domain name or is being cybersquatted by someone else, then you may take action to stop such infringement of the rights of your company. One option would be to use WIPO's popular online service for **domain name dispute resolution** at: www.wipo.int/amc/en/domains/. These online facilities include a model complaint as well as a legal index to the thousands of WIPO domain name cases that have already been decided. This service offers a time- and cost-effective solution outside the courts. To find out information on the registrant of a domain name, you can use one of the many free online domain name search tools, such as www.betterwhois.com, www.easywhois.com or www.internic.net.

Box 3.21: Tips for Domain Names

- **Be sure that your choice of a domain name does not conflict with a third party's trademark.** Do a trademark search (see Section 9.2.22 in Annex 9) in order to find out whether the selected name is being used as a trademark by a competitor for similar goods or services, or is a well-known mark.
- **Consider registering your trademark(s) as a domain name.** Customers will find your company's website easily if you use a domain name that is the same as or similar to your business name or trademark. Therefore, try to register your trademark(s) as a domain name before someone else does. Also, while selecting a new trademark for your products, check that the corresponding domain name is available.
- **Register your domain name as a trademark.** Registration of a domain name does not automatically grant trademark rights. For example, if you acquire the domain name "sunny.com," that does not mean you can prevent others from using "sunny" for selling products (on- or offline). It only gives you the right to use that specific Internet address. You should consider registering your domain name as a trademark. A trademark registration will (a) strengthen your power to enforce your rights against anyone else who tries to use the name to market similar products; and (b) prevent someone else from registering the same name as a trademark. In most countries, you can register your domain name as a trademark, provided that it is distinctive and that is being used to market products.
- **How to register a domain name?** Domain name registration is relatively easy, fast and cheap. The easiest way is to register online through any of the accredited domain name registrars listed at <https://www.icann.org/registrar-reports/accredited-list.html>

3.2.42 What should be kept in mind when using trademarks on the Internet?²⁵³

The use of trademarks on the Internet has raised a number of controversial legal problems with no uniform solution.

- One problem stems from the fact that trademark rights are territorial (that is, they are only protected in the country or region where the trademark has been registered or used), whereas the reach of the Internet is global. This creates problems when it comes to settling disputes between businesses that legitimately own **identical or confusingly similar trademarks for identical or similar products in different countries**. As the law in this area is still developing, the way courts treat this issue differs considerably from one country to another.
- **Keyword advertising** is a form of online advertising. It relies on keywords to trigger the display of advertisements in a separate column from the actual hits. Some search engine operators sell keywords to businesses. When a web user enters those particular keywords in a search engine, advertisements appear alongside the actual search results. For example, a bike business may buy the word PASTA from

²⁵³ Making a mark: An introduction to trademarks for small and medium-sized enterprises, p. 43; http://www.wipo.int/edocs/pubdocs/en/sme/900/wipo_pub_900.pdf.

a search engine. Each time a web user enters the word PASTA into the search engine, the advertising banner of the bike business would appear. Moreover, if the web user clicks on the banner, he would be directed to the website of the pasta business. The problem arises, however, when a search engine sells a competitor's trademark as a keyword to trigger advertisement. For example, suppose that the above-mentioned pasta business bought the word BARILLA[®]. After a web user enters BARILLA[®], a banner of the competing bike business would appear at the top of the result list. This kind of keyword triggering may, in some countries, expose both the search engine operator and the advertising business to legal liability for trademark infringement, misleading advertising and unfair competition.

- **Hyperlinks** to other websites are a useful service to your customer, but in many countries there is no clear law on when and how you can use such links. In most cases, links are completely legal and no permission is needed from the linked site to include a link. However, some types of links can create legal liability; it makes sense to get permission for them:
 - Links that lead to sites containing **illegal content**;
 - Links that comprise the **logo of a business**;
 - **Deep links** (links that bypass a website homepage and instead go straight to a specific page within the site), if it is a way of bypassing a subscription or payment mechanism, or if it is expressly forbidden by the site itself; and
 - **Framing** (displaying the contents of someone else's site within a frame at your website) or **in-lining** (incorporating a graphic file from another website into your own website).

3.2.43 What is the role of a trademark supervisor or coordinator?²⁵⁴

Depending on the size of your business and its trademark portfolio, you may need a dedicated staff member to oversee the management of the portfolio. One of the key functions of an in-house trademark supervisor or coordinator is to ensure that best practices are uniformly followed. Before printing business cards, stationary, advertising materials, packaging and other documentation, the supervisor will check for compliance with the trademark usage guidelines. The supervisor should also monitor the volume and possible changing nature of the trademark usage, and verify that any necessary registration renewals (remember, if you miss the deadline, your registration will be cancelled) or new filings are brought to the attention of the trademark agent. The supervisor may also serve as the initial point of contact for any questions concerning the management and use of existing or proposed trademarks while coordinating with outside trademark agents and/or trademark attorneys.

In addition, the trademark supervisor may be made responsible for audit of your trademark portfolios. A portfolio audit may be helpful for the following:

²⁵⁴ Making a mark: An Introduction to Trademarks for Small and Medium-sized Enterprises, p. 43; http://www.wipo.int/edocs/pubdocs/en/sme/900/wipo_pub_900.pdf.

- preparing a status report for all registered trademarks and pending applications, organized by product, trademark and country;
- deciding whether specific registrations should be maintained, or whether costs could be saved by abandoning registrations, partially or completely;
- reviewing products and collateral marketing materials to ensure that its trademarks are being used consistently and in accordance with their registrations and applicable trademark laws;
- assessing whether unregistered trademarks, slogans, taglines and logos ought to be registered and, if so, where;
- reviewing procedures for selecting and registering trademarks, and making recommendations for improvements; and
- preparing the trademark portfolio for transaction due diligence and for use as collateral in asset-based financing.

Box 3.22: Dedicating a person to manage all your IP assets and coordinate with all related areas

The individual responsible for managing your trademark portfolio should work in close coordination with the staff member who manages your company's marketing, advertising and public relations. In addition, this could be the same individual who manages all the IP of the company, coordinates with outside agents and attorneys and sets policies to educate staff on good IP practices. To maximize the benefits and fully protect your IP assets, all these areas need to be coordinated.

3.3 Geographical indications (GIs)²⁵⁵

3.3.1 What is a GI?²⁵⁶

A geographical indication is a sign used on goods that have a specific geographical origin and possess qualities, a reputation or characteristics that are essentially attributable to that place of origin.

Most commonly, a geographical indication includes the name of the place of origin of the goods. For example, agricultural products typically have qualities that derive from their place of production and are influenced by specific local factors, such as climate and soil.

3.3.2 Why protect a geographical indication?²⁵⁷

GIs are more than just a name or a symbol. They reflect a reputation strongly linked to geographical areas of varying sizes, thus giving them an emotional component. A geographical indication's reputation is a collective, intangible asset. If not protected, it

²⁵⁵ WIPO; Cf. http://www.wipo.int/geo_indications/en/.

²⁵⁶ *Ibid.* 253; Cf.

http://www.wipo.int/geo_indications/en/\wipogvafs01\usr2\home\Crisp\Translations\37052\www.wipo.int\geo_indications\en/.

²⁵⁷ *Ibid.* 253; Cf. http://www.wipo.int/geo_indications/en/.

could be used without restriction and its value may be diminished and may be eventually lost.

3.3.3 What rights does a geographical indication provide?²⁵⁸

A geographical indication right enables those who have the right to use the indication to prevent its use by a third party whose product does not conform to the applicable standards. For example, in the jurisdictions in which the Darjeeling geographical indication is protected,²⁵⁹ producers of Darjeeling tea can exclude use of the term *Darjeeling* for tea not grown in their tea gardens or not produced according to the standards set out in the code of practice²⁶⁰ for the geographical indication.

However, a protected geographical indication does not enable the holder to prevent someone from making a product using the same techniques as those set out in the standards for that indication. Protection for a geographical indication is usually obtained by acquiring a right over the sign that constitutes the indication.

3.3.4 How can I obtain protection for a geographical indication?²⁶¹

There are three main ways to protect a geographical indication:

- So-called *sui generis* systems (i.e., special regimes of protection);
- Using collective or certification marks; and,
- Methods focusing on business practices, including administrative product approval schemes.

These approaches involve differences with respect to important questions, such as the conditions for protection or the scope of protection. On the other hand, two of the modes of protection – namely *sui-generis* systems and collective or certification mark systems – share some common features, such as the fact that they set up rights for collective use by those who comply with defined standards.

Broadly speaking, GIs are protected in different countries and regional systems through a wide variety of approaches and often using a combination of two or more of the approaches outlined above. These approaches have been developed in accordance with different legal traditions and within a framework of individual historical and economic conditions.

3.3.5 What is the difference between a geographical indication and an appellation of origin?²⁶²

Appellations of origin and GIs both require a qualitative link between the product to which they refer and its place of origin. Both inform consumers about a product's geographical origin and a quality or characteristic of the product linked to its place of

²⁵⁸ *Ibid.* 253; Cf. http://www.wipo.int/geo_indications/en/.

²⁵⁹ Cf. Illustration 2 in 3.2.9 above.

²⁶⁰ Cf. 3.3.7 below.

²⁶¹ *Ibid.* 253; Cf. http://www.wipo.int/geo_indications/en/.

²⁶² *Ibid.* 253; Cf. http://www.wipo.int/geo_indications/en/.

origin. The basic difference between the two terms is that the link with the place of origin must be stronger in the case of an appellation of origin.

The quality or characteristics of a product protected as an appellation of origin must result exclusively or essentially from its geographical origin. This generally means that the raw materials should be sourced in the place of origin and that the processing of the product should also happen there. In the case of GIs, a single criterion attributable to geographical origin is sufficient, be it a quality or other characteristic of the product, or only its reputation. Moreover, the production of the raw materials and the development or processing of a GI product does not have to necessarily take place entirely in the defined geographical area.

3.3.6 The Lisbon System²⁶³

Champagne, Cognac, Roquefort, Chianti, Porto, Tequila and Darjeeling are some examples of names which are associated with products of a certain nature, quality and geographical origin.

As its name indicates, *The Lisbon Agreement for the Protection of Appellations of Origin and Their International Registration* (hereinafter referred to as *the Lisbon Agreement*)²⁶⁴ was specifically concluded in response to the need for an international system that would facilitate the protection of a special category of such GIs, (i.e., *the appellations of origin*), in countries other than the country of origin, by means of their registration with WIPO through a single procedure, for a minimum of formalities and expense.

The Lisbon Agreement helps protect national economic interests. In many countries, goods bearing an appellation of origin represent a substantial share of exports, and it is, therefore, important that the appellations should be effectively protected against any appropriation in the largest possible number of countries.

3.3.6.1 What is an Appellation of Origin?²⁶⁵

As stated above, an appellation of origin is a special kind of geographical indication. It generally consists of a geographical name or a traditional designation used on products which have a specific quality or characteristics that are exclusively or essentially due to the geographical environment in which they are produced.

Article 2(1) of the Lisbon Agreement defines an *appellation of origin* as *the geographical denomination of a country, region, or locality, which serves to designate a product originating therein, the quality or characteristics of which are due exclusively or essentially to the geographical environment, including natural and human factors*".

²⁶³ The Lisbon System: International protection of identifiers of typical from a defined geographical area, WIPO Publication No. 942(E), p. 1; http://www.wipo.int/edocs/pubdocs/en/geographical/942/wipo_pub_942.pdf.

²⁶⁴ The Lisbon Agreement was adopted in 1958 and revised at Stockholm in 1967. It entered into force on September 25, 1966, and is administered by the International Bureau of the WIPO, which keeps the International Register of Appellations of Origin and publishes a bulletin entitled Appellations of origin.

²⁶⁵ The Lisbon System: International protection of identifiers of typical from a defined geographical area, p. 2; http://www.wipo.int/edocs/pubdocs/en/geographical/942/wipo_pub_942.pdf.

- iii) **Economic development:** appellations of origin are tools for the development and promotion of regions and countries. When the name of a product receives protection as an appellation of origin, the local communities benefit from the positive impact, in various ways.

3.3.6.3 How can Appellations of Origin be protected? (Registration Modalities)²⁶⁸

International registration. Once protected in the country of origin, the holders of the right to use the appellation of origin may request their Government to file an application for international registration under the Lisbon Agreement. International registration of an appellation of origin takes place at the request of the *country of origin*, in the name of interested parties (i.e., any natural person or legal entity, public or private, having, according to their national legislation, a right to use such appellation). The International Bureau then notifies the competent Offices of the other Contracting Parties²⁶⁹ to the Lisbon Agreement of any new international registration of an appellation of origin.

Fee. International registration is subject to payment of a single 500 CHF fee.

Term of protection. The international registration of an appellation of origin ensures the protection of that appellation without renewal, for as long as it is protected in the country of origin.

Scope of protection. A registered appellation may not be presumed to have become generic in a Contracting State as long as it continues to be protected in the country of origin. In addition, the other Contracting States are under the obligation to provide a means of defense against any usurpation or imitation of an internationally protected appellation of origin in their territory.

Territorial effect of registration. In principle, an internationally registered appellation of origin must be protected in all countries of the Lisbon system. However, these countries do have the right to refuse such protection, for example, on the ground that, in their territory, the appellation of origin corresponds to a protected trademark or to a generic indication of a particular product. They can do so by notifying a declaration of refusal to WIPO within one year from the receipt of the notification of registration issued by the International Bureau. When a refusal has been initially issued, but it appears over time that the conditions that have motivated such refusal are no longer valid, a country may either issue a withdrawal of refusal or a statement of grant of protection. If no refusal is submitted, the appellation of origin will be considered automatically protected for as long as it is registered (unless a court in the country invalidates the effects of the registration in the country in question).

²⁶⁸ The Lisbon system: International protection of identifiers of typical from a defined geographical Area, p. 3; http://www.wipo.int/edocs/pubdocs/en/geographical/942/wipo_pub_942.pdf .

²⁶⁹ The [Lisbon Express database](http://www.wipo.int/treaties/en/ShowResults.jsp?lang=en&treaty_id=10) allows for a search on appellations of origin as registered under the Lisbon Agreement, the product to which they apply, their area of production, the holders of the right to use the appellation of origin, any refusals or invalidations notified by member countries, etc (cf. http://www.wipo.int/treaties/en/ShowResults.jsp?lang=en&treaty_id=10 the 28 countries adhering to the Lisbon Agreement).

Appeal against refusal. The International Bureau notifies the competent Office of the country of origin as soon as possible of any declaration refusing the protection of the international registration of an appellation of origin. The interested party, on being informed by his/her national Office of the declaration made by another country, may resort, in that other country, to all the judicial and administrative remedies open to nationals of that country.²⁷⁰

Box 3.23: Agri-food Sector in the Emilia-Romagna region of Italy²⁷¹

The Emilia-Romagna food industry is characterized by the presence of many industrial districts located around the different provinces. These realities are mainly related to the production of traditional foods. Among them, the most important are: the District of Prosciutto di Parma, the District of Parmigiano-Reggiano, the District of pig meat and sausages in Modena, the fruit and vegetables District, the District of vegetable (Piacenza, Parma), the poultry District of Forli-Cesena, the wine industry, the dairy industry, baked goods, pasta and finally the feed industry.

The regional food chain is made up of about 24,571 companies and 185,993 employees (Istat-Asia, 2008). Agricultural sector accounts for about 82,000 units and 77,000 employees (2007). The agri-food system in Emilia-Romagna is known at the international level not only for combining tradition and innovation, but also for achieving high standards of food quality and safety. The regional agri-food system is experiencing a structural adjustment process in order to maintain its competitiveness in the world markets, with the diversification of the production, an increasingly structured agricultural system and a greater integration with the downstream processing stages. A great contribution to the regional agri-food results is made by the cooperative companies and other forms of associations, which are dominant in many activities of processing and sales of agricultural products. They are responsible for more than a third of the national turnover of the sector. The food industry specialized in the processing of products, plays a considerable role in the chain, also involving other important cross-cutting segments such as agricultural machinery, one of the region's best performing industries, as well as, food packaging.

Emilia-Romagna is the Italian region with the highest number of traditional products with high visibility at the international level. Out of the 711 PDO and PGI products of the European Union, 155 belong to Italy (21.8 per cent of the European Union total) and 25 to its Emilia-Romagna region (16.13 per cent of Italy total and 3.52 per cent of the European Union).

²⁷⁰ The list of the 28 Contracting Parties can be seen at http://www.wipo.int/treaties/en/ShowResults.jsp?lang=en&treaty_id=10

²⁷¹ Report on key factors of MED agro-food Clusters: Emilia- Romagna by ERVET, PACMA Project, 2012; http://www.pacmanproject.eu/page/project-documents/doc-2012/01/Report_Key_factors_ERVET_WP32_DEF.pdf.

In 2010, in Emilia-Romagna there were 33 PDO and PGI certified products. The best-known brands at the international level are Parmigiano Reggiano (cheese), Prosciutto di Parma (cured ham) and Aceto balsamico di Modena (balsamic vinegar).

“Quality” and “Tradition” represent the real value of the certified products and are considered more relevant targets than reducing the costs required for the production process, leading to a niche market, characterized by small availability of high added value specialties.

The research laboratories in the Regional High Technology Network are organized in a thematic platform (an established group of research laboratories specializing in agri-food issues) and work on the quality and safety of raw materials, processing, machinery, equipment, finished products, health issues, and on the enhancement and development of traditional products.

**Box 3.24: *Asociacion De Productores De Maiz Blanco Gigante Del Cusco*
– APROMAIZ (Peru)²⁷²**

For generations, giant white maize (the cob grows to between 12 and 20 centimeters in length, with the entire plant standing at between 2 and 3 meters tall) has been cultivated around Cusco City (Cusco), in the Urubamba Valley of the Andes Mountains in the Peru.



Giant white maize

In 2005, a milestone was reached when 17 of Cusco’s mainly small and medium-sized farming communities joined hands and established the *Asociacion De Productores De Maiz Blanco Gigante Del Cusco* (APROMAIZ) – the association of giant white maize producers of Cusco. Since its foundation, APROMAIZ has united the voice and strengthened the bargaining power of its members.

By coming together under the auspices of APROMAIZ, maize growers in the region sought to preserve their crop cultivating

culture and improve methods for growing it while strategically developing the maize’s unique potential for economic development.

²⁷² Cf. www.wipo.int/ipadvantage/en/details.jsp?id=3500.

In 2006 an Appellation of Origin certification for *Maiz Blanco Gigante Cusco* was granted by the *Instituto Nacional de Defensa de la Competencia y de la Proteccion de la Propiedad Intelectual* –Peru’s national IP office - with a view to allowing producers and to establish a marketable reputation for the product based on its place of origin and production practices or traditions.

In the following year, Cusco putation for the prd under the Lisbon System for International Registrations of Appellation of Origins isbon SysteWIPO.²⁷³

Among other things, a Code of Practice (CoP) has established strict standards for maize cultivation and production (which include specific standards for the size, texture and quality of grains), as well as enhancing the reputation and economic potential of Cuscoba Valley of the

Because of the strict standards in the cooperative’s CoP, farmers in the region have maintained seed diversity by ensuring the pedigree of giant white maize is free of artificial modification and cross-breeding.



In order to win new customers and to compete in the national and international markets, APROMAIZ has developed a comprehensive commercialization strategy. The farmers’ organization has relied on a growing network of local and national suppliers and retailers in order to enter both regional and

international markets.²⁷⁴

Between January and September of the same year, the region enjoyed an increase of 29% – compared to the same period in 2009 – in exported maize

APROMAIZ has also developed new export markets around the world including the Bulgaria, Mexico and Salvador. Cusco’s economy – in part driven by the impressive producers of APROMAIZ – has continued to grow and to ensure that Urubamba Valley remains the number one tourist destination – with two million visitors annually – in Peru

²⁷³ The Appellation of Origin defines and authorizes specific areas or regions of maize production in Peru that can legally use the Maiz Blanco Gigante Cusco certification. Moreover, only maize farmers in the specified areas fic areas or regions of maize production in Peru that can legally use the AIZ Code of Practice (CoP) for producers ns of maize productioMaiz Blanco Gigante Cusco label as a means of marketing their maize products.

²⁷⁴ In 2010, giant white maize from Cusco was exported in growing numbers to Spain (which accounts for 69 per cent of its market or 5.3 million USD), Japan (20.7 per cent, or 1.6 million USD), the United States (6.4 per cent, or 507, 800 USD), and the People te maize from Cusco was 5 per cent, or 174, 800 USD).

3.3.7 The case of European Union recognition²⁷⁵

The name **Geographical Indications (GIs)** brings together all those food products produced in a particular place or region, while complying with certain European Union rules.

The term includes products covered by a **Protected Designation of Origin (PDO)**, a **Protected Geographical Indication (PGI)** or a **Traditional Speciality Guaranteed (TSG)**, which now complements PDO and PGI products). The up-to-date European Union database of registered PDOs, PGIs and TSGs is available by following this link.²⁷⁶ A list of Italian PDOs and PGIs is on the website of the Italian IP office, which can be found by following this link.²⁷⁷

More than 80 per cent of GI products are registered in six member states of the European Union: Italy, France, Spain, Greece and Germany. GIs are mainly a European phenomenon, although their use in countries outside the European Union is increasing.²⁷⁸

EU producers have traditionally observed that consumers feel more confident with typical products that have gone through a selective procedure involving a degree of quality control, and have been given credibility by GI status (before European Union common regulations in that field - the first was European Union Council Reg. no. 2081/92 - producers used to obtain national recognition under national law governing GIs).

The **definition of PDOs is close to the concept of *Appellation of Origin***, where all phases of the production process should be localized inside the production area and the quality of the product should be strictly related to a particular geographical environment with its inherent natural and human elements.

Examples of PDOs: **Ardenne** butter, **Herve** cheese, **Feta**,” and **“Normandy Camembert** cheese.”²⁷⁹

²⁷⁵ Agriculture and Rural Development, European Commission, Quality Policy; http://ec.europa.eu/agriculture/quality/schemes/index_en.htm.

²⁷⁶ Ibid. 273;

<http://ec.europa.eu/agriculture/quality/door/list.html;jsessionid=pL0hLqgLXhNmFQyFI1b24mY3t9dJQPflq3xbL2YphGT4k6zdWn34!-370879141>.

²⁷⁷ <http://www.uibm.gov.it/attachments/article/2006088/ice3foldfinal2a.pdf>.

²⁷⁸ Intellectual property rights intensive industries: Contribution to economic performance and employment in the European Union, Office for Harmonization in the Internal Market, September 2013, p. 47; http://ec.europa.eu/internal_market/intellectual-property/docs/joint-report-epo-ohim-final-version_en.pdf

²⁷⁹ Geographical Indications, Traditional Speciality Guaranteed and other quality labels, FPS Economy, SMEs Self Employed and Energy, Economie, Intellectual Property, Trademarks; Copyright inguishingian Federal Government; http://economie.fgov.be/en/entreprises/Intellectual_property/Trademarks/quality_labels/#.VHhbcVTznCS.

PGIs cover agricultural products and foodstuffs closely linked to a geographical area, where at least one of the stages of production, processing or preparation takes place within the given area.

Examples of PGIs: “*mattons de Geraardbergen*,” “*paté gaumais*,” “**Brussels chicory**”, and “**Ardenne ham**”,²⁸⁰ “*Mela Alto Adige* (Italian) or “*Südtiroler Apfel*” (German).²⁸¹

Box 3.25: MARLENE: A quality brand²⁸²

In little more than a decade, Marlene® has become a symbol of quality fruit from South Tyrol/Südtirol, as well as the leading Italian brand in terms of apple production and variety offered: sweet and juicy, red, yellow or green.

Marlener apples are checked one by one and cultivated in keeping with integrated production guidelines: with great care and considerable attention to environmental issues.

Moreover, all **Marlener** apple varieties bear the PGI – Protected Geographical Indication – mark that certifies their South Tyrol/Südtirol origin.

Marleneo was established on October 21, 1995 as part of a VOG (South Tyrol/Südtirol Fruit Growers Cooperative) initiative, with the purpose of using a single brand to identify the products and shared strengths of the member cooperatives: extremely wholesome apples cultivated in the pristine South Tyrol/Südtirol region, apples that stay fresh throughout the entire journey from the orchard to the store. In short, guaranteed superior quality compared with other apples.

The VOG Consortium that includes 16 cooperatives, with 5,200 member producers, is now the largest and most important European organization for the sale of apples. It centrally coordinates cultivation, quality control, logistics and marketing activities, including the advertising and promotion of its own products.

TSGs (Traditional Speciality Guaranteed) cover agricultural products or foodstuffs, which have a certain feature or a set of features, setting them clearly apart from other similar products or foodstuffs belonging to the same category. The product or foodstuff must be manufactured using traditional ingredients or must be characteristic for its traditional composition, production process, or processing reflecting a traditional type of manufacturing or processing. It is the most lenient of the European Union food designations, because it doesn't restrict a food item to a geographical area, as the other designations do. Rather, the emphasis is on the product being made with “traditional”

²⁸⁰ *Ibid.* 277;

http://economie.fgov.be/en/entreprises/Intellectual_property/Trademarks/quality_labels/#.VHhbcVTzn

CS.

²⁸¹ Vegetable and Cereals, Fresh and Processed, ADIGE PGI, AICIG, 2005;

<http://www.aicig.it/download/soci/uk/orto/mela%20alto%20adige%20ing.pdf> and

<http://www.naturalmenteitaliano.it/flex/FixedPages/IT/Prodotto.php/L/EN/P/4283>

²⁸² Marlene: A Quality Brand, 2008; <http://www.marlene.it/en/who-are-we/our-story.html>.

ingredients, or techniques, rather than being on the place where it is made. The registration of a product as a TSG now requires that the use of the name of the product is reserved to producers who comply with the product specification. For example, Serrano ham used to be made only up in mountainous areas, but now is made throughout Spain.

The quality scheme for agricultural products and foodstuffs concerning TSGs under Regulation (EU) 1151/2012 applies to the agricultural products listed in Annex I of the Treaty on the functioning of the European Union and Annex I(II) of the Regulation which covers prepared meals, beer, chocolate and derived products, bread, pastry, cakes, confectionery, biscuits and other baker's wares, beverages made from plant extracts, pasta and salt. The object of the quality scheme for TSGs is to safeguard traditional methods of production and recipes by helping producers of traditional products in the marketing and communicating of the added-value attributes of traditional recipes and products to consumers. Regulation (EU) 1151/20123 was designed to bring about the following changes and improvements:

- the use of the TSG logo became compulsory for products of European Union origin on January 4, 2014.
- the scheme was simplified and strengthened, in particular, only registration with reservation of a name will in future be possible.
- in order to qualify as "traditional" the proven usage of a product on the domestic market was increased from 25 to at least 30 years.

The name of a product is eligible for registration as a TSG where it describes a specific product or foodstuff that:

- results from a mode of production, processing or composition corresponding to traditional practice for that product or foodstuff; or
- is produced from raw materials or ingredients that are those traditionally used.

In order to be registered as a TSG, the name of the product must:

- have been traditionally used to refer to the specific product; or
- identify the traditional character or specific character of the product.

In this context, "traditional" means proven usage on the domestic market for a period that allows transmission between generations, which must be at least 30 years.

Where the name of a product is also used in another Member State or in a third country, in order to distinguish between products, the decision on registration may provide that the name of the TSG is to be accompanied by the claim "made following the tradition of" immediately followed by the name of a country or region.

A name may not be registered if it refers only to claims of a general nature used for a set of products, or to claims provided for by particular European Union legislation.

Who can apply for a TSG?

An application to register a product may be made by groups of producers or processors, meaning any association, irrespective of its legal form, mainly composed of producers or processors working with the same product.

Applications may only be submitted by groups who work with the products with the name to be registered. A single natural or legal person may be treated as a group where the following conditions are met:

- 1) the person concerned is the only producer willing to submit an application;
- 2) in the case of a PDO or PGI, the defined geographical area possesses characteristics which differ appreciably from those of neighboring areas or the characteristics of the product are different from those produced in neighboring areas.

Examples of TSGs: “Geuze,” “Faro,” “Kriek” and “Mozzarella”²⁸³

The EU PDO/PGI regulation provides EU-wide protection to names of agricultural products and foodstuffs that have a close link to their geographic region of production and aims to prevent the use of registered names unless the products are produced in a specified territory and according to a specified code of practice.²⁸⁴

In order to benefit from PDO/PGI protection, European Union producer organizations can apply to register a name with their national authorities. The request may be filed by a national group of producers or processors of the concerned product (often agricultural organizations). These indications are not open to individual use; they are meant for the collective interest. All those who meet the objective conditions of the specifications sheet will receive the right to use the protected indication. As a result of amendments introduced under EU Regulation 510/2006, the Commission can now receive applications not only from non-EU national authorities, but also directly from non-EU producer organizations. The application for review and publication of a GI by the EU commission is free of charge.

All applications must refer to a code of practice that must include at least the following:

- (i) the name of the product comprising the designation of origin or geographical indication;

²⁸³ Geographical indications, traditional speciality guaranteed and other quality labels, FPS, Economym, Belgian Federal Government; http://economie.fgov.be/en/entreprises/Intellectual_property/Trademarks/quality_labels/#.VHhbcVTznCS.

²⁸⁴ Protection is also provided to names of products produced in countries outside the EU, provided that these names are themselves protected in their own country of origin.

- (ii) a product description, including raw materials, if appropriate, and principal physical, chemical, microbiological or sensory properties of a product (involving taste, color, odor and feel);
- (iii) the geographical region of production (and any details relating to the origin of raw materials used in production of the product);
- (iv) a description of the method of production, including local know-how and packaging of the product, where appropriate;
- (v) details of the relationship between the quality or characteristics of the product and the geographical environment in the case of a PDO or, as the case may be, the link between the specific quality, reputation or other characteristic of the product and the geographical origin in the case of a PGI;
- (vi) the name, address and specific tasks of the authorities or bodies verifying compliance with the provisions of the specification;
- (vii) any specific labelling rules for the agricultural product in question; and,
- (viii) evidence that some quality, reputation or other characteristic associated with the product is linked to the region of production.

If the application is successful and the name is registered, then any producer from within the region complying with the product specification and controlled by a control body or national authorities can use the name.

Following registration of a name, PDO/PGI regulations are enforced by public authorities in European Union member States (it is the national enforcement authorities who provide protection of the name and exclusive rights for its use to producers who can meet the product specification).



Example: PARMIGIANO REGGIANO[®] is recognized as a Protected Designation of Origin in the European Union under its *sui generis* system while in the United States, which does not have a separate *sui generis* system, both the name and the logo including the name PARMIGIANO REGGIANO[®] are registered as certification marks. The logo may be used only on cheese certified as originating in the PARMIGIANO REGGIANO[®] delimited geographical area (Parma and Reggio are the main regions) of Italy and complying with the relevant

specifications

*Courtesy of the Consorzio del Formaggio Parmigiano-Reggiano.*²⁸⁵

²⁸⁵ Making a mark: An introduction to trademarks for small and medium-sized enterprises, p. 10; http://www.wipo.int/sme/en/documents/guides/making_mark.html.

Box 3.26: Pizza Napoletana (STG)²⁸⁶

With the publication on February 4, 2010, of European Union Commission Regulation No. 97/2010, the name PIZZA NAPOLETANA has been entered in the register of Traditional Specialities Guaranteed (TSGs).

A TSG protects an agricultural product or foodstuff with characteristics that distinguish it from other, similar products of the same category. Along with the Protected Denomination of Origin (PDO) and Protected Geographical Indication (PGI), it is one of the forms of protection for agricultural products and foodstuffs governed by the European Union's Protected Geographical Status (PGS) regime. TSGs are specifically dealt with in EU Regulation No. 509/2006.

Originating in the southern Italian city of Naples and dating back to the eighteenth century, PIZZA NAPOLETANA TSG is defined as a round product baked exclusively in wood-fired ovens at a temperature of 485°C for between 60 to 90 seconds with a variable diameter not exceeding 35 cm, a raised rim (1–2 cm thick) and a garnished center (0.4 cm thick).

According to the regulation, the pizza must be tender, elastic and easily foldable. Only pizzas that are prepared in a continuous cycle on the same commercial premises with tomatoes, “Mozzarella di Bufala Campana” (PDO) or Mozzarella (TSG), extra virgin olive oil, oregano, garlic and basil and oven-baked in a wood stove may use the official TSG label.



Registration for PIZZA NAPOLETANA was applied for in the Italian language, while the words “*Prodotta secondo la tradizione napoletana*” (“produced in the Neapolitan tradition”) and the acronym STG (TSG) that feature on the TSG label are translated according to the place of production. It is not necessary that the pizza be manufactured in Naples, but the pizza must be made according to the Naples tradition as described in

Regulation No. 97/2010, which also provides for three inspection bodies to ensure that the mark is being used only to distinguish pizza prepared according to the regulation.

While the granting of TSG status enables Neapolitan pizza to take its place among Europe's most prized culinary delights, registration was sought without reservation of the name, so the protection falls short of prohibiting use of the name “Pizza Napoletana” (without the TSG logo) for pizzas that do not meet the required standards.

²⁸⁶ International Trademark Association;
<http://www.inta.org/INTABulletin/Pages/EUROPEANUNIONPIZZANAPOLETANAObtainsTraditionalSpecialityGuaranteedStatus.aspx>.

3.3.8 What is a Code of Practice for a GI?

As has been pointed out above, the reputation of a GI is directly linked to the real unique attributes of the products related thereto. As a result, the reputation and value of a GI product are very attractive for imitators, usurpers and free riders, both inside and outside the original production area. Misleading practices mainly target the name of the product and/or, in some cases, specific characteristics of the product.

For all these reasons, a set of common rules built up at the local level is strongly recommended in order to prevent the loss of product specificity, avoid misuse and foster consumer confidence. This includes the development of a Code of Practice (CoP) to define the product in relation to its geographical origin and a local organization to ensure both coordination among stakeholders and product conformity.

Moreover, the CoP is the document containing the requirements companies have to fulfil to be entitled to use the GI over its products.

3.4 Trade Secrets²⁸⁷

3.4.1 What is a Trade Secret?

Trade secrets are confidential business information that is not generally known in the trade and that has commercial value to a business, and for which the owner has made reasonable efforts to maintain secrecy. The exact legal definition of a “trade secret” varies somewhat from country to country, or among regional governments within a country. In general, any type of information which derives commercial value from being held confidential may qualify for trade secret protection, provided it satisfies the following criteria:

- i) **Competitive advantage:** the information must provide the enterprise with some value contingent on the information remaining a secret.
- ii) **Secrecy:** the information is confidential; it is not generally known or ascertainable by proper means.
- iii) **Reasonable measures:** the owner/holder of the information has taken all the reasonable measures or precautions to keep the information confidential.

Box 3.27: The Coca-Cola® formula – a valuable and well-kept trade secret

For more than 100 years, the Coca-Cola Company has maintained the Coca-Cola® formula as a trade secret to prevent its competitors from replicating its signature product. The list of ingredients of Coca-Cola® is printed on every bottle or can, but the world-renowned soft drink can be made only by mixing those ingredients in the right proportions and under the proper conditions. An affidavit filed by the Coca-Cola

²⁸⁷ Cf. In confidence: An introduction to Trade Secrets for SMEs. WIPO publication No. 929 and Module 4 of IP PANORAMA™; www.wipo.int/sme/en/multimedia.

Company in a court case, explains the basic procedure for protecting the formula of the Coca-Cola® syrup.

The written version of the secret formula is kept in a security vault at the Trust Company Bank in Atlanta. The vault can only be opened by a resolution from the Company's Board of Directors.

At any given time, only two persons in the Company know or have access to the formula, and only those two persons may oversee the actual preparation of the Coca-Cola® syrup. The Company will not disclose the identity of those persons or allow those persons to fly together on the same airplane.

3.4.2 What types of information may be protected as a trade secret?

Virtually any information or expression, recorded or not, qualifies for trade secret protection if its limited availability gives it economic value and it is reasonably guarded. This information may be tangible or intangible and stored physically or electronically. It may include one or more of each of the following: text, sketches, photographs, graphs or diagrams. In plant breeding, *trade secrets are especially important for protecting inbred lines for producing hybrid varieties.*

One appealing aspect of trade secret protection is that it applies to a far broader range of information than the protection for patents, utility models and industrial designs. The types of information that may be protected include, *inter alia*, the examples below:

<p>Technical & Scientific Information</p>	<ul style="list-style-type: none"> • Manufacturing/development Information <ul style="list-style-type: none"> • Production or design techniques, processes, methods, compounds, recipes, formulas, technological know-how, engineering specifications, tolerances • Specialized machinery • Patterns, plans, blueprints, technical drawings, sketches, diagrams, designs, prototypes • Test results and quality control methods • Product information <ul style="list-style-type: none"> • Product specifications • Physical devices (tools, machinery, equipment, layout of equipment, etc.) • Service/maintenance details • Statuses relating to products/services under development • Product roadmaps for future releases
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	<ul style="list-style-type: none"> • Computer technology <ul style="list-style-type: none"> • Unpublished software, such as source code • Software design documents • Algorithms, formulas, data flow charts, circuitry • Research results <ul style="list-style-type: none"> • Data in laboratory notebooks • Ideas in invention disclosure reports • “Negative” know-how (research results indicating that expensive or difficult testing did not solve a particular problem) • Pending, unpublished patent or utility model applications
Strategy Information	<ul style="list-style-type: none"> • Business, marketing, advertising and investment strategies <ul style="list-style-type: none"> • Business methods that confer a particular advantage • Expressions of ideas <ul style="list-style-type: none"> • that give your business a competitive advantage, for example, a new product, an innovative business model, or a new online concept • Market research and competitive intelligence reports <ul style="list-style-type: none"> • if combined from labor-intensive efforts
Financial Information	<ul style="list-style-type: none"> • Cost and Complex Pricing Information • Financial Forecasts • Sales Data and Price Lists

Commercial Information	<ul style="list-style-type: none"> • Supplier Information <ul style="list-style-type: none"> • names, terms of supply contracts, transactions – the details of which are not generally known • Customer Information <ul style="list-style-type: none"> • names, addresses, backgrounds, records of purchases, creditworthiness, the company or a new entrant in geographic regions, etc., to the extent that the information cannot easily be ascertained from public sources • Specific Contract Terms <ul style="list-style-type: none"> • with consultants, vendors, service providers, and partners in distribution or marketing channels • complex pricing, supply, and discounting details • Databases and Data Compilations
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3.4.3 What is the difference between confidential information, trade secrets and know-how?

Confidential information is any information held under an obligation of confidence. It may be categorized as follows:

- Information that, although confidential, is trivial and could be found or gathered independently;
- Information that is confidential but that, due to its nature, will remain in one's memory and that is an integral part of his/her skills and knowledge;
- Information that is confidential because of an express or implied contract;
- Information that is kept confidential because of a statutory requirement—this may include bank and tax records, bank account numbers, credit/debit card numbers (and security codes), bank loan information, educational records, health/medical records, personnel information, human relations investigations, conciliations and mediations, and the like;
- Information about attorney-client consultations;
- Information concerning the reputation or private lives of persons;
- Information concerning IT security;
- Client-specific information, including social security numbers;
- Government secrets;
- Information of economic value that arises from the fact that the relevant information is secret or confidential.

Only information in the last listed category qualifies as a trade secret (also called *proprietary information*). Trade secrets are necessarily confidential information, but represent only one type of such information.

In a business context, confidential information generally refers to a singular event in the conduct of a business, whereas trade secrets refer to information, such as a process or device, which is used for an extended period in the operation of the business. For example, a formula, developed confidentially, for pricing assets or products constitutes a trade secret; a specific application of such a formula to determine an asset's value is simply confidential information. The misappropriation of such confidential information is actionable in a court, but not under the law for trade secrets.

It is also important to differentiate between confidential information and know-how. Know-how may be defined as the general knowledge, skills and experience that an employee acquires during the course of employment and is entitled to take to a future employer without any restriction during such employment or in setting up a competing business.

3.4.4 Why are trade secrets important for a business?

Protecting trade secrets serves two basic functions. It provides a means for preserving standards of commercial ethics, and it encourages innovation. Trade secrets are often among an enterprise's most valuable assets, and enable it to:

- **maintain competitive advantage.** Virtually all businesses engage in some sort of competitive intelligence work; vigilant use and protection of trade secrets is one of the best ways for an enterprise to maintain its edge in an industry;
- **Exercise future use of other, potentially more effective IP rights.** Any information that is ultimately protected by a patent, utility model or industrial design begins life as a secret susceptible to protection. In most cases, it is crucial that the information in question (a new invention, a suggested name for a new product, a draft pattern for a textile, etc.) is kept secret until the enterprise applies for an IPR;
- **Earn income from assigning or licensing the trade secret.** The ownership of a trade secret can be transferred to another party, a process called *assignment*. Trade secrets can also be licensed out to another party for a specified duration and purpose, subject to mutually agreed-upon conditions;
- **Respond to commercial imperatives.** Many potential business partners are disinclined to work with enterprises that have poor or inadequate systems for the protection of trade secrets.

3.4.5 Are trade secrets protected by all countries, worldwide?

Almost all countries protect trade secrets, but the exact manner in which they do so varies from one country to the next. The legal basis for protection of trade secrets depends to a large extent on the controlling legal concept: contract, fiduciary relationship property, misappropriation, privacy, tort, unfair competition, or unjust

enrichment. In most common-law countries, confidentiality and trade secrets are regarded as a negative equitable right rather than a property right. Some countries have a specific trade secret law, while others make provisions for trade secrets in broader laws. In China, Germany, and Japan, the protection of trade secrets forms part of the general concept of protection against unfair competition. Generally, though, the extent of the property right in a trade secret is defined by the extent to which the owner of the secret protects his/her interest from disclosure to others.

3.4.6 How are trade secrets protected?

The rights from a trade secret arise automatically if the criteria for protection are fulfilled. There is no need to register trade secrets or undertake any procedural formality at a government office or registry. An enterprise's trade secret rights will be protected by a court as long as all reasonable steps have been duly taken to keep the information confidential. It is crucial to have a suitable trade secret protection system as part of the enterprise-wide security system, and to make reasonable efforts that are cost-effective in the facts and circumstances of a business to prevent its confidential information and trade secrets from being compromised, disclosed or lost.

3.4.7 What criteria must a trade secret meet to qualify for protection?

To be protectable as a trade secret, the information:

- i) must provide a competitive advantage or some commercial value to the firm, i.e., provide a competitive advantage and thus have independent economic value for the owner of the information;
- ii) must not be generally known. Absolute secrecy is not required, but all reasonable measures should be taken to protect the trade secret. In contrast, publicly available information or information considered to be general knowledge in an industry cannot be protected as a trade secret; and,
- iii) must be held in confidence, using reasonable efforts, by the owner. What is *reasonable* will vary from case to case, and will depend on: the size of the business, the type of information involved, the economic value of the trade secret, the estimate of how long that value will persist, the risk of theft, etc. The measures may vary from just a confidentiality agreement to extensive defense in depth security measures. Considering measures to be put in place to protect trade secrets involves looking at the standard industry/business practice(s), if any, that are generally considered to be reasonable measures.

3.4.8 What types of information is not protected as a trade secret?

Certain information, although confidential, may not have the legal protection of a trade secret, because it does not fulfil one or more of the legal requirements. Such information may qualify for other forms of legal protection, under contractual law, privacy law, duty of fidelity, patent or copyright law, etc. The following are some examples of information that are *not* eligible for trade secret protection.

Publicly available information; for example:

- Information revealed in public files (e.g., newspapers, websites, television, libraries, published patent applications, online databases, publicly available annual reports, etc.);
- Information publicly disseminated or displayed (e.g., at a conference or an exhibition, or in communications with customers without adequate protection);
- Graphics and object code of publicly sold computer software;
- Information that is freely accessible to any person or that is subject to a signed agreement expressly disclaiming any secrecy or confidentiality;
- Information that was not adequately protected during litigation or in filings with the government.
- **General knowledge.** This signifies widely known information used by competitors. For example, any self-evident information that is primarily based on common sense, or information that becomes common practice in an industry;
- **General business practices/methods.** In contrast, all business methods that are particular to your enterprise and that confer special advantages, business opportunities or superior product designs may be protected as trade secrets.
- **Information obtained by inspection or basic reverse engineering** of the final product. Whether such information is readily ascertainable by reverse engineering will depend on:
 - a. The amount of time, effort and cost necessary to reverse engineer the product,
 - b. Novelty of the confidential or secret information,
 - c. Actual measures taken to keep it secret or confidential,
 - d. Unsuccessful attempts by others to duplicate the confidential or secret information, and,
 - e. The willingness of others to pay for a license to use the information.
- **Skills and experience**—generally, businesses cannot prevent former employees from using their experience or technical expertise gained during employment.

3.4.9 What rights does trade secret protection provide?

Trade secret protection allows the owner to control access to and use of information. The owner of a trade secret may take legal action against any infringer who misappropriates the trade secret. Whilst unlike tangible property, however, trade secrets are like other types of IP, in that they can be accessed and used by multiple parties simultaneously. Such use may even occur without each user being aware of or directly affected by other users. Misappropriation actions, then, focus only on *unauthorized* use and *improper* disclosure or acquisition of trade secrets.

The type of remedies available for dealing with a trade secret misappropriation in a country depends on the relevant law(s) of that country and the specific circumstances of the misappropriation. The most common remedy enables the owner/holder of the trade

secret to prevent further use of the trade secret and/or recover damages resulting from the misappropriation.

Ownership of a trade secret does not confer a right of exclusive possession or use. The owner of a trade secret has no right, except against those who (1) are bound by an agreement, expressly or by implication, not to disclose the secret/confidential information, or (2) have obtained it by unfair means. In particular, there is no legal remedy against a competitor who independently discovers or develops information protected as a trade secret. Moreover, if such a competitor publicly discloses the information, it loses its status as a trade secret.

The owner of a trade secret who cannot demonstrate that all reasonable precautions were taken for protecting the secret/confidential information risks losing the trade secret, even if the information is obtained illegally by a competitor.

3.4.10 Can more than one person have trade secret rights over the same information?

Yes; two or more individuals or businesses can concurrently claim the same information as a trade secret, provided they acquired the information legally and independently and keep it confidential.

3.4.11 How long does trade secret protection last?

Indefinitely; there is no fixed term for trade secret protection. Trade secrets can maintain their value as long as the information is not outdated or generally known to the public through independent discovery or by accidental disclosure, misappropriation, reverse engineering by competitors.

Examples: Some trade secrets have been maintained for centuries, despite widespread use of the product concerned. The formulae for **Coca-Cola®** and Smith's Black Cough Drops are supposedly each over a century old.

3.4.12 Why is it important to have a written confidentiality or non-disclosure agreement (NDAs)?

While an employee may have an implied duty to keep information confidential, enterprises should still include explicit non-disclosure agreements (NDAs) in contracts with some, if not all, of its employees. A written confidentiality agreement is useful for preventing negligent and inadvertent rather than intentional disclosure, can impose ancillary obligations such as the return of documents, and provides evidence in the event of litigation. A confidentiality agreement is effective both during the period of employment and for a period of time following the termination of employment. In order to exercise proper diligence, trade secret owners should sign non-disclosure agreements with any employees who have access to trade secrets.

3.4.13 Who owns trade secret rights in material created by an employee?

Laws on ownership of trade secrets differ from one country to the next. The rules also differ depending on the type of material that is covered by the trade secret.

- **Inventions.** In most countries, trade secrets that cover inventions developed by an employee in the course of employment belong to the employer. However, inventions developed by an employee on his/her own time and with his/her own equipment can sometimes belong to the employee. In some cases the employee may retain the right to exploit the invention, but the employer is given a non-exclusive right to use the trade secret, patent or invention for its internal purposes (called “shop rights”).
- **Copyright works.** The situation may be different in the case of employees who developed copyright works such as software, images, technical drawings, scientific publications, etc. In a number of countries, if a work was created by an employee within the scope of his/her employment, then the employer automatically owns the copyright, unless otherwise agreed. But this is not always the case. In some countries the original creator (employee) is always considered the owner of the copyright even if the work was created during or in close connection with an employment relationship.

3.4.14 Who owns trade secret rights in commissioned works?

Businesses often assume that they own the IP embodied in the items developed by contractors or consultants since they paid for its development. However, in most countries, the “inventor” or “creator” of the IP is the owner. Thus, without a written assignment of rights, an independent contractor hired by your business to develop a new product, process or other creative work will generally own all rights to it. Your business will only have a license to use the work/invention for the purposes for which it was commissioned.

Box 3.28 Tip

Address trade secret and other IP ownership issues in a **written agreement**, which should be entered into before commissioning external creative services. Contractor agreements should include, at a minimum, provisions that:

- Assign all developed technology/work to the business;
- Prohibit reuse of the technology/work developed by the contractor, by others;
- Protect your business’s confidential information; and,
- Oblige the contractor to take all steps necessary for your business to protect its IPRs through registration and other means.

3.5 Patents and utility models²⁸⁸

3.5.1 What is a patent?

A patent is an exclusive right granted by the government for an **invention** that is **new**, **involves an inventive step** and is **capable of industrial application**.

It gives its owner the **exclusive right** to exclude or stop others from making, using, offering for sale, selling or importing a product or a process, based on the patented invention. A patent is a **powerful business tool** to gain exclusivity over a new product or process while developing a strong market position or earning revenues through licensing. A complex product may incorporate many different patented inventions owned by various holders.

A patent is granted by the **national patent office** of a country or a **regional patent office** for a group of countries. It is valid for a limited period of time, generally **for 20 years** from the date of filing the application, provided the required maintenance fees are paid on time. A patent is a **territorial right**, limited to the geographical boundary of the relevant country or region.

In return for the exclusive right provided by a patent, the applicant is required to **disclose the invention** to the public by providing a detailed, accurate and complete written description of the invention in the patent application (see No. 11). The granted patent and, in many countries, the patent application are published in an official journal or gazette.



3.5.2 What is an invention?

An **invention** is generally defined as a **new and inventive solution to a technical problem**. It may relate to the creation of an entirely new device, product, method or

²⁸⁸ Cf. Burrone, E., Koglin, L. V., Jaiya, G. S., and Marzano de Marinis, M. Inventing the future: An introduction to patents for small and medium-sized enterprises, Intellectual Property for Business Series, WIPO Publication No. 917 of 2006 http://www.wipo.int/edocs/pubdocs/en/sme/917/wipo_pub_917.pdf and 917.1 of 2015 and Module 03 of IP PANORAMA™ (www.wipo.int/sme/en/multimedia and www.ippanorama.com).

process, or may simply be an **incremental improvement** to a known product or process. Merely finding something that already exists in nature generally does not qualify as an invention; a substantial amount of human ingenuity, creativity and inventiveness must be involved.

While most inventions are the result of considerable effort and long-term investments in R&D, many simple and inexpensive technical improvements have yielded significant income and profits to their inventors or companies.

Box 3.29: The Power of Innovation

Appreciating the distinction between *invention* and *innovation* is important. In this guide, the word **innovation** is used as the process of **creating a commercial product from an invention**. Thus, an invention brings something new into being, while an innovation brings something new into use. Accordingly, technical criteria are used to determine the success of an invention, whereas commercial criteria are used to determine the success of an innovation. An invention occurs when the technical solution to a problem meets the specific legal requirements for patenting. Innovation may or may not produce patentable ideas.

Some of the main reasons why companies are interested in innovations include:

- improving manufacturing processes in order to save costs and improve productivity;
- introducing new products that meet customer needs;
- remaining ahead of the competition and/or expand market share;
- ensuring that technology is developed to meet actual and emerging needs of the business and its clients; and,
- preventing technological dependence on other companies' technology.

In today's economy, managing innovations requires a good knowledge of the patent system in order to ensure that an enterprise draws maximum benefit from its own inventive and creative capacity, establishes profitable partnerships with other patent holders and avoids making unauthorized use of technology owned by others.

3.5.3 Why should you consider patenting your inventions?

Short product cycles and increasing competition pressure enterprises to innovate or obtain rights to others' innovations. The exclusivity provided by a patent may make the difference that brings success in a challenging, risky and dynamic business climate.

Key reasons for patenting include:

- **Strong market position.** A patent gives its owner the exclusive right to prevent or stop others from using the patented invention, thereby reducing uncertainty, risk and competition from free riders and imitators. Rights to a patented invention may make it more difficult for new competitors to enter your market. This will help you stretch your lead time and become more safely established.

- **Higher profit or returns on investment.** If your enterprise has invested significantly in R&D, patent protection can help you recover that cost and increase your return on capital.
- **Additional income from licensing.** As a patent owner you may license your rights to the invention to others in exchange for lump-sum payments and/or continuing royalties. Selling (or assigning) a patent transfers ownership, whereas licensing implies only permission to use the invention under specified conditions.
- **Access to new markets.** Licensing out patents to other businesses (or even pending patent applications) may provide access to new markets, which are otherwise inaccessible due to regulations on businesses. In order to take advantage of new international markets, the invention must also be protected in the relevant foreign market(s). The Patent Cooperation Treaty (PCT) provides an option for seeking protection for an invention in any member countries of the PCT through a single application (see **3.5.27 - 3.5.29**).
- **Enhanced ability to raise funds.** Investors value the certainty that comes with patenting. Cloaking your company in patent rights (even with pending applications) can enhance your ability to raise the capital required to take a product to market. Indeed, in some sectors such as modern biotechnology, a strong patent portfolio is often a requirement to attract venture capitalists.
- **A powerful tool against imitators and free riders.** In order to effectively enforce patent exclusivity, you may have to give notice of infringement, or even file a lawsuit. Owning a patent improves your ability to take successful legal action against copiers and imitators.
- **A positive image for your enterprise.** Business partners, investors and customers will often see patent portfolios as a demonstration of the high level of expertise, specialization and technological capacity of your company. This may prove useful in finding business partners and otherwise raising your company's profile and market value. In fact, some companies describe their patents in advertisements to project an innovative image to the public.

3.5.4 If an invention is patentable, should you apply for a patent?

Not always. Just because a technological idea is novel doesn't mean that it will be a commercial success. In fact, the vast majority of patented inventions are not commercialized; and often a product or technological innovation can be more effectively protected by other means. Therefore, a careful cost/benefit analysis, including consideration of possible alternatives, is essential before filing a patent application. A patent may be expensive and difficult to obtain, maintain and enforce. Your decision should be based primarily on the probability of obtaining commercially useful protection for the invention.

Questions to ask when deciding to file a patent application include:

- Is there a market for the invention?
- What are the alternatives, and how do they compare with your invention?

- Is the invention useful for improving an existing product or developing a new product? In the case of the latter, does that fit with your company's business strategy?
- Are there potential licensees or investors who would be willing to help take the invention to market?
- How valuable will the invention be to your business and to competitors?
- Is it easy to *reverse engineer* your invention from a marketed product or to *design around* it?
- How likely are others, especially competitors, to invent and patent what you have invented?
- Do the expected profits from an exclusive position in the market justify the costs of patenting (see **3.5.16** on patenting costs)?
- How broadly can patent coverage be claimed, and will this provide commercially useful protection?
- Will it be easy to identify infringement of the patent (process patents, for example, are easier to infringe secretly); and are you ready to invest time and financial resources for enforcing your patent(s)?

3.5.5 What can be patented in general and in the agri-food sector in particular?

In general, to be eligible for patent protection, a claimed invention must:

- consist of patentable subject matter (see **3.5.6**);
- be new (novelty requirement) (see **3.5.7**);
- involve an inventive step (inventive step or non-obviousness requirement) (see **3.5.8**);
- be capable of industrial application (or be useful) (see **3.5.9**); and,
- be disclosed in a clear and complete manner in the patent application (disclosure requirement) (see **3.5.10**).²⁸⁹

The best way of understanding these requirements is to study what has been patented by others in the technical field of your interest. For this, you may consult patent databases (see **3.5.13 - 3.5.14**).

Patent law differentiates between product and process patents. A product patent can either refer to a machine or a “manufacture” or to a “composition-of-matter.” Composition-of-matter patents are product patents in the field of chemistry, yet increasingly also in biotechnology. The composition-of-matter patent protects the new substance. Normally this substance is unequivocally identified in the patent claim through specific properties (structural attributes). The new substance can, therefore, be identified purely through inspection of the matter. Process patents are different from product patents and describe either a production process or a method. Production processes are processes by which something novel is produced or an existing object is

²⁸⁹ When this is not possible, as in the case of microorganisms, the patent law may require the deposit of the biological material at a depository authority; refer to the Budapest Treaty on the International Recognition of the Deposit of Microorganisms for the Purposes of Patent Procedure; http://www.wipo.int/treaties/en/text.jsp?file_id=283784.

essentially altered. The product (or composition-of-matter) automatically enjoys a certain protection in the form of so-called secondary product protection (without the product itself having to be patented). For patents in the field of biology, this secondary product protection also covers the ensuing generations of a patented biological material (so-called vertical patent extension). Neither derived product protection nor vertical patent extension apply to methods, i.e., processes that do not obtain a new product, but use or manipulate an object without altering it. The selection methods used in animal and plant breeding constitute such working processes, since they select genetic material, but do not alter it.²⁹⁰

Occasionally, for instance in synthetic chemistry, it is not possible to precisely identify the structural or physical and chemical attributes of a product, for example if there are no suitable analysis and measuring methods available. Therefore, to precisely demarcate the product, the production conditions are specified in the patent. Such claims are called product-by-process (PbP) claims. For example, in some of the claims for the “broccoli and tomato” patents, the plants are defined as products by taking recourse to the breeding method they have been obtained by (in the case of the broccoli, a so-called smart breeding process).²⁹¹

In a PbP, the novelty of the product and not of the process is essential; the novelty of the process alone is not suitable justification of a PbP claim.

One way to illustrate the dynamics of agriculture is to look at the number of patent applications in the field of biotechnology, especially in the area of gene patents. A search in the International Patent Classification (IPC) classes A61K 48/00, C12N 15/12 and C12N 15/52, for example, shows a dramatic increase of patent activity during the late 1980s and 1990s, a slight decline from 2002 to 2006, and a renewed increase since then.²⁹²

The food-processing industry depends to a significant extent on related industries such as for the storage and distribution of processing materials and processed outputs. Also, it has to be supported by the manufacturing industries which produce processing machinery and equipment, materials used for packing, wrapping, and filling, and transport machinery for distribution. Thus, these related industries are integrated within the framework of the food industry. Protection of inventions by patents is important in all of these areas of the food industry.

²⁹⁰ Product-by-process claims for biopatents in animal and plant breeding – Prerequisites, problems and recommendations, Scientific Advisory Board on Biodiversity and Genetic Resources at the Federal Ministry of Food, Agriculture and Consumer Protection, Prof. Dr. Matthias Herdegen, University of Bonn Dr. Peter H. Feindt, Cardiff University, October 2011, p. 5; http://beirat-gr.genres.de/fileadmin/SITE_GENRES/downloads/docs/Beirat-GR/Gutachten_Stellungnahmen/Beirat_PbP_Patente_Englisch.pdf

²⁹¹ *Ibid.* 288, p. 5; http://beirat-gr.genres.de/fileadmin/SITE_GENRES/downloads/docs/Beirat-GR/Gutachten_Stellungnahmen/Beirat_PbP_Patente_Englisch.pdf.

²⁹² Global Agenda Council on Genetics, Intellectual Property Law, Genetics and ethics: Facts, challenges and opportunities; http://www3.weforum.org/docs/WEF_GAC_Genetics.pdf.

Currently, a F&B company depends not only on food and agricultural expertise but also on new techniques in biotechnology, packaging, chemistry, etc. Non-food innovation accounts for around 45 to 50 per cent of the innovations usable in this sector. The boundaries between non-food technological fields and the food chain are often blurred. “Other”, for instance, could include new products and processes in textiles, paper or electronics, apparently unrelated to the food chain. Unlike commodity producers, processors of high value-added foodstuffs rely more on food inventions than on innovation in machinery, chemicals, etc.. Other analysts note that the F&B industry nowadays actively combines a breadth of many different new techniques and scientific discoveries and plays a significant role in selecting and adapting them.²⁹³ Thus, patenting in all these other areas is of relevance to the food industry and *vice versa*.

Patenting in the agri-food industry is pertinent to a very large number of stakeholders in the agri-food chain: be it agricultural input sector (seeds/germplasm, GMOs, transgenic plants and animals, fertilizers, pesticides, herbicides), agricultural equipment and machinery, cold-chain technologies, precision agriculture technologies, food processing technologies (for example, to speed up production, to process, stabilize color and to improve taste), food processing equipment, food preservation technologies, clean-in-place process technologies in the F&B industry, functional food packaging, food storage technologies, food packaging equipment technologies, food serving technologies (robotics), bioinformatics, food monitoring technologies, food safety technologies, functional food technologies, food aroma technologies, food texture technologies, technologies for lowering costs of food ingredients, etc. Then there are patents in nanotechnology which also promise to provide a means of altering and manipulating food products to more effectively deliver nutrients like protein and antioxidants for precisely targeted nutritional and health benefits. Shefer developed the encapsulated system, which resulted in nano-spheres and micro-spheres. The major potential product applications for the nano-sphere/micro-sphere system are baked goods, refrigerated/frozen batters, tortillas and flat breads, processed meat products, seasonal confectionery, specialty products, chewing gums, dessert mixes, and nutritional foods.^{294,295,296}

Box 3.30: Patenting of speciality foods and an example of patent claims

The complex systems used for developing specialty foods or combining spices and ingredients into new flavorings are, at their core, technological innovations that can be

²⁹³ Technological fields and concentration of innovation among food and beverage multinationals, Oscar Alfranca, Ruth Rama, and Nicholas von Tunzelmann, International Food and Agribusiness Management Review, Volume 5, Issue 2, 2003, p. 2; <http://www.ifama.org/files/rama.PDF>.

²⁹⁴ Shefer A and S Shefer Biodegradable bioadhesive controlled release system of nano- particles for food products, U.S.patent 2003a; 6565873BI.

²⁹⁵ Shefer A and S Shefer Multi component biodegradable bioadhesive controlled release system for food products. U.S. patent 2003b; 6: 589,562BI.

²⁹⁶ Shefer A and S Shefer Multi component controlled release system for oral care, food products, nano beverages. U.S. patent application 2003c; 20030152629 AI.

protected by patents. McCormick & Co. has recently filed a patent application in the United States (US 20140272011 A1; WO2014146092)²⁹⁷ for an invention that relates to encapsulation compositions in solid matrices made by a process known as melt extrusion. More particularly, the invention relates to flavor encapsulation compositions in which a flavoring agent is encapsulated by melt extrusion in a glassy, amorphous, or in a viscoelastic solid dense matrix containing spices, herbs, fruit, and vegetable powders as a major part of the matrix. The flavoring agent can be inherently present in the extruded spices, herbs, fruit and vegetable powders or intentionally added to enhance functionality. The incorporation of spices, herbs, fruit, and vegetable powders in the matrix creates an active carrier protecting and modulating the flavor and functionality of the encapsulated flavors or other encapsulates. In addition, interactions between the matrix components and flavors can create unique new flavors. The invention also relates to processes for preparing such compositions. The **claims** in this **patent application** are the following:

1. A solid particulate extrusion encapsulation composition, comprising:

(A) an encapsulate, encapsulated in,

(B) a solid dense matrix comprising one or more matrix components, and one or more plasticizers;

wherein said solid dense matrix (B) comprises:

- (i) at least one of a spice, an herb, a fruit powder, a vegetable powder, and a mixture thereof, in an amount of above 40 per cent and up to 100 per cent by weight based on the total weight of said solid dense matrix (B); and
- (ii) at least one carbohydrate or protein in an amount of 0 to 50 per cent by weight based on the total weight of said solid dense matrix (B);

wherein the encapsulate (A) is present in the extrusion encapsulation composition in an amount of from 0.1 per cent to 20 per cent by weight, based on the total weight of the extrusion encapsulation composition;

wherein said extrusion encapsulation composition is prepared by a process comprising:

- (i) mixing the matrix components of the dense matrix (B), the encapsulate (A), and the plasticizer, thereby obtaining a blend;
- (ii) in at least one extruder melting the blend, dispersing the encapsulate in the melted blend to form a viscous dispersion, and optionally cooling the viscous dispersion in the extruder or in a combination of extruders;

²⁹⁷ Patentscope, WIPO;

<http://patentscope.wipo.int/search/en/detail.jsf?docId=WO2014146092&recNum=1&office=&queryString=FP%3A%28WO%2F2014%2F146092+%29&prevFilter=&sortOption=Pub+Date+Desc&maxRec=1>.

- (iii) shaping, extruding, and die-face cutting said viscous dispersion, thereby obtaining said extrusion encapsulation composition, wherein said encapsulate (A) is encapsulated in the glassy matrix (B),
 - (iv) optionally drying the extruded encapsulation composition, and,
 - (v) further cooling the encapsulation composition.
2. A food product comprising the extrusion encapsulation composition of Claim 1.
 3. The composition of Claim 1, wherein the solid dense matrix further comprises one or more plasticizers in an amount of at least 5 per cent by weight based on the total weight of the extrusion encapsulation composition.
 4. The composition of Claim 1, wherein the glassy matrix comprises at least one carbohydrate selected from the group consisting of a starch, a modified starch, a gum, a maltodextrin, a sugar, a polyol, a corn syrup solid, a modified cellulose, an inulin or other oligosaccharide, a polydextrose, a cyclodextrin, an organic acid, a salt of an organic acid, and mixtures thereof.
 5. The composition of Claim 4, wherein the carbohydrate is present in an amount of up to 20 per cent by weight based on the total weight of the extrusion encapsulation composition.
 6. The composition of Claim 1, wherein the matrix (B) comprises less than 30 per cent water before the melting.
 7. The composition of Claim 1, wherein the matrix mixture further comprises up to 30 per cent of at least one plasticizer before the melting.
 8. The composition of Claim 1, which has a glass transition temperature in the range from 30°C to 90°C.
 9. The composition of Claim 1, wherein said dense matrix (B) comprises 50 per cent to 100 per cent by weight based on the total weight of said dense matrix (B) of at least one selected from the group consisting of a spice, an herb, and mixtures thereof.
 10. The composition of Claim 1, wherein said dense matrix (B) comprises 70 per cent to 100 per cent by weight based on the total weight of said dense matrix (B) of at least one selected from the group consisting of a spice, an herb, a fruit powder, a vegetable powder, and mixtures thereof.
 11. The composition of Claim 1, wherein said dense matrix (B) comprises 95 per cent to 100 per cent by weight based on the total weight of said dense matrix (B) of at least one selected from the group consisting of a spice, an herb, a fruit powder, a vegetable powder, and mixtures thereof.
 12. The composition of Claim 1, wherein said dense matrix (B) comprises 95 per cent to 100 per cent by weight, based on the total weight of said dense matrix (B), of at least one selected from the group consisting of a spice, an herb, and

mixtures thereof.

13. The composition of Claim 1, wherein said encapsulate (A) is at least one selected from the group consisting of a flavor, a fragrance, a vitamin, a dietary supplement, a medication, a preservative, a color, and a pesticide.
14. The composition of Claim 9, wherein said encapsulate (A) is a flavor.
15. The composition of Claim 10, wherein said encapsulate (A) is a flavor.
16. The composition of Claim 14, wherein said flavor is at least one selected from the group consisting of a natural extract, a natural flavor, an oleoresin, an essential oil, a protein hydrolyzate, a reaction flavor, an artificial flavor, and a compounded flavor.
17. The composition of Claim 3, wherein said plasticizer is at least one selected from the group consisting of water, glycerin, propylene glycol, and mixtures thereof.
18. The composition of Claim 1, wherein said mixing, melting, dispersion, and cooling are performed in an extruder selected from the group consisting of a single screw extruder, a twin screw extruder, or in a combination of the extruders.
19. The composition of Claim 1, wherein said shaping is performed by extruding the viscous dispersion through a die to form strands, and subsequently milling the strands after drying and cooling.
20. The composition of Claim 1, wherein said shaping is performed by extruding and die-face cutting the viscous dispersion with a cutter to form particles, and subsequently cooling the particles and optionally drying.

The food industry makes use of a variety of food-processing enzymes, such as amylases and lipases, the properties of which are improved using rDNA technology and protein engineering. The deletion of native genes encoding extracellular proteases, for example, increases enzyme production yields of microbial hosts. In fungi, for example, the production of toxic secondary metabolites has been reduced to improve their productivity as enzyme-producing hosts. Some large groups of enzymes like proteases, amylases and lipases are important for both food and detergent industries, as they have a broad range of industrial applications. Proteases, for example, are used for several applications in the food industry regarding low allergenic infant formulas, milk clotting and flavors. Amylases are also important for both food and detergent industries. In the food industry, they are used for liquefaction and saccharification of starch, as well as in the adjustment of flour and bread softness and volume in baking. Amylases are also important for both food and detergent industries. The conversion of starch to bioethanol or to functional ingredients requires microbial fermentation in the presence of biocatalysts such as amylases to liquefy and saccharify starch. To improve the industrially important properties of amylases, such as high activity, high thermo- and pH-stability, high productivity, etc.; recombinant enzyme technology, protein engineering

and enzyme immobilization have been used. In a recent review article, rice was given as a typical example for biocatalytical production of useful industrial products and functional foods from cheap agricultural raw materials and transgenic plants. Another major group of enzymes utilized by food and detergent industries is constituted by lipases. They are used in many applications of food industry such as for the stability and conditioning of dough (as an *in situ* emulsifier), and in cheese flavor applications.²⁹⁸

Box 3.31: Patenting by the McCormick & Company²⁹⁹

McCormick & Co., the food manufacturer best known for its spices and herbs, boldly promotes the strength of its R&D, which has produced extremely valuable patents. Far from simply putting its ubiquitous red canisters on grocery shelves, *the 115-year-old company dedicates most of its resources to R&D and, subsequently, to **patenting a wide array of consumer products, including batters, spices, sauces and marinades.***³⁰⁰

McCormick & Company Incorporated manufactures, markets and distributes spices, seasoning mixes, condiments and other flavorful products to the food industry comprising retail outlets, food manufacturers, and foodservice businesses.

Segments

The company operates in two segments, Consumer and Industrial.

Consumer Business

From locations worldwide, its brands reach consumers in approximately 125 countries and territories. The company's brands in the Americas include McCormick, Lawry's and Club House. The company also markets authentic ethnic brands such as Zatarain's, Thai Kitchen and Simply Asia. In Europe, the Middle East and Africa its major brands include the Ducros, Schwartz and Kamis brands of spices, herbs and seasonings and a line of Vahiné brand dessert items. In the Asia/Pacific region, the company markets products under the McCormick and DaQiao brands in China. In the Commonwealth of Australia, its primary brand is McCormick, and in the India, its majority-owned joint venture owns and trades under the Kohinoor brand. Approximately 250 other brands of spices, herbs and seasonings are sold in the United States with additional brands in international markets. Some are owned by large food manufacturers, while others are supplied by small privately owned companies.

Industrial Business

²⁹⁸ Protein engineering methods and applications, Burcu Turanli-Yildiz, Ceren Alkim, and Z. Petek Cakar , pages 9 and 10; <http://cdn.intechopen.com/pdfs-wm/29172.pdf>

²⁹⁹ Bloomberg Business website write up on McCormick & Co-non vtg shrs (MKC:New York); http://investing.businessweek.com/research/stocks/snapshot/snapshot_article.asp?ticker=MKC

³⁰⁰ Complement research with patent protection by Joe Berghammer, Partner, Banner and Witcoff, Food processing, The information source for food and beverage manufactures, September 24, 2005; <http://www.foodprocessing.com/articles/2005/516/>

In its industrial business, the company provides a range of products to multinational food manufacturers and foodservice customers. The foodservice customers are supplied both directly and indirectly through distributors. The company's range of products includes seasoning blends, spices and herbs, condiments, coating systems and compound flavors.

Customers

In the Consumer segment, products are sold to consumers through various retail outlets, including grocery, mass merchandise, warehouse clubs, discount and drug stores under various brands.

In the Industrial segment, products are used by F&B manufacturers as ingredients for their finished goods and by food-service customers as ingredients for menu items to enhance the flavor of their foods. The company's major customers include Wal-Mart Stores, Inc. and PepsiCo, Inc.

R&D

The company's expenditure for R&D was 61, 300, 000 USD in 2013.

Governmental Regulation

In the United States, the safety, production, transportation, distribution, advertising, labeling and sale of many of its products and their ingredients are subject to the *Federal Food, Drug, and Cosmetic Act*, the *Food Safety Modernization Act*, the *Federal Trade Commission Act*, *state consumer protection laws*, *competition laws*, *anti-corruption laws*, *customs and trade laws*, *federal, state and local workplace health and safety laws*, *various federal, state and local environmental protection laws*, and *various other federal, state and local statutes and regulations*.

Box 3.32: Enzyme applications and patenting in the food industry^{301,302}

Foods modified by and containing (animal, plant and microbial) enzymes prior to ingestion have been consumed by humans for millennia. Early examples of enzyme applications are cheese and bread-making, dry aging of meats, and a variety of fermentation processes including brewing, wine and vinegar production and lactic acid fermentations. Yeast has been used medically not only as a source of vitamins but also to combat constipation and to stimulate normal digestion by the action of yeast proteases and amylases.

The enzyme industry as it exists today began in the late 19th century. By 1894, Dr. Jokichi Takamine had been granted U.S. Patent 525,823 for a process of making diastatic enzyme, which detailed the process and extraction of amylases from koji

³⁰¹ Health & dietary supplements, Enzyme, Technical Association; http://www.enzymeassociation.org/?page_id=51.

³⁰² Novozymes, enzymes at work, rethink tomorrow...; http://www.novozymes.com/en/about-us/brochures/Documents/Enzymes_at_work.pdf.

(*Aspergillus oryzae*). His patented product, Taka-diastase, was marketed by Parke, Davis & Company as a digestive aid throughout the world.

By 1932, Dr. Edward Howell formed a company in Illinois to provide supplemental enzymes to replace those destroyed in cooking, canning and food processing. Dr. Howell's 1947 survey "Status of food enzymes in digestion and metabolism" cites use of papain as an aid to digestion and a benefit to "digestive disturbances of widely different kinds." Fungal amylase is similarly cited as used in digestive tract therapy, as are lipases and pancreatic extracts.

The first major breakthrough for microbial enzymes in the food industry came in the early 1960s with the launch of a glucoamylase that allowed starch to be completely broken down into glucose. Since then, almost all glucose production has changed to enzymatic hydrolysis from traditional acid hydrolysis. For example, compared to the old acid process, the enzymatic liquefaction process cut steam costs by 30 per cent, ash by 50 per cent and by-products by 90 per cent.

Since 1973, the starch-processing industry has grown to be one of the largest markets for enzymes. Enzymatic hydrolysis is used to form syrups through liquefaction, saccharification, and isomerization.

Another big market for enzymes is the baking industry. Supplementary enzymes are added to the dough to ensure high bread quality in terms of volume and a uniform crumb structure. Special enzymes can also increase the shelf life of bread by preserving its freshness longer.

A major application in the dairy industry is to bring about the coagulation of milk as the first step in cheese making. Here, enzymes from both microbial and animal sources are used.

In many large breweries, industrial enzymes are added to control the brewing process and produce consistent, high-quality beer.

In food processing, animal or vegetable food proteins with better functional and nutritional properties are obtained by the enzymatic hydrolysis of proteins.

In the juice and wine industries, the extraction of plant material using enzymes to break down cell walls gives higher juice yields, improved color and aroma of extracts, and clearer juice.

**Box 3.33: Hormel Foods Specialty Products Division and VIRUN®,
Granted U.S. Patent No. 8,741,373; July 09, 2014³⁰³**

VIRUN® and the Specialty Products Division at Hormel Foods were granted **U.S. Patent number 8,741,373, Composition for Non-Polar Compounds**. This particular patent allows unwavering high oil load encapsulation of non-polar compounds, such as Omega-3 EPA and DHA, CoQ10, Vitamins A, D, E, K, Carotenoids such as Lutein, Beta Carotene or Astaxanthin into certain water soluble and stable foods and beverages.

Walnut, CA, July 09, 2014 – (PR.com) – VIRUN³⁰⁴ and the Specialty Products Division at Hormel Foods announce the granting of U.S. patent number 8,741,373 after only three years. This patent marks VIRUN's first joint patent-grant since the company's inception and accentuates the growing trend toward smaller R&D cooperation with large, professional corporate organizations, such as Specialty Products at Hormel Foods. These types of joint ventures lead to avant-garde thinking and accelerated new product categories that inevitably stimulate and satisfy consumer demand.

Omega-3 EPA and DHA in certain foods and beverages

Together, the Specialty Products Division at Hormel Foods and VIRUN have developed dozens of finished product applications utilizing this particular patent combined with Omega-3 EPA and DHA, such as single serving smoothie ready-to-drink beverages, baked good products, tomato sauces, dips, orange juices and low fat dairy products. These products do not just include Omega-3 EPA and DHA, but go above-and-beyond the usual doses of EPA and DHA typically found in a food or beverage. One notable application developed using patent number 8,741,373 is a 600 mg EPA and DHA 8 oz smoothie with 10 grams of protein that is stable under ambient conditions for up to a year unopened. No matter what food, beverage or supplement application, the Specialty Products Division at Hormel Foods and VIRUN deliver innovation that exceeds expectation with their patented technology.

Joint innovation s Division at Hormel

Great ideas are the lynchpins of great inventions. As individuals, our ideas can often be limited by the extent of our own experiences and understanding. However, as a collective group, where more than one individual contributes to the idea, the corroborative effort spans further than what we may have invented ourselves. The Specialty Products Division at Hormel Foods and VIRUN demonstrate this concept; that

³⁰³ Hormel Foods Specialty Products Division and VIRUN® Granted Patent No. 8,741,373, PR.com; <http://www.pr.com/press-release/569191>.

³⁰⁴ About VIRUN: We are a Nutra-BioSciences™ company formed in 2003, headquartered in Walnut, CA, with an emphasis on safe and effective delivery technology for pharmaceuticals, dietary supplements, foods and beverages. Our aim is to focus on delivery to the human body, via improving the efficacy of nutrients utilizing our patent and patents pending technologies. In addition to over 40 patents and patents-pending, VIRUN recently received a joint patent with Specialty Products Division at Hormel Foods that combine fully integrated research and production facilities with manufacturing in California and finished product processing in Florida; <http://www.virun.com/>.

collective thinking and joint innovation can be used to create great products which draw upon the strengths of the collaborating entities. The Specialty Products Division at Hormel Foods can allocate its extensive knowledge of successful brand-inclusion and product development while VIRUN contributes its unique Nutra-BIOsciences delivery technology platform; the ultimate creation is an infusion of patented ingredients for foods, supplements and beverages, such as the FUXIONS™ brand of ingredients offered by Hormel Foods.

Nicole Shute, marketing manager of the Specialty Products Division at Hormel Foods, commented, “we have an entire menu of developed products with omega-3 EPA and DHA that we can offer our customers. Using this patent, we can deliver almost any oil or non-polar compound.”

Chet Rao, strategy and business development manager of the Specialty Products Division at Hormel Foods and co-inventor of patent number 8,741,373 stated, “we collaborated with Philip Bromley, CEO of VIRUN, four years ago, and this application being granted shows that joint innovation between two companies can be successful.

FUXIONS branded ingredients

New food, beverage and supplement applications can be difficult to develop, and the resources required to achieve the desired specification can also be expensive and time consuming. The Specialty Products Division at Hormel Foods takes the burden away from having to develop the application internally. Contact the Specialty Products Division at Hormel Foods today and make an impossible concept a reality.

Box 3.34: Patents and PEF cooking³⁰⁵

Pulsed electric fields (PEF) is a non-thermal method of food preservation that uses short pulses of electricity for microbial inactivation and causes minimal detrimental effect on food quality attributes. PEF technology has been presented as advantageous in comparison to, for instance, heat treatments, because it kills microorganisms while better maintaining the original color, flavor, texture, and nutritional value of the unprocessed food. Apple and orange juices are among the foods most often treated in PEF studies. The sensory attributes of juices are reported to be well preserved, and the shelf life is extended. Yogurt drinks, apple sauce, and salad dressing have also been shown to retain a fresh-like quality with extended shelf life after processing. Other PEF-processed foods include milk, tomato juice, carrot juice, pea soup, liquid whole egg, and liquid egg products.³⁰⁶

Another application of a not-so-novel-anymore technology is cooking with PEF. Relatively mild PEF treatments had been shown to separate cells in animal and plant

³⁰⁵ Novel Applications of Sometimes-Novel Processing Technologies, By Huub Lelieveld, Food Safety Magazine, April/May 2014; <http://www.foodsafetymagazine.com/magazine-archive1/aprilmay-2014/novel-applications-of-sometimes-novel-processing-technologies/>.

³⁰⁶ Refer to p. 2 of Pulsed Electric Fields for Food Processing Technology, Chapter 11, Maged E.A. Mohamed and Ayman H. Amer Eissa, INTECH, 2012; <http://cdn.intechopen.com/pdfs-wm/38363.pdf>.

tissues. Because PEF also perforates cell membranes, the author had the idea in 2008 that PEF could also be suitable for making tough meat tender. This was followed up initially by small-scale (~1 g), but successful experiments by Van Oord and Lelieveld that showed that in a few seconds—with an actual treatment time of just a few milliseconds—stew meat became tender. Similarly, potatoes were ready to eat in a short time. *Van Oord decided to patent the application and to scale up the equipment, resulting in several prototypes that were made available to a few restaurants, among which was a Michelin three-star restaurant.* The owner and chef of the latter declared that the meat prepared with the PEF equipment was better than could be achieved in a traditional way. This resulted in several innovation awards in the past few years and ultimately in commercial equipment. Investigations by Mastwijk showed that for the cooking of potatoes, the total amount of energy needed is less than 20 per cent of what is needed for traditional cooking. Because tenderness is achieved in milliseconds, stew meat requires less than about 5 per cent of the energy, mainly to heat the meat to serving temperature.

Box 3.35: LiquiGlide pursues international patent protection for its liquid-impregnated surface technology and non-toxic, self-lubricating surfaces for food packages and food processing equipment³⁰⁷

Cambridge, Mass. s international patent *LiquiGlide Inc. today announced it has initiated international patent filings to protect the IP of its liquid-impregnated surface technology. Protecting LiquiGlide's unique IP globally is a top priority as the company looks to swiftly commercialize internationally. The international patent filing is directly related to United States Patent 8,574,704 – granted to the Massachusetts Institute of Technology (MIT) by the U.S. Patent Office. MIT currently holds two patents for the slippery coating technology with more than a dozen pending, and LiquiGlide, Inc. is the sole commercial entity with exclusive licensing rights.*

The '704 patent was originally granted in November 2013, and describes the company's unique method for creating permanently wet slippery surfaces by stably trapping liquids in a matrix of solid, micro-scale engineered features – reducing friction for viscous liquids moving across treated surfaces. In addition to the *liquid-impregnated surfaces patent*, MIT has also been granted United States Patent 8,535,779 for self-lubricating surfaces for food packaging and food processing equipment, which relates to LiquiGlide's practical, non-toxic applications for sticky foods like peanut butter and mayonnaise.

As part of LiquiGlide's international patent strategy, the company filed an international patent application under the Patent Cooperation Treaty (PCT), in relation to the '779 patent in order to seek protection of its IP in 148 countries. As a result of that application, the European Patent Office (EPO) acting as the International Searching

³⁰⁷ LiquiGlide Lays Legal Groundwork for Global Commercialization, Cambridge, Mass., USA Maged E.A. es-novel-processing-technologies/tive delivery technh<http://liquiglide.com/wp-content/uploads/2014/09/140910-LiquiGlide-International-Patents.pdf>.

Authority (ISA) has conducted a patent search and issued an International Search Report (ISR), which did not identify any references that would preclude patentability of LiquiGlide's non-toxic coating technology. This is a major milestone in LiquiGlide's initiative to protect its unique IP.

"It's critical that we take steps to protect our IP, and we're making that investment now as an important step toward global commercialization," said LiquiGlide CEO and Co-Founder, Dave Smith. "We know we have something special; LiquiGlide is the only commercially viable solution for creating permanently wet slippery surfaces," continued Smith. "We have a global-reaching technology with immense potential and broad applications. We believe not only will LiquiGlide become an industry standard for consumer goods, but it will have immense implications far beyond the packaging sector, including eliminating waste, enabling innovation and even saving lives."

Box 3.36: Patented absorbent packaging of Maxwell Chase Technologies³⁰⁸

Maxwell Chase Technologies specializes in the development and manufacturing of absorbent packaging that delivers freshness and extends the shelf life of fresh and fresh-cut foods. The company holds several patents that cover its absorbent packaging including trays, pads, pouches, retail containers, and its semi-automatic and automatic slicers. Maxwell Chase has an ongoing commitment to R&D, with specific emphasis on food safety and shelf life extension. Maxwell Chase Technologies' food packaging solutions are improving quality and extending shelf life in fresh foods, including fresh-cut fruits, vegetables, meats, poultry, and seafood around the world. The Company's equipment line integrates with their packaging to deliver superior yield and lower labor costs. The Company also offers Ice Wrap™ products, which are cost-effective replacement for gel packs, due to shipping them dry then hydrating and freezing in-house for a complete solution lineup for fresh-cut processors and others.

Maxwell Chase's forte is to design specific packaging solutions for a variety of applications. The Company's aim is to offer cost-effective packaging and equipment that delivers freshness, extends shelf life and absorbs excess fluids and juice from fresh-cut foods.

Food Packaging

The **Fresh-R-Pax®** absorbent technology comprises of a *patented blend of food safe items* that comply with both FDA and European Union food contact regulations, as well as being natural food ingredients. This technology which extends the shelf life and quality of fresh-cut foods incorporates into absorbent pads, pouches, trays and retail containers. These are sold in different sizes and shapes to meet your product and packing needs, no matter the item.

IceWrap™

³⁰⁸ Maxwell Chase Technologies, LLC, Absorbent Packaging and Equipment; <http://www.maxwellchase.com/>.

IceWrap™ is a cost-effective ice blanket that maintains the quality of temperature-sensitive products during shipment. It replaces dry ice, regular ice and gel packs during shipment. It won't freeze your sensitive products like dry ice, it won't melt like ice, and it won't cost to ship water like gel packs due to its light weight before hydration.

Processing Equipment

MCT Equipment offers semi- and fully automated slicers, tray sealers and pouch fillers. The equipment fully integrates with the company's absorbent food packaging and cuts costs while improving yields. *We are constantly inventing new ways to make it more cost-effective and easier to pack your product in our packaging.*

Box 3.37: The Australian food industry: A patent analytics report, 2014³⁰⁹

This study identified 28,997 food-related PCT applications (inventions) worldwide; of which 704 were designated Australian because they had an Australian applicant or an Australian inventor. Of the 704 Australian food inventions, 501 inventions (71 per cent) listed only Australian inventors, which indicates that the innovative activity for these Australian food inventions took place domestically. The study identified 1,050 food related inventions that originated from Australia between 2000 and 2011. With 2 per cent of the global food inventions, Australia ranks 14th in food patenting globally a performance comparable with Canada and Sweden.

The Commonwealth of Australia exhibits a positive technological specialization in the food industry, which means that the share of food patents filed by Australian inventors is more than the overall proportion of food patents filed worldwide. The results indicate Australia's relative importance in innovative activity in the field. Regional specializations include South Australia's wine and beer brewing, Queensland's slaughtering, New South Wales' bakery and Victoria's beverages.

In terms of the volume of patent filings, the sub-industries that have a sustained presence over the study period include: cocoa, confectionery and chocolate, beverages including wine, beer brewing and tea extraction, dairy and cheese, and bakery. Other inventions include containers for food storage, food transport, food with nutritive value, food preservation and extension of shelf life.

Inventions in the cocoa/chocolate, confectionery, wine and tea areas appear to be targeting product improvements that relate to consumer preferences, prolonging shelf-life, and improvements in production.

Many inventions in therapeutic foods and foods as medicine, such as probiotics, address a new need or demand in society.

Around 45 per cent of all Australian food inventions are cited by follow on inventors. Collaboration in Australian food inventions is a defining characteristic of many prolific inventors and occurs in approximately 23 per cent of the filings. The Commonwealth of

³⁰⁹ The Australian Food Industry: A Patent Analytics Report 2014, Australian Government, Department of Industry, IP Australia; [http://www.ipaustralia.gov.au/uploaded-files/reports/The Australian Food Industry Patent Analytics Report.pdf](http://www.ipaustralia.gov.au/uploaded-files/reports/The%20Australian%20Food%20Industry%20Patent%20Analytics%20Report.pdf).

Australia's national science agency CSIRO is the most prolific filer and most prominent collaborator.

Applicants with higher filings are generally large employers with a focus on food research and production, such as CSIRO, Moffat, Murray-Goulburn Co-operative, Horizon Science, and Agriculture Victoria Services.

3.5.6 Exclusions from patentability: what is patentable subject matter?³¹⁰

The WTO's TRIPS Agreement provides for the following:

Article 27(1): "Subject to the provisions of paragraphs 2 and 3, patents shall be available for any inventions, whether products or processes, in all fields of technology, provided that they are new, involve an inventive step and are capable of industrial application. Subject to paragraph 4 of Article 65, paragraph 8 of Article 70 and paragraph 3 of this Article, patents shall be available and patent rights enjoyable without discrimination as to the place of invention, the field of technology and whether products are imported or locally produced."³¹¹

In most national or regional patent laws, patentable subject matter is defined negatively, i.e., by providing a list of what type of inventions cannot be patented. In view of the flexibilities built into the TRIPS Agreement of the WTO, there are considerable differences amongst countries in this regard; examples of areas that are often excluded from patentability in many jurisdictions include the following:

- Abstract ideas, laws of nature, natural phenomena, and scientific theories;
- Aesthetic creations;
- Schemes, rules and methods for performing mental acts;
- Substances as they naturally occur in the world, i.e., "products of nature";
- Inventions the exploitation of which may affect public order, morality³¹² or public health;
- Diagnostic, therapeutic and surgical methods of treatment for humans or animals;
- Plants and animals other than microorganisms, and essentially biological processes for the production of plants or animals other than non-biological and microbiological processes,³¹³ and

³¹⁰ *Inventing the Future: An Introduction to Patents for Small and Medium-sized Enterprises*, p. 14; http://www.wipo.int/edocs/pubdocs/en/sme/917/wipo_pub_917.pdf

³¹¹ Part II http://www.wipo.int/edocs/pubdocs/en/sme/917/wipo_pub_917.pdf "gieszation; Enterprises, Analytics_Report.pdfs_Report.pdf" http://www.wto.org/english/docs_e/legal_e/27-trips_04c_e.htm.

³¹² Refer to Article 27.2 of the WTO TRIPS Agreement: "Members may exclude from patentability inventions, the prevention within their territory of the commercial exploitation of which is necessary to protect ordre public or morality, including to protect human, animal or plant life or health or to avoid serious prejudice to the environment, provided that such exclusion is not made merely because the exploitation is prohibited by their law."

³¹³ Refer to Article 27.3b of the WTO TRIPS Agreement: "Members may also exclude from patentability:

- (a) diagnostic, therapeutic and surgical methods for the treatment of humans or animals;
- (b) plants and animals other than micro-organisms, and essentially biological processes for the production of plants or animals other than non-biological and microbiological processes. However, Members shall provide for the protection of plant varieties either by patents or by an effective sui generis system or by any combination thereof."

- Computer programs.

Box 3.38: Morality and patenting of plants in Europe³¹⁵

In Europe, in principle, any invention in any field of technology has to be eligible under the ethical clause. However, the morality rule is put to a test more often in biotechnology than in other industries. As a result, in Europe, morality functions as a significant restriction on patenting in biotechnology.

The question of morality and plants came up with the grant of a patent on a GM plant (Lubrizon case). On opposition, the EPO Opposition Division decided that the exclusion of patentability in Article 53(a) of the European Patent Convention (EPC) for inventions, which are contrary to public order and morality, concerns only extreme cases which are universally regarded as abhorrent. In view of the consideration that the actual patent related to an invention that might be used for creating new plants; the nutritive value of which is increased in comparison with conventionally obtained plants, and that the plants covered by said patent might give rise to a better management of food shortage in the world; the Opposition Division ruled that the exploitation of such an invention could not, therefore, be considered immoral or against public order and decided that a violation of Article 53(a) EPC was not apparent.

In a later plant patent case (Plant Genetic Systems), the Opposition Division reached a similar decision. On appeal, the Technical Board of Appeal specified the twin concepts *ordre public* and morality in the latter case. The Board set forth that the concept of *ordre public* covers the protection of public security and the physical integrity of individuals as part of society, and the protection of the environment. The Board added that the concept of morality is related to the belief that some behavior is right and acceptable, whereas other behavior is wrong, this belief being founded on the totality of the accepted norms which are deeply rooted in a particular culture. The Board concluded that the evidence provided by the appellant did not lead to the definite conclusion that the exploitation of the invention would seriously prejudice the environment and run counter to *ordre public*, and that plant biotechnology *per se* cannot be regarded as being more contrary to public morality than traditional selective breeding.

The United States has never excluded biological material, including plant varieties, from the scope of patentable subject matter. Plant varieties can be protected in the United States under a system of plant patents, or under a system of utility patents or under the Plant Variety Protection Act (PVPA). In the United States, it was recently held that an isolated DNA segment is a “product of nature” and, therefore, excluded from

³¹⁴ “WTO members agreed on 11 June 2013 to extend until 1 July 2021 the deadline for the LDCs to protect IP under the WTO’s TRIPS Agreement, with a further extension possible when the time comes,” http://www.wto.org/english/news_e/news13_e/trip_11jun13_e.htm. Even so, this extension does not diminish the pressure to develop IPR legislation for plant varieties in several countries, because bilateral trade negotiations between developing countries and the United States or EU often include requirements that go beyond the TRIPS requirements (the so-called “TRIPS-plus” requirements). These developments towards strengthened IPRs arise from a trade perspective rather than from a perspective of increasing innovation in the developing countries concerned; http://siteresources.worldbank.org/INTARD/Resources/IPR_ESW.pdf.

³¹⁵ Policy levers tailoring patent law to biotechnology: Comparing U.S. and European approaches, Geertrui Van Overwalle, UC IRVINE LAW REVIEW, Vol. 1:2, pages 17 and 18; <http://www.law.uci.edu/lawreview/Vol1No2Articles/VanOverwalle.pdf>.

patentability. In June 2013, the U.S. Supreme Court issued its third decision in as many years on judicially created doctrines of patent ineligibility. In *Association for Molecular Pathology v. Myriad Genetics, Inc.*, the Court held that an “isolated” DNA molecule is patent-ineligible if its sequence is the same as a naturally occurring sequence, although a molecule whose sequence does not occur in nature is patent-eligible.^{316,317}

Furthermore, although on face value Myriad may appear limited to genetic material, its rationale may be just as easily applied to other molecules that are discovered in nature but “isolated” and purified from naturally occurring contaminants and associated molecules or to synthetic replicas of such molecules (e.g., a bactericide produced by a mold, a protein produced by an animal that has therapeutic properties or by a plant that affects vegetable longevity, a chemical produced by a plant that can function as a drug, or a compound found in crude oil that functions as a lubricant). For example, in a letter addressed to the U.S. Attorney General and Solicitor General while Myriad was remanded to the Federal Circuit, a number of “industrial, environmental, food and agricultural biotechnology companies” warned against a ruling that would overturn the more than 100-year-old policy of USPTO of granting patents on “new and useful preparations of naturally-sourced chemicals; fungal, bacterial, or algal cultures; enzyme preparations; and other isolated, purified, or modified biological products,” which would create “significant uncertainty” as to patent strength and value in their industries.³¹⁸

In the Commonwealth of Australia, however, isolated nucleic acids, either DNA (e.g., genomic DNA or cDNA) or RNA, are patentable.

³¹⁶ The Supreme Court Holds Genes Are Patent-Ineligible Products of Nature, By Teige P. Sheehan, NYSBA, Bright Ideas, Fall 2013, Vol. 22, No.2; http://www.hrfmlaw.com/img/articles/The_Supreme_Court_Holds_Genes_Are_Patent-Ineligible_Products_of_Nature_article_295628.pdf.

³¹⁷ The exclusion from patentability to “products of nature” has existed in US patent law for many years,” Murray said. “Previously, practice before the US Patent Office was that isolation of a section of DNA from the full strand resulted in a product – the isolated sequence – that does not exist naturally and is, therefore, not a “product of nature”, thus not excluded from patentability. This was the stance previously taken by the US Court of Appeals in this case, and is also the interpretation that has been introduced into statute in Europe by the Biotech Directive. The Supreme Court’s decision, therefore, has the effect of broadening the statutory exclusion in US patent law,” he said. “However, this does not mean that companies will be unable to patent inventions based on isolated DNA sequences in the US. It will still be possible to do so, although patent claims covering such material will have to be worded differently. While it will not be possible to obtain per se product protection on isolated sequences, it will still be possible to protect applications of those sequences using “method of treatment” claims, “diagnostic method” claims, composition claims and other types of claims,” Murray added. The Supreme Court said that Myriad’s gene sequences could not be validly patented by virtue of the fact that “isolating DNA from the human genome severs chemical bonds and thereby creates a non-naturally occurring molecule”. The pharmaceutical giant’s patent claims focused on “the genetic information encoded in the BRCA1 and BRCA2 genes” rather than the “chemical composition” of them, it said. Because synthetically created DNA segments involve the creation of “something new,” those gene sequences cannot, in most cases, be said to be “naturally occurring,” the Supreme Court said. The Court said, though, that it was not offering a view on whether cDNA could be said to satisfy other legal requirements for patentability. “The lab technician unquestionably creates something new when cDNA is made,” the Court said. “cDNA retains the naturally occurring exons of DNA, but it is distinct from the DNA from which it was derived. As a result, cDNA is not a “product of nature” and is patent eligible.. except insofar as very short series of DNA may have no intervening introns to remove when creating cDNA. In that situation, a short strand of cDNA may be indistinguishable from natural DNA;”

³¹⁸ *Ibid.* 314; http://www.hrfmlaw.com/img/articles/The_Supreme_Court_Holds_Genes_Are_Patent-Ineligible_Products_of_Nature_article_295628.pdf.

In Europe, Article 53(b) of the European Patent Convention (EPC), which takes account of UPOV Conventions, specifically excludes the patenting of “plant or animal varieties or essentially biological processes for the production of plants or animals, explaining that “this provision shall not apply to microbiological processes or the products thereof”. Rule 23b(5) of the Implementing Regulations to the EPC considers a process for the production of plants and animals to be essentially biological “if it consists entirely of natural phenomena such as crossing or selection”.

For most of history, however, farmers not only planted and harvested, but also bred and improved, their own crops without any of the restraints now found in some national and regional patent laws; this is so mostly in developed countries. Historically, farmers saved seeds from plants with desirable characteristics, leading over time to the production of plant varieties adapted to local conditions. As a “common heritage” good, plant genetic resources (PGR) were freely exchanged within and between farming communities as individual growers sought to improve the PGR they depended on for their own subsistence. Even in developed countries, patents did not apply to plants until the 20th century. PGR for food and agriculture were considered part of the “common heritage of mankind”, and, as such, were not subject to individual ownership.

Box 3.39: Essentially biological processes for the production of plants or animals (European Patent Office)³¹⁹

A process for the production of plants or animals which is based on the sexual crossing of whole genomes and on the subsequent selection of plants or animals is excluded from patentability as being essentially biological, even if other technical steps relating to the preparation of the plant or animal or its further treatment are present in the claim before or after the crossing and selection steps (see G 1/08 and G 2/07). To take some examples, a method of crossing, inter-breeding, or selectively breeding, say, horses involving merely selecting for breeding and bringing together those animals (or their gametes) having certain characteristics would be essentially biological and, therefore, unpatentable. This method remains essentially biological and unpatentable even if it contains an additional feature of a technical nature, for example the use of genetic molecular markers to select either parent or progeny. On the other hand, a process involving inserting a gene or trait into a plant by GE does not rely on recombination of whole genomes and the natural mixing of plant genes, and hence is patentable. A process of treating a plant or animal to improve its properties or yield or to promote or suppress its growth e.g., a method of pruning a tree, would not be an essentially biological process for the production of plants or animals since it is not based on the sexual crossing of whole genomes and subsequent selection of plants or animals; the same applies to a method of treating a plant characterized by the application of a growth-stimulating substance or radiation. The treatment of soil by technical means to suppress or promote the growth of plants is also not excluded from patentability.

³¹⁹ Guidelines for Examination, European Patent Office; http://www.epo.org/law-practice/legal-texts/html/guidelines/e/g_ii_5_4_2.htm.

Box 3.40: A Sustainable Approach to Livestock Health that Meets Global Food Demands and Maintains Profitability^{320,321}

One sustainable approach to meet evolving global food demands and consumer expectation for healthy foods would be to adopt a system that incorporates efficient health management of livestock with superior inherent health genetics. A good example is dairy cattle with superior genes that have an enhanced ability to mount an effective immune response. These animals have fewer diseases requiring less antibiotic treatment. In turn, this improves food quality and safety, as well as animal wellbeing.

The innovative **High Immune Response** Technology (HIR) illustrates this type of alternative strategy designed to naturally improve livestock health. High Immune Response (HIR) is a *unique patented evaluation technology developed at the University of Guelph, Guelph, Ontario.*

Various articles about HIR and a You Tube video are available for viewing in print and on-line (Ontario Milk Producer July 2011 “Identifying Healthier Cows”; You Tube video: <http://ontag.farms.com/video/bonniemallard-high-immune-response-technology-farms-com>).

The HIR test system for dairy cattle identifies animals with high adaptive immune response capability. This technology has the potential to significantly improve the health and food quality of Canadian dairy cattle by reducing antibiotics and disease treatment costs, and enhancing resistance to major and costly diseases such as mastitis. This system does not rely on GMOs or other synthetic manipulations, but takes advantage of the animal’s natural ability to mount a protective immune response. Dairy cattle with high immune response following immunization with specified inert test antigens are at a lower risk of developing disease in comparison to animals that demonstrate an average or low immune response. Identification of high, average and low immune response dairy cattle may be useful to the producer as an effective health management tool for culling, grouping, breeding and treatment of cattle. To understand how the HIR test works we need to provide a brief background on host response in dairy cattle.

Box 3.41: Patenting by Leprino Foods³²²

Founded in 1950 the family-owned Leprino Foods is an international company headquartered in Denver, Colorado, the United States. It has 11 manufacturing plants that support global sales to over 40 countries. With 9 manufacturing plants throughout the United States, two plants in the United Kingdom, and three innovation labs (including one in Singapore), it relies on both a centralized and decentralized supply chain model with its headquarters responsible for warehousing, corporate purchasing,

³²⁰ A Sustainable Approach to Livestock Health: A position paper for the Canadian Agri-food Policy Institutet.pdfs_Report.pdf” gies/ded that such exclusion is not made merely because the exploitation is prohibited by their law.of Guelph, p. 5; <http://capi-icpa.ca/awards/Wagter-Lesperance2012.pdf>.

³²¹ Genetic Selection of Cattle for Improved Immunity and Health, Author/s: Bonnie A. Mallard, Shannon Cartwright, Mehdi Emam, Kelly Fleming, Natasha Gallo, Doug Hodgins, Marlene Paibomesai, Kathleen Thompson-Crispi and Lauraine Wagter-Lesperance (University of Guelph), Dairy Cattle, Technical articles, Published on: 9/25/2014; <http://en.engormix.com/MA-dairy-cattle/genetic/articles/genetic-selection-cattle-improved-t3273/103-p0.htm>.

³²² Leprino Difference, Innovation, Careers, What Opportunities Awaits You?; <http://www.leprinofoods.com/leprino-difference/innovation/>.

forecasting, and medium-term scheduling. Each plant is responsible for its own direct purchasing and daily execution tasks, including short-term scheduling and warehouse management.

As the world's largest mozzarella manufacturer and cheese supplier to most of the large nationwide pizza chains, Leprino Foods uses some 5 per cent to 7 per cent of the milk supply in the United States at any given time. It is also the largest exporter of whey products in the United States; its dairy segment provides the whey, lactose, and proteins found in a variety of products, including yogurt, baby formula, and animal feed.

MARKETING IDEATIONS and insights help it to create new and innovative products for its customers allowing them to grow as partners. Partnering with its customers provides them with much more than a cheese supplier. They get a solution provider, a problem solver, and an idea factory. They get a company with a dedicated group of marketers and market researchers who want to understand consumer and business trends better than anyone. The customers get a staff of innovative culinary chefs and food scientists with a keen understanding of how to combine great food with smart business. They get the **Innovation Studio™** – marketers, chefs, and product researchers with a passion for food and the business of food. A group whose sole purpose is to ensure that the customers grow faster and more profitably.

PATENTED BREAKTHROUGHS allow Leprino Foods's manufacturing processes to drive differentiation and offer innovative customer solutions. It holds over 50 production and manufacturing patents, and is constantly striving to deliver advanced technology wins for its customers. It will continue to prove our commitment to innovation through investments in people and infrastructure that rivals any other company in the food industry.

PRODUCT FLEXIBILITY is a core competency enabled by the unique Leprino Foods manufacturing process. Using a proven combination of heating, kneading, stretching and mixing, *Leprino Foods' patented pasta filata process* provides an ideal environment to create just about anything a customer could imagine.

Box 3.42: Patent litigation around the kitchen: from ancient Greece to Thermomix®³²³

Spanish Courts have recently decided two interesting cases that show that patent litigation is not the exclusive realm of big pharma or high tech. *Patent litigation extends its tentacles to quotidian cooking tools that we and/or our most significant others use day after day in the kitchen.*

The first judgment, handed down by the Supreme Court on 6 June 2013, put to an end the long-standing judicial battle between the manufacturer of the famous “Thermomix®” automatic cooking machine and a Spanish company that manufactures another automatic cooking machine under the trademark “MyCook®”.

*The proceedings began in 2007, when the claimant filed a **patent infringement action** against the defendant alleging that the latter had infringed three European patents. The*

³²³ Patent litigation around the kitchen: From ancient Greece to Thermomix, Miguel Montagu, Clifford Chance, Kluwer Patent Blog, 19 September 2013; <http://kluwerpatentblog.com/2013/09/19/patent-litigation-around-the-kitchen-from-ancient-greece-to-thermomix/>.

case was assigned to Commercial Court number 5 of Barcelona, one of the only three Barcelona Courts that at present have jurisdiction to decide patent cases. As is usually the case in patent litigation, the defendant filed a counterclaim requesting the revocation of the patents. On 30 December 2008, the Court handed down a judgment upholding the complaint in part, and dismissing the invalidity counterclaim. In particular, the Court considered that the defendant had infringed one of the patents.

Both parties filed an appeal before Section 15 of the Court of Appeal of Barcelona, which is the only section that deals with IP cases since 1993. On 1 July 2010, the Court of Appeal handed down a judgment dismissing the appeal filed by the claimant and upholding in part the appeal filed by defendant. Among other aspects, the Court reversed the declaration of infringement, and declared the nullity of claims 1-18 and claims 20-24 of the patent that the Court of First Instance had found to be infringed.

The claimant filed an appeal before the Supreme Court based on two counts: breach of due process and breach of law. These appeals were dismissed by the Supreme Court in the aforementioned judgment of 6 June 2013.

Patent litigation around the kitchen seems to be here to stay. Or at least it would appear so, as indicated by another judgment handed down by Commercial Court number 6 of Barcelona, which ordered a Spanish company to pay 3.3 million euros to another Spanish company for having allegedly infringed a patent that protects cooking tools that may be use both in traditional and in induction kitchens.

Interestingly, these “patent litigation around the kitchen” cases have taken us back to the very origins of patents, or exclusive rights roughly similar to patents. For example, Chisum et al., in their Principles of Patent Law, quoting a manuscript from Rich (“The Exclusive Right since Aristotle”), wrote that “one of the earliest expressions of an incentive-based system can be found in Sybaris, a Greek colony in southern Italy that existed from 720 to 510 B.C. Known for their luxurious and decadent lifestyle, the Sybarites were said to have enacted a law that gave exclusive rights to those who created certain culinary delights.”

If Sybarites were to resurrect, perhaps they would be fascinated by wonderful cooking devices, such as “Thermomix®” and “MyCook®”. Or maybe they would prefer to continue relishing the joy of cooking by handu

Box 3.43: Nestle files over 250 patent applications per year³²⁴

WIPO recently announced its list of top patent applicants in 2009. Despite the difficult economic climate last year, Nestlé continued to invest in R&D and IP and has increased its ranking in the WIPO list Nestlé has now entered the **top 100 and is the top patent applicant for the F&B industry.**

Leading edge technologies and highly differentiated products, solutions and benefits are key to Nestlé’s four growth drivers and its global brands such as **Nespresso, Nan, Nescafé, Nido and Purina.** Protecting these technologies, products, solutions and benefits significantly contributes to sustaining the competitive advantage coming from Nestlé’s unmatched R&D capability and product and brand portfolio. To do this, Nestlé

³²⁴ Nestl/kluwerpatentblog.com/2013/09/19/patent-litigatiGood Food Good Life, Media, Mar 31, 2010; <http://www.nestle.com/media/newsandfeatures/nestle-tops-food-industry-patent-filings>.

files over 250 patent applications per year and manages a global patent portfolio of about 20,000 patents.

Box 3.44: Tetra Pak began with an innovation³²⁵

The first Tetra Classic carton package changed the milk industry in the 50s. The first ultra-hygienic aseptic Tetra Pak packages revolutionized the food industry in the 60s and 70s. This was one package type. Today, we deliver 236 package types and are as innovative as ever.

The tradition continues

The search for new, efficient ways to help you reach your customers goes on. We put 4 per cent of our annual revenue back into R&D. This focus has enabled our 12 R&D units to produce 5,000 technology patents, 1,000 of which were received in the last 10 years. That's more than anyone in the carton packaging industry.

Box 3.45: The Breville patented Razor-Precision Dose Trimming Tool³²⁶

A barista will quickly tell you that the most important ingredient to deliver an amazing espresso is to use fresh beans and to grind them as close to the time of use as possible. Actually, it's best to limit the time between grinding and extraction to seconds, not minutes. That's why we've built a grinder into the **Barista Express™** espresso machine.

The in-built conical burr grinder allows you to grind only what you need directly into the portafilter. It's fully adjustable in grind size and dose, so you can tweak to taste. The patented Razona dosing tool trims the puck for consistent extraction, while PID digital temperature control delivers accurate water temperature throughout the extraction.

With a dedicated hot water outlet, impressive steam pressure and dual and single wall filters, you'll move from novice to barista in no time at all.

Unlike the United States, the EPC provides that European patents shall not be granted in respect of methods for treatment of the human or animal body by surgery or therapy, nor in respect of diagnostic methods practiced on the human or animal body; however, this does not apply to products—in particular substances or compositions—for use in any of these methods (Article 53 (c) EPC). The reason for this exclusion of medical methods is not because they are not considered inventions, as is the case with subject matter listed under Article 52 (2) EPC. Medical methods can be qualified as inventions but are carved out from patent law as a matter of policy, to ensure that those who carry

³²⁵ Our Package Portfolio, Get to know our packages, Meet the bodyguards of goodness, what is good products, Tatra pak, p. 33; http://www.tetrapak.com/sa/documents/package_portfolio.pdf.

³²⁶ The Barista Express TM, Breville; <http://www.brevilleusa.com/the-barista-expressstm.html>.

out such methods as part of the medical treatment of humans or the veterinary treatment of animals are not inhibited by patents.³²⁷

Box 3.46: Protecting Computer Software

In some countries, the mathematical algorithms, which are the basis of improved functionality of a computer program, may be protected by patents, while in others, they are explicitly excluded as unpatentable subject matter. In some of the latter countries, software-related inventions may still be patentable, provided the software is considered to make a technical contribution to the state of the art.

In most countries, the object and source code of computer programs can be protected by copyright. Copyright protection is not contingent upon registration but optional registration is possible and desirable in some countries. Copyright protection is more limited in scope than patent protection, as it only covers the expression of an idea and not the idea itself. Many companies protect the object code of computer programs by copyright, while the source code is kept as a trade secret.

³²⁷ *Ibid.* 313, p. 20; <http://www.law.uci.edu/lawreview/Vol1No2Articles/VanOverwalle.pdf>.

3.5.7 How is an invention judged to be new or novel?

An invention is new or novel if it does not form part of the prior art. In general, prior art refers to all the relevant technical knowledge available to the public anywhere in the world prior to the first filing date of the relevant patent application. It includes patents, patent applications and non-patent literature of all kinds.

The definition of prior art can differ from country to country. In many countries, any information disclosed to the public anywhere in the world in written form, by oral communication, by display or through public use, constitutes prior art. Thus, in principle, the publication of the invention in a scientific journal, its presentation in a conference, its use in commerce or its display in a company's catalogue could all destroy the novelty of the invention and render it unpatentable.

3.5.8 When does an invention involve an inventive step?

An invention is considered to involve an inventive step (or to be non-obvious) when, taking into account the prior art, the invention would not have been obvious to a person skilled in the particular field of technology. The non-obviousness requirement is meant to ensure that patents are only granted for truly creative and inventive achievements, and not to developments that a person with ordinary skill in the field could easily deduce from what already exists.

Historically, plant breeding was considered not to meet the inventive step criterion, since nearly all the procedures were well known and obvious. Even today, there is little clarity as to how this requirement is met while patent applications for plant breeding are examined by USPTO and EPO, for example.³²⁸ In any case, it is difficult to divine a consistent approach to the assessment of inventive step across most developed country jurisdictions when it comes to conventional plant breeding techniques. The Enlarged Board of Appeal of EPO recently had the opportunity to consider the application of the inventive step requirement to plants produced by traditional breeding methods in Plant Bioscience/Broccoli (T83/05 (2008) EPOR 145). At the priority date of the patent, all of the materials and techniques that were necessary to reproduce the claimed method – including seeds of both *B. villosa* and *B. drepanensis*, the techniques to obtain double haploid lines of broccoli, methods of backcrossing, the selection of hybrids with elevated glucosinolates levels, and the design of molecular markers that segregate with a desired trait – were publicly available or generally known in the art, and the Board accepted that the implementation of these techniques “would not cause any problem to the skilled

³²⁸ Plant Patent Law and Practice: Australia, North America and Europe, Discussion Paper, ARC Discovery Project DP0987639 “Promoting plant plant innovation in Australia: Maximising the benefits of intellectual property for Australian agriculture,” 2011, Australian Centre for Intellectual Property in Agriculture, Sections 3.3 and 3.4, www.acipa.edu.au ; <http://acipa.edu.au/pdfs/plant-patent-law-and-practice-australia-north-america-and-europe.pdf>.

person.” Despite this, the Technical Board of Appeal found that the inventive was not obvious.³²⁹

In respect of claims directed to genetically-modified plants, the EPO has consistently framed the question of whether or not the claimed subject matter contains an inventive step in terms of whether or not the skilled worker, starting from the closest piece of prior art, has a reasonable expectation of success in solving the objective technical problem.³³⁰

3.5.9 What is capable of industrial application?

To be patentable, an invention must be capable of being used for an industrial or business purpose. An invention cannot be a mere theoretical phenomenon: It must be useful and provide some practical benefit. The term *industrial* is meant here in the broadest sense as anything distinct from purely intellectual or aesthetic activity, and includes, for example, agriculture. In some countries, this criterion is expressed as utility. The utility requirement has become particularly important for patents on genetic sequences, because it may not be known at the time of filing the application what they are useful for.

Article 57 of the European Patent Convention states that an invention is susceptible of industrial application “if it can be made or used in any kind of industry, including agriculture.”

3.5.10 What is the disclosure requirement?

According to the national legislation of most countries, a patent application must disclose the invention in a manner sufficiently clear and complete for the invention to be carried out by a person skilled in the specific technical field. In some countries, patent law requires that the inventor disclose the **best mode**³³¹ for practicing the invention. For

³²⁹ *Ibid.* 326; pp. 29-30; <http://acipa.edu.au/pdfs/plant-patent-law-and-practice-australia-north-america-and-europe.pdf>.

³³⁰ *Ibid.* 326; p. 31; <http://acipa.edu.au/pdfs/plant-patent-law-and-practice-australia-north-america-and-europe.pdf>.

³³¹ To obtain a valid U.S. patent, it has traditionally been necessary to include in your patent application a disclosure of the best way you know to practice the invention. This so-called “best mode requirement” reflects the idea that if you are going to seek the legal protection afforded by a patent, then you should not be allowed to leave out of the patent application the best details of the invention. In 2011, Congress passed sweeping patent law legislation, called the America Invents Act (AIA). The AIA changed many aspects of U.S. patent law; including the consequences of failing to disclose in your patent application the “best mode” you are aware of for practicing the invention. Traditionally, if you failed to disclose the best mode in your patent application, then that could be grounds for invalidating the resulting patent. The AIA changed this; no longer can patents be invalidated for failing to include the best mode. The AIA, however, did not change the basic legal requirement that inventors and patent applicants must disclose the best mode in their patent applications. In effect, the AIA left untouched the best mode requirement, but eliminated the punishment, or at least the main punishment, for failing to comply with the requirement. Given these changes, inventors may ask whether they can now leave out of future patent applications the most valuable, sensitive details about their inventions. After all, when we include in our patent application the “special sauce” of the invention, our competitors get to see that information when our patent application is later published; <http://www.lexology.com/library/detail.aspx?g=860cc819-7075-4c7e-9c2a-312065db4bfd>.

patents involving microorganisms, many countries require the microorganism to be deposited at a recognized depository institution.

Disclosure requirements have subtle distinctions in different jurisdictions. For example, in the United States, disclosure requires not only a written description but also a “How to Make” and “How to Use” the invention requirement which constitute “enablement.”³³²

The Budapest Treaty allows deposits of microorganisms at an international depository authority to be recognized in order to meet the requirement of sufficiency of disclosure in patent applications for inventions involving microorganisms. The treaty ensures that an applicant doesn’t need to deposit the biological material in all countries where he/she wants to obtain a patent. The applicant needs only to deposit the biological material at one recognized institution, and this deposit will be recognized in all countries party to the Budapest Treaty.³³³

3.5.11 What rights are granted by patents?

A patent grants its owner the right to exclude others from commercially using the invention. This includes the right to prevent or stop others from making, using, offering for sale, selling or importing a product or process based on the patented invention, without the owner’s permission.

It is important to note that a patent does not grant the owner the *freedom to use* or the right to exploit the technology covered by the patent, but only the right to exclude others. While this may seem a subtle distinction, it is essential in understanding the patent system and how multiple patents interact. In fact, patents owned by others may overlap, encompass or complement your own patent. You may, therefore, need to obtain a license to use other people’s inventions in order to commercialize your own patented invention.

3.5.12 Who is an inventor and who owns the rights over a patent?

The person who conceived the invention is the inventor, whereas the person (or enterprise) that files the patent application is the applicant, holder or owner of the patent. While in some cases the inventor may also be the applicant, the two are often different entities; the applicant is often the company or research institution that employs the inventor.

- **Employee inventions.** In many countries, inventions developed in the course of employment are automatically assigned to the employer. In some countries, this is

³³² The purpose of the requirement that the specification describe the invention in such terms that one skilled in the art can make and use the claimed invention is to ensure that the invention is communicated to the interested public in a meaningful way. The information contained in the disclosure of an application must be sufficient to inform those skilled in the relevant art how to both make and use the claimed invention. The enablement requirement of 35 U.S.C. 112(a) or pre-AIA 35 U.S.C. 112, first paragraph, is separate and distinct from the written description requirement; <http://www.uspto.gov/web/offices/pac/mpep/s2164.html>.

³³³ http://www.wipo.int/wipolex/en/wipo_treaties/details.jsp?treaty_id=7.

only so if it is stated in the employment contract. In some cases (e.g., if there is no employment agreement) the inventor may retain the right to exploit the invention, but the employer is given a non-exclusive right for its internal purposes (called *shop rights*). It is important to find out about the specific legislation in your own country and to ensure that employment contracts deal with issues of ownership over employee inventions to avoid future disputes.

- **Independent contractors.** In most countries, an independent contractor hired by a company to develop a new product or process owns all rights to the invention, unless specifically agreed otherwise in writing. This means that, unless the contractor has a written agreement with the company assigning the invention to that company, in general, the company will have no ownership rights to whatever is developed, even if it paid for the development.
- **Joint inventors.** When more than one person contributes in significant ways to the conception of an invention, they must be treated as joint inventors and mentioned as such in the patent application. If the joint inventors are also the applicants, the patent will be granted to them jointly.
- **Joint owners.** Different countries and institutions have different rules concerning the exploitation or enforcement of patents that are owned by more than one entity or person. In some cases, no single co-owner may license a patent or sue third parties for infringement without the consent of all other co-owners.

3.5.13 How to get a patent – where should you start?

Generally the first step is to perform a prior art search. With over 40 million patents granted worldwide, and millions of printed publications, which are potential prior art against your patent application, there is a serious risk that some reference, or combination of references, may render your invention non-novel or obvious, and, therefore, unpatentable.

A prior art patentability search can prevent you from wasting money on a patent application if the search uncovers prior art references that are likely to preclude patenting. A prior art search should extend to all relevant non patent literature, including technical and scientific journals, textbooks, conference proceedings, theses, websites, company brochures, trade publications and newspaper articles.

Patent information is a unique source of organized technical information, which can be valuable for strategic business planning.³³⁴ Often, patents and published patent applications provide means of learning about current research and technological innovations long before the relevant innovative product appears on the market. Therefore, patent searches should be essential inputs to any company's R&D effort.

³³⁴ For more information, see IP PANORAMATM Module 06, Learning Point 1 at www.wipo.int/sme/en/multimedia/.

To search for patents, a useful starting point is The Lens (an open access, autonomous web-based patent search facility), and in particular, its biological innovation capability, part of which is referred to here as the PatSeq facility.³³⁵

Box 3.47: The Importance of Searching Patent Databases

Aside from revealing whether an invention is patentable, the timely and effective searching of patent databases may provide very useful information on:

- the R&D activities of current and future competitors;
- current trends in a given field of technology;
- technologies available for licensing;
- potential suppliers, business partners or researchers;
- possible market niches at home and abroad;
- relevant patents of others to ensure that your products do not infringe them (*freedom to operate*);
- expired technology that has contributed technology to the *public domain*; and,
- possible new developments based on existing technologies.

3.5.14 How and where can you conduct a prior art search?

The patents and patent applications published by many patent offices are accessible online, thus making it easier to conduct prior art searches. The worldwide dataset for agri-science patents published between 2004 and 2013 contains more than 118,000 published patents equating to over 400,000 patent families.³³⁶

WIPO offers free online access to all published international patent applications processed through the PCT, together with millions of patents from the collections of many National and Regional Offices, through its **PATENTSCOPE** search service at <http://www.wipo.int/reference/en/>

Many IP offices also have made their **patent databases freely available online**.³³⁷ In addition, most national patent offices offer patent search services for a fee.

Access to patent information is considerably simpler thanks to the Internet, but it is not easy to perform a high-quality patent search. Patent jargon is often complex and obscure, and professional searching requires considerable knowledge and expertise. While preliminary searches may be performed through free online patent databases, most companies requiring patent information for making key business decisions (e.g.,

³³⁵ <http://www.lens.org/lens/> and <http://www.lens.org/about/news/exploring-the-scope-of-gene-patents-through-new-levels-of-transparency/>

³³⁶ Eight Great Technologies, Agri-Science: A patent overview, © UK Intellectual Property Office 2014; p. 5; https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/329312/informatics-agriculture.pdf.

³³⁷ Search for Patents, USPTO; <http://www.uspto.gov/patents/process/search/>.

whether to apply for a patent or not) will generally rely on the services of patent professionals and/or use more sophisticated commercial databases.³³⁸

A prior art search can be done based on keywords, patent classification or other search criteria. The prior art uncovered depends on the search strategy employed, the classification system used, the technical expertise of the person who conducts the search, and the patent database being used.

Box 3.48: The International Patent Classification³³⁹

The International Patent Classification (IPC) provides for a hierarchical system of language independent symbols for the classification of patents and utility models according to the different areas of technology to which they pertain. It also serves as an instrument for orderly arrangement of patent documents, a basis for selective dissemination of information and a basis for investigating the state of the art in given fields of technology. Sections are the highest level of hierarchy of the Classification. The IPC divides technology into eight sections with approximately 70,000 subdivisions. Each subdivision has a symbol consisting of Arabic numerals and letters of the Latin alphabet. The 8 sections are:

- A. Human Necessities;
- B. Performing Operations; Transporting;
- C. Chemistry; Metallurgy;
- D. Textiles; Paper;
- E. Fixed Constructions;
- F. Mechanical Engineering; Lighting; Heating; Weapons; Blasting;
- G. Physics; and,
- H. Electricity.

Currently, over 100 countries use the IPC to classify their patents. In order to keep the IPC up to date, it is continuously revised and a new version is regularly published. For more information, refer to: www.wipo.int/classifications/ipc/en/

In the United Kingdom, patents relating to agriculture, horticulture and food and drink processing technologies are mostly found within four classes of the International Patent Classification (IPC) and European patent classification (ECLA).³⁴⁰

- A01 (agriculture; forestry; animal husbandry)

Class A01 includes patents relating to, amongst others, soil working, fertilizing, harvesting, cultivation, manufacture of dairy products, apiculture, and pesticides.

³³⁸ For more information, see IP PANORAMATM Module 03, Learning Points 2 Panorama; <http://www.wipo.int/multimedia-video/en/sme/multimedia/flash/03/>.

³³⁹ International Patent Classification (IPC), WIPO; <http://www.wipo.int/classifications/ipc/en/>.

³⁴⁰ Agrifoods: A brief overview of the UK agri-food patent landscape, UK Intellectual Property Office; https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/312605/informatic-agrifood.pdf.

- A21 (baking; edible doughs)

Class A21 includes patents relating to, amongst others, bakersA21 includes patents relating, and the treatment and preservation of bakery products.

- A22 (butchering; meat treatment; processing poultry or fish)

Class A22 includes patents relating to, amongst others, slaughtering and the processing of meat, poultry and fish.

- A23 (foods or foodstuffs; their treatment)

Class A23 includes patents relating to, amongst others, preserving, edible oils of fats, coffee and tea, cocoa products, confectionery, fodder, protein compositions, and the shaping and working of foodstuffs.

The worldwide dataset for agri-science patents published between 2004 and 2013 contains more than 118,000 published patents equating to over 400,000 patent families.³⁴¹ Most of these patent families belong to the following patent classes:³⁴²

- A01G1/00 Horticulture; cultivation of vegetables
- A01N63/00 Biocides, pest repellants or attractants, or plant growth regulators containing micro-organisms, viruses, microbial fungi, enzymes, fermentates or substances produced by, or extracted from, micro-organisms or animal material, e.g., enzymes or fermentates > containing compounds of determined constitution
- A01P3/00 Fungicides
- A01N25/00 Substances for reducing the noxious effect of the active ingredients to organisms other than pests
- A01N65/00 Biocides, pest repellants or attractants, or plant growth regulators containing material from algae, lichens, bryophyta, multi-cellular fungi or plants, or extracts thereof
- A01P7/04 Arthropodocides > Insecticides
- A01C11/02 Transplanting machines > for seedlings
- A01N43/40 Biocides, pest repellants or attractants, or plant growth regulators containing heterocyclic compounds > six-membered rings
- A01P1/00 Disinfectants; Antimicrobial compounds or mixtures thereof

³⁴¹ *Ibid.* 334, p. 5;
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/329312/informatics-agriscience.pdf.

³⁴² *Ibid.* 334, p. 13;
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/329312/informatics-agriscience.pdf.

- A01N59/00 Biocides, pest repellants or attractants, or plant growth regulators, containing organic compounds containing elements other than carbon, hydrogen, halogen, oxygen, nitrogen and sulphur > containing organo-phosphorus compounds

One may also use a national classification for search purposes; for example in the United States class 426 of the US Patent classification concerns Food or Edible Materials; see details by following these links.³⁴³³⁴⁴

Recently, the Cooperative Patent Classification (CPC) system was introduced, a scheme jointly developed by the European Patent Office and the United States Patent and Trademark Office. The CPC classifications are largely based on the previous European Classifications (ECLA) and combine features of the European and US patent classification systems to provide a united, detailed scheme with more than 210,000 subdivisions.

3.5.15 How do you apply for patent protection?

After a prior art search has been performed and the decision to seek patent protection has been made, a patent application has to be prepared and submitted to the relevant national or regional patent office. The application will include a full description of the invention, the patent claims that determine the scope of protection, drawings and an abstract (see box below). Some patent offices make it possible to submit applications through the Internet. In some countries, there may be an option for filing a *provisional* patent application that requires fewer formalities (see 3.5.19).

Patent applications are usually prepared by a patent attorney or agent who will represent your interests during the application process. The box below provides a basic overview of this process. Note that there may be important variations between countries, and it is always best to check with the patent office of the relevant country or a patent law firm in the relevant country to obtain up-to-date information on procedures and applicable fees.

³⁴³ Food or edible material: processes, compositions, and products, Section I - Class definition, USPTO; <http://www.uspto.gov/web/patents/classification/uspc426/defs426.htm>.

³⁴⁴ Food or Edible Material: Processes, Compositions, and Products Patents (Class 426), JUSTIA Patents; <http://patents.justia.com/patents-by-us-classification/426>.

Box 3.49: Processing an Application – step by step

Patenting generally involves these steps:

- **Formal examination.** The patent office examines the application to ensure that it complies with the administrative requirements or formalities (e.g., that all relevant documentation is included and the application fee has been paid).
- **Search.** In many countries, the patent office conducts a search to determine the prior art in the specific field to which the invention relates. The search report is used during the substantive examination to compare the claimed invention with the prior art.
- **Substantive examination.** The aim of the substantive examination is to ensure that the application satisfies the patentability requirements. Not all patent offices check applications against all the patentability requirements, and some only do so upon request within a specified time. The results of the examination are sent in writing to the applicant (or his/her attorney) to provide an opportunity to respond to and/or address any objections raised during the examination. This process often results in the narrowing of the scope of the patent application.
- **Publication.** In most countries, the patent application is published 18 months after the first filing date. In general, patent offices also publish the patent once it is granted.
- **Grant:** If the examination process reaches a positive conclusion, the patent office grants the patent and issues a certificate of grant.
- **Opposition.** Many patent offices provide a period during which third parties may oppose the grant of a patent, for example, on the basis that the claimed invention is not new. Opposition proceedings may be pre-grant and/or post-grant, and are possible within specified time limits.

3.5.16 How much does it cost to patent an invention?

The costs vary considerably from country to country and within countries depending on factors such as the nature of the invention, its complexity, attorney not new. Opposition proceedings may be preobjections raised during the examination by the patent office. It is important to keep the costs related to patenting in mind and to budget for them appropriately, including the payment of maintenance fees after the patent is granted:

- There are generally costs associated with performing a prior art search, particularly if you rely on the services of an expert;
- There are official filing fees that vary widely from country to country. The relevant national or regional patent office will be able to give you details on the fee structure. Some countries have discounts for SMEs and/or for on-line application filing. In addition, some countries allow expedited examination on payment of additional fees;
- If you rely on the services of a patent agent/attorney to assist you in the application process (e.g., provide the patentability opinion, draft the patent application, prepare the formal drawings and correspond with the patent office), you will incur additional costs;

- Once a patent has been granted by the patent office, you must pay maintenance or renewal fees, generally on an annual basis, to maintain the validity of the patent;
- In case you decide to patent your invention abroad, you should consider the relevant foreign filing fees for the countries in question, the translation costs and the costs of using local patent agents (a requirement, in many countries, for foreign applicants) (see **3.5.25**); and,
- In case of inventions involving micro-organisms, where the deposit of the micro-organism or biological material with a recognized depository institution is necessary, fees for filing, storage and viability testing of the deposited material will have to be paid.

3.5.17 When should you file a patent application?

In general, you should apply for patent protection as soon as you have all the information required for drafting the application. And there are a number of other reasons to file early:

- In virtually all countries, patents are granted on a first-to-file basis. Thus, filing an application early helps to ensure that you do not lose your invention to others.
- Applying for patent protection early will make it easier to get financial support or to license your invention to others.
- The earlier you file, generally speaking, the earlier your patent will be issued, and you can begin to enforce your rights; remember, getting your application through to issuance can take a long time (see **3.5.15**).

Nevertheless, rushing to file a patent application as soon as you have an invention may also create problems:

- If you apply too early and your invention evolves, it will generally not be possible to make significant changes to the original description of the invention.
- Once you have filed your application in one country or region, you normally have 12 months to file for the same invention in other countries in order to enjoy the benefit of the filing date of your first application (see **3.5.27**). But filing in multiple foreign countries, especially before you know whether the invention will be commercially successful, may be too expensive. One way of mitigating this problem is by postponing the payments of translation and national fees for an additional 18 months by using the PCT patent procedure (see **3.5.29**).

As important as any other consideration, your application should be filed before you disclose the invention to anyone. Any pre-filing disclosure (e.g., for test-marketing, to investors or other business partners) should be made only after signing a confidentiality or non-disclosure agreement.

3.5.18 How important is it to keep an invention confidential prior to filing a patent application?

If you want to obtain a patent, keeping your invention confidential prior to filing the application is absolutely necessary. In many circumstances, pre-filing public disclosure can destroy the novelty of your invention, rendering it unpatentable, unless the applicable law provides for a **grace period** (see 3.5.19).

It is, therefore, critical that inventors, researchers and companies avoid any disclosure of an invention that might affect its patentability until the patent application has been filed.

Box 3.50: First-to-file versus First-to-Invent

In almost all countries, patents are granted to the first person to file a patent application on an invention. A notable exception was the United States where a first-to-invent system applied until March 15, 2013, in which the patent would be granted to the first inventor who had conceived and reduced the invention to practice, whether or not his/her patent application had been filed first. In order to prove inventorship within a first-to-invent system, it is crucial to maintain bound, duly witnessed and dated laboratory notebooks, which may be used as evidence in case of a dispute with another company or inventor. Effective as of March 16, 2013, the United States now has a first-to-file system.

3.5.19 What is a grace period?

The legislation of some countries provides a **grace period** of 6 or 12 months, from the moment an invention was disclosed by the inventor or the applicant until the application is filed, in which the invention does not lose its patentability because of such disclosure. In such countries, a company may disclose its invention, for example, by displaying it in a trade show or publishing it in a company catalogue or technical journal, and file the patent application within the grace period.

However, as the grace period does not apply in all countries, relying on it in your own country may preclude you from patenting the invention in other markets of interest where a grace period is not available.

Box 3.51: Provisional Patent Application (PPA)

In a few countries (including Australia, Canada, India and the United States, applicants have the opportunity to file a provisional patent application (PPA). The PPA is intended as a relatively low-cost entry point to the patent system. Once a PPA is filed, the applicant has 12 months to test the idea and seek funding before filing a corresponding full patent application. While details of how PPAs work vary from country to country, common features include:

- Provisional patents applications generally do not undergo substantive examination;
- The official filing fees are lower; and,
- The provisional application need not include claims, although it does require a full description of the invention.

3.5.20 What is the structure of a patent application?

A patent application has a range of functions:

- It determines the legal scope of patent protection;
- It describes the nature of the invention, including instructions on how to implement it; and,
- It gives details of the inventor, the patent owner and other legal information.

Patent applications are similarly structured worldwide and consist of a request, a description, claims, drawings (if necessary) and an abstract. A patent document may be a few pages or hundreds of pages long, depending on the nature of the specific invention and the technical field.

- **Request.** The Request shows the title of the invention, date of filing, priority date and bibliographic data such as the name and address of the applicant and inventor.
- **Description.** The written description of an invention must provide sufficient details so that anyone skilled in the same technical field can reconstruct and practice the invention from the description and the drawings without putting in any inventive effort. If the description falls short of this standard, the patent may be denied or may be revoked after it is challenged in a court action.
- **Claims.** The claims determine the scope of protection of a patent. The claims are absolutely crucial since, if they are badly drafted, even a truly valuable invention could result in a worthless patent that is easy to circumvent or design around (See Box 9.28).

In patent litigation, interpreting the claims is generally the first step in deciding whether the patent is valid and whether it has been infringed. You should invariably seek the advice of an expert to draft patent claims.

- **Drawings.** The drawings show the technical details of the invention in an abstract and visual way. They help to explain some information, tool or result set out in the disclosure. Drawings are not always a necessary part of the application.

If the invention is for a process or method of doing something, drawings usually are not required. If drawings are required, formal rules govern their acceptability.

- **Abstract.** The abstract is a brief summary of the invention. When the patent is published by the patent office, the abstract is included on the front page. The abstract is sometimes improved or drafted by the patent examiner in the relevant patent office.

3.5.21 How long does it take to obtain patent protection?

The time for processing a patent application varies significantly from office to office and between fields of technology and may range from a few months to a few years, generally between two to five years. Some patent offices have established a procedure for accelerated examination that can be requested by applicants in specific circumstances.

3.5.22 When does patent protection begin?

Your rights are effective from the date of grant of your patent. In some countries, you may sue infringers at that time for infringement that occurred since the date of publication of the patent application (generally 18 months after filing). But this is not the case in all countries (see **9.5.40 - 9.5.43**).

In some countries, it is possible to file a patent application and a utility model application for the same invention. This is sometimes done in order to benefit from utility model protection (which is generally granted faster) until the invention patent is granted later.

3.5.23 How long does patent protection last?

The current international standard provides protection for 20 years from the filing of the application, provided the renewal or maintenance fees are paid on time and that no request for invalidation or revocation has been successful during this period.

While this defines the legal life of a patent, the business or economic life of a patent is limited by the commercial success of the protected technology. It often turns out that an apparently valuable invention becomes obsolete or cannot be successfully commercialized for some other reason. In such circumstances, the patent holder may decide to stop paying maintenance or renewal fees, leaving the patent to expire earlier and allowing the product or technological innovation to fall into the *public domain*.

In some countries, notably in Europe, an additional patent-like protection may be provided, if specified conditions are duly met. This is done by issuing a Supplementary Protection Certificate (SPC). The SPC is not an extension of the patent, which simply extends the term of the original patent, as used, for instance, in the United States. The SPC commences upon the expiry of the relevant patent and is available only for those

patents where the patent owner has suffered because of delay in commercialization of the patented product due to undue time being consumed in obtaining regulatory marketing approval from the appropriate governmental authorities (e.g., as is the case for pharmaceuticals and agrochemicals). SPCs have a limited duration which generally does not exceed five years.³⁴⁵

Box 3.52: Patent Pending

Many companies label their products embodying the invention with the words *Patent Pending* or *Patent Applied For*, sometimes followed by the number of the patent application. Similarly, once the patent is granted, it is increasingly common for companies to place a notice indicating that the product is patented, sometimes including the patent number. While these terms do not provide any legal protection against infringement, they may serve as a warning to dissuade others from copying the product or its innovative features. They may also affect the remedies available for infringement, depending on the law of the country where enforcement is sought.

3.5.24 Do you need a patent agent to file a patent application?


Preparing a patent application and following it through to the grant stage is a complex task. Applying for patent protection requires:

- Performing a search to identify any prior art that may render your invention unpatentable;
- Writing the claims and a full description of the invention that combines legal and technical terminology;
- Corresponding with the national or regional patent office, especially during the substantive examination of the patent application; and,
- Making amendments to the application as requested by the patent office.

All these aspects require in-depth knowledge of patent law and patent office practices and a full understanding of the invention. Therefore, **even if legal or technical assistance is generally not mandatory it is strongly recommended**. You should rely on a patent agent who has not only the relevant legal knowledge and the experience but also the technical background in the field of the invention. Most laws require foreign applicants to be represented by a registered patent agent who is resident in the country.

³⁴⁵ In EU member countries, a Supplementary Protection Certificate (SPC) is a unique right that provides an additional monopoly that comes into force after the expiry of the patent upon which it is based. This type of right is available for various regulated, biologically active agents, namely human or veterinary medicaments and plant protection products (e.g., insecticides, and herbicides); <http://www.franksco.com/assets/files/Information%20Sheet%20-%20Supplementary%20Protection%20Certificates.pdf>.

Example:

	<p>Patent No. EP1165393/US 6,568,660/HK 1043099: Torben Flanbaum's patent on a <i>Pourer for simultaneously pouring liquid from a container and mixing into the liquid</i> was licensed to Menu A/S, a Danish SME, becoming the company's best-selling product. In particular, the pourer may be used for simultaneously pouring wine from a bottle and decanting the wine.</p>
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Box 3.53: BlueOcean NutraSciences announces additional patent applications³⁴⁶

Nov 12, 2014, IPFrontline. BlueOcean NutraSciences is a Canadian listed public company (TSXV:BOC) that is focused on developing sustainable, specialty nutraceutical oil products.

BlueOcean NutraSciences (TSX VENTURE:BOC) is pleased to announce that it has continued to expand its IP portfolio with additional patent application filings.

“BlueOcean’s strategy of forming partnerships with strategic partners to develop and commercialize specialty astaxanthin and omega 3 products for the nutraceutical markets is augmented by our own innovations which we are capturing through a growing I.P. portfolio,” said BlueOcean’s CEO, Gavin Bogle.

BlueOcean’s patent portfolio now includes:

- Canadian Patent 2,271,170, US Patent 6,209,855, European Patent 1,173,271, Australian Patent 778,289, US Patent 6,436,290 and US Patent 7,537,200 covering unique methods of dramatically increasing microalgae growth yields which are under exclusive license to BlueOcean;
- US Patent Application No.: 62/072,865 claiming natural source highly oxygenated drinks comprising fatty acids;
- US Patent Application Nos.: 62/061,763 and 61/995,416 – claiming methods and Apparatus for Growing Microalgae;
- US Patent Application No.: 62/063,623 claiming formulations of Omega Oils;
- US Patent Application No.: 61/987,539 – claiming natural Shrimp Source Extracts Comprising Fatty Acids and Astaxanthin;
- US Patent 8,030,348; US Patent 8,278,351; US Patent 8,383,675, US Patent 6,800,299, and Canadian patent, CA 2,493,888 under exclusive license for BlueOcean’s shrimp oils.

³⁴⁶ BlueOcean NutraSciences announces additional patent applications, IP Frontline, November 12, 2014; <http://www.ipfrontline.com/depts/article.aspx?id=53698&deptid=10> and BlueOcean NutraSciences, Innovative Health and Wellness Products; <http://blueoceannutra.ca/>.

3.5.25 Can you apply for the protection of multiple inventions through a single application?

Most patent laws limit the number of different inventions that may be included in one patent application. These include the so-called requirement of unity of invention. While some countries (for example, the United States) enforce this requirement rather strictly, others (e.g., the European Patent Convention) permit groups of inventions so linked as to form a single **inventive concept** to be included in a single application. In case of lack of unity of invention, the applicant may be required to either restrict the claims or divide the application (creating *divisional* applications). As a result of differences in the applicable law, one patent application may suffice in some countries, while in others, two or more applications may have to be filed to cover the same ground. When filing under the PCT, it is common to link groups of inventions according to the European approach, and to divide the application as necessary after entering the national phase.

Box 3.54: Summary Checklist

- ✓ **Is your invention patentable?** Conduct a prior art search and make good use of patent databases.
- ✓ **Filing a patent application.** Consider using a patent agent/attorney with expertise in the relevant field of technology, particularly for drafting the claims.
- ✓ **Timing of application.** Consider carefully the best timing for filing your patent application, and pay close attention to required filing dates.
- ✓ **Do not disclose information** too early in order not to compromise its patentability.
- ✓ **Maintenance fees.** Remember to pay maintenance or renewal fees on time to maintain your patent(s) in force.

3.5.26 Why apply for foreign patents?

Patents are **territorial rights**, which means that an invention is only protected in the countries or regions where protection has been obtained. In other words, if you have not been granted a patent with effect in a given country, your invention will not be protected in that country, enabling anybody else to make, use, import or sell your invention in that country.

Patent protection in foreign countries will enable your business to enjoy exclusive rights over the patented invention in those countries. In addition, patenting abroad may

enable your business to license the invention to foreign firms, develop outsourcing relationships, and access those markets in partnership with others.

3.5.27 When should you apply for patent protection abroad?³⁴⁷

The date of your first application for a given invention is called the **priority date** and any subsequent applications in other countries filed by you within **12 months** (i.e., within the **priority period**) will benefit from the date of the earlier application and will have priority over other applications for the same invention filed by others after the priority date. It is critical that you file your foreign patent applications within the priority period, or that you file under the PCT by that time, which will give you an additional 18 months to decide whether to enter the national phase in any PCT member country.

After the expiration of the priority period and until the patent is first published by the patent office (generally **18 months** after the priority date) you will still have the possibility to apply for protection for the same invention in other countries, but you can no longer claim priority from your earlier application. Once the invention has been disclosed or published, you may be unable to obtain patent protection in foreign countries, due to loss of novelty.

3.5.28 Where should you protect your invention?

Because getting foreign patents is expensive, businesses should carefully select the countries in which they require protection. Some of the key questions are:

- Where is the patented product likely to be commercialized?
- What are the main markets for similar products?
- What are the costs involved in patenting in each target market?
- Where are the main competitors based?
- Where will the product be manufactured?
- How difficult will it be to enforce a patent in a given country?

3.5.29 How do you apply for patent protection abroad?

There are three main ways of filing for foreign patents:

The National route. You apply to the national patent office of each country of interest, by filing a patent application in the required language, complying with the national formality requirements and paying the required fees. This path may be very cumbersome and expensive for multiple countries.

The Regional route. When countries are members of a regional patent system, you may apply for protection, with effect in the territories of all or some of these, by filing an application with the relevant regional office. The regional patent offices are:

- The African Intellectual Property Organization (OAPI) (www.oapi.wipo.net);

³⁴⁷ For more information, see IP PANORAMA™ Module 03, Learning Point 2 and Module 06, Learning Points 1–3 at www.wipo.int/sme/en/multimedia/

- The African Regional Industrial Property Organization (ARIPO) (www.aripo.org);
- The Eurasian Patent Organization (EAPO) (www.eapo.org);
- The European Patent Office (EPO) (www.epo.org);
- Nordic Patent Institute, an Intergovernmental Organization established by the governments of Denmark, Iceland and Norway.³⁴⁸ (<http://www.npi.int/en>)
- The Patent Office of the Cooperation Council for the Arab States of the Gulf (GCC Patent Office) (www.gccpo.org).

The International route. If your business wants to have the option of protecting an invention in any member countries of the PCT, then you should consider filing a PCT application. To do so, you must be a national or resident of a PCT Contracting State, or your business must have an effective industrial or commercial presence in one of these countries. By filing one international application under the PCT, you may later seek patent protection in any of the 148 member countries on March 1, 2015.³⁴⁹ This application may be filed either at your national or regional patent office and/or at the PCT receiving office at WIPO in Geneva, Swiss Confederation.

Box 3.55: Advantages of the Patent Cooperation Treaty (PCT)

The PCT provides at least **18 additional months** on top of the 12 month priority period, during which applicants can explore the commercial potential of their product in various countries and decide where (and whether) to seek patent protection. Payment of the fees and translation costs associated with national applications is thus delayed. The PCT is widely used by applicants to keep their options open for as long as possible.

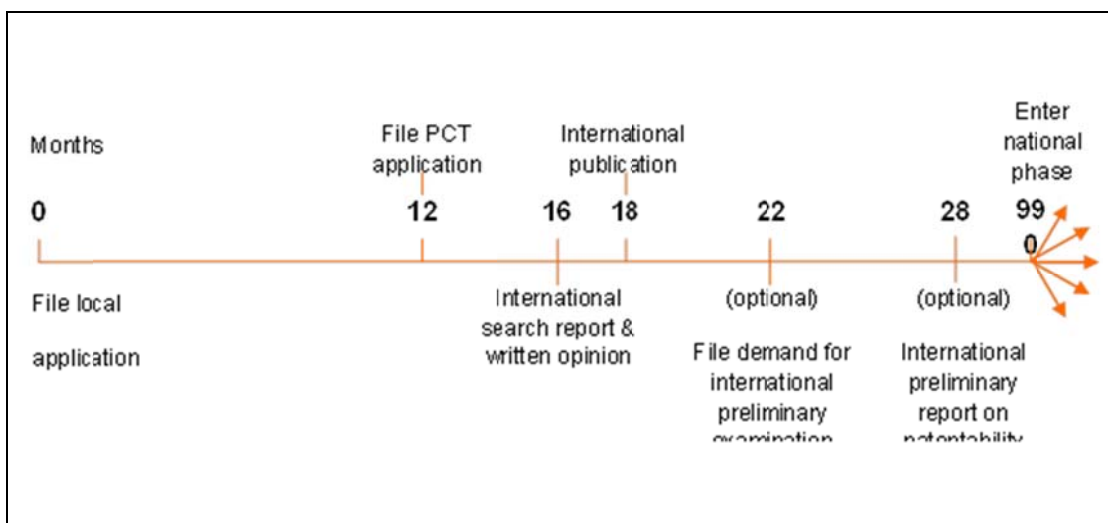
PCT applicants receive **valuable information** about the potential patentability of their invention, in the form of the PCT **International Search Report** and the **Written Opinion of the International Searching Authority**. These documents provide PCT applicants with a strong basis on which to make their decisions about whether and where to pursue patent protection. The International Search Report contains a list of prior art documents which have been identified as relevant to the invention. The Written Opinion of the International Searching Authority analyzes the potential patentability in light of the results of the International Search Report.

A single PCT application has legal effect in all PCT member countries. This effect significantly **reduces the initial transaction costs** of submitting separate applications to each patent office. The PCT may also be used to file applications under some of the regional patent systems. Guidance on how to submit an international application under the PCT can be obtained from your national patent office and at: www.wipo.int/pct

³⁴⁸ About Nordic Patent Institute, Nordic Patent Institute <http://www.npi.int/en/About-Us/>.

³⁴⁹ A list of member countries is available at http://www.wipo.int/export/sites/www/pct/en/list_states.pdf

Box 3.56: Outline of the PCT application process



Box 3.57: Summary Checklist

- ✓ Territorial rights. Remember that patent rights apply only in the country where they were obtained.
- ✓ Priority period. Make use of the priority period to apply for protection abroad but pay careful attention to deadlines and to the need for secrecy before filing.
- ✓ **Where to apply.** Consider where you will benefit from protection, taking into account the costs of patenting in various countries.
- ✓ **How to apply.** Consider using the PCT to facilitate the application process, gain time and receive valuable patentability information on which you can base your decisions about where to apply for patent protection.

Table 3.1: Examples of patents* involving methods and genetic markers in livestock.

Species	Date	Patent No.	Abbreviated Title
Chicken	1998	US 5,707,809	Avian sex identification probes
Cattle	1991	US 5,041,371	Genetic marker for superior milk products...
Cattle	1994	US 5,374,523	Allelic variants of bovine somatotropin gene...

Cattle	1997	US 5,614,364	Genetic marker for improved milk production...
Cattle	2001	US 6,242,191	Methods for assessing the beef characteristics...
Cattle	2001	US 6,284,466	Double muscling in mammals
Cattle	2001	WO9923248**	Assessing lipid metabolism
Sheep	2001	US 6,306,591	Screening for ... spider lamb syndrome in sheep
Pig	1994	US 5,358,649	Diagnosis for porcine malignant hyperthermia
Pig	1994	US 5,374,526	Method...genetic marker for increased pig litter size
Pig	2000	US 6,143,880	Pig myogenin gene ... related to muscle growth
Pig	2001	US 6,183,955	Methods for determining the coat color ...of a pig
All	1987	US 4,683,195	Process for amplifying ... nucleic acid sequences
All	1996	US 5,582,979	Length polym. in (dC-dA)n.(dG-dT)n sequences...
All	2001	US 6,287,564	Method of identifying high immune response...
All	2001	US 6,309,853	Modulators of body weight,...

* See <http://www.genome.iastate.edu/resources/patent/table1.html> ** Pending application

Box 3.58: Patenting of an elver substitute by Angulas Aguinaga S.A.U.³⁵⁰³⁵¹

Angulas Aguinaga S.A.U. was founded in Aguinaga (Guipúzcoa, Spain) in 1974 to market elvers, a sector in which it has become the leading company. By the late 80s, it became clear that a biological crisis was decimating the natural production of elver. To create an elever substitute, Angulas Aguinaga S.A.U. made an upfront payment to the *Instituto del Frío* from the *Consejo Superior de Investigaciones Científicas* (Spanish National Research Council) for undertaking the required research. The output of their

³⁵⁰ Leadership, ANGULAS AGUINAGA; <http://www.angulas-aguinaga.es/en/leadership>.

³⁵¹ Associated Member Angulas Aguinaga, SEAFOOD Plus, a better life with seafood <http://www.seafoodplus.org/Angulas-Aguinaga.481.0.html>.

research efforts was two patents linked to Spanish patent application N° 8901508 and 8904085 as well as European patent (Publication number: 0 396 487 B1; publication date: 16.02.94 Bulletin 94/07; IPC Class: A23L 1/325). These patents provided the company a time-limited monopoly (which ended on Feb 15, 2014) to manufacture and market an “elver substitute” based on surimi.³⁵² The company commercialized it, among others, under the trademark “La Gula del Norte,” which has become a common product on Spanish dining tables. The value of the patent has been transferred to the trademark “La Gula del Norte,” which potentially can last forever.

Since 1991, the trademark “La Gula del Norte” has become the category’s indisputable driving force, leading a new category in the market and becoming Spain’s surimi expert. It is registered in a number of countries by using WIPO’s international filing system (the Madrid System); the international registration number being 595911.³⁵³ It was initially registered on 02.12.1992 and has been renewed up to 02.12.2022.

The company has always been innovative and is committed to the continuous development of groundbreaking, new products. As a result of this policy, it has developed and marketed a range of surimi-based products under the brand “KRISIA.” These products are similar to crab stick meat, lobster tails, shredded crab and crab slices. Its other products are prawns, mussel, salmon, and octopus. It exports its products primarily to Europe and Latin America.

At the same time, it offers new quality, convenient and easy to prepare solutions to the market in the form of the “Heat and Ready” prepared portions and new packaging such as individual bags and the two cavity packaging of the “La Gula del Norte.”

A clear focus on communication has also allowed the company to attain a leadership position and to become the preferred brand of a large number of consumers.

Currently, the company is recognized for being **innovative** and providing **quality and convenient** solutions to the food market. For instance, the company incorporated at the end of 2012 the reference “*Mejillones con tomate con un toque picante*” (Mussels with a touch of spicy tomato sauce). The product is sold in a package in a 125 g format

³⁵² A high percentage of surimi is used for the manufacture of analogs of various types of fish or shellfish, the Japanese word surimi being used internationally to define fish muscle which is comminuted, washed, drained until it contains a proportion of water similar to that in the original, has protein cryo-protectors added to it and is generally preserved in the frozen state. Surimi, which can be obtained from different species, serves as a base for the manufacture of various products which are traditionally sold in Japan, and of others which are also consumed in Western countries such as crab claws, prawns, scallops, lobsters, etc. All these products are developed by forming gels with distinct texture, form and flavor, as a function of the physico-chemical variations which are introduced into the myofibrillar fish protein which is the base of surimi (Okada, 1963, Lee, 1984; Borderias and Tejada, 1987; Tejada and Borderias, 1987). These modifications of the gel are obtained by applying different heat treatments, kneading times, atmospheric conditions in which the process takes place, etc., and/or by adding certain ingredients or additives which physically or chemically vary the texture of the protein network (Suzuki, 1981; Lee, 1984) or confer on it a characteristic aroma.

³⁵³ Madrid, The International Trademark System, WIPO; <http://www.wipo.int/romarin/detail.do?ID=0>.

with the label/instruction: “Open, heat and ready,” although it may be eaten either cold or hot (One minute in the microwave).³⁵⁴

In 2003, it became the first company in Spain in the Prepared Meals and Surimi Products Sector and third in the Food and Drinks sector to obtain the Danish Standard DS-3027 certification for food safety. In 2005, it became the first company in the world to obtain the ISO 22000 food safety certificate.

3.5.30.1 What is traditional biotechnology for plant breeding and what is modern biotechnology?

Conventional plant breeding has been going on for hundreds of years, and is still commonly used today. Early farmers discovered that some crop plants could be artificially mated or cross-pollinated to increase yields. Desirable characteristics from different parent plants could also be combined in the offspring. Conventional plant breeding techniques include (a) traditional cross-breeding, (b) mutagenic techniques, and (c) cell culture techniques such as hybridization or protoplast fusion. In general, results of conventional plant breeding are not patentable. However, recently, perhaps incorrectly, a patent has been granted for a watermelon variety developed through conventional plant breeding.³⁵⁵

The end result of plant breeding is either an open-pollinated (OP) variety or an F1 (first filial generation) hybrid variety. OP varieties, when maintained and produced properly, retain the same characteristics when multiplied. The only technique used with OP varieties is the selection of the seed-bearing plants. Hybrid seeds are an improvement over open pollinated seeds in terms of qualities such as yield, resistance to pests and diseases, and time to maturity. Hybrid seeds are developed by the hybridization or crossing of parent lines that are “pure lines” produced through inbreeding. Pure lines are plants that “breed true” or produce sexual offspring that closely resemble their parents. By crossing pure lines, a uniform population of an F1 hybrid seed can be produced with predictable characteristics. Conventional plant breeding resulting in OPVs or hybrid varieties has had a tremendous impact on agricultural productivity over the last decades. While an extremely important tool, conventional plant breeding also has its limitations. First, breeding can only be done between two plants that can sexually mate with each other. This limits the new traits that can be added to those that already exist in a particular species. Second, when plants are crossed, many traits are transferred along with the trait/s of interest - including those traits that have undesirable effects on yield potential.

Mutation Breeding: Creating genetic variation in plants is largely a process of chance. In the late 1920s, researchers discovered that they could greatly increase the number of these variations or mutations by exposing plants to X-rays and chemicals. “Mutation

³⁵⁴ Bloomberg Business website Company Overview of Angulas Aguinaga, S.A.U.; <http://investing.businessweek.com/research/stocks/private/snapshot.asp?privcapId=27467718>.

³⁵⁵ European Patent Specification, Bulletin 2014/08, 19.02.2014; http://www.keinpatent.de/uploads/media/EP1816908_B1.pdf.

breeding” was further developed after World War II, when the techniques of the nuclear age became widely available. Plants were exposed to gamma rays, protons, neutrons, alpha particles, and beta particles to see if these would induce useful mutations. Chemicals, too, such as sodium azide and ethyl methanesulphonate, were used to cause mutations. Mutation breeding efforts continue around the world today. Of the 2,252 officially released mutation breeding varieties, 1,019 or almost half have been released during the last 15 years. Examples of plants that have been produced via mutation breeding include wheat, barley, rice, potatoes, soybeans, and onions.

Plants usually reproduce by forming seeds through sexual reproduction. That is, egg cells in the flowers are fertilized by pollen from the stamens of the plants. Each of these sexual cells contains genetic material in the form of DNA. During sexual reproduction, DNA from both parents is combined in new and unpredictable ways, creating unique plants. This unpredictability is a problem for plant breeders as it can take several years of careful greenhouse work to breed a plant with desirable characteristics. Nowadays, not all plants are grown from seeds. Researchers have developed several methods of growing exact copies of plants through a method called “tissue culture.” **Tissue culture** is the cultivation of plant cells, tissues, or organs on specially formulated nutrient media. Under the right conditions, an entire plant can be regenerated from a single cell. The range of plants important to developing countries that have been grown in tissue culture include oil palm, plantain, pine, banana, date, eggplant, jojoba, pineapple, rubber tree, cassava, yam, sweet potato, and tomato. Tissue culture is labor intensive, time consuming, and can be costly. Micropropagation, which is a form of tissue culture, increases the amount of planting material to facilitate distribution and large scale planting. In this way, thousands of copies of a plant can be produced in a short time. Micropropagated plants are observed to establish more quickly, grow more vigorously and are taller, have a shorter and more uniform production cycle, and produce higher yields than conventional propagules. Micropropagation by shoot culture technique has been developed for the mass propagation of banana. In the Philippines, this is used as a control approach to viral diseases in banana such as: banana bunchy top virus (BBTV) and banana bract mosaic virus (BBrMV), which are commonly spread through propagative materials.

Modern biotechnology is a collection of technologies that capitalize on the genetic attributes of cells.³⁵⁶ For more information please see Box 1.17 which provides a lot of useful information on the application of modern biotechnology-based approaches in plant breeding.

Historically, modern biotechnology, as opposed to traditional biotechnology, dates from the mid-1970’s and involves the use of GE techniques to shuffle or transfer genes between and among plant and animal species, with the aim of passing on certain desirable hereditary traits to the host plants or animals. Perhaps the most significant

³⁵⁶ Biotechnology Industry Organization, Guide To Biotechnology, 2007; <https://www.bio.org/sites/default/files/BiotechGuide2008.pdf>

difference between the traditional plant breeding technique and the plant GE technique is the latter's capability for trans-species gene transfer, a feat that is patently beyond conventional plant breeding technique. Thus, due mainly to its inherent capability to breach "the walls of speciation," the plant GE breeding technique surpasses, and is qualitatively superior to the conventional plant breeding methodology, which is inherently limited by sexual compatibility constraints. This superiority is two-dimensional. First, GE operates at the cellular and molecular levels. Second, GE technique dispenses with sexual reproduction and allows for the transfer of genes between totally unrelated organisms. A typical example of trans-species gene transfer is the transgenic Bt maize, which uses GM material to carry genes from *Bacillus thuringiensis* bacterium, in order to avoid the use of "synthetic pesticides for the control of certain caterpillars."³⁵⁷

Many foods consumed today are either GM whole foods, or contain ingredients derived from gene modification technology. GM plants are used to produce ingredients (e.g., oils, flours, meals, syrups, flavors, colorants), whole foods, food products, and feed used in various industries. Some scholars argue that modern biotechnology and GE allow, in the long term, a considerable increase of labor productivity in agriculture, a reduction of production costs, as well as the production of plants and animals with intended characteristics.³⁵⁸ Proponents of biotechnology and a large portion of agri-food policy makers around the world project a positive future in which technology overcomes food shortages, improves the environment, heals or eliminates disease and leads to a prosperous and healthy society. A smaller but significant array of policy makers, citizens and consumers fear that the technology will exacerbate food insecurity, threaten the environment, endanger human health and ultimately impoverish society itself.³⁵⁹

It is also argued that, by increasing the productivity of resource-poor farmers, biotechnology increases overall global prosperity.³⁶⁰ The direct use of DNA, either from unrelated organisms or from synthetic sources through molecular biological techniques, to manipulate the genetic make-up of organisms has provided a large number of alternative strategies in making agriculture productive. Biotechnology food crops were first established in 1996. Today, it's widely recognized that new traits developed through biotechnology are important for crop improvement in that they address the

³⁵⁷ The limits of regulatory science in transnational governance of transgenic plant agriculture and food systems, by Taiwo A. Oriola, N.C. J. INTy Scien& COM. REG. Vol. XXXIX, 1/28/2014; <http://www.law.unc.edu/components/handlers/document.ashx?category=24&subcategory=52&cid=1253>.

³⁵⁸ Liodakis G., The Role of Biotechnology in the Agro-Food System and the Socialist Horizon, 2003;

³⁵⁹ Biotechnology in the global agri-food system by Peter W.B. Phillips, Cell Picture Show supported by Zeiss, Trends in Biotechnology; <http://www.sciencedirect.com/science/article/pii/S0167779902020395>.

³⁶⁰ According to the FAO flagship publication The state of food and agriculture (2003-2004 edition, whose title was Agricultural biotechnology Meeting the needs of the poor?), one of the main messages emerging is that biotechnology is capable of benefiting small, resource-poor farmers. The key question is how this scientific potential can be brought to bear on agricultural problems of developing-country producers since the evidence suggests that the research and farm-level applications - with some exceptions primarily in the plant sector - are taking place primarily in developed countries.

challenges posed by population increase, climate change, abiotic stress, the depletion of aquifers, water shortages and the decline of arable farm land. Increasing yield is a main concern for modern farming in all markets.

The Seed Market*

- In 2012, 170.3 million hectares of biotech crops were planted globally
- Herbicide tolerance (HT) crops increased by 7 per cent from 2011-2012 to 100.5 million hectares
- Insect resistant crops (IR) crops increased by 9 per cent to 26.1 million hectares in 2012
- Stacked traits, the ability to combine traits into a single plant variety, has increased 4 per cent from 42.2 million hectares in 2011 to 43.7 million hectares in 2012.³⁶¹

The global market for plant biotechnology crops, which includes the seed sales of HT, IR and biotech crops for 2011 is 19.7 billion USD compared with 9.0 billion USD in 2008, an increase of 119 per cent.

There is evidence that, in SSA,³⁶² improved varieties are finally making an impact on some food staples, such as, for example:

- **Maize.** Improved maize varieties and hybrids were widely adopted by smallholders in many African countries in the 1980s, reaching almost universal coverage in a few countries, such as Zimbabwe;
- **Cassava.** Improved disease-resistant strains of cassava have been adopted, reaching more than half the cassava area in Federal Nigeria (the world's largest producer). Cassava has been the fastest growing food staple in Africa, and since it is a staple of the poor, the impacts of productivity gains are especially pro-poor;
- **Rice.** The New Rice for Africa - combining the high-yielding potential of Asian rice with the resistance of African rice to weeds, pests, diseases, and water stress - was released to farmers in 1996;
- **Beans.** In eastern, central, and southern Africa, nearly 10 million farmers, mostly women, are reportedly growing and consuming new bean varieties (*Phaseolus vulgaris*), many with multiple stress resistances.

In 2003 improved strains from a single project - for the genetic improvement of farmed tilapia - accounted for 68 per cent of the total tilapia seed produced in the Philippines, 46 per cent in Thailand, and 17 per cent in Vietnam.³⁶³

3.5.30.2 Patents in Biotechnology

Inventors have been filing applications for biotechnology patents for over 100 years. Patent No. 3, granted in Finland on 8 November 1843, introduced a novel method for

³⁶¹ An Exploding Global Seed Market, Performance Plants, The Promise of Growth; <http://www.performanceplants.com/commercial-markets/An-Exploding-Global-Market>.

³⁶² Pray E., Courtmanche A., Govindasamy R., cit.

³⁶³ Yosef, S., Genetically improved tilapia for the Philippines, 2009; <http://www.ifpri.org/sites/default/files/publications/ifpridp00925.pdf>.

producing yeast cultures. On 29 July 1873, the microbiologist Louis Pasteur patented his improved yeast-making method at the French Patent Office. Commercial firms also sought to patent biotechnological processes, with BASF patenting alizarin in 1869. The substance the scientists managed to successfully synthesize - a red dye - was used in textile manufacturing. In agriculture, biotechnology is used to modify the physiology of plants with a view to introducing specific desirable features such as resistance to disease and herbicides, or achieving higher yields.³⁶⁴

Yet, historically, IP law has had little impact on agricultural practices. Over the past fifty years or so, however, there has been a dramatic change in the impact that IP has had on plant breeding. With a few notable exceptions, IP law only began to exert a significant influence upon plant breeding with the introduction of the UPOV Convention in 1961.

One of the motives which led to the adoption of the UPOV Convention was the realization that patent law was, for a number of reasons, ill-suited to plant breeding. Prime amongst these was the idea that living organisms were beyond the purview of the patent system. To many, it was difficult to conceive of living organisms as “inventions”, much less manners of “manufacture” (in the vernacular of Anglo-Australian patent law), a view which persists in most jurisdictions. Moreover, complex living organisms such as plants were not regarded as being amendable to the written description and enablement requirements of patent law. That is, complex living organisms such as plants were not reducible to a written description of their features in a patent specification, nor were the essential features of a given plant invention capable of precise delineation in patent claims.

Yet another reason given as to why patents were unable to protect the products of plant breeding was that the methods involved in the breeding of plants have been practiced since antiquity. It was also considered difficult to show that the use of these methods involved the exercise of ingenuity that was able to satisfy the inventive step or nonobviousness requirement. The incrementalism which characterizes traditional plant breeding exacerbates the difficulties of meeting this requirement. Finally, the extensiveness of patent rights was also seen to conflict with traditional agricultural practices, such as farmers saving seed from one crop for the generation of further crops, and the development of new plant varieties, which is dependent upon access to germplasm of new varieties for use in further breeding.³⁶⁵

In these circumstances, it is not surprising that patent law had little direct impact upon the development and protection of the products of plant breeding in a majority of countries (with the exception of the plant patent regime in the United States). As a result, over much of the second half of the twentieth century plant variety rights were

³⁶⁴ Patents on biotechnology, Patenting Issues, European Patent Office; <http://www.epo.org/news-issues/issues/biotechnology.html>.

³⁶⁵ *Ibid.* 326, p. 4; <http://acipa.edu.au/pdfs/plant-patent-law-and-practice-australia-north-america-and-europe.pdf>.

used as the predominant form of protection for new plant varieties in the vast majority of countries.³⁶⁶

However, with the development of modern biotechnological techniques, the difficulty of protecting GM plants using rules made for plant varieties and the UPOV system led to a rise in patenting activity in the plant breeding sector.

Provisions on biotechnology patents were laid down in the 1994 WTO TRIPS Agreement, the 1993 CBD, the 1998 European Directive on the legal protection of biotechnological inventions (Directive 98/44/EC), the 2000 revision of the European Patent Convention (EPC) and the 2005 revision of the German Patent Act (Patentgesetz or PatG).³⁶⁷

One of the consequences of these changes is that patents either have become, or are becoming, the predominant form of protection of new plant varieties in those countries which permit the granting of patents for plants. This trend is particularly notable in the United States and Europe, and has also been observed in the Commonwealth of Australia, particularly in relation to genetically-modified plants. Since the early 1980s, there has been a sharp increase in the number of patents granted in respect of agricultural biotechnology by both the United States Patent and Trademark Office (USPTO) and the European Patent Office (EPO). In the United States, during the period 1976-2000, the rate of growth in the patenting of innovations relating to agricultural biotechnology generally surpassed the upward trend in overall patenting during the same period; in respect of plant biotechnology in particular, the growth in the number of patents granted by the USPTO since the early 1980s has been “exponential.” Importantly, this trend is not limited to genetically-modified varieties of plants, but applies also to traditionally bred plants. According to a recent study, at least 35 patents have been granted by the EPO in respect of non-GM plants since 2000.³⁶⁸

As the executive organ of the European Patent Organisation, the EPO examines European patent applications and either grants or refuses patents on the basis of European patent law, as laid down in the European Patent Convention and interpreted in the case law developed by the boards of appeal, the EPO’s second-instance judiciary. To be patentable, biotechnological inventions have to meet the same criteria as those in any other field of technology. Patents can only be granted for inventions that are new, involve an inventive step and are susceptible of industrial application. A specific legal definition of novelty has developed over the years, with “new” meaning “made available to the public.” This means, for example, that a human gene, which

³⁶⁶ *Ibid.* 326, p. 5; <http://acipa.edu.au/pdfs/plant-patent-law-and-practice-australia-north-america-and-europe.pdf>.

³⁶⁷ <http://biopatents.edu.au/pdfs/plant-patent-law-and-practice-australia-north?> Position Paper of the Advisory Board on Biodiversity and Genetic Resources at the Federal Ministry of Food, Agriculture and Consumer Protection, Lead author Dr. Peter H. Feindt, Cardiff University, May 2010, pages 4 and 5; http://www.bmel.de/SharedDocs/Downloads/EN/Ministry/Biopatents.pdf?__blob=publicationFile.

³⁶⁸ *Ibid.* 326, p. 6; <http://acipa.edu.au/pdfs/plant-patent-law-and-practice-australia-north-america-and-europe.pdf>.

existed before but was “hidden” from the public in the sense of having no recognized existence, can be patented when it is isolated from its environment or when it is produced by means of a technical process and as long as its industrial application is disclosed in the patent application. All other requirements of patentability must also be fulfilled.³⁶⁹

European Patent Convention

Articles 52 and 53 of the European Patent Convention say what can and cannot be patented.

Biotechnological inventions are basically patentable. However, no European patent can be granted for any of the following:

- any invention whose commercial exploitation would be contrary to *ordre public* or morality (Article 53(a) EPC);
- plant and animal varieties (Article 53(b) EPC);
- essentially biological processes for the production of plants and animals (Article 53(b) EPC), i.e., classical breeding comprising crossing and selection;
- methods for the treatment of the human or animal body by surgery or therapy, and diagnostic methods practiced on the human or animal body (Article 53(c) EPC).

Discoveries (e.g., the mere discovery of natural substances, such as the sequence or partial sequence of a gene) are not patentable. However, if an inventor provides a description of the technical problem they are intended to solve and a technical teaching they move from being a discovery to being a patentable invention (Article 52(2)(a) EPC).

EU legislation as reflected in the EPC

In Europe, a debate on biotechnology patents started in the late 1980s with the aim of clarifying the distinction between what is patentable and what is not and harmonizing European Union member states’ laws in this area. This led to the adoption on July 6, 1998 of EU Directive 98/44/EC on the legal protection of biotechnological inventions. The directive has been implemented by all EU member states. As early as 1999, the EPC contracting states decided to incorporate the directive as secondary legislation into the Implementing Regulations to the EPC. Together with the EPC articles on substantive patent law, these rules now provide the basis for deciding on the patentability of biotechnology applications at the EPO.

In a significant extension of the scope of the rights conferred by a patent on a gene, EU Directive 98/44/EC also provides that the protection conferred by a patent on a product containing or consisting of genetic information (such as a gene) shall extend to all material in which the product is incorporated and in which the genetic information is contained and performs its function. Thus, a claim to a gene that has been incorporated

³⁶⁹ Patents on Biotechnology, EPO; <http://www.epo.org/news-issues/issues/biotechnology.html> and [http://documents.epo.org/projects/babylon/eponet.nsf/0/50e49b8a1ca12437c12575ad00372678/\\$FILE/biotechnology_brochure_en_2014.pdf](http://documents.epo.org/projects/babylon/eponet.nsf/0/50e49b8a1ca12437c12575ad00372678/$FILE/biotechnology_brochure_en_2014.pdf).

into a plant or animal will extend to the plant or animal and to offspring of that plant or animal. Likewise, Article 8(1) of the Directive states that the protection conferred by a patent on a biological material possessing specific characteristics as a result of the invention shall extend to any biological material derived from that biological material through propagation or multiplication in an identical or divergent form and possessing those same characteristics. Thus, a claim to genetically-modified plant cells will extend to plants containing those cells.³⁷⁰

These principles are subject to the limited exceptions contained in Articles 10 and 11. Article 10 clarifies that the reproduction of biological material for a purpose for which it was marketed does not constitute patent infringement. Thus, seed produced from legitimately purchased seed does not of itself constitute patent infringement. Article 11(1) also provides a limited authorization for a farmer who purchases propagating material to use the product of his/her harvest for propagation or multiplication on his/her own farm, whilst Article 11(2) permits a farmer to use patented livestock for the purpose of pursuing his/her “agricultural activity,” provided that this does not involve the sale of livestock or is not otherwise done for the purpose of commercial reproduction.³⁷¹

The Directive also clarifies that a plant grouping which is characterized by a particular gene (and not its whole genome) is not covered by the exclusion of plant varieties and is not, therefore, excluded from patentability even if it comprises new varieties of plants. Thus, genetically-modified plant varieties are in principle patentable.³⁷²

The incorporation of the EU directive into the EPC strengthened the practices of the EPO in biotechnology, whilst putting greater focus on ethical considerations.

For example, the directive affirmed that isolated biological material is patentable even if it has occurred previously in nature (Rule 27(a) EPC). It also confirmed that plants or animals are patentable if the technical feasibility of the invention (e.g., a genetic modification) is not confined to a particular plant or animal variety (Rule 27(b) EPC).

Furthermore, an invention relating to gene sequences can be patented as long as the industrial application of the sequence is disclosed in the application, and all other patentability criteria are fulfilled (Rule 29(3) EPC).

However, the directive rules out the patenting of the entire human body in all its developmental phases (Rule 29(1) EPC). The same applies to processes for cloning human beings, processes for modifying the germ line genetic identity of human beings and the use of human embryos for industrial or commercial purposes. Also excluded from patentability are processes for modifying the genetic identity of animals which are likely to cause them suffering without any substantial medical benefit to man or animal,

³⁷⁰ *Ibid.* 326, p. 17; <http://acipa.edu.au/pdfs/plant-patent-law-and-practice-australia-north-america-and-europe.pdf>.

³⁷¹ *Ibid.* 326, p. 1; <http://acipa.edu.au/pdfs/plant-patent-law-and-practice-australia-north-america-and-europe.pdf>.

³⁷² *Ibid.* 326, pages 17 and 18; <http://acipa.edu.au/pdfs/plant-patent-law-and-practice-australia-north-america-and-europe.pdf>.

and also animals resulting from such processes. This catalogue of exceptions to patentability is not exhaustive (Rule 28 EPC).

Evolving European case law

In addition to the provisions of the EPC and the EU directive, the case law of the EPO's technical boards of appeal and the decisions of its Enlarged Board of Appeal (EBoA) form a further source of guidance when considering the patentability of biotechnological inventions under the EPC.

In 2000, in line with the EU directive, which was explicitly codified in Rule 27(b) EPC in 1999, the Novartis decision of the EPO's EBoA in G 1/98³⁷³ confirmed that plants are patentable, notwithstanding the variety exclusion, provided that the patent claims do not specify individual varieties. Thus, a patent claim in which specific plant varieties *per se* are not individually claimed is not excluded from patentability, even though it may embrace such plant varieties. Other related aspects, such as transformation processes and transformed plant cells, can also be claimed.

Decision G 1/98 is not concerned with methods or steps for obtaining a new plant, be it a variety or not, but exclusively with the issue of whether this new plant is a variety or not. This becomes evident from the answer given by the Enlarged Board in response to question (4), which reads:³⁷⁴

“The exception to patentability in Article 53(b), 1st half-sentence, EPC applies to plant varieties irrespective of the way in which they were produced. Therefore, plant varieties containing genes introduced into an ancestral plant by recombinant gene technology are excluded from patentability.”

Although the position is reasonably clear for GM technology, it is less so for plant breeding. One might imagine that classically bred plants would be excluded from patentability and protectable only by variety rights. One might also imagine that non-biotech breeding processes that produce plants by crossing would be excluded as essentially biological. However, recent technologies –such as marker-aided selection, which speeds up breeding processes – have caused the EPO's EBoA to examine the issues in its Broccoli and Tomatoes cases.

In May 2010 the EBoA decided that conventionally-bred plants, their seed and the products of harvests may themselves be patented even if the process for breeding them cannot (T1854/07). Thus, conventional, non-transgenic plants obtained by breeding are also patentable as long as they are not varieties that meet the definition encompassing the Distinct, Uniform and Stable (DUS) criteria under UPOV/Rule 26(4) EPC.

³⁷³ Amtsblatt EPA / Official Journal EPO / Journal officiel OEB, 3/2000, p. 111; http://archive.epo.org/epo/pubs/oj000/3_00/3_1110.pdf.

³⁷⁴ T 1854/07 (Oil from seeds/Consejo Superior) of 12.5.2010, Case laws and appeals, European Patent Office; <http://www.epo.org/law-practice/case-law-appeals/recent/t071854eu1.html>.

In 2010 the EBoA decided, in what is referred to as the “Broccoli and Tomato cases” (G 2/07 and G 1/08), that a non-microbiological process for the production of plants comprising the steps of sexually crossing the whole genome of a plant and of subsequently selecting a plant is in principle excluded from patentability (as it remains an “essentially biological process”) even if it contains an additional step of a technical nature, such as the use of molecular genetic markers to facilitate the selection and thereby speed up the breeding process. Thus, classical methods for producing new plants by sexual crossing of whole genomes and subsequent selection of desired plants are not patentable even if there is an additional technical step before or after the breeding steps; so “marker-assisted breeding” is not patentable.

The response to the Broccoli and Tomatoes cases has been to claim non-GM plant inventions in product format. Although an essentially biological process for the production of plants cannot be patented, the EPC does not preclude explicitly the patenting of the product of such a process – for example, a plant obtainable by a breeding process. This is vital for so-called “native trait” applications that are becoming more common in light of improvements in technologies such as molecular markers. Here, the invention is the identification of the part of a plant’s genome responsible for a beneficial trait, which may not be a single gene as in a GM situation, but can nonetheless be transferred from one genetic background to another by breeding. Such inventions are, therefore, not confined to a single variety and can be claimed generically in line with the EPO’s EBoA’s Novartis decision. These inventions also cannot adequately be protected by plant variety rights, because such rights relate to single varieties, whereas a native trait is a more broadly based contribution requiring more extensive protection. Such product claims are in practice often hard to secure for other reasons, but current case law supports them in principle. This position is controversial, however. The seed industry considers that it needs and deserves such claims to protect its investment in the development of new plants. By contrast, breeders’ groups argue that, compared to the narrower and weaker protection of a plant variety right, patent claims on non-GM plants unduly restrict their members’ freedom to develop new varieties.³⁷⁵ The EBoA has been asked to clarify whether the products of such processes (i.e., plants or fruits) are likewise excluded from patentability. As of September 2014, these referrals were pending as G 2/12 and G 2/13.

³⁷⁵ Patents in Europe, Biotechnology patentability /recent/t071854eu1.html1854eu1.html” pean Patent Office; Andrew Bentham, 2013/2014 Helping business compete in the global economy, p. 5; [http://www.jakemp.com/uploads/files/published-articles/Patents in Europe Biotechnology patentability the latest from the EPO.pdf](http://www.jakemp.com/uploads/files/published-articles/Patents%20in%20Europe%20Biotechnology%20patentability%20the%20latest%20from%20the%20EPO.pdf).

Box 3.59: Development of plant biotechnology and different types of plant inventions³⁷⁶

- **Pre-1950:** conventional plant breeding to make new varieties
- **1980:** start of GE of plants: insertion of non-plant genes into plant genomes
 - **Monsanto:** glyphosate (Roundup Ready) - resistant plants
 - **Ciba-Geigy:** BT (Bacillus toxin) -containing corn
- Early patents all for transgenic plants
- **From 2000:** rapid development of gene technology: possible to work on plant genomes to improve classical plant breeding
 - marker-assisted breeding
 - characterization of native plant traits (natural genes encoding resistance to herbicides, pests, drought)
- Types of plant inventions
 - A Better processing
 - herbicide resistance
 - pest resistance (viruses, nematodes)
 - B Improved plants
 - functional food (broccoli, sunflower, “golden rice”)
 - drought resistance
 - high yield
 - baking quality
 - C New ornamental plants
 - flowers with novel colors
 - dwarf plants
 - D Plants as a biofactory (vaccines, antibodies)
 - E Methods for making new plants
 - expression systems

³⁷⁶ Latest developments in patenting plant inventions in Europe by Dr. Siobhán Yeats, European Patent Office, Brussels, 11th October 2011; http://ec.europa.eu/food/plant/plant_property_rights/conference/docs/conf_11102011_11_00_epo_en.pdf.

▪ transformation methods

Gene technology includes the discovery of genes, understanding gene functions and interactions, the use of genetic markers,³⁷⁷ controlling gene activity, modifying genes and transferring genes. Increasingly, IPR regimes, mostly in developed countries, provide for patents for gene technologies for plant breeding. In general, patents are not granted for products of conventional plant breeding.³⁷⁸ However, many of the diagnostic and selection processes used in conventional plant breeding are patented, and their protection has implications for researchers' ability to use these tools and release varieties developed through these techniques. Developing countries still have relatively limited experience in managing patents for biotechnology.³⁷⁹

In countries where the law permits the patenting of plants, patents may be sought for a variety of biological, non-biological and microbiological materials and processes, including:

- Isolated DNA sequences (genes) that code for certain proteins;
- Isolated or purified proteins;
- Seeds;
- Plant cells and plant itself (e.g., GM plants or non-GM plants);
- Progeny of a protected plant;
- Plant varieties, including parent lines;
- Hybrids;
- Processes to genetically modify plants; and,
- Processes to obtain hybrids;
- Methods of producing a new plant (e.g., breeding) or cultivation of the plant;
- Products produced by and/or from the plant (e.g., fruit, fiber, oils, etc.) together with methods of producing those products.

A GMO³⁸⁰ commonly includes an inserted construct³⁸¹ that contains a functional gene, a selection marker, a promoter and other sequences that may all be patented (by one or

³⁷⁷ Genetic markers, also known as DNA markers, are DNA sequences that naturally exist in an organism and sit near a specific gene of interest, and can be easily identified. DNA markers are tools that help locate a gene of interest used for both conventional and gene technology-based animal and plant breeding.

³⁷⁸ On 12th June 2013, the European Patent Office (EPO) in Munich granted a patent to Seminis, a company owned by Monsanto, (EP 1597965) on broccoli derived from conventional breeding. The plants, which are supposed to make harvesting easier, are derived from conventional cross-breeding and selection. The patent covers the plants, the seeds and the "severed broccoli head". It additionally covers a "plurality of broccoli plants... grown in a field of broccoli." The European Parliament as well as the German Parliament have both been highly critical of such patents; <http://www.swissaid.ch/en/monsanto-granted-patent-on-severed-broccoli>.

³⁷⁹ Refer to p. 15 of Intellectual property rights, designing regimes to support plant breeding in developing countries, Agriculture and Rural Development Department, Report No. 35517-GLB Agriculture and Rural Development Department, The World Bank; http://siteresources.worldbank.org/INTARD/Resources/IPR_ESW.pdf.

³⁸⁰ The GMO is political shorthand for any agricultural product involving rDNA techniques; its success as a cognitive frame is such that even proponents of GE in agriculture accept this political

many different inventors). The patenting of genes extends the scope of protection to all plants, which include a cell with the claimed gene.³⁸² Thus, if a process to produce a plant (e.g., by GE)³⁸³ is patented, exclusive rights would also apply with respect to the plants obtained with such a process. As a result, an agri-food enterprise may have to obtain authorizations to operate from a wide variety of patent holders (as long as the patents are valid in the country where the variety or its products will be used) since the patent holder is given the right to prevent any commercial use of the materials, including for research and breeding purposes.³⁸⁴

The first applications of rDNA technology were to introduce useful genes into bacteria. The first transgenic organism patent was issued in 1981 for a bacterium engineered to break down hydrocarbons. Now, a majority of all cheese is made using chymosin, an enzyme purified from microbes expressing a cloned chymosin gene, rather than using rennet extracted from calf stomachs.

The prohibition on the dual protection of new plant varieties by both patents and plant breeder's rights was removed from the 1991 text of the UPOV Convention (though member countries remain entitled to maintain the prohibition in their national laws). Therefore, if it meets the requirements of patentability a new plant variety may also be protected by a patent for such an invention; i.e., breeder's rights over a new plant variety can coexist with patent rights over the same variety, each with its own scope.

Most of the genes and tools used in the development of transgenic crops are patented. Even so, the protection of transgenic crops has proven particularly difficult in developing countries. Most experience with transgenic crops revolves around Roundup-Ready soybean and Bt (*Bacillus thuringiensis*) cotton and shows that the presence of IPR

terminology. The frame does not apply to rDNA techniques in pharmaceuticals, medicine or industry, where transgenics have been globally accepted.

³⁸¹ There are three basic parts of a gene: (a) the gene promoter that determines the number of copies of mRNA made and when and where they are made in the organism; (b) the protein coding region, which specifies the make-up of the protein encoded by the gene, and (c) the downstream stop switch, which determines the end of the mRNA molecule. For a gene to work, it must have all three basic parts, but they do not have to be from the same source. That is, they can be "recombined" from different sources. The protein-coding region is from the gene of interest of the donor organism. The promoter must be able to understand and interact with the signals of the cells in the receiving plant to work. The promoter is often from the receiving plant because it already knows how to work in that plant. The stop control region is less complex than the promoter and can be taken from a variety of plant genes. The different gene parts are pasted together ("recombined") to make a functional gene with instructions to produce the protein of interest. Scientists call this a gene construct, which will become a transgene when it is transferred to a new host.

³⁸² This could threaten commercial breeding, especially with broadly drafted patents. In the case of process patents, the patentee may prevent the use of the process as well as the commercialization of a product obtained directly by that process.

³⁸³ Modifying and transferring genes is called genetic modification or genetic engineering.

³⁸⁴ Maredia, M., Application of intellectual property rights in developing countries: implications for public policy and agricultural research institutes, cit. According to Article 30 of the TRIPS Agreement, WTO members may, however, provide limited exceptions to the exclusive rights conferred by a patent, provided it does not conflict with a normal exploitation of the patent. This provides some flexibility in drafting patent legislation and may allow members to include exemption for research purposes.

systems is not necessarily correlated with the effectiveness of controlling access to seed of transgenic varieties. Indeed, the most effective control has been achieved through contracts in controlled output markets and the application of seed and biosafety regulations. The experience with transgenic crops emphasizes the importance of learning how to use a judicious combination of seed regulation, biosafety, and IPRs to provide a reasonable degree of protection to the providers of transgenic technology.³⁸⁵

Making patents apply for a limited period tends to be in the common interest in the long term because knowledge disclosed in them helps others continue technical progress. This common interest can be harmed by “evergreening,” however, where patent owners use a range of strategies to extend the revenue stream from patents that are about to expire. These include market strategies such as long-term licensing agreements with potential users of a patent, or even buying up copycat manufacturers and their products. Technical evergreening strategies include registering follow-on patents for process elements, applications and incremental innovations whose novelty, inventive step and added utility are often questionable. In animal and plant breeding, the use and further development of patentable inventions depends on access to the genetic material. This fact presents biotechnology-specific opportunities for evergreening. The US administration began investigating possible anticompetitive behavior by Monsanto in early 2010. The investigations relate both to licensing practices and to breeding strategies such as “gene stacking.” By shifting the balance between the inventor’s individual interest and the common interest, evergreening – if tolerated – can cast doubt over the legitimacy of the patent system.³⁸⁶

Box 3.60: Gene patents and salmon³⁸⁷

Spawn used for stocking salmon pens in the past may have been considered to be an undifferentiated commodity without any particular or unique characteristics, but this view is changing as genetic material increasingly is seen as a form of IP over which certain rights are protected either by contract or by patent. Large European corporate actors including Wessjohan, Landcatch and Stofnfiskur have begun to exert a stronger proprietary interest in the genetic resources which they control. Rosendal, Olesen and Tvedt note that the German EW Group (a leader in poultry genetics through its subsidiary Aviagen) has gained majority ownership of AquaGen AS, a Norwegian company with 35 per cent of the world market. AquaGen AS is a direct descendent of the Norwegian Salmon Breeding Association which in turn was heir to the original non-profit research institute which began the salmon breeding program in 1971. The result

³⁸⁵ *Ibid.* 377, p. 16; http://siteresources.worldbank.org/INTARD/Resources/IPR_ESW.pdf.

³⁸⁶ Biopatents esources.worldban Use and Conservation of Agrobiodiversity? Position Paper of the Advisory Board on Biodiversity and Genetic Resources at the Federal Ministry of Food, Agriculture and Consumer Protection, Lead author Dr. Peter H. Feindt, Cardiff University, May 2010, pages 6 and 7;

http://www.bmel.de/SharedDocs/Downloads/EN/Ministry/Biopatents.pdf?__blob=publicationFile.

³⁸⁷ Remaking Fish for Aquaculture in the United States From Selective Breeding to Genetic Engineering, by Conner Bailey, Professional Report No. 4 -2013, National Institute for Consumer Research (SIFO), 2013, pages 25 and 26; http://www.sifo.no/files/file79294_professional_report_4-2013_web.pdf.

of this transaction is that genetic material of salmon from Norwegian rivers, developed through selective breeding programs supported by public funds in Norway, may become isolated and patented by a German corporation.

Whether the EW Group turns to patents to protect investments in genetic improvements in their breeding lines remains to be seen. Rosendal *et al.* note, however, that AquaGen and Landcatch Natural Selection of Scotland have chosen not to use patent law to protect their IP, instead using a tracking system to monitor compliance with contracts. One reason is that without continuously introducing genetic heterogeneity the health and performance of selective breed stocks tends to decline due to inbreeding. Patenting a breeding line is problematic because breeders continuously introduce new fish from the wild to maintain heterogeneity, and whole fish populations cannot be patented. Rosendal *et al.* report that most actors in the industry agree that patenting is not the right approach because the real value of their breeding stocks is achieved through continuous improvement through cross breeding with wild populations. Patents “freeze” the stock at a particular moment in time, but improvements must continue each year. There is also the problem of defending patents in different parts of the world. However, recent research in isolating genes that affect susceptibility to certain specific disease introduces the option for moving from tracking contract compliance to patentability. AquaGen and Landcatch identified the gene which affects susceptibility of salmon to infectious pancreas necrosis, a costly viral disease. They chose not to patent this development, but the sale of AquaGen to the EW Group leaves this option open.

That said, Rosendal *et al.* report that “The increased drive for patenting is not a strategy that the sector itself wishes. Actors in both the private and public sectors agree about the great value of securing free access to wild genetic resources for breeding material.”

3.5.30.3 Open source biotechnology and related business models for management of IPRs

Typically when an agri-food enterprise or R&D institution makes an invention, it initially keeps it as a secret. It then makes a cost benefit analysis of going down the patent route. If it determines that filing a patent application is the best option then it files for a patent at a national or regional patent office. To preserve its novelty, (which is essential if a patent is to be granted) before filing the patent application, the invention is not disclosed (e.g., publishing it in a journal or presenting it at a conference) irrespective of the type of its subject matter: be it a promoter,³⁸⁸ a gene, a transformation tool, or any other enabling technology.

Enterprises usually do not share information because with the power to exclude for a limited period of time given by a patent, they are allowed an opportunity to recover the R&D investments made to create the invention and subsequent investments such as obtaining regulatory approvals for taking the innovation, based on the patented invention, successfully to market.

³⁸⁸ A promoter is a nucleotide sequence that enables a gene to be transcribed.

The development of “Golden Rice” was only possible because of patenting. Much of the technology that Ingo Potrykus, Professor Emeritus, Institute of Plant Sciences, Swiss Federal Institute of Technology, had been using was known publicly because its inventors had been able to protect their rights. Much of it would have remained secret if this had been the case. If he and his team were interested in using all this knowledge to the benefit of the poor, it did not make sense to fight against patenting. It made far more sense to fight for a sensible use of IPRs. Thanks to public pressure, there is a lot of goodwill in the leading companies to come to an agreement on the use of IPR/TPR for humanitarian use that does not interfere with commercial interests of the companies.³⁸⁹

When looking at open source software from an IPR perspective the focus is on copyright while in biotechnology it is on patents. Yet, the application of open source model in software development led to the concept of applying the open source model in agricultural biotechnology. Open source biotechnology is a method of creating GM crops that do not infringe patents held by large biotechnology companies. The technique would be made available free of charge to others to use and improve as long as the improvements are also available free. As with open source software, the idea is to spur innovation. It is believed that open source will create opportunities through which life science inventions can be made available to the public and broad research communities by effectively unblocking the IPR “logjam.”³⁹⁰

In the agricultural biotechnology sector, new (preferably enabling) technologies, such as transformation systems and selection markers, are often developed with funding from the public sector of the economy. Nowadays, these are patented but licensed to anybody and everybody on the condition that any improvements or products developed from them are licensed out under the same conditions.³⁹¹

Such licenses are called “humanitarian licenses.”³⁹² A number of universities in the United States have taken the initiative to reduce the number of exclusive licenses on their patented inventions in order to retain control over opportunities to grant licenses on a preferential basis to users that work for the benefit of the poor.

Co-operating with others in the development and commercialization of new products and technologies is, therefore, an important way to innovate in an *open* manner, that is to say combining internal and external paths for the development and commercialization

³⁸⁹ The “Golden Rice” tale, by Ingo Potrykus, AgBioWorld; <http://www.agbioworld.org/biotech-info/topics/goldenrice/tale.html>.

³⁹⁰ Analysis of open source biotechnology in developing countries: An emerging framework for sustainable agriculture by Ademola A. Adenle, Sulayman K. Sowe, Govindan Parayil, Obijiofor Aginam, *Technology in Society, Volume 34, Issue 3*, August 2012, Pages 256-262. <http://www.sciencedirect.com/science/article/pii/S0160791X12000450>.

³⁹¹ Cf. Cambia, enabling innovation; www.cambia.org.

³⁹² In the sub-licensing agreement for Golden Rice, “humanitarian use” has been defined as (including research leading to) use in developing countries (low-income, food-deficit countries as defined by the UN FAO) by resource-poor farmers (earning less than 10, 000 USD per year from farming); <http://www.gmfrecymru.org/documents/golden-rice.html>.

of new technologies and products.³⁹³ Open innovation does not mean the absence of IP, but the proactive leveraging of IP through more open approaches towards knowledge management. In open innovation, licensing is the means to facilitate structured knowledge and IP transfers in an effort to open the innovation process itself and support technology transfer. In that context, IP is not seen as a defensive right but as a starting point for inclusion.

The Generation Challenge Program of the CGIAR has developed a format in its consortium agreement that will result in an automatic humanitarian license to all users for the benefit of the poor of IP developed in the course of the program's activities.³⁹⁴

Other innovative approaches to acquire proprietary science – or at least reduce the transaction costs of doing so – for the benefit of small farmers in the developing world include the following:

Box 3.61: PIPRA: Public Intellectual Property Resource for Agriculture³⁹⁵

PIPRA is a non-profit initiative striving to make it easy for developing countries to access new technologies.

PIPRA serves a number of purposes, the most important of which is helping public sector technologies to have an impact on the poor worldwide. We do this by decreasing IP barriers, improving commercialization strategies, and increasing technology transfer. We also help public institutions more broadly by supporting them in getting their technological innovations to those who need it most.

PIPRA's core activities

PIPRA helps innovators working to create new applications for agricultural, health, water, and energy technologies in developing countries and helps public sector organizations get their technologies out of the lab and into use. We do this by improving innovators' ability to navigate IPR issues and think strategically about commercialization.

PIPRA's core activities include the following:

³⁹³ Neal Stewart C., Open source agriculture, ISB News Report, 2005. Sharing software freely has, for example, enabled the open-source movement to grow; <http://www.isb.vt.edu/news/2005/news05.dec.htm>.

³⁹⁴ Biotechnology Industry Organization, Guide to Biotechnology, 2008, pp 36-37; see also Socially responsible licensing, Euclidean innovation, and the Valley of Death by Carol Mimura, Julie Cheng, & Braden Penhoet at http://journals.law.stanford.edu/sites/default/files/stanford-journal-law-science-policy-sjlspprint/2011/02/minura_sjlspp.pdf and Nuanced management of IP rights: Shaping industry-university relationships to promote social impact by Carol Mimura, Ph.D. Assistant Vice Chancellor for Intellectual Property and Industry Research Alliances (IPIRA), University of California, Berkeley, 2150 Shattuck Ave., Suite 510, Berkeley, CA 94704-1347, carolm@berkeley.edu; <http://ipira.berkeley.edu> at <http://innovate.ucsb.edu/wp-content/uploads/2010/04/Mimura-SSRN-id1434545.pdf>.

³⁹⁵ PIPRA a non-profit initiative striving to make it easy for developing countries to access new technologies. About us, PIPRA; <http://www.pipra.org/about/>.

- IP analysis – either broad landscapes or focused on particular technologies
- Biotechnology resources, e.g., the pPIPRA vector
- Drafting and negotiating agreements, with the support of our *pro bono* attorney network
- Research consortia support, including public-private partnerships
- IP management workshops at public institutions
- Regional IP Resources, mainly in Latin America and Southeast Asia
- Commercialization strategy to improve technology delivery
- IP handbook³⁹⁶
- IP policy analysis

Background and history

PIPRA's origins

If you're new to PIPRA, consider reading our first publication in Science Magazine.

PIPRA's founding mandate was to focus on IPR issues, particularly patents, in plant biotechnology for crops in developing countries and minor crops. The early model of PIPRA was a clearing house one – patent information from major public sector organizations (mostly US universities) would be gathered, licensing information would be collected. By providing accessible and searchable data on public sector patenting, PIPRA would increase transparency and lower transaction costs – supporting better commercialization of agricultural biotechnology innovations from the public sector. Complementary to the clearinghouse structure, PIPRA also promoted better management of IP among public sector organizations, including education and outreach on humanitarian use licensing and a range of other topics.

Over the years, PIPRA has evolved from its early design to meet the demands of its stakeholders. We now work across a range of technology sectors, providing IPR analysis and commercialization strategy services, delivering public sector research tools, and continuing a wide range of activities in education and outreach.

Changes over time

Much has changed over the decade since PIPRA was first conceived. While perspectives on the use of IPR remain wide-ranging, especially where public sector and developing country interests are at stake, there has been a general movement toward viewing IPR less as a block to innovation and more as a high, but surmountable, transaction cost. Importantly, IPR-related transaction costs have been put into perspective amidst other costs of developing GM crops (including regulatory, technical, marketing, and political issues).

³⁹⁶ Managing Innovation for a Better World, IP Handbook of Best Practices, Concept Foundation, MIHR, PIPRA; <http://www.iphandbook.org/>.

Concurrently, there has been a movement away from on-line marketing and clearinghouses for patents. Many patent aggregator web sites and businesses modeled on promoting on-line licensing of patents have folded during the last decade and we have, collectively, a better appreciation for the complexity of how IPRs are used and licensed.

PIPRA's growth responded to this changing climate. We moved away from identifying our core function as a patent clearinghouse, and toward a model that provides services and products that we have found are most demanded by our stakeholders. Our products include our pPIPRA plant transformation vector with maximal freedom-to-operate, as well as our educational resources such as the IP Handbook. Our services are now focused on: research and analysis; agreement negotiation and drafting; lab services; and international workshops. And we now work with water, health, and energy as well as agricultural technologies.

We built PIPRA's business over these years on a model that depends on a strong core analysis and lab staff within PIPRA as well as access to a large international IP attorney network and membership base. We believe this model of leveraging outside professional resources as well as in-depth technical knowledge provides PIPRA with a unique capacity to serve our stakeholders.

• **Biological Information for Open Society (BiOS)** fosters collaborative *open source* development of key enabling technologies, such as tools of genetic transformation, which will be made freely available to developing countries. It is also a clearinghouse for databases from IPR offices to reduce transaction costs in acquiring IP;

Box 3.62: Biological Innovation for Open Society (BiOS)³⁹⁷

The BiOS Initiative is fundamentally an effort to develop new innovation ecosystems for disadvantaged communities and neglected priorities.

BiOS, Biological Innovation for Open Society, holds to a “3-D” philosophy espoused by its founding institute, CAMBIA.³⁹⁸

Democratize, Decentralize and Diversify: human creativity and science can be harnessed through social, economic, and environmental responsibility for improving quality of life, and for promoting sound business and prosperous communities.

Design, Develop, and Disseminate: grand philosophical ambitions must be grounded with practical tools for achieving the goals in a meaningful time frame. The communications and IT revolutions afford unique abilities to harvest and share information, knowledge and wisdom within and between communities that have been marginalized or inadequately served.

³⁹⁷ BiOS Initiative, BiOS a framework to collaboratively solve our shared challenges; An initiative of Cambia; <http://www.bios.net/daisy/bios/bios/bios-initiative.html>.

³⁹⁸ Cambia enabling innovation, Cambia means change; <http://www.cambia.org/daisy/cambia/home.html>.

The BIOS Initiative uses the communications tools of the Internet and open source to generate open access to capabilities for innovation. We believe that doing this will greatly multiply the potential for public good.

The BIOS initiative will foster decentralized, cooperative innovation in the application of biological technologies, through the merging of:

- IP informatics and analysis
- Innovation system structural reform
- Cooperative open access technology development activities

• **African Agricultural Technology Foundation** brokers the acquisition of IP for smallholders in Africa, case-by-case, on a humanitarian basis. The Foundation brokered the partnership of CIMMYT (*International Maize and Wheat Improvement Center*), the Kenya Agricultural Research Institute, BASF (a private producer of agrochemicals), the Forum for Organic Resource Management and Agricultural Technologies, seed companies, and NGOs to make the *Striga*-killing maize-herbicide technology available to smallholders in Kenya.³⁹⁹

Box 3.63: Golden Rice⁴⁰⁰

“Golden Rice” (GR) takes its name from its orange-yellow color. The first version of Golden Rice - GR1 - was developed by Dr. Ingo Potrykus of the Swiss Federal Institute of Technology in Zurich and Dr. Peter Beyer of the University of Freiburg, Germany, between 1991 and 2000 with an expenditure of about 100 million USD. This was funded by four donors, including the RF, one of the founding donors of the IRRI that is housing the Golden Rice Project and managing the Golden Rice Network for the continued development of GR. The level of carotenoids (including beta-carotene) in GR1 was minimal at 1.6 micrograms per gram, and critique of this led to the subsequent creation of GR2 with a maximum of 31 micrograms per gram of beta-carotene.⁴⁰¹

The vitamin A-enriched rice contains a gene from maize and another gene from a common soil bacterium.⁴⁰² GR is one potential tool to reduce Vitamin A Deficiency (VAD), which increases the risk of death from certain common disease infections among young children and is also the leading cause of blindness among children.⁴⁰³

³⁹⁹ Wright, B., Pardey, P, Changing intellectual property regimes: Implications for developing country agriculture, *International Journal for Technology and Globalization*, 2006; <http://are.berkeley.edu/~bwright/IJTGWP1.pdf>.

⁴⁰⁰ *Ibid.* 391; Neal Stewart C., Open-source agriculture; <http://www.isb.vt.edu/news/2005/news05.dec.htm>.

⁴⁰¹ GM-Free Cymru, the community pressure group campaigning to keep Wales free of genetically-modified crops; <http://www.gmfrecymru.org/documents/golden-rice.html>.

⁴⁰² Added through genetic transformation, the two genes completed the biosynthetic pathway for beta-carotene in the rice grains. Beta-carotene is a pro-vitamin A carotenoid that is converted into vitamin A in the body of humans and animals when that individual's vitamin A status is low or deficient. Unlike vitamin A, beta-carotene has no known toxicity level.

⁴⁰³ VAD has been the cause of death of about 670,000 and blindness for 350,000 children around the world (approximately 90 million Southeast Asian children also suffer from VAD). Deficiency in vitamin

It is estimated that eating about one cup of golden rice per day could provide half of an adult's vitamin A needs. Putting together the golden rice technology platform, however, has required the use of multiple inventions with complex IP ownership. It took strong determination on the side of the developers (to make their product free), their good public relations, and the good will of some of the companies holding IP rights to GR1 technology, to resolve the issue of 70 technical and IPRs belonging to 32 different universities and companies.

“Golden Rice” was developed for the vitamin A-deficient and iron-deficient poor and disadvantaged in developing countries. To fulfill this goal it has to reach the subsistence farmers free of charge and restrictions. Peter Beyer had written up a patent application and the inventors, Peter and myself, were determined to make the technology freely available. As only public funding was involved this was not considered too difficult. The RF had the same concept, the Swiss Federal Institute of Technology supported it, but the EC had a clause in its financial support to Peter Beyer, stating that industrial partners of the “Carotene plus” project, of which our rice project was a small part, would have rights on project results (The fourth and fifth framework of European Union funding forces public research into coalitions with industry and thus is responsible for two very questionable consequences: Public research is oriented towards problems of interest to industry, and public research is losing its independence).

We did not consider this too big a problem because the European Union funding was only a small contribution at the end of the project. But we realized soon that the task of technology transfer to developing countries, the international patent application, and the numerous IPRs and Technical Property Rights (TPRs) we had used in our experiments, were too much to be handled properly by two private persons. We urgently (because of the deadline of the international patent application) needed a powerful partner. In discussions with industry, defining “subsistence farmer” and “humanitarian use” was the most difficult problem to be solved. We wanted as generous a definition as possible, because we not only wanted the technology free for small-scale farmers, we also wanted to contribute to poverty alleviation via local commercial development. Very fortunately the company that agreed to the most generous definition was also the company that had legal rights because of its involvement in the EU-project. This facilitated the agreement, via a small licensing company (Greenovation), with Zeneca. Zeneca received an exclusive license for commercial use and in return supports the humanitarian use via the inventors for developing countries. The cut-off line between humanitarian and commercial is 10, 000 USD – income from “Golden Rice.” This agreement also applies for all subsequent applications of this technology to other crop plants. It turned out that our agreement with Zeneca and the involvement of our partner in Zeneca, Adrian Dubock, were a real asset to the development of the humanitarian project. Dubock was very helpful in reducing the frightening number of IPRs and TPRs,

A also causes night blindness and increases risk of maternal mortality among pregnant and nursing women.

and he organized most of the free licenses for the relevant IPRs and TPRs such that we are now in the position of having reached “freedom-to-operate” for public research institutions in developing countries to go ahead with breeding and *de-novo* transformation into the best adapted local varieties. Publicity sometimes can be helpful: only a few days after “Golden Rice” had appeared in TIME Magazine, I had a phone call from Monsanto offering free licenses for the company’s related IPR. A really amazing quick reaction of the PR department was to make best use of this opportunity.⁴⁰⁴

One of the world’s top pesticide and seed companies, Syngenta, acquired exclusive rights to the GR1 technology from its inventors but went on to develop GR2 itself. On World Food Day in 2004, it announced the donation of GR2 to the Golden Rice Humanitarian Board. The Golden Rice Humanitarian Board, chaired by Dr. Potrykus, is a public-private partnership responsible for the global development, introduction and promotion of genetically engineered Golden Rice in target countries. It provides governance to the Golden Rice Project. In 2000, the RF commissioned an IPR audit through the International Service for the Acquisition of Agri-biotech Applications for IRRI. The patented key technology to create GR1 involved a package of ancillary proprietary technologies needed to engineer the trait into rice belonging to Syngenta, Bayer AG, Monsanto Co, Orynova BV, and Zeneca Mogen BV. Syngenta Seeds AG negotiated access to all these technologies and provided the GR Humanitarian Board with the right to sub-license the GR technology to breeding institutions in developing countries, free of charge. It is not known if a similar audit has been carried out for GR2. It has also provided a “humanitarian use” license that ensures that the use of GR seeds is free of royalty or similar charges to small farmers. Syngenta reserves its rights to commercial exclusivity over GR1 and GR2, including commercial rights over improvements to the technology - but the “humanitarian use” of such improvements is guaranteed. Syngenta announced several years ago that it will not commercialize GR, however, there is no legal obstacle to its doing so.⁴⁰⁵

The Golden Rice Humanitarian Board, which now provides strategic guidance to development and deployment of golden rice, manages sub-licensing arrangements on the use of the technology by breeding institutions in developing countries such as the Philippine Rice Research Institute (PhilRice).⁴⁰⁶

Syngenta, the Syngenta Foundation for Sustainable Agriculture (SFSA) and both of Syngenta’s legacy companies (Novartis and Zeneca) provided financial support and other resources to the inventors to support the development of Golden Rice for a period of time. IRRI is now the lead developer of Golden Rice and is directly involved in breeding, capacity building, and safety research. IRRI has been working together, and continues to do so, with leading agriculture and nutrition research organizations such as the PhilRice, the Bangladesh Rice Research Institute (BRRI), and Helen Keller

⁴⁰⁴ *Ibid.* 387; <http://www.agbioworld.org/biotech-info/topics/goldenrice/tale.html>.

⁴⁰⁵ *Ibid.* 399; <http://www.gmfrecymru.org/documents/golden-rice.html>.

⁴⁰⁶ Golden Rice and Intellectual Property, Golden Rice Licensing Agreement, Golden Rice Project, Golden Rice Humanitarian Board; http://www.goldenrice.org/Content1-Who/who4_IP.php.

International (HKI) to evaluate Golden Rice as a potential new way to reduce vitamin A deficiency. The Bill & Melinda Gates Foundation, the RF, USAID, and national governments are the current donors for the project.⁴⁰⁷⁴⁰⁸

Funding for research has significantly grown with grants coming from the Bill and Melinda Gates Foundation to further improve golden rice with the hope of increasing levels and bioavailability of pro-vitamin A, Vitamin E, iron, and zinc, and to improve protein quality through genetic modification.⁴⁰⁹

The participation of PhilRice in the Golden Rice Project is one of the best, and most clearly documented, examples of developing country access to biotechnology through IPR management and mechanisms. PhilRice's involvement in the Golden Rice Project is driven by its national mandate, its existing manpower and facilities, and the well-established national regulatory policies on biosafety.⁴¹⁰

*Advantages of Golden Rice.*⁴¹¹

- GR fulfils all the wishes the GMO opposition had earlier expressed in their criticism of the use of the technology, and it thus nullifies all the arguments against GE with plants in this specific example.
- GR has not been developed by and for industry.
- It fulfils an urgent need by complementing traditional interventions.
- It presents a sustainable, cost-free solution, not requiring other resources.
- It avoids the unfortunate negative side effects of the Green Revolution.
- Industry does not benefit from it.
- Those who benefit are the poor and disadvantaged.⁴¹²
- It is given free of charge and restrictions to subsistence farmers.
- It does not create any new dependencies.
- It will be grown without any additional inputs.
- It does not create advantages to rich landowners.
- It can be resown every year from the saved harvest.

⁴⁰⁹ <http://searice.org.ph/2013/09/03/going-against-the-golden-grain-a-primer-on-golden-rice-excerpts/>.

⁴⁰⁹ <http://searice.org.ph/2013/09/03/going-against-the-golden-grain-a-primer-on-golden-rice-excerpts/>.

⁴⁰⁹ <http://searice.org.ph/2013/09/03/going-against-the-golden-grain-a-primer-on-golden-rice-excerpts/>.

⁴¹¹ Ibid. 387; <http://www.agbioworld.org/biotech-info/topics/goldenrice/tale.html>.

⁴¹¹ Ibid. 387; <http://www.agbioworld.org/biotech-info/topics/goldenrice/tale.html>.

⁴¹² There is a grave risk that, after substantial investment, GR may not be widely adopted and will have little semblance of the impact envisioned. Farmers who wish to sell it in markets (most rice in Asia is traded in markets, not consumed at home) may not want to take the risks of adopting a new variety (e.g., lower yield, susceptibility to pests and diseases) unless they are compensated with higher prices or yields. However, such higher prices would work against its incorporation into the diets of the poor, possibly causing it to wind up as a niche product for rich consumers. One possibility to counter these incentives would be to bundle the increased beta-carotene content with other new desirable traits that farmers find helpful. Alternatively, GR could be grown by poor farmers for their own consumption, although again they may be discouraged by the risks noted above. Furthermore, this strategy would limit the potential impact of GR because the poorest of the poor typically buy much of their rice on markets. Yet another possibility would be for governments to subsidize the production and/or consumption of GR through public distribution systems to encourage adoption by farmers and consumption by poor consumers. However, it should be noted that targeted government subsidies in agriculture and food are difficult to deliver without substantial leakage of financial resources; <http://www.agbioforum.org/v10n3/v10n3a04-unnevehr.htm>.

- It does not reduce agrobiodiversity.
- It does not affect natural biodiversity.
- There is, so far, no conceptual negative effect on the environment.
- There is, so far, no conceivable risk to consumer health
- It was not possible to develop the trait with traditional methods, etc.

Yet, so far (September 2014) neither GR1 nor GR2 variety is available for human consumption. GR technology still needs considerable research investment to be viable in farmers' fields and to meet the rigorous standards for consumer safety. Moving past regulatory hurdles will not be easy, and thus, this crop is unlikely to play a role in meeting micronutrient needs before the next decade. No wonder, GR is still so far from actual production and consumption, little is known about bioavailability, losses in storage or cooking, or many other factors that would influence the actual delivery of Vitamin A. These studies are beginning and will help define the deployment options for the product. Costs of development will include basic research, adaptation to local conditions, biosafety testing, and costs of consumer and producer education, as well as any specific marketing regulations and future maintenance breeding.

In 2002, Dawe *et al.* made very crude estimates of GR costs for Asia, which now appear to have underestimated the costs of development and promotion. Stein's (2006) estimates of the costs for bringing GR to market in India are 21-28 million USD total for the next 30 years (discounted to the present), or 0.7-0.9 million USD annually. This includes costs of development within India of 4.1-8.7 million USD, 2.2-2.5 million USD for regulatory review, and 15.6-30.7 million USD for promotion and marketing. These estimates show that significant investments must still be made to bring GR to farmers' fields in Asia, above and beyond international R&D to support understanding of bioavailability and biosafety.⁴¹³

"Golden Rice" is, to date, a popular case - supported by the scientific community, the agri-biotech industry, the media, the public, the Consultative Group on International Agricultural Research (CGIAR), FAO, WHO, official developmental aid institutions, etc., but equally strongly opposed by the opponents of GMOs. The first group likes "Golden Rice" because it is an excellent example of how GE plants can be of direct benefit to the consumer, especially the poor and the disadvantaged in developing countries, where GMOs offer many more opportunities for the improvement of livelihood than for those living in well-fed developed nations. The GMO opposition, however, is concerned that "Golden Rice" will be a kind of "Trojan Horse," opening the developing countries to other applications of the GMO technology, and for improving acceptance of GMO food. Indra Vasil persuaded me to write the Golden Rice Tale because the background behind this success, which is embedded in numerous failures and obstacles, and which covers the entire history of the development of plant GE, might be of interest to those who are faced with the numerous specific problems of strategic research, where the target is set

⁴¹³ Crop case study: GMO Golden Rice in Asia with enhanced vitamin A benefits for consumers, AgBioForum, Volume 10 // Number 3 // Article 4; <http://www.agbioforum.org/v10n3/v10n3a04-unnevehr.htm>.

at the outset, where no attractive alternatives to existing academic questions are available, where success is measured in relation to the original target, and not in relation to possible attractive academic solutions.⁴¹⁴

Box 3.64: Synthetic Biology and the BioBricks Foundation⁴¹⁵

The BioBricks Foundation (BBF) is a 501(c)(3) public-benefit organization founded in 2006 by scientists and engineers who recognized that synthetic biology had the potential to produce big impacts on people and the planet and who wanted to ensure that this emerging field would serve the public interest.

The mission of BBF is to ensure that the engineering of biology is conducted in an open and ethical manner to benefit all people and the planet.

It envisions a world in which scientists and engineers work together using freely available standardized biological parts that are safe, ethical, cost effective and publicly accessible to create solutions to the problems facing humanity.

It envisions synthetic biology as a force for good in the world. It sees a future in which architecture, medicine, environmental remediation, agriculture, and other fields use synthetic biology.

It believes that biosecurity, biosafety, bioethics, environmental health, and sustainability must be integrated with scientific research and applied technology.

It brings together engineers, scientists, attorneys, innovators, teachers, students, policymakers, and ordinary citizens to make this vision a reality.

The BioBrickgether engineers, scientists, attorneys, innovators, teachers, students, policymakers, and ordinary citizens to make this vision a reality.chnology.other fields use synthetic biology.solutions to the problems facing humani BioBrick™ parts) but, in practice, it can be used to make the sharing of any genetically encoded function that somebody might already own or make anew free of charge. What is being contributed is immunity from the assertion of IP. The Contributor makes an irrevocable promise not to assert any IPRs held by the Contributor against Users of the contributed genetic functions. Why that matters is that it means the contributed genetic functions – say, a BioBrick™ part – becomes free to use for anyone who’s signed the BPA.

For example, suppose some genetically encoded function is under patent. If the use of that function is contributed under the BPA, the patent-holder promises not to assert patent rights against anyone who signs the BPA. Thus, that function becomes “free-to-use” for all Users. Or suppose that some genetically encoded function is not (yet) under patent; by making it suppose some genetically encoded function is under patent. If the use of that function is contributed under the BPA, the patent-holder promises not to assert patent rights against anyone who signs the BPA. Thus, that function becomes “free-to-use” for all Users. Or suppose that some genetically encoded function is not (yet) under patent; by making it “free-to-use” under the BPA, the Contributor promises

⁴¹⁴ *Ibid.* 387; <http://www.agbioworld.org/biotech-info/topics/goldenrice/tale.html>.

⁴¹⁵ About, BioBricks Foundation, Biotechnology in the public interest; <http://biobricks.org/about-foundation/>.

that any future rights he or she acquires over the function in question cannot be used against anyone who's signed the BP.

Q: Can somebody patent something that uses BPA-contributed parts?

A: Yes. Novel materials and applications produced using BPA-contributed parts may be considered for protection via conventional property rights. Of course, it'd be great if that somebody chose to give something back via the BPA.

3.5.30.4 Patents for nanotechnology inventions for agriculture and food⁴¹⁶

Nanotechnology, the science of building things on a molecular or atomic scale, is invading the food industry, creating a buzz that thus far has been confined for the most part to the electronics industry. All facets of the food industry, from ingredients to packaging to food analysis methods, are already looking into nanotech applications. Nanotechnology has the potential to revolutionize the agricultural and food industry with new tools for the molecular treatment of diseases, rapid disease detection, enhancing the ability of plants to absorb nutrients, etc. Smart sensors and smart delivery systems will help the agricultural industry combat viruses and other crop pathogens. In the near future, nanostructured catalysts will be available which will increase the efficiency of pesticides and herbicides, allowing lower doses to be used. Nanotechnology will also protect the environment indirectly through the use of alternative (renewable) energy supplies, and filters or catalysts to reduce pollution and clean-up existing pollutants.

The definition of nanofood is that nanotechnology techniques or tools are used during cultivation, production, processing, or packaging of food. It does not mean atomically modified food or food produced by nanomachines. Although there are ambitious thoughts of creating molecular food using nanomachines, this is unrealistic in the foreseeable future. Instead nanotechnologists are more optimistic about the potential to change the existing system of food processing and to ensure the safety of food products, creating a healthy food culture. They are also hopeful of enhancing the nutritional quality of food through selected additives and improvements to the way the body digests and absorbs food. Although some of these goals are further away, the food packaging industry already incorporates nanotechnology in products. In addition to packaging, nanotechnology is already making an impact on the development of functional or interactive foods, which respond to the body's requirements and can deliver nutrients more efficiently. Thus, the main areas of application include food packaging and food products that contain nanosized or nano-encapsulated ingredients and additives. The main principle behind the development of nanosized ingredients and additives appears to be directed towards enhanced uptake and bioavailability of nanosized substances in the body, although other benefits, such as improvement in taste, consistency, stability and texture, etc., have also been claimed. A key area of application of nanotechnology in food processing involves the development of nanostructures (also termed nanotextures) in foodstuffs. The mechanisms commonly used for producing nanostructured food products include nano-emulsions, surfactant micelles, emulsion bilayers, double or multiple emulsions and reverse micelles.

⁴¹⁶ FAO/WHO Expert meeting on the application of nanotechnologies in the food and agriculture sectors: potential food safety implications, Meeting report, Food and Agriculture Organization of the United Nations and World Health Organization, Rome 2010; <http://www.fao.org/docrep/012/i1434e/i1434e00.pdf>.

Examples of nanotextured foodstuffs include spreads, mayonnaise, cream, yoghurts, ice creams, etc.

Different options exist for the application of nanotechnology in the agri-food sector, in particular for food-based applications (packaging), animal husbandry (detoxification and nanomedication) or both sectors (tagging and barcode), and for crop-based applications (plant genetic modification and nanomaterials from plants), environment-based applications (pollutant remediation, water purification and water retention) or both (plant protection products and fertilizers), plus applications that are common to all these sectors (e.g., nanosensors).⁴¹⁷

A cursory overview of the current and projected applications of nanotechnologies suggests that many of them have emerged from similar technologies developed in related sectors, in particular pharmaceutical, medical and cosmetic sectors. The cross-cutting nature of nanotechnologies means that materials and applications developed in one sector are gradually finding their way into other related sectors. This is also because there is a certain degree of overlap between the food, medicine and cosmetic sectors. Many food products are marketed as a means to enhance nutrition, and as an aid to health, beauty and well-being. These subsectors, e.g., health foods, supplements, nutraceuticals, cosmeceuticals and nutricosmetics, appear to be the first target of nanotechnology applications. Thus, a large majority of the currently available nanotechnology-derived products falls into the categories of supplements, health foods and nutraceuticals, with currently only a few products in the F&B categories.

Box 3.65: Unique patent-pending nanoparticle delivery system for ice creams of TigerMonkey⁴¹⁸

TigerMonkey Inc. is not just in the ice cream business, it's in the business of combining revolutionary and patented technology with premium ice cream novelties. Determined to create a product that would stand apart from the rest, the company has launched a line of premium gelatos, sorbets, ice creams, and syrups, which can be enjoyed alone or used to add flair to any other dessert.

TigerMonkey Inc. has acquired the technology from one of the worldrbets, ice creams, and syrupies Dermazone Solutions. Below is a thorough explanation of the advanced unique and revolutionary nano delivery system used in TigerMonkey's advanced ice cream novelties. Our Nanolipidic Particle (NLP) technology is a proprietary technology platform that enhances the effectiveness of incorporated active compounds through the utilization of its unique nanoparticle delivery system. This technology is currently patent pending (US Application 60/755,171) and builds upon the proven technology platform of the Solvent Dilution Micro Carrier (SDMC). The SDMC technology platform is currently protected by issued United States Patents (5,269,979 and 5,879,703) and has been utilized in products on a worldwide basis.

One of the many benefits of using NLP technology in frozen products is the ability to retain added alcohol into the nanoparticle allowing for uniform freezing with no leaching

⁴¹⁷ JRC Scientific and Policy Reports, Proceedings of a workshop on "Nanotechnology for the agricultural sector: from research to the field," Prepared by Claudia Parisi, Mauro Viganì and Emilio Rodríguez-Cerezo, 2014, p. 12;
https://ec.europa.eu/jrc/sites/default/files/ijpts_jrc_89736_%28online%29_final.pdf.

⁴¹⁸ Welcome to Tigermonkey, Tigermonkey INC.;
http://www.tigermonkeyinc.com/#/page_technology.

of the alcohol over time. This will improve the shelf life of the product as well as the overall appearance. Products engineered using the NLP technology platform are designed to withstand freezing and thawing without separation of product components or loss of structural integrity.

The composition of the nano-particles, all natural soybean lipids that are naturally rich in essential fatty acids (linoleic and linolenic acids), provides an ideal platform for engineering of ultra-small particles (mean diameters below 150nm). NLPs are designed, engineered and constructed to provide a versatile platform for optimal encapsulation and sequestration of both lipid-soluble and water-soluble passenger molecules. TigerMonkey pays careful attention to ensure that the NLP produced will be both stable in the environment of the finished product and fully capable of delivering maximal product benefits when used by the consumer.

The products we produce using this technology are engineered to deliver a maximal payload of active compound(s) through the optimization of the three critical components central to our product design: 1) number of nano-particles present in the formulation, 2) the size of the finished NLP product, and 3) the desired concentration of the passenger molecules(s) chosen for inclusion into the product.

The application of the NLP technology provides consumers with the sensation of a smooth and silky mouth feel with reduction of bitter or unpleasant taste of encapsulated compounds. In addition, the versatility of the NLP technology platform allows for the modulation of the taste sensation through the inclusion of active compounds, flavorings and sweeteners as well as the initiation of uptake of the product through the oral mucosa. Using this technology platform enables us to manufacture products with better adherence to mucosal surfaces, enhanced absorption through the oral membranes and superior delivery of active compounds.

3.6 Plant Breeders' Rights

3.6.1 What is a new plant variety?⁴¹⁹

The plant kingdom is vast and has been classified into a ranking system containing many divisions and sub-divisions. The division which is most familiar to many people is the *species*.

The most commonly used ranks in classification of plants are, in descending order, Kingdom, Division, Class, Order, Family, Genus and Species. Thus, in general, each species belongs to a genus, each genus belongs to a family, etc. These ranks are called taxonomic groups or *taxa* (singular: *taxon*) for short.

The rank of species, by which most plants are known, is probably the most important because it is the basis on which the classification is constructed. It denotes a group of organisms sharing a long number of heritable characteristics, which are reproductively isolated. Thus, plants of different species such as rose, potato, wheat and apple cannot inter-breed by natural means.

Although the rank of species is an important botanical classification, it is clear that the plants within a species can be very different. Farmers and growers need plants which are adapted to the environment in which they are grown and which are suited to the

⁴¹⁹ www.upov.int/about/en/upov_system.html#what_is_a_pv.

cultivation practices employed. Therefore, farmers and growers use a more precisely defined group of plants, selected from within a species, called a *plant variety*.

A plant variety is defined by Article 1(vi) of the *UPOV Convention*⁴²⁰ as a *plant grouping within a single botanical taxon of the lowest known rank, which grouping, irrespective of whether the conditions for the grant of a breeder's right are fully met, can be:*

- *defined by the expression of the characteristics resulting from a given genotype or combination of genotypes,*
- *distinguished from any other plant grouping by the expression of at least one of the said characteristics and,*
- *considered as a unit with regard to its suitability for being propagated unchanged.*

This confirms that a plant variety results from the lowest sub-division of the species and that a variety must be recognizable by its characteristics, which must be recognizably different from any other variety and remain unchanged through the process of propagation.

3.6.2 The UPOV Convention⁴²¹

The system of plant protection provided by the UPOV Convention, which came into being with the adoption of the International Convention for the Protection of New Varieties of Plants on December 2, 1961, provides a *sui generis* form of IP protection which has been specifically adapted for the process of plant breeding and has been developed with the aim of encouraging breeders to develop new varieties of plants.⁴²² The list of members of UPOV may be seen by following the link⁴²³ (see footnote) and

⁴²⁰ UPOV was established by the International Convention for the Protection of New Varieties of Plants. The Convention was adopted in Paris in 1961 and revised in 1972, 1978 and 1991 (the 1991 Act). The objective of the Convention is the protection of new varieties of plants by IPR. By codifying IP for plant breeders, UPOV aims to encourage the development of new varieties of plants for the benefit of society.

⁴²¹ www.upov.int/about/en/upov_system.html#what_is_a_pv.

⁴²² Button P., Benefits of the UPOV system for technology transfer, UPOV Symposium on the Benefits of Plant Variety Protection for Farmers and Growers, Geneva, 2012. As of April 2014, UPOV had 71 members; 70 States and one international intergovernmental organization, the EU (cf. www.wipo.int/treaties/en/ShowResults.jsp?treaty_id=27). The UPOV Convention is not self-executing. Each Member State must adopt legislation consistent with the requirements of the convention and submit that legislation to the UPOV Secretariat for review and approval by the UPOV Council, which consists of all the UPOV member states acting in committee. In compliance with these treaty obligations, the UK enacted the Plant Variety and Seeds Act 1964. Similar legislation was passed in The Netherlands, Denmark, Germany and New Zealand. In 1970, the United States followed the lead of seventeen Western European nations and passed the Plant Variety Protection Act 1970 (United States). This legislation provided protection to developers of novel, sexually reproduced plants. However, the United States originally acceded to the UPOV Convention on the basis of the Plant Patent Act and did not bring the PVP Act into compliance with UPOV requirements until 1984 when the Commissioner of Plant Variety Protection promulgated rules to do so. Since the 1980s, the US Patent Office has granted patents on plants, including plant varieties this provides a second way of protecting plant varieties in the United States. Commonwealth of Australia passed the Plant Variety Protection Act 1987 and the Plant Breeders Rights Act 1994. Australian patent law also permits the patenting of plant varieties.

⁴²³ V. Members of the International Union for the Protection of New Varieties of Plants, International Convention for the Protection of New Varieties of Plants, UPOV Convention (1961), as revised at Geneva (1972, 1978 and 1991), Status on June 10, 2014; <http://www.upov.org/export/sites/upov/members/en/pdf/pub423.pdf>.

the national laws of the countries which are members of UPOV may be seen by following the link,⁴²⁴ as of June 10, 2014, UPOV has 72 members. Some other countries, such as India,⁴²⁵ have a *sui-generis* plant protection system, similar to that provided by UPOV, but are not members of UPOV. As of June 2014, States and intergovernmental organizations which have initiated the procedure for acceding to the UPOV Convention include Armenia, Bosnia and Herzegovina, Egypt, Ghana, Guatemala, Honduras, India, Kazakhstan, Malaysia, Mauritius, Montenegro, the Philippines, Tajikistan, Tanzania, Venezuela Zimbabwe, as well as the African Regional Intellectual Property Organization (ARIPO).

Most developing countries, including LDCs, are not UPOV members; only 8 per cent of countries with that classification had joined as of 2004. This is due in part to objections from some developing countries that the UPOV Conventions, particularly the revision of 1991, are more protective of private than public interests. Thus the India, for example, has created a *sui generis* system that differs from UPOV in significant ways. The Indian Protection of Plant Varieties and Farmers' Rights Act of 2001 requires applicants to provide information about the origin of genetic material used in an innovation, forbids protection of "terminator" technology that inhibits development of viable seed, and grants farmers extensive rights to save, share, use or sell seed of a protected variety. But the lack of low-income country representation in UPOV primarily reflects a general lack of plant rights regimes in these countries: one survey found that as of 2004, only twenty-two of sixty-one low-income countries had any statutory protection in place for plants.⁴²⁶

An optimal *sui generis* PVP system would have to take into account the type of domestic seed industry that exists, the level of use of farm-saved seed, the current capacity of breeders, local (national) breeders' aims in the next 5-10 years, the country's biotechnology capacity, the goals and realistic expectation[s] of the biotechnology sector, and the types of strategic alliances likely to be entered into. Use of a PVP system that is stricter than a country's optimal level of protection may have a negative impact on food security by enabling a narrow selection of monoculture crops to push out minor crop varieties, by restricting farmers' access to certain seed sources, and by increasing the risk of disease outbreak through promotion of genetic uniformity.⁴²⁷

3.6.2.1 Who qualifies for PBRs?⁴²⁸

The UPOV system offers protection to the breeder of a plant variety, in the form of a *breeder's right*, if his/her plant variety satisfies the conditions set out in the UPOV.

Article 1(iv) of the 1991 Act of the UPOV Convention defines a breeder as:

- The person who bred, or discovered and developed, a variety,

⁴²⁴ Plant Variety Protection Laws, UPOV International Union for the Protection of New Varieties of Plants; <http://www.upov.org/en/publications/npvlaws/index.htm>.

⁴²⁵ Protection of Plant Varieties and Farmers' Rights Act of 2001; <http://www.plantauthority.gov.in/>.

⁴²⁶ "Building intellectual property management capacity in public research institutions in Viet Nam: Current needs and future directions" by Laurel Kilgour, p. 4; http://mjlst.umn.edu/prod/groups/ahc/@pub/@ahc/@mjlst/documents/asset/ahc_asset_366003.pdf.

⁴²⁷ *Ibid.*, p. 7;

http://mjlst.umn.edu/prod/groups/ahc/@pub/@ahc/@mjlst/documents/asset/ahc_asset_366003.pdf.

⁴²⁸ The UPOV System of Plant Variety Protection; http://www.upov.int/about/en/upov_system.html.

- The person who is the employer of the aforementioned person or who has commissioned the latter's work, where the laws of the relevant Contracting Party so provide, or
- The successor in title of the first or second aforementioned person, as the case may be.

3.6.2.2 In respect of which plant varieties may be granted PBRs?⁴²⁹

A breeder may be granted protection in relation to a plant variety if it is:

- (i) **New.** To be eligible for protection, a variety must not have been sold, or otherwise disposed of, in the territory of the member of the UPOV Union for more than one year prior to the application for a breeder's right, or more than four years (six years for trees or vines) in a territory other than that of the member of the Union in which the application has been filed.
- (ii) **Distinct.** A variety is deemed to be distinct if it is clearly distinguishable from any other variety whose existence is a matter of common knowledge at the time of filing of the application.
- (iii) **Uniform.** A variety is deemed to be uniform if, subject to the variation that may be expected from the particular features of its propagation, it is sufficiently uniform in its relevant characteristics.
- (iv) **Stable.** A variety is deemed to be stable if its relevant characteristics remain unchanged after repeated propagation or, in the case of a particular cycle of propagation, at the end of each such cycle.

The distinctness, uniformity and stability (DUS) criteria are often grouped together and referred to as the "technical criteria."

The grant of protection *shall not be subject to any further conditions*, provided the variety is designated by an acceptable denomination and the applicant complies with all the formalities and pays the required fees. Each member of the Union must register the denomination of a new plant variety at the same time as it issues the title of protection for the new variety. Anyone who, within the territory of one of the members of the Union, offers material of the protected variety for sale or markets propagating material of the variety is obliged to use the denomination, even after the expiration of the breeder's right to that variety.

The denomination of the new variety is chosen by the breeder but it must conform to all the criteria set out in Article 20 of the 1991 Act. In summary:

- It must be different from all other denominations used by other members of the Union for the same, or a closely related, species;
- It must not be liable to mislead or cause confusion concerning the nature of the variety or the identity of the breeder;
- It must enable the variety to be identified;
- No rights in the denomination shall hamper its free use as the variety denomination (even after expiry of the breeder's right);

⁴²⁹ The UPOV System of Plant Variety Protection; http://www.upov.int/about/en/upov_system.html.

- Prior rights of third persons must not be affected, and such rights can require a change of the variety denomination;
- It may not consist solely of figures, unless this is an established practice.

The breeder must submit the same denomination to all members of the Union and, unless this is considered to be unsuitable within a particular territory, this same denomination will be registered by all the members of the Union.

A trademark, trade name or other similar indication may be associated with the denomination for the purposes of marketing or selling, but the denomination must be easily recognizable.

3.6.2.3 How do you obtain PBRs?⁴³⁰

The breeders can choose with which member of the Union to file their first application and can file subsequent applications with other members of the UPOV Union without waiting for the outcome of the first. The status of protection provided by one member of the Union must not be used as a basis for determining the protection by another member of the Union. Protection is independent in each member of the Union.

Any breeder (national or a resident of a member of the Union) may file their first application for protection of a given plant variety with any of the members of the Union. If the breeder files an application for the same variety with any other member of the Union within 12 months of the filing of the first application, this *later* application could benefit, if so requested, from the right of priority.

There are two main effects:

- (i) An application benefiting from a right of priority must be examined as if it had been filed on the date of the first application.

This has particular significance for the consideration of novelty and distinctness, since those criteria relate to the *date of filing of the application*. Thus, the examination for novelty and distinctness will relate to the date of the first application.

- (ii) The breeder can defer the examination for up to two years after the expiration of the date of priority.

The Convention states that during the course of the examination, the authority may grow the variety or carry out other necessary tests, cause the growing of the variety or the carrying out of other necessary tests, or take into account the results of growing tests or other trials which have already been carried out.

3.6.2.4 What is the scope of breeders' rights⁴³¹

The nature of the right provided by the UPOV Convention is such that it is an *exclusive right*. In other words, it only *forbids others* from conducting certain acts without the authorization of the breeder of the protected variety. The breeder of a protected variety will not be able to exploit the variety in any way which is contrary to a law in the territory of the member of the Union concerned.

⁴³⁰ The UPOV System of Plant Variety Protection; http://www.upov.int/about/en/upov_system.html.

⁴³¹ *Ibid.* 427; http://www.upov.int/about/en/upov_system.html.

The following acts in respect of the propagating material of the protected variety require the authorization of the breeder:

- (i) production or reproduction (multiplication);
- (ii) conditioning for the purpose of propagation;
- (iii) offering for sale;
- (iv) selling or other marketing,
- (v) exporting,
- (vi) importing,
- (vii) stocking for any of the purposes mentioned in (i) to (vi), above.

The scope of the breeder's right with respect to the propagating material is extended to harvested material, where this has been obtained through the unauthorized use of propagating material of the protected variety, unless the breeder has had reasonable opportunity to exercise his/her right in relation to the propagating material.

3.6.2.5 What varieties are covered?⁴³²

In addition to the protected variety itself, the scope of the breeders' right also covers:

- (i) Varieties which are essentially derived from the protected variety, where the protected variety is not itself an essentially derived variety;
- (ii) Varieties which are not clearly distinguishable from the protected variety; and,
- (iii) Varieties whose production requires the repeated use of the protected variety.

3.6.2.6 What are the exceptions to PBRs?⁴³³

Pursuant to Article 15 of the 1991 Act, the breeder's right does not extend to:

- (i) Acts done privately and for non-commercial purposes; (This exception means that, for example, subsistence farming is excluded from the scope of the breeder's right.),
- (ii) Acts done for experimental purposes; and,
- (iii) Acts done for the purpose of breeding other varieties and, for the purpose of exploiting these new varieties provided the new variety is not a variety essentially derived from another protected variety (the initial variety).

This exception, for the purpose of breeding other varieties, is a fundamental aspect of the UPOV system of PVP and is known as the *breeder's exemption*. It recognizes that real progress in breeding relies on access to the latest improvements and new variations.

The breeder's exemption optimizes variety improvement by ensuring that germplasm⁴³⁴ sources remain accessible to the entire community of breeders. However, it also helps to ensure that the genetic basis for plant improvement is broadened and actively conserved, thereby ensuring an overall approach to plant breeding that is sustainable

⁴³² *Ibid.* 427; http://www.upov.int/about/en/upov_system.html.

⁴³³ *Ibid.* 427; http://www.upov.int/about/en/upov_system.html.

⁴³⁴ A germplasm is a collection of genetic resources for an organism.

and productive in the long term. In short, it is an essential aspect of an effective system of PVP that has the aim of encouraging the development of new varieties of plants, for the benefit of society.

In addition, as an optional exception, each member of the Union may, *within reasonable limits and subject to the safeguarding of the legitimate interests of the breeder, restrict the breeder's right in relation to any variety in order to permit farmers to use for propagating purposes, on their own holdings, the product of the harvest which they have obtained by planting, on their own holdings, the protected variety or other variety covered by the protection.* This optional provision is known as the **farmers' privilege** and it recognizes that, for some crops, there has been a common practice of farmers saving their own seed (i.e. seed is produced on a farm for the purpose of re-sowing on the same farm and not for the purpose of selling the seed). The provision allows each member of the Union to take account of this practice when providing variety protection. However, the purpose of PVP system is to encourage the development of new varieties of plants, for the benefit of society. Therefore, the Convention requires that the farmer's privilege be regulated *within reasonable limits and subject to the safeguarding of the legitimate interests of the breeder.*

Pursuant to article 17, no member of the Union may, except where expressly provided in the Convention, restrict the free exercise of a breeder's right for reasons other than of public interest.

When any such restriction has the effect of authorizing a third party to perform any act for which the breeder's authorization is required, the member of the Union concerned must take all measures necessary to ensure that the breeder receives equitable remuneration.

3.6.2.7 How long do PBRs last?⁴³⁵

The breeder's right is granted for a period of not less than 20 years from the date of grant or, in the case of trees and vines, for not less than 25 years.

3.6.3 Community Plant Varieties Office⁴³⁶

The Community Plant Variety Office (CPVO) is an agency of the European Union, located in Angers, France. It was established in 1994. Its task is to administer a system of plant variety rights, also known as PBRs, a form of IPR relating to plants. The CPVO works rather like the Office for Harmonization in the Internal Market: it grants IP protection for new plant varieties. These rights are valid for a period of either 25 or 30 years.

The European Community's system of protection for plant varieties, which is based on the principles of the 1991 Act of the UPOV Convention, incorporates the principle of the breeders' exemption, free access to protected varieties for the development and exploitation of new plant varieties.

⁴³⁵ *Ibid.* 427; http://www.upov.int/about/en/upov_system.html.

⁴³⁶ www.cpvo.europa.eu/main.

The Community plant variety rights system is a concrete response to all of these requirements; it provides an IPR for new varieties of plants which is valid throughout the European Union (covering 28 Member States and nearly 500 million inhabitants). Prior to 1995, a breeder wanting to protect a new variety throughout the entire European Union had to submit a separate application in each of the Member States.

3.6.3.1 Who can apply?

Any individual or company can apply. Individuals and companies from outside the European Union have to designate a procedural representative domiciled in the European Union.

3.6.3.2 How can applications be made?

An application for PVP can be made directly to the CPVO, in any of the official languages of the European Union. Application forms are available on the CPVO website: www.cpvo.europa.eu.

The first task of the CPVO is to verify that the application is complete and eligible. The Office studies whether the variety is in fact novel. If no formal impediment to granting Community protection is found, the CPVO arranges for a technical examination of the variety submitted.

The purpose of the technical examination is to ensure compliance with the criteria of distinctness, uniformity, and stability (DUS). It is crucial that the variety submitted meet these three conditions:

- (i) Distinctness. The variety must be clearly distinguishable from any other variety of common knowledge at the date of application.
- (ii) Uniformity. The variety is considered to be uniform if it is uniform in the expression of its characteristics.
- (iii) Stability. ***The variety is considered stable if it remains unchanged after repeated propagation.***

Variety denomination

In addition to the technical requirements, a variety must be identified by a variety denomination, which is proposed by the applicant in the form of a code or a fanciful name.

To be approved, a variety denomination must fulfil several criteria; it must allow for the variety to be clearly identified and ensure that it is different from a denomination identifying an existing variety of the same botanical species or a related one.

Grant of title

If the findings of the technical examination are conclusive, and all the other requirements have been met, the CPVO grants Community plant variety rights. In so

doing, the CPVO issues the titleholder a certificate and a copy of the official variety description of the protected variety.

3.6.3.3 Duration of protection

Community protection is granted for 25 years as a general rule, or for 30 years in the case of vines, potatoes and trees.

Box 3.66: Farmer's Interests⁴³⁷

Why would farmers be interested in a legal instrument that is likely to make them pay more for seed? The answer is that farmers are the immediate beneficiaries of new varieties, and they benefit from increased investments in breeding. Even though the immediate link between IPRs and investment in plant breeding is debated, and the study showed a very weak link between the introduction of IPRs and the emergence of a private seed sector, farmers have an interest in creating incentives to develop better planting materials. The **farmer's privilege** creates a useful balance between the rights of breeders and those of farmers. However, revisions of the UPOV Convention (representing the needs of the industrialized member countries of UPOV) have gradually strengthened the rights of the breeders at the expense of farmers' flexibility. The 1991 convention allows breeders to prohibit farmers from saving seed of protected varieties, unless specifically excluded, and prohibits any seed exchange of protected varieties among farmers. The UPOV Union now accepts new member countries only if they adhere to the UPOV 1991 Convention.

A major difficulty for farmers is seen in the rights of breeders and those of farmers. However, revisions of the UPOV Convention (representing the needs of the farmers) have different interests. The interests of commercial farmers are quite close to those in industrialized countries, whereas those of smallholders may be very different. An IPR system that limits the degree of seed saving obviously offers much stronger incentives to plant breeders, but such restrictions may severely limit local seed provision, particularly where competitive and efficient commercial seed systems are not in place.

Box 3.67: Different Farmer's Interests: Two Contrasting Examples⁴³⁸

Flower producers in Kenya or Colombia, for example, may get higher prices for new varieties of roses than for standard varieties. Novelty pays in the flower market, representing the needs of the farmers have different interests in flower types. Flower breeders get their share of this profit by charging higher royalty fees. They are thus very careful to ensure that their market is not spoiled by illegal production, and they are more likely to introduce their newest flower varieties in countries where their control over the planting materials is ensured by strong IPR laws. Flower farmers generally have no problems with an effectively implemented protection system based on the UPOV 1991 Convention.

⁴³⁷ Intellectual property rights in the breeding industry: Farmers' interests by Niels Louwaars, Rob Tripp, and Derek Eaton, Agriculture and Rural Development Notes, Issue 14, June 2006; http://siteresources.worldbank.org/INTARD/Resources/Note14_IPR_FarmersInterests.pdf.

⁴³⁸ *Ibid.* 434;

http://siteresources.worldbank.org/INTARD/Resources/Note14_IPR_FarmersInterests.pdf.

Smallhold farmers commonly obtain new varieties through informal channels. Rural development policies may support such channels for diffusing modern varieties of grains and legumes (called tain new varieties through informal channels. Rural development policies may support such chanty. IPR laws that attempt to limit such lateral spread of modern varieties act against the interests of these smallhold farmers.

Box 3.68: ZESPRI®GOLD Kiwifruit (New Zealand)⁴³⁹

New Zealand kiwifruit was introduced to the global marketplace in the 1950s, dominated by one variety – the Hayward, a cultivar developed by Hayward Wright in the 1920s.

In the 1980s, the New Zealand-based science company Plant & Food Research commenced a kiwifruit breeding program in the search for a new variety to complement the hugely successful Hayward kiwifruit.

Plants were selected from the program based on quality attributes, such as fruit size, color, storage and shelf life, and then analyzed for taste and texture by sensory panels in the key Asian and European markets.

Hort16A, now marketed as **ZESPRI®GOLD** Kiwifruit, was the result of this research.

The fruit's novel yellow flesh and sweet, tropical taste appealed to consumers and was tested in grower trials.

By 1996, new Zealand PBRs were granted for *Hort16A* in New Zealand and large areas of *Hort16A* were planted under license to ZESPRI Group Limited.

ZESPRI®GOLD Kiwifruit was launched commercially in 2000, and Hayward kiwifruit was rebranded as **ZESPRI®GREEN** Kiwifruit

By 2003, *Hort16A* vines had been planted on more than 1200 hectares in New Zealand with net sales of more than NZ\$150 million.

Alongside the commercial propagation of the cultivar, Plant & Food Research scientists undertook research on vine management and post-harvest protocols to ensure the fruit delivered the optimal experience to the global consumer with maximum returns to growers.

Additional research was also undertaken to develop the Kiwigreen IPM system, which allows growers to minimize the use of artificial insecticides and pesticides, meeting the strict requirements of ZESPRI's premium markets and consumers.

Additional Plant Varieties have been applied for across Europe, South America, Republic of South Africa and Asia, and growers in these areas are now licensed to produce **ZESPRI®GOLD** Kiwifruit to provide year round supply to ZESPRI's key markets.

Plant & Food Research researchers work with ZESPRI and ZESPRI's offshore growers to understand the different environments and growing regimes in these geographical areas.

ZESPRI®GOLD Kiwifruit is New Zealand's second-largest horticultural export earner, generating approximately NZ\$468 million in global revenues each year.

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http://www.plantandfood.chhttp://siteresources.worldbank.org/INTARD/Resources/Note14_IPR_Farmer%20Interests.pdf.nz/page/home/case-studies/gold-kiwifruit.

3.7 *Industrial Designs*⁴⁴⁰

3.7.1 What is an industrial design?

In everyday language, an industrial design generally refers to a product's overall form and function. For businesses, designing a product generally implies developing the product's functional and aesthetic features taking into consideration issues such as the product's marketability, the costs of manufacturing or the ease of transport, storage, repair and disposal.

From an IP law perspective, however, an **industrial design refers only to the ornamental or aesthetic aspects of a product**. In other words, it refers only to the appearance of a product. Although the design of a product may have technical or functional features, industrial design, as a category of IP law, refers only to the aesthetic nature of a finished product, and is distinct from any technical or functional aspects.

Industrial design is important for agri-food packaging, including agri-food containers as well as for the *get-up/trade dress* of agri-food products or their packaging. It is also very important for the visually perceptible features of two- or three- dimensional design aspects of crockery and cutlery as well as for the outward appearance of machines, appliances, utensils, gadgets and other equipment employed in home cooking.

As a general rule, an industrial design consists of: three-dimensional features, such as the shape of a product, two-dimensional features, such as **ornamentation, patterns, lines** or **color** of a product; or a combination of one or more such features.

3.7.2 Why protect industrial designs?

An industrial design adds value to a product.

It makes a product **attractive** and **appealing** to customers, and may even be its unique selling point. So protecting valuable designs should be a crucial part of the business strategy of any designer or manufacturer.

By protecting an industrial design through its registration at the national or regional IP Office, the owner obtains the **exclusive right to prevent its unauthorized copying or imitation by others**. This makes business sense as it improves the competitiveness of a business and often brings in additional revenue in one or more of the following ways:

- By registering a design you are able to prevent it from being copied and imitated by competitors, and thereby strengthen your competitive position;
- Registering a valuable design contributes to obtaining a **fair return on investment** made in creating and marketing the relevant product, and thereby improves your profits;

⁴⁴⁰ Looking good: An introduction to Industrial Designs for small and medium-sized enterprises, WIPO Publication No. 498, 2006; http://www.wipo.int/edocs/pubdocs/en/sme/498/wipo_pub_498.pdf.

- Industrial designs are **business assets** that can increase the commercial value of a company and its products. The more successful a design, the higher is its value to the company;
- A protected design may also be **licensed** (or sold) to others for a fee. By licensing it, you may be able to enter markets that you are otherwise unable to serve.

3.7.3 Creative Designs in Business

Enterprises often devote a significant amount of time and resources to enhancing the design appeal of their products. New and original designs are often created to:

- (i) **Customize products to appeal to specific market segments:** Small modifications to the design of some products (e.g., a watch) or of their packaging (e.g., a breakfast cereal) may make them suitable for different age groups, cultures or social groups. While the main function of the product or its packaging remains the same, children and adults generally have very different tastes in design.
- (ii) **Create a new niche market:** in a competitive marketplace, many companies seek to create a niche market by introducing creative designs for their new products to differentiate them from those of their competitors.
- (iii) **Strengthen brands:** creative designs are often also combined with distinctive trademarks to enhance the distinctiveness of a company's brand(s). Many companies have successfully created or redefined their brand image through a strong focus on product design.

3.7.4 How do you obtain protection for industrial designs?

In most countries, **an industrial design must be registered in order to be protected** under industrial design law.

To register an industrial design you must file an application at the national/regional IP office of the country/region where you are seeking protection (for protection abroad, see Section **3.7.19** below).⁴⁴¹

While this part of the Guide focuses mainly on registered industrial designs, it is important to point out that, in some countries, there may be an alternative depending on the particular national law and the kind of design, one such alternative for protecting

⁴⁴¹ It is worth noting that some countries or common economic areas such as the EU, where recent legislation has made it possible to obtain limited industrial design protection for unregistered designs for three years from the date on which the design was published in the EU. The unregistered design provides companies with the opportunity to market test their products before going through the effort and expense of registering all designs, many of which may not succeed in the marketplace. In addition, some designs may remain on the market for a very short time, especially in the fashion industry. For such products, the unregistered design provides a good alternative. However, once the product is manufactured, designers have up to 12 months in which to register it. The protection provided to an unregistered design is limited, in that it is more difficult to enforce than for a registered design, and shorter, as it lasts for three years as opposed to the 25 years provided to registered designs in the EU.

designs is **copyright law**. Copyright generally provides exclusive rights for literary and artistic works. As some designs may, in some countries, be considered works of art or applied art, copyright protection may apply and may represent an attractive option for SMEs.

In addition, in some countries, if an industrial design functions as a trademark in the marketplace, then it may be protected as a **three-dimensional mark**. This may be the case when the shape of the product or its packaging is considered to be distinctive.

In some countries, laws on **unfair competition** may also protect a company in the shape of the product from imitation by competitors.

For more details on protecting your design under copyright, trademark or unfair competition laws, see **Section 5**.

3.7.5 What rights are provided by industrial design protection?

When an industrial design is protected by registration, the owner is granted **the right to prevent unauthorized copying or imitation** by third parties. This includes the right to exclude all others from **making, offering, importing, exporting or selling** any product in which the design is incorporated or to which it is applied. The law and practice of a relevant country or region determine the actual scope of protection of the registered design.

3.7.6 What can be registered as an industrial design?

As a general rule, to be able to be registered, a design must meet one or more of the following basic requirements, depending on the law of the country:

The design must be **new**. A design is considered to be new if no identical design has been made available to the public before the date of filing, or the application for registration.

The design must be **original**. A design is considered original if it has been independently created by the designer and is not a copy or an imitation of existing designs.

The design must have **individual character**. This requirement is met if the overall impression produced by a design on an informed user differs from the overall impression produced on such a user by any earlier design which has been made available to the public.

Traditionally, protectable designs relate to manufactured products such as the ornamentation on a teapot. In the **digital world**, however, protection is gradually extending in some countries to a number of other products and types of design. These include electronic desktop icons generated by computer codes, typefaces, the graphic display on computer monitors and mobile telephones, etc.

3.7.7 What cannot be protected by industrial design rights?

Designs that are generally barred from registration in many countries include the following:

- (i) Designs that do not meet the requirements of novelty, originality and/or individual character (as explained above).
- (ii) Designs that are considered to be dictated exclusively by the **technical function** of a product; such technical or functional design features may be protected, depending on the facts of each case, by other IP rights (e.g., patents, utility models or trade secrets).
- (iii) Designs incorporating protected **official symbols or emblems** (such as the national flag).
- (iv) Designs which are considered to be **contrary to public order or morality**.

Depending on the national legislation there may be further restrictions on what cannot be registered as a design. It is advisable to consult an IP agent or the relevant national IP office.

3.7.8 How do you register a design?

To register a design in your own country you must generally take the following steps:

- Fill in the **application form** provided by your national IP office including your name, contact details and **drawings, and/or photographs of the design(s)** in question (standard formats are usually specified).
- In some countries, you may also be required to file, or have the option of filing, a **written description or statement of novelty** of the industrial design(s). The description generally needs to be of the design and not of the product to which it has been applied. It should be accurate and adequate in differentiating it from any similar earlier designs. It should cover all the distinctive esthetic features of the design and should describe which feature(s) is/are the most important. In some countries, the examiner may ask for a sample of the design to understand it better or to feel its texture or material.
- You will also be required to **pay the appropriate filing fee**.
- You may choose to employ an IP agent to assist you in filing the application and completing the registration process.
- In that event, you will also have to file a **document certifying the transfer of power to your representative**.
- Some offices register the design only after undertaking a formal examination to ensure that administrative formalities have been met. Others may conduct a substantive examination checking the existing designs on the register for novelty and/or originality. More and more offices are accepting registration without checking for novelty and/or originality.

- Once a design is registered, it is entered into the design register, published in the official design gazette and a **design registration certificate** is issued. In some countries/regions, it may be possible to request a **deferment of publication**, in which case the design will be kept secret for a certain period specified by the relevant law.

3.7.9 How long does it take to register a design?

Depending on each national IP office, the process of registration of an industrial design generally takes six to 12 months or longer depending on a number of issues, such as whether any objections are raised by the design examiner or if there is a provision for opposition prior to the registration of the industrial design under consideration.

3.7.10 How important is it to keep the design confidential before registration?

If you wish to protect your industrial design under a registration system, keeping the design confidential is absolutely crucial. The reason for this is that the central requirement for design protection is generally, that the design must be “new.” If you show your design to others, it is advisable to have confidentiality clauses in written agreements, clarifying that the design is confidential.

A design that has already been disclosed to the public, for example, by advertising it in your company’s catalogue or brochure, may no longer be considered “new.” It becomes part of the *public domain* and cannot be protected, unless the applicable law provides for a *grace period* (cf. **3.7.11** below) or unless the priority of an earlier application can be claimed (cf. **3.7.20** below).

3.7.11 What is a grace period?

In some countries, the legislation allows for a grace period for registration of generally six months or a year from the moment a design was made public, disclosed or published.

This is the case when articles bearing the design are sold, displayed at a trade show, exhibition or fair, or are published in a catalogue, brochure or advertisement prior to filing an application.

During that period, you may market your design without it losing its “novelty” and you may still apply for registration.

However, as this is not the case in all countries, and, in any event, as it is limited in time, it is often advisable to keep the design confidential until you apply for design protection. In addition, you will have no exclusive design rights during the grace period (although your design may be automatically protected under copyright or unfair competition law, depending on the provisions of the relevant national legislation).

3.7.12 How long does industrial design protection last?

The term of protection for a registered industrial design varies from country to country, but is usually **at least 10 years** (although it is often longer; for example, 14 years for design patents in the United States, and up to 25 years under the registered Community Design of the European Union). In many countries, rights holders are required to renew their design protection after five years.

3.7.13 How much does it cost to protect an industrial design?

The actual costs will vary significantly from country to country. However, it is important to bear in mind the different types of costs that may be involved in the process:

- (i) There will be **registration fees** to be paid to the national or regional IP office. The fees will generally vary depending on the number of designs to be registered and the number of countries in which registration is being sought. By way of example, an application for a single Community Design in the countries of the European Union costs 350 EUR. This amount would rise to 1,925 EUR if the application contained 10 designs. Details on the exact fees should be obtained from your IP agent or from the IP offices concerned.
- (ii) There will also be **costs associated with the hiring of the services of an IP agent** to assist you in the registration process, if you choose to rely on expert advice to file your application.
- (iii) Most countries require the payment of **renewal fees**, usually on a five-year basis, to maintain their exclusive rights over an industrial design.
- (iv) There may be costs associated with the **translation** of the industrial design if it is to be protected abroad.

3.7.14 What should you do if your design combines functional improvements with esthetic features?

To obtain exclusivity over the functional improvements of a product, it is generally advisable to apply for patent or utility model protection (cf. **3.5** above) or, where the function is not obvious from the product, to keep it as a trade secret (cf. **3.4** above).

However, it is often the case that a new product combines functional improvements with innovative esthetic features

Decisions on how, when and where to protect a company's industrial designs may have an important impact on other areas of design management. It is crucial, therefore, to integrate issues of design protection into the broader business strategy of an enterprise. For example, the type of protection, the costs, the effectiveness of protection and issues of the ownership of designs, may be important considerations when deciding: whether to undertake design development in-house or to commission an outside agency; the timing of the initial use of a new design in advertising, marketing or public display in an exhibition; which export markets to target; if, when and how to license or assign a

design to be commercially exploited by other companies in return for economic remuneration.

3.7.15 Who may apply for industrial design protection?

In general, the person who created the design or, if working under contract, his/her employer, can apply for registration. The applicant can be either an individual (e.g., a designer) or a legal entity (e.g., a company). In either case, the application may be made directly or through an agent. If you are a foreign applicant you may be required to be represented by an agent duly authorized by the IP office of that country.

3.7.16 Who owns the rights over an industrial design?

The creator of a design, i.e. the designer, is usually the first owner of the design, unless there are special circumstances. For example, in most countries, if an **employee** has developed a design under the terms of an employment contract, i.e., during his/her working hours within the enterprise and as part of his/her regular duties within the enterprise, the design (and the related rights) will belong to the employer or may require being transferred by a formal written assignment.

If the design was developed by an **external designer under contract**, the rights will generally belong to the company that commissioned the design. In such cases, it is considered that the design was produced for the use of the person who commissioned the design, who is, therefore, the owner.

Misunderstandings at a later date can be avoided by clarifying the issue of rights ownership in the original contract with the designer. You should also bear in mind that the designer of the product may have automatic copyright protection over the drawings of the original design and the issue should also be covered by the contract.

3.7.17 Can you apply for the registration of many different designs through a single application?

The answer varies significantly from country to country. In many countries, you may apply for the registration of many designs (10, 20 or even 50 designs) through a single application as long as they all relate to the same product or “class” of products (see explanation of *classes* in **3.7.18** below).

3.7.18 International Classification System

Industrial designs are generally classified or grouped into classes for ease of retrieval.

You may be asked to refer to the class of products for which you intend to use the design in question in your application form. Many countries use the classification of the **Locarno agreement establishing an international classification for industrial designs** (See www.wipo.int/classifications/en/locarno/about).

3.7.19 Why protect designs abroad?

If your company intends to export products bearing an original design, or intends to license the manufacture, sale or export of such products to other firms in foreign countries, it should consider protecting its designs in such countries in order to enjoy the same benefits of protection abroad as it enjoys in the domestic market.

3.7.20 How do you protect your industrial designs abroad?

Industrial design protection is territorial. This means that industrial design protection is generally limited to the country or region where you have registered your design. Hence, if you wish to have your industrial design protected in export markets you would have to make sure that protection is applied for in those specific countries.

It is important to bear in mind that you usually have **six months** from the date on which you applied for protection in the first country to claim the **right of priority** when you apply for design protection in other countries. Once this period has lapsed, you will be unable to apply for design protection in foreign countries, as your design will no longer be considered new.

There are three ways of protecting your industrial designs abroad.

- (i) **The National Route:** Companies may seek protection by applying separately to the national IP offices of each country in which they intend to obtain protection.

The process can be rather cumbersome and expensive as translation into the national languages is generally required as well as payment of administrative (and sometimes legal) fees.

- (ii) **The Regional Route:** If you are interested in a group of countries that are members of regional agreements that enable the registration of designs in more than one country, then you can consider filing a single application at the regional IP office concerned. **Regional IP offices** include:

- a. The African Regional Industrial Property Office (ARIPO) for industrial design protection in English-speaking African countries;
- b. The Benelux Designs Office (BDO) for protection in Belgium, The Netherlands and the Grand Duchy of Luxembourg;
- c. The Office for Harmonization in the Internal Market (OHIM) for Community designs in the countries of the European Union;
- d. The *Organisation Africaine de la Propriété Intellectuelle* (OAPI) for protection in French-speaking African countries.

- (iii) **The International Route:** Companies that wish to register their designs internationally in several countries may also use the procedures offered by the **Hague agreement concerning the international deposit of industrial designs**, a WIPO-administered treaty. An applicant from a country member of the Hague Agreement can file a single international application with WIPO; the

design will then be protected in as many Member countries of the treaty as the applicant wishes. The agreement provides applicants with a simpler and cheaper mechanism for applying for industrial design registration in various countries.⁴⁴² The **costs** of an industrial design registration under the Hague Agreement vary depending on the number of designs to be protected and the number of countries where protection is sought. For example, the cost of protection for five designs in 11 countries using the international route offered by The Hague system is approximately 900 Swiss francs.

3.7.21 What are the differences between copyright protection and industrial design protection for designs?

In some countries, the applicable law recognizes copyright protection for certain designs.

In many countries, you may obtain cumulative protection, (i.e., copyright protection and industrial design protection, which can exist concurrently for the same design), while in a few countries, the two forms of protection are mutually exclusive.

The first step before taking any decision on how best to protect your design is to understand the differences between these two forms of protection.

Some of the main differences are outlined below:

- (i) **Registration.** Under industrial design law, the industrial design generally needs to be **registered** by the applicant before publication or public use anywhere, or at least in the country where protection is claimed.

The **registration certificate**, provided by protection under industrial design law, may prove useful in cases of infringement, as it provides a more solid basis from which you may enforce your exclusive rights.

Copyright in works considered to be original subsists without formalities. While **registration is not necessary for protection**, copyright depositaries exist in some countries where you may deposit your design and obtain a certificate.

- (ii) **Duration.** Industrial design protection generally lasts for a period that varies **between 10 and 25 years** depending on the country where protection is sought. It must also be borne in mind that the process of registration of industrial designs may take some time, and may not always be adequate for products that are linked to passing trends.

Copyright endures in most countries for **the life of the author and 50 or 70 years after his/her death**.

- (iii) **Types of products.** In most countries, not all **designs can be protected by copyright** but primarily those that may be considered as works of art. While the distinction may not always be clear, some designs, such as the shape of

⁴⁴² For full information about the Hague Agreement including a list of Member States and the application form, visit the WIPO website at: <http://www.wipo.int/hague/en/>.

manufactured products, are unlikely to be protectable under copyright law, while others, such as textile designs, are often covered by both forms of protection.

- (iv) **Costs.** Registering your design in the countries you are interested in means that you will have to pay the applicable fees. In addition, it may be useful or necessary to use the services of an IP agent to assist you in drafting the application, which will incur additional costs.

Given that no formal registration of works protected by copyright is required by most national copyright laws, there are generally no direct costs relating to copyright protection. However, there may be costs related to (a) the deposit of the work at the copyright depositary, in countries where it exists, and (b) demonstrating proof of ownership in case of disputes.

In **summary**, while the protection granted by registered industrial designs is stronger in that it covers even unintentional infringement and provides a registration certificate which may be an important proof in case of infringement, it involves more effort (financial and administrative) because it requires registration, and is shorter in duration.

In any case, and particularly if the design is not registered, it is generally advisable to **keep good records of every step in the development of the design**. Signing and dating each sketch and properly archiving them may help in case of infringement.

3.7.22 When can trademark law protect a design?

A trademark is a distinctive sign (generally a word, a logo or a combination of the two) used to differentiate the products of one company from those of others. There are circumstances in which the form, design or packaging of a given product may be considered to be a distinctive feature of the product in question and may be protectable as a three-dimensional trademark. The bottle of Coca-Cola (cf. **3.2.16** above) or the triangular shape of the Toblerone chocolate bar (cf. **3.2.32**) are some such examples. It may be useful or necessary to use the services of an IP agent to assist you in drafting the application, which will incur additional costs.

It is advisable to consult an IP agent to determine whether a particular design may be considered a three-dimensional trademark.

Trademark protection has the advantage of being renewable indefinitely, while industrial design protection is usually protectable for a limited period of time (generally 10 or 25 years).

There may also be a difference in the costs of registering trademarks as compared with industrial design protection. Depending on the legal system, the two types of protection may co-exist.

3.7.23 Do laws on unfair competition protect your design?

In many countries, industrial designs are often protected under laws on unfair competition.

Thus, a design may be protected against acts of unfair competition including, in particular, slavish copying and acts that may lead to confusion, acts of imitation or use of a third party's reputation. However, protection under unfair competition is generally significantly weaker and infringement is more difficult to prove.

3.8 Software

While national copyright laws do not generally provide an exhaustive list of works, they list a number of categories of works that are often broad and quite flexible. The categories or types of works protected in most countries include the following:

- (i) **Literary works** (e.g., books, magazines, newspapers, technical papers, instruction manuals, catalogs, tables and compilations of literary works);
- (ii) **Musical works** or compositions, including compilations;
- (iii) **Dramatic works** (includes not only plays but also, for example, a sales training program captured on videocassettes);
- (iv) **Artistic works** (such as cartoons, drawings, paintings, sculptures and computer artwork);
- (v) **Photographic works** (both on paper and in digital form);
- (vi) **Computer programs** and software;
- (vii) **Databases.**

An agri-food enterprise usually has to deal with copyright issues concerning software created by its employees or by contractors who have been specifically commissioned by it to create software (copyright issues may also arise in relation to designs/logos/advertising that an agency has been commissioned to create on behalf of the enterprise).

3.8.1 Protection of software

As stated above, copyright⁴⁴³ protects an author's original expression in a computer program as a *literary work*. Source code can thus be viewed as a human-readable literary work, which expresses the ideas of the software engineers who authored it. Not only the human-readable instructions (source code) but also binary machine-readable instructions (object code) are considered to be literary works or *written expressions*, and, therefore, are also protected by **copyright**.

⁴⁴³ Copyright law grants authors, composers, computer programmers, website designers' and other creators' legal protection for their literary, artistic, dramatic and other types of creations, which are usually referred to as works. Copyright law protects a wide variety of original works, such as books, magazines, newspapers, music, paintings, photographs, sculptures, architecture, films, computer programs, video games and original databases. Copyright law gives an author or creator of a work a diverse bundle of exclusive rights over his/her work for a limited but rather lengthy period of time. These rights enable the author to control the economic use of his work in a number of ways and to receive payment. Copyright law also provides "moral rights," which protect, amongst other things, an author's reputation and integrity (cf. Creative Expression: An Introduction to Copyright and Related Rights for SMEs, cit, p. 2).

In some countries, functional elements of computer programs may be protected by **patents**, while in other countries, all types of software are explicitly excluded from the purview of patent protection.

It is common commercial practice to keep source code of computer programs as a **trade secret** in addition to copyright protection.

Certain features created by computer programs, such as icons on a computer screen, may be protected, in some countries, as **industrial designs**.

Beyond legal protection, a new facet in protecting software is provided by **technology** itself; for example, through lockout programs and use of encryption methods. Thus, technology allows clever producers to craft their own extra-legal protection.

At the same time, it must be noted that some aspects of software simply cannot be copyrighted. Methods of operation (e.g., menu commands) are generally not copyrightable, unless they contain highly individual or artistic elements. Likewise, a Graphical User Interface (GUI) is not copyrightable, unless it contains some truly expressive elements.

3.8.2 How to obtain copyright protection?

Practically all countries, worldwide, have one or more national laws concerning copyright and related rights. As there are significant differences amongst the copyright and related rights laws of different countries, it is advisable to consult the relevant national copyright and/or related rights law(s) and/or take legal advice from a competent professional before taking any key business decision involving copyright and/or related rights.

A large number of countries are signatories to several important **international treaties** that have helped to harmonize, to a considerable extent, the level of copyright and related rights protection amongst countries. In a very large number of countries, this has made it possible for works to benefit from copyright protection **without any formalities or requirement of registration**.

Copyright and related rights protection is granted without any official procedure. A copyright work is automatically protected as soon as it comes into existence, without any formal registration, deposit, payment of fee or any other formal requirement (though some countries require that it be fixed in some material form).

However, it would be advisable to deposit/register a program through national copyright offices that offer that option. The deposit will provide the author evidence of its existence on the date of its deposit/registration and will constitute the legal presumption of its ownership by the author concerned.

Moreover, it would be advisable to add a copyright notice⁴⁴⁴ to the work, since it will remind third parties that the work is protected and identifies the copyright owner, as well as helping all those who may wish to obtain prior permission to use that program.

3.8.3 What criteria must software meet to qualify for protection?

To qualify for copyright protection, a work must be **original**. An original work is one that “originates” in its expression from the author, i.e., the work was independently created and was not copied from the work of another or from materials in the *public domain*. The exact meaning of originality under copyright law differs from one country to another. In any case, originality relates to the **form of expression** and not to the underlying idea.

A work enjoys copyright protection **irrespective of its creative elements, quality or value** and does not need to have any literary or artistic merit. Copyright also applies, for example, to packaging labels, recipes, purely technical guides, instruction manuals, or engineering drawings as well as to the drawings of, say, a three-year-old child.

3.8.4 Software exclusive rights

Copyright provides two sets, or bundles, of rights. Economic rights protect the author’s or owner’s economic interests in terms of possible commercial gain. Moral rights protect an author’s creative integrity and reputation as expressed through the work.

Economic rights give the owner/holder of copyright the **exclusive right** to authorize or prohibit certain uses of a work (**exclusive** means no one may exercise these rights without a copyright owner’s prior permission).

The scope of these rights, and their limitations and exceptions, differ depending on the type of work concerned and the relevant national copyright law. The economic rights are more than simply a *right to copy*; the emphasis is not solely on this right, but on several different rights to prevent others from unfairly taking advantage of the creative work of the original owner of the copyright. Generally, the economic rights include the exclusive rights to:

- (i) **Reproduce a work in copies** in various forms. For example, downloading a computer program. This is one of the most important rights granted by copyright;
- (ii) **Distribute copies of a work to the public**. Copyright allows its owner to prohibit others from selling, leasing or licensing unauthorized copies of the work. But there is an important exception: in most countries, the right of distribution comes to an end on the first sale or transfer of ownership of a particular copy. In other words, a copyright owner can control only the “first sale” of a copy of a work, including its timing and other terms and conditions. But, once a particular copy is sold, the copyright owner has no say over how that copy is further distributed in the territory of the relevant country(ies). The

⁴⁴⁴ A copyright notice generally consists of the word copyright, *copr.* or the copyright symbol ©; the year in which the work was first published; and the name of the copyright owner.

buyer can resell the copy, or give it away, but cannot make any copies or prepare derivative works (see below) based on it;

- (iii) **Rent copies of a work.** This right does not, however, extend to computer programs that are part of an industrial product, for example, the program controlling the ignition in a rental car.
- (iv) **Make translations or adaptations of a work.** Such works are also called **derivative works**, which are new works that are **based on a protected work**. For example, translating an instruction manual from English into other languages, turning a novel into a film (motion picture), rewriting a computer program in a different computer language, making different musical arrangements, or making a toy based on a cartoon figure. In many countries, there are, however, important exceptions to the exclusive right to create derivative works; e.g., if you lawfully own a copy of a computer program, you may adapt or modify it only for its regular use;
- (v) **Communicate a work to the public.** This includes the exclusive rights to transmission by Internet.
- (vi) **Receive a percentage of the sale price if a work is resold.** This is referred to as resale right or *droit de suite*. It is available in some countries only and is usually limited to certain types of works (e.g., paintings, drawings, prints, collages, sculptures, engravings, tapestries, ceramics, glassware, original manuscripts, etc.).
- (vii) **Make works available** on the Internet for on-demand access by the public so that a person may access the work from a place and at a time individually chosen by him/her. This covers, in particular, on-demand, interactive communication through the Internet.

Any person or company wishing to use protected works for any of the purposes listed above must normally obtain prior authorization from the copyright owner(s).

Although a copyright owner's rights are exclusive, they are limited in time (see page 23) and are subject to some important exceptions and limitations (see page 47).

3.8.5 Moral rights

These are based on the French *droit d'auteur* tradition, which sees intellectual creations as an embodiment of the spirit or soul of the creator. The Anglo-American common law tradition, on the other hand, regards copyright and related rights as property rights pure and simple, which means that any creation can be bought, sold or leased in much the same way as a house or a car.

Most countries recognize moral rights, but the scope of these rights varies widely, and not all countries grant them in the copyright law itself.

Most countries recognize at least the following two types of moral rights:

(i) The right **to be named as the author of the work** (be namship rightauthor of the workf the work (“authorship right” or “paternity right”). When the work of an author is reproduced, published, made available or communicated to the public, or exhibited in public, the person responsible for doing so must in relation to the work, whenever reasonable; and,

(ii) The right **to protect the integrity of the work**. This prohibits the making of any changes to a work that would tend to damage the authorlished, made available

Unlike economic rights, moral rights **cannot be transferred** to someone else, as they are personal to the creator (but they may pass onto the creatorrlished, made available or communicated to the public, or exhibited in public, the person responsible for doing so must make sure that the authorme appears on oran author or creator may **waive his/her moral rights by a written agreement**, whereby he/she agrees not to exercise some or all of his/her moral rights.

(iii) The right to object to any distortion, mutilation or other modification of his/her performances that would be prejudicial to his/her reputation.

3.8.6 How long does copyright last?

For most works, and in most countries, protection of **economic rights** lasts for the lifetime of the author plus an additional period of at least 50 years. In a number of countries, this period is even longer (for example, 70 years after the death of the author in Europe, the United States and several other countries). It is, thus, not only the author who benefits from a work but also the author’s heirs. If several authors are involved (work of joint authorship) then the term of protection is calculated from the death of the last surviving author. Once copyright protection over a work has expired, it is considered to be in the *public domain* (cf. **3.8.12** below).

The term of the protection of **moral rights** differs. In some countries, moral rights are perpetual. In others, they expire at the same time as economic rights, or upon the author’s death.

3.8.7 What do you have to do to obtain copyright protection?

Copyright is granted without any official procedure. A work is automatically protected as soon as it exists, without any special registration, deposit, payment of a fee or other formal requirement, though some countries require that it be fixed in some material form (see page 12 above).

A system of protection without formalities may pose some difficulty when trying to enforce your rights in case of a dispute. Indeed, if someone claims that you have copied a work of his/hers, then how do you prove that you were the first creator? You can take some precautions to create evidence that you authored the work at a particular point in time.

For example, some countries have a national **copyright office** that provides an option to deposit and/or register your works for a fee (see Annex II for a list of the website

addresses of some national copyright offices). Doing so provides evidence of the existence of a valid claim to copyright protection. In some of those countries, you can more effectively pursue a lawsuit for copyright infringement if you have registered the work at the national copyright office. In such countries, prior optional registration is, therefore, strongly advisable.

3.8.8 What protection do you have abroad?

Most countries are members of one or more international treaties to ensure, amongst other things, that a copyright work created in one country is **automatically protected in all countries that are members of such international treaties**. The most important international treaty on copyright is the **Berne convention for the protection of literary and artistic works**. If you are a national or a resident of a country party to the Berne Convention, or if you have published your work in one of the member countries, your work will automatically enjoy the level of copyright protection granted in the Berne Convention in all other countries that are party to this Convention.

However, copyright protection remains **territorial** in nature. Therefore, your work will only enjoy copyright protection if it **meets the legal requirements of the copyright law of the relevant country**. So while your work may automatically be protected by copyright in many countries (because of international treaties), you still have a separate copyright protection system in each country, which varies considerably amongst countries.

3.8.9 Is the author always the owner of a copyright work?

The concept of *ownership* is quite different from that of *authorship*. The author of a work is the person who created the work. The owner of the copyright in a work is, instead, the person who has the exclusive rights to exploit the work, for example, to use, copy, sell, and make derivative works.

Generally, copyright in a work initially belongs to the person who actually created it, that is to say, the *author*. However, this is not the case in every country and may particularly not be the case in the following circumstances:

- the work was created by an employee as a part of his/her job;
- the work was commissioned or specially ordered;
- the work was created by several persons.

The meanings of *authorship* and *ownership* are often confused. The **author** of a work is the person who created the work. If the work was created by more than one person, then all the creators are considered as co-authors or joint authors. The issue of authorship is especially relevant in connection with moral rights and in order to determine the date on which protection expires (see page 23).

Copyright ownership is a different issue. The **owner** of the copyright to a work is the person who has the exclusive rights to exploit the work, for example, to use, copy, sell, and make derivative works. Generally, copyright in a work initially belongs to the person

who actually created it, that is to say, the author. However, this is not the case in every country and may particularly not be the case in the following circumstances:

- (i) the work was created by an employee as a part of his/her job, in general, the employer automatically owns the copyright, unless otherwise agreed. In some cases, anyway, such transfer of rights may have to be specified in the employment contract;
- (ii) the work was commissioned or specially ordered, the copyright owner may vary depending on national laws. As a result, it would be advisable to address copyright ownership issues in a written agreement
- (iii) the work was created by several persons, unless otherwise agreed, such authors may be joint owners of the entire work (if the work is intended to be a single one) or simply each author owns the copyright in the part he/she created (if each part may be use separately).

Moral rights always belong to the individual creator of the work (or his/her heirs). But, as noted above, moral rights may be waived in some countries.⁴⁴⁵

3.8.10 When do you need a permission to use the works of others?

Businesses often need to use works protected by copyright or related rights works to support their business activities.

When using the work of others you must first determine if copyright permission is required. In principle, you will need authorization from the copyright owner if:

- (i) the work is covered by copyright and/or related rights law(s);
- (ii) the work is not in the *public domain* (see **3.8.12**);
- (iii) your planned exploitation implies the use of all or part of the rights granted to the copyright and/or related rights owner; and,
- (iv) your intended use is not covered by *fair use* or *fair dealing* or by a limitation or exception specifically included in the national copyright or related rights law (see **3.8.15**).

Copyright protection applies to digital use and storage in the same way as it does to any other uses. Therefore, you may need prior permission from the copyright owners to scan their works; post their works on an electronic bulletin board or a website; save their digital content on your enterprise's database; or publish their works on your website. Most websites list the e-mail address of a contact person, making it relatively easy to request permission to reproduce images or text.

⁴⁴⁵ Companies cannot have moral rights.

3.8.11 If you have bought a work protected by copyright, are you free to use it as you wish?

As explained above, copyright is separate from the right of possession of the work. Buying a computer program by itself does not necessarily give the buyer the right to make further copies or play or show them in public. The right to do these things will generally remain with the copyright owner, whose permission you would need to do those acts. You should note that, as with photocopying a work, scanning a work to produce an electronic copy and downloading a copy of a work, which is in an electronic form, all involve copying the work; prior permission is generally needed before doing any of those acts.

3.8.12 What content or material are you entitled to use without permission?

Authorization from the copyright owner is not needed if:

- (i) you are using an aspect of the work which is not protected under copyright law. For example, if you are expressing the **facts or ideas** from a protected work in your own way, rather than copying the author's expression;
- (ii) the work is in the **public domain**; and if your use is covered by the concept of *fair use* or *fair dealing* or by a **limitation or exception** specifically included in the national copyright law.

3.8.13 How do you find whether a work is still protected by copyright?

In accordance with moral rights, an author's name will normally be indicated on the work, whereas the year in which the author died maybe available in bibliographic works or public registers. If that search does not give clear results, you may consult the copyright register of your country's copyright office (if any) to check for any relevant information, or you may contact the relevant collective management organization or the publisher of the work.

Remember that there may be several copyrights in one product, and these rights may have different owners, and with different periods of protection.

3.8.14 When can you use a work under a limitation or exception to copyright?

All national copyright laws include a number of limitations and exceptions, which limit the scope of copyright protection, and which allow either free use of works under certain circumstances, or use without permission but against a payment. The exact provisions vary from one country to another, but generally exceptions and limitations include the use of a **quotation** from a published work (i.e., to use short excerpts in an independently created work), some copying for **private and personal use** (e.g., for research and study purposes), some reproduction in **libraries and archives** (e.g., of works out of print, where the copies are too fragile to be lent to the general public), reproduction of excerpts of works by **teachers** for use by the students in a class, or the making of special copies for use by **visually handicapped** persons.

Numerous other limitations or exceptions for the benefit of various groups exist in different countries. Quite often, the limitations and exceptions are described exhaustively in the national law, which should be consulted for guidance. Otherwise, you should seek expert advice.

In common law countries, such as the Commonwealth of Australia, Canada, India, the United Kingdom, and the United States works are subject to ***fair use*** or ***fair dealing***. Here, the descriptions in the copyright laws are less specific. *Fair use* recognizes that certain types of use of other people's copyright-protected works do not require the copyright holder's authorization. It is presumed that the use is sufficiently minimal that it will not unreasonably interfere with the copyright holder's exclusive rights to reproduce and otherwise use the work. It is difficult to describe any general rules about *fair use* because it is always very fact specific. However, private individuals who copy works for their own **personal use** generally have much greater *fair use* rights than those who copy for commercial uses.

Examples of activities that may be permitted as *fair use* include making quotations from a published work and reverse engineering software to achieve compatibility. The scope of *fair use* varies from one country to another. Note that, even if you use other people's work under these provisions, you still need, in most countries, to cite the name of the author.

3.8.15 Free and open source software

Open source software is a rapidly expanding phenomenon in the computer software industry. It is software that is freely distributed and can be freely modified

As already described above, the source code of a computer program consists of the instructions for the program, written in a human-readable format (usually following the syntax of a high-level programming language such as C or COBOL). Instructions in the source code cannot be directly executed by a computer and must first be run through a special program called a compiler which produces machine-readable *binary* or *object* code.

While source code can easily be read, understood, and modified by a programmer, it is very difficult to understand binary code, and even more difficult to modify it.

For this reason, a program only distributed as binary code is called a *closed source* program, which cannot be reproduced without the owner's authorization.⁴⁴⁶

A program where the source code is distributed and can be freely modified (even without payment of a royalty or fee) by other programmers is, loosely speaking, called *open source* software.

⁴⁴⁶ The economics of open source software: A survey of the early literature by Schiff A., Department of Economics, University of Auckland, 2002; <http://flosshub.org/system/files/schiff.pdf>.

In general, according to the specific provisions of the license related thereto, however, open source software can be modified, extended, adapted, and incorporated into other programs by other programmers, without paying a fee to any previous contributors to the software.

The most common restriction placed on such activity is that any future modifications or derivative programs must also be released as open source software (the so-called *viral clause*).

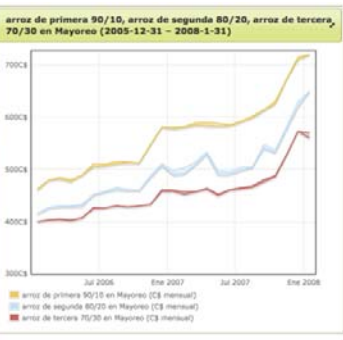
In the light of the above, some authors believe that the open source software development model could also be helpful for SMEs in the agri-food sector.

An experiment in the Nicaragua shows just how powerful Open Source software can be in levelling the playing field insofar as the second poorest country of the Americas now has one of the best software solutions for displaying agricultural data in the western hemisphere.

Box 3.69: ALBAstryde (Nicaragua)⁴⁴⁷

Agriculture is the base of the Nicaraguan economy. Effectively managing and delivering information to the farmers is, therefore, an essential part of development and also essential in the fight to reduce poverty.

ALBAstryde is, in effect, a dynamic web-based information system that combines data



from different sources. The numerical data can easily be combined with textual data (by placing comments on the graphs), the write ups from the wiki component, and PDF documents (added in a library section) and is released under a free software license (GPL v.3).

One can, for example, easily create a graph that shows rainfall, the price of beans, the total amount of production of beans and the availability of bean seeds from the county of León and check if there is any interrelation, even though these data are maintained by completely different parts of the Nicaraguan Agriculture Ministry.

3.9 Databases

A database is a collection of information that has been systematically organized for easy access and analysis. It may be in paper or electronic form. Copyright law is the primary

⁴⁴⁷ Wilm J., Nicaragua builds an innovative agricultural information system using open source software, 2009; <http://www.linuxjournal.com/content/nicaragua-builds-innovative-agricultural-information-system-using-open-source-software>.

means to legally protect databases. However, **not all databases are protected by copyright**, and even those that are may enjoy very **limited protection**.

In some countries (e.g., the United States) copyright only protects a database if it is selected, coordinated, or arranged in such a way that it is sufficiently **original**.

However, databases in which the data is arranged according to basic rules (e.g., alphabetically, as in a phone directory) are usually not protected under copyright law in such countries (but may sometimes be protected under **unfair competition law**).

In other countries, mostly in Europe, **non-original databases** are protected by a *sui generis* right called the **database right**.

This gives a much greater protection to databases. It allows makers of databases to sue competitors if they extract and re-use substantial (quantitatively or qualitatively) portions of the database, provided there has been a **substantial investment** in obtaining, verifying, or presenting the data contents. If a database has a sufficient level of originality in its structure, it is also protected by copyright.

When a database is protected by copyright, this protection **extends only to the manner of selection and presentation** of the database and not to its contents. In most cases, the question as to whether any similarities are expression (protected by copyright) or function (not protected by copyright) does not need to be considered.

As stated above, in some jurisdictions (notably the Member States of the European Union), databases are afforded legal protection.

Directive 96/9/EC has, in fact, harmonized the treatment of databases under copyright law in the European Union and created a new *sui generis* right for the creators of databases that do not qualify for copyright.

Article 1(2) of the Directive defines a database as *a collection of independent works, data or other materials arranged in a systematic or methodical way and individually accessible by electronic or other means* (non-electronic databases are also covered (para. 14 of the preamble).

Under Article 3, databases which, *by reason of the selection or arrangement of their contents, constitute the author's own intellectual creation* are protected by copyright as collections.

The acts restricted by copyright are similar to those for other types of work (article 5):

- temporary or permanent reproduction by any means and in any form, in whole or in part;
- translation, adaptation, arrangement and any other alteration;
- any form of distribution to the public of the database or of copies thereof, subject to the exhaustion of rights;
- any communication, display or performance to the public;
- any reproduction, distribution, communication, display or performance to the public of a translation, adaptation, etc.

Pursuant to article 6(2), Member States may provide for any or all of the following limitations, as well as applying any traditional limitations to copyright:

- reproduction for private purposes of a non-electronic database;
- use for the sole purpose of illustration for teaching or scientific research, as long as the source is indicated and to the extent justified by the non-commercial purpose to be achieved;
- use for the purposes of public security or for the purposes of an administrative or judicial procedure.

While copyright protects the creativity of an author, the *sui generis* database rights contemplated by the Directive specifically protect [a] *substantial investment in either the obtaining, verification or presentation of the contents* (if there has not been substantial investment (which need not be financial), the database will not be protected).

Database rights are held in the first instance by the individual or enterprise that made the substantial investment, so long as:

- the individual is a national or domiciliary of a Member State, or,
- the enterprise is formed according to the laws of a Member State and has its registered office or principal place of business within the European Union.

The holder of database rights may prohibit the extraction and/or re-utilization of the whole or a substantial part of the contents:

Pursuant to Article 10 of the Directive, database rights last for fifteen years from the end of the year that the database was made available to the public (as opposed to the term of seventy years from the death of the author that applies to copyright works) or from the end of the year of completion for private databases.⁴⁴⁸

⁴⁴⁸ Any substantial change that could be considered to be a substantial new investment will lead to a new term of database rights, which could, in principle, be perpetual. Database rights are independent of any copyright in the database, and the two could, in principle, be held by different people (especially in jurisdictions which prohibit the corporate ownership of copyright). As such, database rights can be compared to the rights of phonogram and film producers.

4. Managing and leveraging IPRs for business success

A successful and sustainable business enterprise, including an agri-food SME, survives and thrives only in its particular competitive context provided that:

- (a) it forcefully implements a well thought out business strategy that builds on its key strengths and works in a focused manner to overcome all the critical challenges in its internal and external environments. The whole endeavor is to serve the needs and demands of a defined set of customers/consumers faster, cheaper and better than its competitors. It may do so as a stand-alone enterprise or as a part of a complex value chain/network, which may be a global FSC or an alternative value chain/network. It may be owned or run by an entrepreneur/CEO.⁴⁴⁹ Thus, it may be family owned, a cooperative or a legally incorporated entity.
- (b) It has an *IP strategy*⁴⁵⁰ that seeks to prevent IP risks, gain competitive intelligence, create roadblocks for imitators, leverages its key strengths, signal its positive differentiation from its competitors and deal with free riders. Following an IP checklist (created in the United Kingdom)⁴⁵¹ or adapting BASCAP's IP Guidelines for Business⁴⁵² would be good start. There is no one best way to manage IP and many managers overestimate the attractiveness of using IP to exert market power. Rather, the value of the various means to protect and benefit from IP depends on firm strategy, the competitive landscape, and the rapidly changing contours of IP law.⁴⁵³

For the purpose of this chapter, it is assumed that this entrepreneur/CEO is working in the context of an agri-food SME or an agri-food cooperative which has:

- (a) a clear business plan and strategy for starting/growing an agri-food SME. This business plan has a due focus on IP issues⁴⁵⁴ in all markets of interest;⁴⁵⁵
- (b) grasped the basics of IPRs and their relevance/protection/management in relation to a business in general and the relevant agri-food product in particular (having read the relevant chapters of this Guide) and/or knows how to obtain

⁴⁴⁹ Chief Executive Officer (CEO)

⁴⁵⁰ http://www.anaqua.com/about-anaqua/Unifying_IP_Strategy_Perspectives.pdf

⁴⁵¹ Intellectual Property Checklist;

<http://www.dlapiper.com/~media/Files/Insights/Publications/2014/05/Intellectual%20Property%20Checklist.pdf>

⁴⁵² Intellectual Property Guidelines for Business, International Chamber of Commerce, The World Business Organization; http://www.uscib.org/docs/BASCAP_IP_Guidelines.pdf

⁴⁵³ Strategic Management of Intellectual Property: An Integrated Approach by William W. Fisher III Felix Oberholzer-Gee, CALIFORNIA MANAGEMENT REVIEW, VOL. 55, NO. 4, SUMMER 2013; http://www.hbs.edu/faculty/Publication%20Files/CMR5504_10_Fisher_III_7bbf941f-fe1b-4069-a609-9c6cd9a8783b.pdf

⁴⁵⁴ Practical IP issues in developing a business plan, WIPO;

http://www.wipo.int/sme/en/ip_business/managing_ip/business_planning.htm.

⁴⁵⁵ Intellectual property for exporting businesses, Canadian Intellectual Property Office; <http://www.cipo.ic.gc.ca/eic/site/cipointernet-internetopic.nsf/eng/wr03073.html>.

these at no or a low cost (for instance, from or through a chamber of commerce/industry)⁴⁵⁶ or by use of fee-based IP services;

- (c) taken timely steps and/or put in place a system to identify and protect all potential IP assets that are essential to the success/competitiveness of the agri-food SME and to proactively manage the IPR assets needed for the success of the SME;
- (d) the profile of a high potential business that has the requisite financial resources as well as the relevant business knowledge, competencies and skills for seamlessly and efficiently running the different business functions on a stand-alone basis or as part of an agri-food value chain/network (business functions include: formulating business strategy/business model, managing business records, keeping business accounts, undertaking product pricing, procuring inputs/supplies, logistics, distribution, manufacturing operations, product testing/quality testing, new/improved prototype development, human resource management, marketing and branding, sales, customer service, legal, security/secrecy, insurance, management information system, etc.) or has ready access to all of these (financing services and business advice/guidance services), which are either provided on full fee recovery basis or are provided free or at a subsidized price through a publicly funded or civil society sponsored support mechanism;⁴⁵⁷
- (e) developed or has access to a quality traditional agri-food product or to valuable R&D output in the form of a new or improved agri-food product (an innovative product offering);
- (f) developed or assured access to knowledge, competencies and skills for consistently producing/manufacturing, transporting and marketing the product;⁴⁵⁸
- (g) access to land, building and machines or a reasonable basis that it would be possible to do so well in time;
- (h) understood the regulatory and competitive environment and the major business risks (both general risks for any business and risks specific to the particular type of agri-food business) that need to be proactively managed on a continuing basis;
- (i) identified all the relevant technologies, especially ICTs, needed for running an efficient and modern business or has access to free guidance;⁴⁵⁹
- (j) an appreciation of the fact that the purpose of starting and/or running/growing an agri-food business goes much beyond it being a means of livelihood; that he/she is in it to make not only enough profit to justify the risks taken to start and/or

⁴⁵⁶ <http://www.iccwbo.org/advocacy-codes-and-rules/bascap/international-engagement-and-advocacy/icc/wipo-handbook/>.

⁴⁵⁷ Some randomly chosen examples of support are linked:

http://www.fairfoodnetwork.org/sites/default/files/FFN_FFBC_Application_09.16.14.pdf.

<http://www.scottish-enterprise.com/services/develop-your-organisation/insights/whats-involved>.

⁴⁵⁸ Hereafter, unless the context makes it clear otherwise, the word “product” includes a “service” as well.

⁴⁵⁹ Food Business Bootcamp Webinars, FSC Food Secure Canada;

<http://foodsecurecanada.org/resources-news/webinars-podcasts/food-business-bootcamp>.

run/grow the business but also to make enough profit to be able to continue to innovate and market the agri-food products successfully on a sustainable basis against competitors in all markets of interest;

- (k) An open mind to possibility of partnering with others in one or more of the activities required to be undertaken for successfully creating and delivering a product over a long period of time.

Traditionally, agri-food SMEs generated profits by processing agricultural inputs in mills, canneries, freezing plants and the like. In the current globalized economy, agri-food corporate profits are being made, amongst other things, increasingly by protecting and leveraging knowledge based innovative and creative assets. For doing so, the smart use of the tools of the IP system has become essential.

This guide assumes that the reader has met the basic requirement of running a business consistently. Even so, though the reader is presumed to be from elsewhere, the linked⁴⁶⁰ basic guide (*Getting started in a food manufacturing business in Tennessee, USA*) may be profitably consulted as it provides good general guidance for starting such a business.

Depending on the circumstances of an agri-food SME, there are many ways of extracting value from its IPRs: selling (i.e., assigning) the IP right to another enterprise in whose hands it would be more valuable; licensing the right, perhaps even to competitors; using IPRs as a vehicle to organize profit enhancing collaborations with competitors, suppliers, customers, or the developers of complements; and, least obviously, even giving the IPRs away.⁴⁶¹

The process of global economic integration has been profoundly altered the nature of agricultural production and consumption, aided both by reductions in barriers to trade and by the accelerating pace of cross-border trade and investments. The emerging global knowledge economy highlights the evolution of an economic order in which the clever and organized use of natural resources is insufficient for success – as was possible in Argentina at the end of the 19th and the beginning of the 20th century – to an economic order based on knowledge, in which the exploitation of natural resources is not only insufficient but, as Singapore demonstrates, is not even necessary.⁴⁶² The agri-food sector straddles both (natural resources and new/original knowledge) given its link to land, living things (microorganisms, plants, fish, birds, animals, biodiversity), environment (climate) and continuing rapid advances in human knowledge (which enables us to improve land and other natural resources, such as seeds and plant/animal breeding, more productive).

⁴⁶⁰ <https://utextension.tennessee.edu/publications/Documents/pb1399.pdf>.

⁴⁶¹ *Ibid.* 450, p. 2; http://www.hbs.edu/faculty/Publication%20Files/CMR5504_10_Fisher_III_7bbf941f-fe1b-4069-a609-9c6cd9a8783b.pdf.

⁴⁶² The future of the global economy towards a long boom, OECD 1999, p. 79; <http://www.oecd.org/futures/35394025.pdf>.

Seed business management differs from many other manufacturing or retailing businesses. While seed businesses have the same basic goal as other businesses, i.e., making sustainable profits through meeting customer needs, there are many differences in their business organizations, product cycles, marketing strategies and financial management. Field crop seed businesses are faced with a long production lead-time (up to four years in the case of certain hybrids), a concentrated seasonal selling period, and a product line that is perishable, subject to strict regulatory production and quality systems and vulnerable to environmental stresses. In addition, the development and registration of new products is often a long process, while customers are diverse, decentralized, and have a wide range of product requirements in light of the highly variable socio-economic and biophysical environment of Africa. Consequently, seed business managers need to have particular skills in issues such as long-term cash flow and inventory management; seed production; processing and quality assurance; market knowledge application; and product evaluation and development. Regardless of how a seed business is structured or how much of the seed chain it is directly involved in, long-term success requires that the whole chain operates effectively and is well managed to ensure that quality seed of improved, adapted and appropriate varieties is available for sale to farmers.⁴⁶³

Box 4.1: The Cantabrian PDO's as brands and the local agri-food system⁴⁶⁴

In the Cantabrian case, the PDO's have worked as collective brands that helped creating a shift from an exchange to a cash economy. The PDO's offers some protection against foreign and domestic competition. But the PDO's are value adding tools only because the local population, which constitutes their main market, is willing to choose these local cheeses, over other ones from other parts of Spain or Europe. The act of adding value was achieved by the actions of others, not the producers.

The local government took on some the entrepreneurial functions that the cheese producers lacked when they promoted the certification of the cheeses, when they contributed to the improvement of quality and when they financed and performed the massive marketing of the cheeses to Cantabrian consumers. While providing a service to cheese producers, the authorities also benefited from increased taxes and improvement of food security. They also benefit from slowing down the depopulation of rural areas. An entrepreneurial function was also present in the actions of local chefs and restaurant owners that also were and still are involved in the promotion of the cheeses. These stakeholders play a double role; they promote their own business highlighting the culinary benefits of Cantabrian cheese, and doing so they provide a

⁴⁶³ Seed business management in Africa by John F. MacRobert CIMMYT, pp. 3-4;

http://dtma.cimmyt.org/index.php/publications/doc_view/87-seed-business-management-in-africa.

⁴⁶⁴ When do trademarks create new markets? Entrepreneurship, brands and growth – experiences from small scale cheese production in Austria, Spain and Sweden, by Paulina Rytönen and Karl Gratzler, WS4.2 –Localised sustainable agri-food systems in times of rural changes, p. 4; http://ifsa.boku.ac.at/cms/fileadmin/Proceeding2010/2010_WS4.2_Rytönen.pdf.

service to the cheese producers and *vice versa*, the cheese producers provide a service to the Cantabrian cuisine business. Another important service provided by the PDO is that it helped cheese production to survive. The articulation of the local agri-food system in Cantabria is, in the case of traditional cheese, directly dependent on the entrepreneurial functions provided and interlinked by a variety of stakeholders. But the outcomes of entrepreneurial activities under the local agri-food system would be weaker without the value adding, collective brand provided by the PDO. The most important market protection feature of the PDO is its territorial link. The articulation of the local agri-food system would also be weaker without the entrepreneurial function that provides mutual benefits for all stakeholders.

Whether in domestic or international markets, strategic management of IP assets is, therefore, crucial for the business success of an agri-food SME.⁴⁶⁵ Unfortunately, most decision makers in agri-food SMEs treat IP as a legal matter, and delegate its management to a lawyer/the legal department, often far removed from those who are responsible for building and implementing the overall business strategy. As a result, the implications of IPRs for the business model and business strategy of the agri-food SME, and the possibilities afforded by the strategic management of IPRs as valuable business assets, are lost. Given the fact that the value of IP is determined with reference to potential profits in the future, it is rarely reflected as an asset in the books of a company, unless it was acquired for a defined sum from external parties. This often results in IP becoming an “invisible asset”, and, therefore, left out of strategic planning, unlike other business assets. Most IP lawyers and patent attorneys are focused on their respective areas of practice – lawyers on litigation and contractual matters, and patent attorneys on patent drafting. As a result, they have very narrow, legal/technical perspectives of IP, which are centered on their own practice. While some use IP management jargon in their marketing, most IP professionals do not understand, or care about, the complex connections between an individual IP asset or a particular patent and/or trademark portfolio or contract and the success of the related products/businesses. This contributes to the *ad hoc* treatment of IP within organizations/enterprises, as a legal/procedural matter which is largely handled by the external IP service provider, with little connection to business strategy.⁴⁶⁶ One of the first steps, therefore, for an agri-food entrepreneur/CEO is to have an IP audit done to uncover relevant facts.⁴⁶⁷

⁴⁶⁵ http://books.google.ch/books?id=Ehz-QD_pN8MC&pg=PA91&lpg=PA91&dq=ip+strategy+audit+food+business&source=bl&ots=W4uP8ybZKE&sig=YhT7Jxc_6sNmOd9qqNpvGEqfdMk&hl=en&sa=X&ei=K7xcVNjyFNLUasPxgogL&ved=0CC4Q6AEwAw#v=onepage&q=ip%20strategy%20audit%20food%20business&f=false.

⁴⁶⁶ Igniting possibilities: a guide to strategic IP management, Yusarn Audrey;
<http://www.yusarn.com/wp-content/uploads/2011/10/Yusarn-Audrey-Brochure7.pdf>.

⁴⁶⁷ Intellectual property audit checklist, Alan R. Singleton Singleton Law Firm, P.C.;
<http://researchpark.illinois.edu/sites/default/files/media/IP%20Audit%20Checklist.pdf>.

Box 4.2: An IP audit⁴⁶⁸

1. An IP audit is a systematic review of the IP owned, used or acquired by a business so as to assess and manage risk, remedy problems and implement best practices in IP asset management.
2. It involves undertaking a comprehensive review of a company's IP assets, related agreements, relevant policies and compliance procedures.
3. It helps a business to make an inventory of its IP assets or update it and analyze:
 - a. how the IP assets are used or unused;
 - b. whether the IP assets used by the business are owned by the company or by others;
 - c. whether these IP assets are infringing the rights of others or others are infringing on these rights; and
 - d. determine, in the light of all this information, what actions are required to be taken with respect to each IP asset, or a portfolio of such assets, to serve the relevant business goals of the company.
4. It seeks to uncover unused or under-utilized assets, to identify any threats to a company's bottom line, and to enable business managers to devise informed business and IP strategies that help maintain and improve its competitive position in the relevant market(s).

IP assets can be commercially exploited by their owner or with the permission of the owner by others. Their IP assets may be sold by the owner or can be exploited by licensing to third parties.⁴⁶⁹

For a successful business, it is just a matter of time before unscrupulous competitors' will free ride on its goodwill/reputation in the market or imitate its success by hook or by crook. For instance, they will try everything possible to copy or imitate a successful production process and/or some or all attributes of the final product. Often, in doing so, the unscrupulous competitors will, unknowingly or knowingly, transgress legal limits. Often, they will break civil laws or criminal laws, including IP laws. The willful breaking/transgression of IPRs owned by others results in counterfeit and pirated products on the market. Amongst the counterfeit products on the market, agri-food products are often prominent.

While an entrepreneur/CEO should not use an IPR of another without prior authorization from its owner, at the same time, s/he should not permit others to free-ride on the valuable IP assets that provide her/his agri-food business a crucial competitive

⁴⁶⁸ See module 10 on IP Audit in IP PANORAMA <http://www.wipo.int/sme/en/multimedia/>.

⁴⁶⁹ Exchanging value - Negotiating technology licensing agreements, WIPO publication No. 906, 2005; p. 13; http://www.wipo.int/edocs/pubdocs/en/licensing/906/wipo_pub_906.pdf.

advantage in the relevant market(s). This requires the agri-food SME itself, or a hired professional IP service provider, to monitor/police, periodically or continuously, the relevant markets for any IP infringements/violations. Detection of such IP violations/infringements, innocent or willful, is the first step. Dealing with such violations/infringements is the next step. There are three broad categories of option: (1) ignore the violation(s); (2) stop the violations (which may require litigation); or (3) permit the violations for a valid consideration (generally by licensing, franchising and/or merchandising the relevant IPRs).

An effective IP infringement strategy is part of an overall IP strategy. In turn, the IP strategy is part of the overall business strategy of an agri-food SME. An effective IP infringement strategy should have clear goals. It should take into consideration the likely outcomes, costs, benefits, and, where available, the need for IP insurance.

IP rights are most effective when they are enforced as part of an IP infringement strategy. An IP infringement strategy is not simply an intention to commence legal proceedings when you believe your IP rights are infringed. It involves a strategic assessment of the relevant IP rights and setting parameters for beginning (and ending) an infringement action. There may be cases where an agri-food SMEs IP rights have been infringed, but it may be advised by its IP counsel not to bring legal proceedings against the infringer(s). This may be due to:⁴⁷⁰

- difficulties in proving the existence or ownership of the IP rights;
- difficulties in proving infringement;
- the costs of the proceedings outweigh the value of succeeding in the infringement action;
- the IPR (particularly a patent) may be declared invalid or unenforceable;
- it making sense to make the infringer(s) business partners, for instance, by licensing the IPR to the infringer(s).

⁴⁷⁰ Preventing infringement, enforcing your IP, Australian Government, IP Australia;
<http://www.ipaustralia.gov.au/ip-infringement/enforcing-your-ip/preventing-infringement/>.

Box 4.3: Ceasefire declared in lycopene IP war as LycoRed⁴⁷¹ and Parry settle patent infringement case, by Elaine WATSON, 04-Nov-2013⁴⁷²

ORANGE, N.J., March 20, 2012 – LycoRed Limited and Lycored Corporation (“Lycored”), leading developers and marketers of ingredients for food fortification, dietary supplements and food coloring, including **Lyc-O-Mato®** lycopene product, announced today that on March 19 they filed a lawsuit⁴⁷³ against E.I.D. Parry Ltd. and Valensa International for patent infringement.

LycoRed, a science-based Israeli company with over 15 years of experience, claims Parry infringed upon three patents, violating the company’s science on the composition, process and applications for lycopene products. The lawsuit was filed in US District Court, District of New Jersey, for infringement of US Patent Nos. 6,515,018; 5,837,311; and 5,965,183.

LycoRed alleges that Parry/Valensa engaged in acts of infringement by making, using and selling its tomato lycopene products in the United States, and has, therefore, placed its customers in the position of doing so as well.

LycoRed is asking the Court to grant an injunction to stop sales of, and to recall, all products that infringe on the noted patents and to award damages to compensate the company for the unlawful violations.

“Parry Nutraceuticals unlawfully leveraged our proprietary science to produce and market its Tomato Lycopene Complex,” said Morris Zelkha, president and CEO of LycoRed. “Parry, however, has not offered any scientific research to demonstrate that its lycopene products have the same clinical attributes as **Lyc-O-Matoe®**.”

Lyc-O-Mato® has a unique patented particle size of less than five microns and is supported by clinical studies demonstrating high bioavailability and absorption.

⁴⁷¹ About LycoRed: LycoRed Ltd. is a manufacturer and supplier of natural carotenoids and nutritional ingredients to the dietary supplement, nutricosmetics, functional F&B industries. The company also offers microencapsulated ingredients, vitamin and mineral premixes, colorants, and cosmeceutical products, as well as fortification solutions, such as dairy products, beverages and powder drinks, bakery products, confectionary and snacks, breakfast cereals, nutritional bars and meat substitutes. Its flagship product, Lyc-O-Mato®, is a natural lycopene-rich tomato complex, providing a full complement of carotenoids and other organically occurring antioxidants. Founded in 1993, LycoRed operates as a subsidiary of Makhteshim Agan Industries Ltd. The company is headquartered in Beer Sheva, the State of Israel with subsidiaries in Yavne, the State of Israel; Ayleford, UK; Orange, New Jersey; Schaffhausen, Swiss Confederation and Changzhou, China. For more information, please visit www.lycored.com or www.lycopene.com.

⁴⁷² Ceasefire declared in lycopene IP war as LycoRed and Parry settle patent infringement case by Elaine Watson, Food navigator, [www.usa.com](http://www.foodnavigator-usa.com/Regulation/Ceasefire-declared-in-lycopene-IP-war-as-LycoRed-and-Parry-settle-patent-infringement-case), 04, Nov 2013; <http://www.foodnavigator-usa.com/Regulation/Ceasefire-declared-in-lycopene-IP-war-as-LycoRed-and-Parry-settle-patent-infringement-case>.

⁴⁷³ United States District Court District of New Jersey, William L. Mentlik, Russell W. Faegenburg, Keir J. Lolacono, Lerner, David, Littenberg, Krumholz & Mentlik, LLP; <http://patentdocs.typepad.com/files/2012-03-19-lycored-v.-u.s.-nutraceuticals.pdf>.

After 18 months of legal wrangling, LycoRed has agreed to a settlement with E.I.D. Parry (India) Ltd., US Nutraceuticals LLC and Parry Phytoremedies PVT, Ltd. (which trade collectively as Valensa International), regarding a patent infringement suit that LycoRed filed against the group in the US, in March 2012. Although the full settlement terms are unknown, Parry has now acknowledged the validity of LycoRed's patents and has withdrawn a request for further review.

Box 4.4: Food fraud and counterfeit and pirated agri-food products

Food fraud, or the act of defrauding buyers of food or ingredients for economic gain—whether they be consumers or food manufacturers, retailers, and importers—has vexed the food industry throughout history. Some of the earliest reported cases of food fraud, dating back thousands of years, involved olive oil, tea, wine, and spices. These products continue to be associated with fraud, along with some other foods. Although the vast majority of fraud incidents do not pose a public health risk, some cases have resulted in actual or potential public health risks. Reports also indicate that fish and seafood fraud is widespread, consisting mostly of a lower valued species, which may be associated with some types of food poisoning or allergens, mislabeled as a higher-value species. Other types of foods associated with fraud include honey, meat and grain-based foods, fruit juices, organic foods, coffee, and some highly processed foods.⁴⁷⁴

Fake food is being sold by criminal organizations across Europe and this may be as high as 40 per cent of all packaged food products on the market. These fake products include food like “ham” that is actually just a “meat emulsion,” teas that are loaded with prescription drugs, prawns that are actually just 50 per cent water and fruit juices that are made of banned chemical additives. The investigations led to the discovery of 22 tons of long-grain rice that was about to be sold as much healthier basmati rice. Cheap peanut butter was used as filler in an almond flour product, while products labeled “goat’s milk” actually contained cow’s milk. These cheats could negatively affect people’s allergies. Another controversial food marketed to children included the highly toxic industrial red dye rhodamine B. Drinks were also found to be routinely counterfeit. One vodka product drew the concerns of news agents. The fake vodka failed to meet the percentage of alcohol scribed on the label. In one case, a vodka drink actually contained isopropanol, which is an industrial antifreeze solvent. Another illegal product being peddled was a “fruit juice” that actually contained large amounts of brominated vegetable oil, which is a banned flame retardant chemical linked to behavioral problems. Further investigations found that manufacturers of meat products were using meat-mincing machines that were not cleaned thoroughly. Cheaper meat was often thrown in

⁴⁷⁴ January 10, 2014 of the US’s Congressional Research Service entitled, “Food fraud and “Economically motivated adulteration” of food and food ingredients Congressional research” by Renée Johnson, Specialist in Agricultural Policy, p. 2; <http://fas.org/spp/crs/misc/R43358.pdf>.

to make real meat go further, while some meat was colored pink to make it appear normal.⁴⁷⁵

The WTO defines product counterfeiting⁴⁷⁶ as: “Unauthorized representation of a registered trademark carried on goods identical or similar to goods for which the trademark is registered, with a view to deceiving the purchaser into believing that he/she is buying the original goods” (WTO, 2011). The key elements of this basic definition are if the product is *similar* to the trademarked product and if there is *deception* of the consumer.⁴⁷⁷

Counterfeit and pirated⁴⁷⁸ products are being produced and consumed in virtually all economies, with Asia emerging as the single largest producing region. While counterfeiting is commonly motivated by economic gain that deceives consumers, this does not comprehensively explain the cause and effect of all counterfeit crimes. For example, the cause of food fraud is the deliberate adulteration of food for economic gain, including acts of terrorism. The effect is not just the simple economic deception of consumers but also the introduction of risks to public health (e.g., undeclared allergens, toxic additives, etc.).⁴⁷⁹ The public health risks associated with counterfeiting are diverse. Examples include lethal amounts of melamine in infant formula, carcinogenic Sudan Red food dye.

There are two principal markets for trademark- and copyright-infringing products. In the first (the **primary market**), counterfeiters and pirates infiltrate distribution channels with products that are often substandard. Consumers unwittingly purchase these products, thinking that they are genuine. In fact, they have been deceived. The **secondary market** involves consumers who, under certain conditions, are willing to purchase counterfeit or pirated products that they know are not genuine. Consumers who knowingly purchase such products are also aware that they are supporting the parties producing and supplying them, although the true nature of those parties (such as organized crime and/or terrorist operations) may not be apparent to the consumer.⁴⁸⁰

An illustrative list of counterfeit food products in the primary market include: fruit (kiwis), conserved vegetables, milk powder, butter, ghee, baby food, instant coffee, alcohol (vodka, wine), drinks, candy/sweets, hi-breed corn seeds, spices.

⁴⁷⁵ Fake food being sold by criminal organizations across Europe, Natural News; http://www.naturalnews.com/044099_fake_food_criminal_organizations_europe.html.

⁴⁷⁶ The term counterfeiting has two distinctly different uses. One is the over-arching term for the general issue and another common use for the term is the specific infringement of IPRs regarding trademarks and patents; <http://www.crimesciencejournal.com/content/2/1/8>.

⁴⁷⁷ Defining the types of counterfeiters, counterfeiting, and offender organizations, by John Spink, Douglas C Moyer, Hyeonho Park, and Justin A Heinonen, Crime Science a SpringerOpen Journal <http://www.crimesciencejournal.com/content/2/1/8>.

⁴⁷⁸ The word Tpiratedrd the types of counterproducts that essentially violate another’s copyright ownership.

⁴⁷⁹ *Ibid.* 473; <http://www.crimesciencejournal.com/content/2/1/8>.

⁴⁸⁰ The economic impact of counterfeiting and piracy, Executive Summary, OECD 2007, p. 10; <http://www.oecd.org/sti/38707619.pdf>.

The counterfeit products include supposedly healthy “herbal slimming teas” which actually contain no herbs or teas. Instead, these slimming potions are made with a glucose powder mixed with a prescription obesity medication. The fake slimming tea actually contained amounts of a prescription drug 13 times greater than the normal dose!⁴⁸¹

The phenomenon of “Italian sounding” appears to be alarming: 97 per cent of the Italian sounding pasta sauces sold in the North American market are actually mere imitations; 94 per cent of Italian sounding olive oil or vinegar is fake, as well as 76 per cent of Italian sounding canned tomatoes.⁴⁸²

Six million euros per hour: that’s the amount of the “made in Italy” turnover loss – as reported by Confagricoltura – caused by the so-called “Italian sounding” products whose images, names and colors imitate Italian products, but which actually have nothing to do with the original “made in Italy” quality, culture and traditions. “While the food piracy – the real counterfeiting – is an illicit act punishable by law, the huge business of the Italian sounding plays in a gray area that can be fought only through international rules and agreements in order to assure a total transparency about raw materials and manufacturing process employed by traders, claims the agricultural organization.⁴⁸³

Counterfeit or pirated agri-food products may damage the brand image and reputation of firms over time. For instance, those consumers who believed they were buying a genuine article when in fact it was a fake, will be likely to blame the manufacturer of the genuine product if the fake does not fulfil expectations, thus resulting in a loss of goodwill. If consumers never discover that they were deceived, they may be reluctant to buy another product from that manufacturer and may communicate dissatisfaction to other potential buyers.⁴⁸⁴

In the food and drink sector, few people would knowingly purchase counterfeit food or drink products, due in part to the potential health risks involved. Such risks range from general discomfort, to serious illness and even death. As discussed in the sectoral assessment, this has been the case for poorly distilled raw spirits and fake baby formula.

Box 4.5: IRA running a counterfeit Vodka operation⁴⁸⁵

May 2014: Customs officials in Ireland broke up a counterfeit vodka operation managed by the Irish Republican Army (IRA) which is estimated to be a multimillion euro moonshine operation.

⁴⁸¹ *Ibid.* 472; http://www.naturalnews.com/044099_fake_food_criminal_organizations_europe.html.

⁴⁸² Italy: Piracy and counterfeit: the agri-food sector, Consulegis International Network of Law Firms; <http://www.consulegis.com/news/piracy-and-counterfeit-the-agri-food-sector/>.

⁴⁸³ Food piracy: The phenomenon of the Italian sounding food products, by Gabriele Monti, Posted on 20 January, 2014, Emilia Delizia; <http://www.emiliadelizia.com/food-piracy-phenomenon-italian-sounding-food-products/>.

⁴⁸⁴ *Ibid.* 477, p. 18; <http://www.oecd.org/sti/38707619.pdf>.

⁴⁸⁵ Havocscope global black market information; <http://www.havocscope.com/tag/counterfeit-foods/>.

In a raid by Custom agents, nearly 1,110,000 bottles caps, 400,000 fake labels of popular vodka brands, 500 cardboard boxes and a bottling plant were seized in May 2014.

Intelligence officials state that the IRA is potentially bringing in fake alcohol from Eastern Europe, and is filling up empty bottles with counterfeit alcohol. IRA members collected empty spirit bottles from bars and pubs across Ireland and brought them back to the operations center. There, the bottles are washed and the new labels and bottle tops are attached. The new fake bottles of vodka are then sold to bar owners and vendors across the Ireland and the United Kingdom. The moonshine bottles, known as Provo vodka, are readily available across Northern Ireland and are often sold at places where smuggled cigarettes are also available.

The vodka labels discovered by security officials included **Smirnoff** and **Stolichnaya**.

As in most other sectors, in the agri-food sector, IP assets may be owned by individuals or institutions in the private sector, public sector, or the NGOs/civil society. In every situation, the owner of an IP asset needs to have a clear IP policy and strategy for its exploitation. Before thinking of exploiting an IP asset, it may have to be formally created and/or protected, for example, by registering it after following a prescribed procedure at the IP office(s) concerned.

An example of a public sector IP exploitation policy is that of Agriculture and Agri-Food Canada (AAFC)'s Intellectual Property Decision-Making Manual.⁴⁸⁶ AAFC's IP Policy is based on the following guiding principles:

- **Benefit to Canadians.** AAFC generates IP, expands existing IP and generates new knowledge from which IP is identified, protected, managed and transferred for the maximum social, environmental and economic benefit and well-being of Canada and Canadians.
- **Responsiveness.** AAFC responds to the needs of Canadians (clients, collaborators, industry, producers, public) involved in the creation and diffusion of IP to maximize the socio-economic benefit to Canada. To this end, AAFC works with Canadian and international knowledge-based public and private sector entities. AAFC participates with other federal science-based departments and agencies (for example, through the Federal Partners in Technology Transfer) to advance federal technology transfer activities.
- **Timeliness.** AAFC ensures timely arrangements for IP transfer to the benefit of the taxpayer and Canada's agri-food sector.

⁴⁸⁶ Agriculture and agri-food Canada intellectual property decision-making manual, Agriculture and Agri-Food Canada; <http://www.agr.gc.ca/eng/science-and-innovation/technology-transfer-and-licensing/agriculture-and-agri-food-canada-intellectual-property-decision-making-manual-1-of-6/?id=1301318649787>.

- **Transparency.** AAFC is committed to a transparent and straightforward approach to IP management that will provide clarity to its employees, clients, and collaborators.
- **Consistency (fairness, legality, accountability).** AAFC is committed to fair, thorough, predictable and consistent practices in dealing with all external organizations. The Minister is accountable to Parliament and Canadians for the management of AAFC's intellectual and physical assets. All procedures for protecting and exploiting AAFC's IP must be consistent and in compliance with government acts, policies, TB directives, and laws applicable to IP assets.

4.1 Can the owner sell her/his IPRs?

Yes, as in the case of physical property, the owner of an IPR has the right to transfer its ownership to another person/legal entity. Such a decision must be very carefully considered.

There are occasions when an assignment/sale is advantageous. For instance, the assignment/sale of a patent provides immediate income, that is, without having to wait to realize a possibly greater value, although gradually, over its 20 year life period (term). The total amount realized by a sale may be significantly smaller but it is like a bird in hand versus two in the bush; compared with the total amount that could be realized by licensing it to one or more entities but with greater uncertainty and risk over its remaining patent term. Also assignment/sale avoids the risk that a patented technology may be superseded by another technology during the remaining period of its 20-year patent term. In addition, the assignment of a patent to a start-up agri-food SME may be a pre-condition for the SME for obtaining funding. Companies with substantial patent portfolios are mining their patents to determine whether some that were being held for defensive or other strategic purposes should be sold or licensed out. Companies may sell patents that no longer relate to core products or patents that may have related to a product which is no longer being manufactured.

In any case, the decision to assign/sell an IP asset is taken on a case-by-case basis, based on its owner's needs, circumstances and priorities. For instance, an agri-food R&D institution is likely to be more willing to assign/sell a patent than an entrepreneur who wants to set up or grow her/his agri-food SME. Before making such a decision it is advisable to consult an IP savvy business adviser/consultant/attorney.

4.1.1 Can the owner sell/transfer the trademark of her/his business to another business?

If a business has not provided its trademark as a security to a lender (for instance, to a Bank), it should be able to transfer the trademark to another business provided it is done in manner that is provided for in the relevant trademark law(s). Both parties should make sure that the seller is indeed the owner of the trademark proposed to be sold/assigned/transferred.

Registered trademarks typically are transferred by assignment during the acquisition of a business or business division, and when a business attempts to gain greater, more senior rights in a certain mark to gain an advantage over a competitor. Both scenarios can foster an invalid transfer of a trademark regardless of the intentions of the parties involved. In the business acquisition, the buyer of a business reasonably expects to receive the trademarks that represent the acquired business and serve as the repository of goodwill for the business. If the trademark is one that is recognized by the customers of the acquired business, or any portion of the public, then it is an asset with substantial value, albeit one that is difficult to quantify.

Similarly, the seller of a business should reasonably expect to part with the attendant trademarks that promote and identify the business, and may expect to receive a premium for them if the trademarks are particularly well known within a definable market. Properly executed, a trademark assignment allows the assignee to step into the shoes of the assignor, gaining whatever goodwill the assignor has built up, and whatever priority the assignor has in the mark against others.

The second situation, the priority contest, usually results from a declared or impending trademark infringement dispute, where two or more businesses using the same trademark are competing for the sole ownership rights to the mark. Because trademark rights in a common law country like the United States are determined by priority in time, an enterprising company will often attempt to acquire an assignment of an older, identical trademark in order to establish a pattern of use that predates that of its competitors. Sometimes the buyer in this situation will intend to use the purchased trademark as a part of its business. Typically, the purchaser in this scenario intends to buy a form of priority as an asset.⁴⁸⁷

A trademark may be transferred from a subsidiary company to a parent company or by a parent company to a wholly owned subsidiary IP/Trademark Holding Company (IPHC).⁴⁸⁸⁴⁸⁹ This is done for better management of the trademark and/or for tax

⁴⁸⁷ Avoiding illegal trademark transfers: Introducing the assignment-in-gross by Michael Cavendish, The Florida Bar Journal; <http://www.floridabar.org/divcom/jn/jnjournal01.nsf/Author/1F959DF53012155B85256ADB005D62DF>.

⁴⁸⁸ Sometimes there may be an intermediate holding company. Many companies are somewhat reluctant to directly transfer this IP information to China Wholly Foreign Owned Enterprise (WFOE), both for enforcement reasons and for tax consideration reasons. In these cases, it may be beneficial to set up an intermediary holding company in a jurisdiction such as Hong Kong or Singapore to hold the IP. For example, the foreign company owns the Hong Kong holding company which, in turn,

reasons. A company that files a case to recover a trademark illegally registered by another person/company also transfers the registered trademark by assignment to the right owner.

In most common law countries, trademarks cannot be sold apart from their businesses because they do not have discrete value as property, are meaningless apart from the business with which they are associated, and so are inseparable from that business. Trademark assignments, whether or not they are assigned attendant to a sale, are declared illegal if the trademark is sold alone, divorced from the business it formerly represented. When an attempted trademark assignment results in a bare transfer, not involving assets, trade secrets, management, or genuine goodwill, courts will invalidate the transfer as an *assignment-in-gross*.⁴⁹⁰ An *assignment-in-gross* occurs when a purchaser and seller violate the common-law requirement that a mark be assigned only together “with the good will of the business in which the mark is used, or with that part of the good will of the business connected with the use of and symbolized by the mark.”⁴⁹¹

However, Article 21 of the TRIPS Agreement provides “...that the owner of a registered trademark shall have the right to assign the trademark with or without the transfer of the business to which the trademark belongs.”⁴⁹² In fact, some countries allow assignment-in-gross of trademark rights independent of any transfer of goodwill.⁴⁹³

An additional problem arising from the transfer of trademarks from multiple unrelated entities to a jointly held subsidiary IPHC is the separation of the marks from the goodwill that is associated with them. Goodwill is the advantage of reputation in connection with a business. Where a mutual IPHC is intended to manage a diverse portfolio of marks worldwide, certain assignments from a parent must be accompanied by a recitation of the transfer of goodwill, while the transfer of goodwill may not be required for others. In order to minimize the risks of challenge by third parties to trademark rights stemming

holds the WFOE in China, providing an extra layer of “insulation” from the China enterprise; IP Considerations For High-Tech Companies Entering The China Market, by Margaret Burke and WuBin Yan from Ella Cheong (Hong Kong & Beijing), 21st June 2011; <http://www.corporatelivewire.com/top-story.html?id=ip-considerations-for-high-tech-companies-entering-the-china-market>.

⁴⁸⁹ The Law Journal of the International Trademark Association, Likelihood of confusion studies and the straitened scope of squirt by Jerre B. Swann at http://www.inta.org/TMR/Documents/Volume%2098/vol98_no3_a2.pdf and Initial Interest confusion versus consumer sovereignty:

A consumer protection perspective on trademark infringement by Ross D. Petty taking unfair advantage or diluting a famous mark — A 20/20 perspective on the blurred differences between U.S. and E.U. dilution law by Marcus H. H. Luepke; Combining trademarks in a jointly owned IP holding company by Lanning Bryer and Matthew Asbell; Virtual trademark use - The parallel world of keyword ads by Jonathan Moskin, May-June, 2008; http://www.inta.org/TMR/Documents/Volume%2098/vol98_no3_a4.pdf.

⁴⁹⁰ *Ibid.* 484;

<http://www.floridabar.org/divcom/jn/jnjournal01.nsf/Author/1F959DF53012155B85256ADB005D62DF>.

⁴⁹¹ *Ibid.* 486, p. 3; http://www.inta.org/TMR/Documents/Volume%2099/vol99_no3_a2-cover.pdf.

⁴⁹² P. 10 of TRIPS Agreement of the WTO at http://www.wto.org/english/docs_e/legal_e/27-trips.pdf.

⁴⁹³ *Ibid.* 486, p. 1; http://www.inta.org/TMR/Documents/Volume%2098/vol98_no3_a4.pdf.

from the transfer, IPHC management should be mindful of those jurisdictions that require that goodwill be included in an assignment of trademarks and file accordingly.⁴⁹⁴

A parent company must ensure that it is indeed the registered owner of the marks it seeks to transfer and that assignment to another entity is permissible. Some countries will not recognize or permit ownership of trademarks by holding companies, or alternatively, they charge transfer taxes upon their assignments. A Canadian trademark might be endangered by the transfer to an IPHC.⁴⁹⁵

Thus, in many countries, it is possible to sell or assign a trademark independently of the operating business it is linked to, provided the goodwill of a trademark is contemporaneously transferred with the trademark in some jurisdictions while this may not be required in other jurisdictions. In the case of sale or assignment of a trademark, it may be required to deposit a copy of the sale/assignment agreement, or the relevant parts of it, at the relevant trademark office. The transfer of the trademark is registered/recorded by in the relevant trademark office.

While determinations of ownership and transferability usually can be readily obtained in the case of registered marks, unregistered or “common law” trademarks may pose greater difficulty because their legal ownership is a matter of local law, and some jurisdictions impose restrictions on their assignment separate from related business assets.⁴⁹⁶

In the United States, intent-to-use trademark applications cannot be assigned before submitting evidence to the USPTO that the applicant is using the subject mark in US commerce, unless the assignment:⁴⁹⁷

- is made to a successor of the applicant’s business; or
- occurs as part of a transfer of the entire business to which the mark pertains, if the business is ongoing and existing.

4.1.2 Can other businesses resell your trademarked products without authorization?⁴⁹⁸

Another business can normally resell trademark-protected goods bought from your business within the same country, without having to seek your consent. However, whether someone else can legally resell your trademarked products in another country, will depend on the relevant law (refer to Box 11.5). While developing your export strategy, you should verify this question, preferably by consulting an IP counsel with

⁴⁹⁴ *Ibid.* 486, p. 13; http://www.inta.org/TMR/Documents/Volume%2098/vol98_no3_a4.pdf.

⁴⁹⁵ *Ibid.* 486, p. 14; http://www.inta.org/TMR/Documents/Volume%2098/vol98_no3_a4.pdf.

⁴⁹⁶ Countries that may impose such restrictions specifically on unregistered marks include: Anguilla, Antigua and Barbuda, Australia, The Bahamas, Bahrain, Bangladesh, Hong Kong, Ireland, Kenya, Lithuania, Malawi, Malta, Namibia, Singapore, South Africa, St. Lucia, Switzerland, Thailand, and the United Kingdom.

⁴⁹⁷ Intellectual Property: Asset purchases by Daniel Glazer, Fried, Frank, Harris, Shriver & Jacobson LLP, p. 4; http://tech.friedfrank.com/wp-content/uploads/2013/05/Marketing_TTG_PLC-IP-Asset-Purchases_Glazer.pdf.

⁴⁹⁸ Making a mark, cit., p. 54.

expertise in this area. Similarly, if your business plans to buy goods that bear a trademark owned by another business, then you should ascertain whether you need the prior, formal permission of the trademark owner before you sell those goods abroad. Various countries have, in fact, developed so-called *exhaustion* or *first sale* doctrines that regulate when a trademark owner can and cannot act against a reseller of his/her products.

Box 4.6: Parallel imports (gray market⁴⁹⁹ goods) and the doctrine of exhaustion of IPRs

A **parallel import** is an IP protected good that is imported into a market and sold there without the permission of the IP owner. The goods are “genuine” (as distinct from counterfeit goods), in that they have been manufactured by or under license from the IP (say, trademark) owner. However, they may have been formulated or packaged for a particular country/market, and then imported into a different market from that intended by the IP (trademark) owner.

The main difference between parallel importation and “official” importation is that the parallel imports probably were produced originally for sale in a particular market and then were passed through an unauthorized dealer before reaching the consumer. Parallel imports may differ in superficial ways from those made available by the local dealer—they may be packaged differently or lack the original manufacturer’s warranty—but otherwise they will be identical to the official import being marketed locally. When parallel importation occurs, the practical effect is that a patented and/or branded product becomes available locally from multiple sources. Parallel importing allows dealers to bypass official or authorized local suppliers or licensees and obtain products directly from overseas suppliers. The enhanced market competition between sources of the same products tends to drive prices down.⁵⁰⁰

Parallel importing mainly occurs for two reasons:

1. **Different versions** of a product are produced for sale in different markets; and,

⁴⁹⁹ The “gray market” is a term put forth by brand owners. It refers to sale of original, authorized and branded products through distribution channels that are not authorized by the manufacturer or brand owner – usually bargain/discount outlets that provide less customer service than the authorized channels do. Gray market activities are not illegal but they can constitute contract breaches between distributors and the brand owner. Gray markets turn black and illegal only when the sold products are stolen or illegal. Due to dubious product sources, it is often difficult to draw an exact line between gray and black markets. Gray markets can take place on flea markets, internet auctions (eBay etc.), shopping sites that can open and disappear within days, shopping booths in cities, or even dedicated markets, for example in holiday resorts. Brand owners usually try to fight gray markets to manage and control distribution of their goods. The most important way how original products enter the gray market is parallel trade. Parallel trading refers to situations where products are legitimately bought in one territory and diverted for sale to another territory without the consent of the right holder in the receiving territory. If the distribution occurs across national borders it is frequently referred to as parallel importing; refer p. 8 of <http://www.bridge-project.eu/data/File/BRIDGE%20WP05%20%20Anti-Counterfeiting%20Problem%20Analysis.pdf>.

⁵⁰⁰ Parallel trade: A user’s guide, by [Duncan Matthews](#), [Viviana Munoz-Tellez](#), Concept Foundation, 2007; <http://www.iphandbook.org/handbook/ch15/p04/>.

2. Businesses set **different price** points for their products in different markets. Parallel importers ordinarily purchase products in one country at a price (P1), which is cheaper than the price at which they are sold in a second country (P2), import the products into the second country, and sell the products in that country at a price which is usually between P1 and P2.

By depleting the products in the low-price jurisdiction, gray marketing elevates local prices, making the product less attractive to local buyers. More important, gray market products imported into a high-price jurisdiction compete at a low price with the manufacturer's own products and diminish the manufacturer's control over its own brands. Hence, businesses with widespread international sales have a strong interest in resisting and controlling gray marketing.⁵⁰¹

Failure to comply with the importing country's packaging and labelling requirements could also result in preventing the importation of gray products.

Exhaustion of trademark rights refers to the extent to which trademark rights holders can control the distribution of their trademarked goods after the first sale. According to the concept of exhaustion, once the owner of a trademark sells a product to which the trademark is attached, s/he cannot prevent the resale of that product in that country because the trademark rights covering that product have been "exhausted" by the first sale (unless there is a selective distribution agreement).

There are two types of exhaustion regimes: national (or regional) and international. The debate between which is preferable has been highly controversial, because it has important economic implications.

- *National (or Regional) Exhaustion:* These regimes are followed by countries and regions that only allow trademarked goods that have been exhausted to be resold in the national or, in the case of the European Union, regional area that the goods have been put on the market for the first time.
- *International (or Global) Exhaustion:* This regime is followed by countries and regions that allow trademarked goods to be resold in regions other than the country/region of origin.
- "Hybrid" Approaches:⁵⁰² The above two general approaches may be modified by the addition of other rules or restrictions. For example, the United States nominally applies the principle of international exhaustion, but goods may only be allowed for importation if they come from a company which is affiliated with the brand owner, and they are not materially different from those marketed in the United States. In the United States, the brand owner is able to stop imports if they differ materially in relation to, for example, formulation, fragrance, color, calories, lot code removal, size, fill volume, packaging, language, guarantees, labelling and instructions. The same could be said for Canada, but the standard of materiality of physical and other

⁵⁰¹ Canada: How to stop grey goods, p. 2;

<http://www.torlys.com/Publications/Documents/Publication%20PDFs/ARTech-34T.pdf>.

⁵⁰² International Trademark Association, Parallel Imports, July 2007;

<http://www.inta.org/Advocacy/Documents/INTAParallelImports2007.pdf>.

differences is much higher than in the United States: typically, only those physical and other differences that are likely to cause harm to consumers or the public good are sufficient to enable the brand owner to object to parallel importation. Within the European Union, material differences may be sufficient to enable a brand owner to prohibit the movement of goods between Member States, provided that such differences have not been introduced specifically so as to carve up the market; but it is not necessary for a brand owner to show the presence of material differences in order to prevent the entry of branded goods into the European Union from elsewhere in the world.

4.2 Licensing of IPRs⁵⁰³

The word *license* simply means permission granted by the owner of an IPR to another, pursuant to a contractual agreement executed with the latter, to use the IPR on agreed terms and conditions, for a defined purpose, in a defined territory and for an agreed period of time.⁵⁰⁴

The IPR owner, e.g. a trademark owner, continues to own the licensed trademark and merely permits the use of the trademark by one or more other persons. The permission is given subject to payment of periodic royalties and involves the consent of the trademark owner, which is usually specified in a written licensing agreement that describes the terms and conditions of the IPR license/permission.

The most basic requirements for an effective IPR license are:

- The licensor must own the relevant IPR or must have authorization from the IPR owner to grant a license;
- The IPR must be protected by law or at least be eligible for protection. An IPR license can only be granted in a country if the IP in question is legally protected in that country. Therefore, it would be advisable to register an IPR in as many countries as possible, in order to maximize the value of such IPR through licensing;
- The exact **scope of the rights**: The written agreement must specify the exact scope of the rights granted by the licensor to the licensee and the limitation in relation thereto. For instance, if a product or process has or may have more than one potential use/application, the licensor should only grant rights to the licensee in respect of the uses/applications in which the licensee can demonstrate the necessary experience and competence. Even if the licensor believes there is only one use/application for the product or process, the license should be drafted to grant rights to that particular use/application. There have been numerous examples in history of a product that was first thought to have only one use actually performing better in another use. The licensor wants to avoid inadvertently granting rights to these undiscovered uses/applications, which in the long term may be even more valuable than the known use/application.⁵⁰⁵ In the case of a software, such

⁵⁰³ <http://www.wipo.int/sme/en/commercializing.jsp>.

⁵⁰⁴ Exchanging value - Negotiating technology licensing agreements, WIPO publication No. 906, 2005, p. 14; http://www.wipo.int/sme/en/documents/guides/technology_licensing.html.

⁵⁰⁵ License Terms, James and Wells, 2014;

<http://www.jaws.co.nz/information/category/commercialisation/licence-terms>.

limitations could be, for example, the exclusion of the right to perform reverse-engineering;

- A license is usually for a fixed term not exceeding the life of the IP being licensed, except where the IP has an indefinite life span, such as trademarks and trade secrets. Agreements of 5 or 10 year duration are common even in the case of trademarks and trade secrets.
- The **consideration**: it should clearly specify the license fee or other compensation (e.g., an initial lump sum and/or ongoing royalties). A licensor will often require a lump sum initial payment (or sign-on fee) as part of the consideration for the license. Generally, the higher the sign-on fee the lower the ongoing royalty. If the licensee is unwilling to pay a significant sign-on fee, and the licensor requires funds in the short term, consider using a sign-on fee that is credited against the licensee's royalty account (i.e., prepaid royalties). The licensor should be careful to provide that the sum is non-refundable, even if actual royalties do not use up the entire credit.
- **Royalty base**: The key definition in the royalty provisions is not the size of the royalty rate, but the base to which the royalty rate is applied. Should the royalty be a percentage of the invoiced sale price of the product, the manufactured cost or profit margin? Should the royalty be a piece rate - that is a set figure per product sold or manufactured? It is recommended to avoid profit as a royalty base, because profit figures can be manipulated by skillful accounting. It is much harder to manipulate the sale price. When defining what constitutes a royalty bearing sale, consider using terminology familiar to accountants, as it is usually accountants who will calculate the royalty payments, and conduct audits on behalf of the licensor. Give consideration to other means of disposing of the product, such as by lease, hire, gift, internal use and such like. Also consider how transfers between related companies will be dealt with. Piece rates are easy to calculate, although over time they can become eroded by inflation. Accordingly, if a piece rate is used, then an inflation adjustment provision should be included. Royalties for processes can be based on throughput, time used, or degree of cost saving (e.g., output of waste) and such like. Software is often licensed for a fee, either a one off payment or a continuing payment (e.g., an annual fee), and the quantum of payment is sometimes tied to the number of users or size of the user organization.⁵⁰⁶
- **Royalty rate**: Once the royalty base is determined, then the licensor must negotiate the royalty rate (e.g., the percentage applied to the royalty base). Determination of the royalty rate should have regard to two main factors:
 - Industry norms
 - Projected profits

Royalty rates for various groups of technologies based on established and successful licensing arrangements are of interest as a check in relation to costs within industries and the profit margins of efficiently run businesses. This benchmarking against similar products or technologies relies on the availability of sufficient public information. Where such information is not so readily available, research companies may for a fee, provide royalty information on products and industries, based on their surveys and data compiled from various sources. Royalty

⁵⁰⁶ *Ibid.* 502; <http://www.jaws.co.nz/information/category/commercialisation/licence-terms>.

Source is one such company. There are also published studies of royalty rates that can be accessed freely.

The licensee is required to keep books of account relating to the sale of the licensed products or use of the licensed process, for the purpose of calculating royalty payments due to the licensor. It is advisable to require that these accounts be kept separate from general accounting records, to make auditing the royalty payments easier.

Where a licensed product is the subject of patent rights, copyright protection and trade mark protection, the licensee should consider apportioning the total royalty rate between these various forms of protection. In this manner, if a patent lapses or is invalidated, there is less likely to be a dispute as to whether the agreement should be renegotiated or terminated. It may also make accounting for tax easier as different tax rules can apply to different IP types.

Where there is a differential royalty rate depending on the protection in a country, care has to be taken that the licensee cannot make and sell products in a low royalty rate country and then have the purchaser resell into a high royalty rate country without paying the differential.

Where products are bundled together and sold as a single unit (A joined with royalty bearing B to form AB), there is the potential for either the licensee's accounting system to fail to recognize the sale of AB as the sale of a royalty bearing B, or for the licensee to code it as a sale of A and a free B, thereby avoiding a royalty (unless the definition of "sale" is made to include using or transferring title to B). Some definitions of "net sales" will specifically exclude product that is given away in the course of a promotion.

Similarly, where a royalty bearing product is provided as part of a service, there may be potential for the licensee to charge little for the product and give the service the bulk of the price weighting, thereby minimizing any royalty due.

- There may be issues where the licensee argues some royalty bearing stock has become obsolete and is scrapped or written off.

The royalty clause should be drafted carefully so as to properly capture sales made by a sub-licensee (if sub-licensing is permitted).

The licensor should require the licensee to comply with all regulations and laws associated with the manufacture and marketing of the licensed product/process in each country of the licensed territory. It may also impose particular requirements in terms of the quality of product sold (particularly if the license involves trademark rights).

- The licensee will generally be required to provide the licensor with periodic reports (usually coinciding with the royalty payment dates) setting out information including the number of products manufactured and sold, the invoiced price of each sale, and the royalty calculation.
- The licensor should reserve the right to enter the licensee's premises for the purpose of auditing the accounts, and to view and take copies of the accounts, and this right should extend to the licensor's duly appointed accountant.

- Most countries require that the license agreement be written, and many countries require that it be duly recorded with the local IP office and/or other government agency.
- The agreement should be signed by duly authorized representatives of both the parties (licensor and licensee).

For a detailed understanding of the general issues in patent licensing refer to the two WIPO publications by following the link⁵⁰⁷ and for specific issues in agriculture and biotechnology refer to Chapter 11 of the IP Handbook of Best Practices.⁵⁰⁸

Agri-biotech licenses have some unique elements that require special attention; please see the linked chapter in the IP Handbook of Best Practices; these include multiple property types that are often covered by a single technology and/or product, “freedom to operate” issues that drive anti-royalty-stacking provisions, philanthropic- and humanitarian use clauses, and stewardship obligations.⁵⁰⁹

In trademark licensing, quality control of the licensee by the licensor is a very important requirement.

⁵⁰⁷ Exchanging value – Negotiating technology licensing agreements: A training manual, WIPO; http://www.wipo.int/export/sites/www/freepublications/en/licensing/903/wipo_pub_903.pdf and http://www.wipo.int/sme/en/documents/guides/technology_licensing.html.

⁵⁰⁸ Technology and product licensing, Concept Foundation, 2010; <http://www.iphandbook.org/handbook/ch11/>

⁵⁰⁹ Licensing agreements in agricultural biotechnology, by Richard S. Cahoon, concept foundation, 2007; <http://www.iphandbook.org/handbook/ch11/p02/>.

Box 4.7: Kraft Foods: trademark/licensing⁵¹⁰

Guiding Principle:

Kraft Foods manages the use of Kraft brands and Trademarks through the use of Licensing agreements. A risk analysis is performed for each proposed license agreement. Prior to usage, permission must be obtained from Kraft Foods to use a Kraft Foods' brand name as part of a product name or promotion.

Procedures:

- The primary point of contact to request an agreement is your Sales Representative.
- Kraft Foods reviews each license request with a cross-functional team comprised of Brand Management, Business Team Management, Legal, R&D, Quality, Food Safety and Marketing Services.
- Depending on the specific Trademark usage or request, Kraft Foods may require a facilities/quality audit prior to approval as well as periodic compliance and validation.

4.2.1 Why should an agri-food SME consider licensing of IPRs?

An agri-food SME may have to license-in IPR from others or license-out its own IPR to others. It should do one or both of these depending on its business model and business strategy.

For instance, a decision to license an agri-biotech invention is typically based on a few important background issues:⁵¹¹

- the significant cost to create, develop, and commercialize agri-biotech products
- the critical role of government regulations in testing and commercializing products
- the importance of public perception and acceptance of agri-biotech products
- the necessity of using numerous, different (and often proprietary) technologies to create agri-biotech products

A successful agri-food SME may own one or more types of IPRs (trademarks, patents, industrial designs, trade secrets, etc.) which it may directly exploit in its business. But most agri-food SMEs depend on innovation resulting from publicly funded R&D or innovation arising out of R&D done by public-private partnerships. In such a case, the innovation protected by a patent or a new plant variety right has to be licensed-in by the agri-food SME. In fact, new institutional arrangements have arisen for the transfer of

⁵¹⁰ <http://www.kraftfoodservice.ca/en/businesssolutions/quality/trademarklicensing.aspx>

⁵¹¹ *Ibid.* 506; <http://www.iphandbook.org/handbook/ch11/p02/>.

new plant varietal technology from research universities to consortia or cooperatives of growers willing to pay for licenses for new varieties.⁵¹²

However, in the context of partnerships, such as the outsourcing of business functions/activities, contract farming and/or as part of a value chain/network, an agri-food SME should look at its IPR portfolio for strengthening its competitive advantages by relying on other alternatives, direct or indirect. The licensing of IPRs may be the core/primary way of monetizing an IP asset or it may be a subsidiary option. This is true of both agri-food SMEs operating in domestic and/or international markets. In fact, the licensing of IPRs may determine the business model and business strategy of an agri-food SME. Commercial relationships in the form of arm's length IPR licensing or IPR licensing as a part and parcel of joint ventures or strategic alliances appear to be an increasingly common practice amongst agri-food firms, including SMEs, in both domestic and international markets.

Licensing of IPRs may be between:

- (a) Agri-food and agri-food
- (b) Agri-food and Non-agri-food
 - (i) Agri-food to non-agri-food and
 - (ii) Non-agri-food to agri-food

For instance, a winery may license-in the use of off-the-shelf Customer Relationship Management (CRM) software or it may hire a software enterprise to develop a customized CRM solution for the winery. In the first case, the winery licenses-in the CRM solution from the IPR owner, whereas in the second case, it could license-out: let other enterprises (for example, a non-competing enterprise, such as a biscuit producer) adapt the same CRM software for its needs on payment of a royalty through a non-exclusive license agreement. The latter course would allow it maximize its profit because of the additional incomes generated by such licenses.

Non-agri-food to agri-food: Graphic characters, including their names and images are commercialized through licensing agreements for children's toys and games, adult and children's clothing, posters, software, video games, and fast food restaurants.

Traditionally, IP licensing or sale has been viewed as a strategy for generating incremental cash from valuable non-core IP assets identified in the IP strategic audit process. Conventional wisdom suggests that IP that creates a competitive advantage, or core IP, should not be licensed to competitors. However, a growing number of companies are moving away from a strict reliance on the exclusivity value of their core

⁵¹² The economics of intellectual property: Suggestions for further research in developing countries and countries with economies in transition, January 2009;
http://www.wipo.int/edocs/pubdocs/en/economics/1012/wipo_pub_1012.pdf.

IP assets and are instead seeking to license them to other companies, including competitors.⁵¹³

Thus, even when an agri-food SME is directly using its core IP assets in its own manufacturing and/or marketing operations, licensing of these IPRs may be useful if it cannot produce in sufficient quantity to meet all the needs of a given market, or is unable to directly build a business to service the same/similar needs to cover another geographical area (where a non-exclusive IPR license agreement could be successfully used).

Licensing, moreover, could also be useful if the agri-food SME is interested in acquiring a new technology but does not have sufficient economic resources to invest in R&D. Acquiring a new technology by licensing-in, therefore, may be one way of obtaining the desired technology.

As a license agreement requires skillful negotiation and drafting, it would be advisable to seek the assistance of a licensing practitioner for negotiating the terms and conditions and for drafting the licensing agreement.

Box 4.8: BlueOcean and Neptune Sign Licensing Agreement⁵¹⁴

TORONTO, ON – October 20, 2014 –BlueOcean NutraSciences Inc. (“BlueOcean”) (TSX-V: BOC) announces the signing of an exclusive world-wide, royalty-bearing, non-transferable, License Agreement (“License”) under Neptune’s composition and extraction patents on the production and sale of marine derived oil products containing phospholipids. The License allows BlueOcean and its shrimp joint venture affiliate to produce and sell shrimp oil products extracted from three species of North Atlantic cold water shrimp (*Pandalus borealis*, *Pandalus montagui*, and *Pandalus jordani*) in the nutraceutical, dietary ingredients, natural health products, functional food and food supplements markets. The medical food, drugs and drug product markets are not included.

The commercial terms of the License include BlueOcean paying Neptune a minimum yearly cash royalty, and a royalty per unit of product sold. As well, an initial upfront payment will be made through the issuance of 3,750,000 shares of BlueOcean at a price of 0.20 USD per share. Closing of the transaction is subject to the approval of the TSX Venture Exchange. The other financial terms of the license are confidential between the parties. Closing of the transaction is being done at arm’s length. No finder’s fee is being paid in connection with this transaction.

BlueOcean CEO, Gavin Bogle added, “Our shrimp oil product is innovative and targets the high value, high growth astaxanthin market. We are encouraged by Neptune’s

⁵¹³ IP finance and monetization, by Joff Wild, Intellectual Asset Management, 2007, p. 3; <http://www.iam-magazine.com/Magazine/Issue/23/Management-report/IP-finance-and-monetisation>.

⁵¹⁴ BlueOcean and Neptune sign licensing agreement, October 2014; <http://blueoceannutra.ca/?p=568> and <http://neptunekrilloil.com/wp-content/uploads/2014/07/20141020-Neptune-and-BlueOcean-Sign-Licensing-Agreement.pdf>.

confidence in our product and Company, demonstrated by its willingness to receive the License upfront payment in equity. The global exclusive License also strengthens our market position by ensuring that our high astaxanthin and phospholipid shrimp oil is protected.”

Price controls by governments can distort the licensing of IPRs as happened in India in the case of patented Bt cotton technology; refer to Box 11.8.

Box 4.9: Impact of price controls on patented Bt cotton technology on the licensor, licensee and sublicensees⁵¹⁵

Monsanto distributes Bt cotton in India through its joint venture with Mahyco, called Mahyco Monsanto Biotech (or MMB). In India, for Bt cotton, the main technology provider is MMB, although Nath Seeds and JK AgriGenetics also had some sales of their Bt.

Since Monsanto does most of the research and product development in the United States, the R&D costs are assumed to be sunk costs; hence, the marginal cost of producing one extra unit of technology in India is zero. The cost of regulatory approval does occur in India, but it is independent of sales of the specific product. Thus, we can say that there is zero marginal cost and a perfectly elastic supply of Bt cotton technology.

The income to MMB can thus be calculated simply by multiplying the royalties by the quantity of seed sold, i.e., Profits = (# of packets sold × trait fee for technology provider). Seed firms that license Bt pay a one-time lump-sum payment for technology fees of 50,000,000 INR to MMB to acquire the Bt gene technology (BGI, BGII, and RR Flex cottons). Currently 37 firms have sub-licensed Monsanto’s Bt gene technology in India. Of the total MMB profits, Monsanto shares nearly half of its revenue with Mahyco as per their agreement.

In 2005, the government of Andhra Pradesh filed a petition with the Monopolies and Restrictive Trade Practices Commission seeking to have MMB and its licensees declared monopolists and to reduce Bt cotton seed prices. Early in 2006, the Commission agreed and stated that the state government should set the price of Bt cotton. MMB appealed against this price-control order set by the MRTPC to the Supreme Court, but the issue is still pending five years later.

MMB took a major cut in royalties in the first year of price controls—from 2.275 billion INR to 612 million INR. Royalties did not reach the 2005/06 levels again until last year. The profits of the licensees were reduced even more than for Monsanto because they not only had lower revenue, but they were also hit with a 35-40 per cent increase in costs of producing and marketing seed. It is interesting to note that before price

⁵¹⁵ Price controls and biotechnology innovation: Are state government policies reducing research and innovation by the ag-biotech industry in India? By Carl E. Pray and Latha Nagarajan, AgBio Forum, 2011; <http://www.agbioforum.org/v13n4/v13n4a02-pray.htm>.

controls, the seed companies captured more profits from sales of Bt seed than MMB, while after price controls MMB received more profits from Bt than the seed companies.

Some of the small biotech companies have been particularly vocal in their opposition to price controls. In July 2009, Metahelix received approval to sell its new Bt gene. Metahelix is a small biotech and seed company that was founded in Bangalore in 2001 by scientists who had worked at Monsanto. It was funded by “angel investors” from the information-technology industry. Their business plan was to develop appropriate biotech products for the Indian market. They started their Bt cotton program in 2003, lost at least one year of field trials due to objections to GM field trials raised at the Supreme Court by NGOs, and then finally in 2009 received permission from the government to sell this Bt product. They had hoped to start selling the product in 2010, but in May 2010 the President of Metahelix reported that the price cap prevented them from introducing hybrids with new Bt in 2010:

“I’ve spent over 25-30 *crore* (INR) [5-6 million USD] in the last seven years on research and regulatory approvals around our Bt genes, but with this price cap, I can’t negotiate appropriate licensing fees with seed companies and I can’t competitively price my seeds. So, we are bleeding,” said K.K. Narayanan, managing director of Metahelix Life Sciences Pvt. Ltd, a Bangalore-based crop biotech firm.

It must be particularly frustrating for Indian companies like Metahelix because government regulations gave MMB a monopoly for 5 years with royalties of up to 24 USD/packet and then when local companies break the monopoly by developing their own new biotech products, the government reduces prices to a level that makes profits on these investments almost impossible. Murugkar, Ramaswami, and Shelar’s 2007 study of the seed industry concluded that price caps were particularly problematic for new domestic firms seeking to enter the market.

4.2.2 What is the difference between an exclusive and non-exclusive license?⁵¹⁶

There are three types of licensing agreements, depending on the number of licensees that will be allowed to exploit the right:

- (i) An **exclusive license**: a single licensee has the right to use the licensed IP right, which cannot even be used by the rights owner;
- (ii) A **sole license**: a single licensee and the rights holder have the right to use the licensed right;
- (iii) A **non-exclusive license**: several licensees and the rights holder have the right to exploit the licensed rights.

⁵¹⁶ Making a mark, cit., p. 51.

Example:



*The Ethiopian Fine Coffee Stakeholder Committee in conjunction with the Ethiopian Intellectual Property Office began the Ethiopian Coffee Trademarking and Licensing Initiative. The initiative strives to alleviate poverty in the Federal Democratic Ethiopia by promoting and using its fine coffees. The three famous brands of Ethiopian coffee, **HARAR™**, **YIRGACHEFFE™** and **SIDAMO™** were secured with trademark registrations in around 36 countries and distributors were required to obtain non-exclusive licenses to sell them. The Federal Democratic Ethiopia now has over 110 licensees in 8 countries.*

An example of an exclusive license can be found by following the link.⁵¹⁷

4.2.3 Should the enterprise grant an exclusive or non-exclusive license?⁵¹⁸

It depends on the product and on the enterprise's business strategy.

For example: If the considered technology (i.e., a biotechnological invention) can become a standard that is needed by all players in a specific market to perform their business, a non-exclusive, widely-held license would be the most advantageous.

If the product needs one enterprise to invest heavily to commercialize the product (e.g., an information system which requires strong investment in hardware), a potential licensee would not want to face competition from other licensees, and may rightly insist on obtaining an exclusive license. In an exclusive license, it is always a good idea to require the licensee to pay minimum royalties. Exclusivity involves certain risks for the licensor, in particular, the risk that the licensee will be a poor performer and will effectively tie up the technology, resulting in a low return for the licensor. As there is more risk for the licensor, the licensor can charge a premium royalty for an exclusive license. The licensor, before agreeing to exclusivity should impose definite performance obligations upon the licensee, which if not met, will entitle the licensor to either terminate the agreement or convert it to a non-exclusive license. These may include minimum royalties, best efforts clauses and other clauses that seek to reduce the risk of being stuck with a non or poor performing licensee. The licensor need not make all the rights granted exclusive. For example, the right to manufacture may be exclusive, while the right to market may be non-exclusive; the rights in a particular geographic territory may

⁵¹⁷ Exclusive variety license agreement between her Majesty the Queen in Right of Canada, as represented by the Ministry of Agriculture and Agri-Food (AAFC), and the Company, WIPO; <http://www.wipo.int/tk/en/databases/contracts/texts/varietylicence.html>.

⁵¹⁸ Making a mark, cit., p. 52.

be exclusive, while elsewhere the rights are non-exclusive; or the rights to one field of use are exclusive, while others are non-exclusive.

Box 4.10: University Licensing of Patents for Varietal Innovations in Agriculture

There has been a sharp increase in the number of patented fruit varieties developed by breeding programs at public universities in the United States. We developed an experiment to examine the revenue stream to universities from the licensing of these varietal innovations. In the experiment we asked subjects to bid for access for a patented input that would be used to manufacture a differentiated product; treatments were employed to solicit bids that were financed by fees, royalties, and a combination of the two mechanisms under exclusive and non-exclusive contracts. All treatments also considered the impact of demand uncertainty for the product that used the patented input. Our empirical results suggest that innovator revenues are greatest when royalties are used alone. In the absence of demand uncertainty, innovator revenues are greatest with an exclusive contract, but with demand uncertainty innovator revenues are greatest with non-exclusive contracts.⁵¹⁹

In the United States, public universities may choose to license a plant variety to a limited number of producers (an exclusive license) or to an unlimited number of producers (an open license). This choice has implications for the quantity and distribution of total benefits from the variety. Universities have traditionally released new apple varieties under open licenses, but several universities have now begun exploring or implementing exclusive licensing. In this paper, we consider the choice faced by a public university when licensing a plant variety patent, with a focus on apples. Our work differs from the majority of past studies on patent licensing, because we allow licensees to determine the signal of product quality through a trademark, and we consider welfare objectives for a public university that differ from simple maximization of patent income. In this context, we compare monopolistic licensing and two oligopolistic licensing scenarios. We then solve for the optimal choice of licensing fees for the university. Using numerical simulations, we find that consumer surplus and social welfare may be higher under exclusive licensing if consumers are relatively responsive to expenditure on the trademark but relatively insensitive to price. However, exclusive licenses may create distributional concerns among producers. Furthermore, different objective functions of the university can imply different optimal outcomes for both the number of licensees and the licensing fees. Although we focus on apples, this model and its results could apply in a variety of settings.⁵²⁰

⁵¹⁹ University licensing of patents for varietal innovations in agriculture, by Bradley J. Rickard, Timothy J. Richards, Jubo Yan, 2013; http://ageconsearch.umn.edu/bitstream/150204/2/AAEA_RickardRichardsYan_2764_LicensingPatent_s_June1_2013.pdf.

⁵²⁰ Optimal licensing for public intellectual property: Theory and application to plant variety patents by Julian M. Alston and Zoe T. Plakias, Department of Agricultural and Resource Economics, University of California, Davis, Corresponding Author: plakias@primal.ucdavis.edu; <http://ageconsearch.umn.edu/bitstream/170649/2/AAEA%202014Alston%20and%20Plakias.pdf>.

Box 4.11: Stevia First Corp. licenses fermentation-based stevia IP from Vineland Research and Innovation Centre⁵²¹

August 29, 2012 *Development efforts aim to bypass traditional stevia farming, create superior products at lower cost* **SACRAMENTO, CA** -- Stevia First Corp. (OTCBB: STVF) (“Stevia First” or the “Company”), an early-stage agribusiness based in California’s Central Valley growing region and focused on the industrial scale production of stevia, the all-natural zero-calorie sweetener that is rapidly transforming the F&B industry, is pleased to advise that the Company has entered into an exclusive and worldwide IP license with the Vineland Research and Innovation Centre (“Vineland”) of Ontario, Canada (www.vinelandresearch.com).

The license encompasses compositions and methods for producing steviol and steviol glycosides through fermentation-based production methods. In addition to the license, Stevia First has entered into a separate consulting agreement with Vineland to assist with further development of the underlying IP.

Today, production of stevia extract involves a complex agricultural supply chain servicing a sector that includes approximately 75,000 acres of stevia plant reportedly being grown overseas in 2010. It is currently estimated that 70 per cent or more of the cost of stevia extract is directly attributable to the cost of stevia leaf production. Because the stevia leaf contains small quantities of the most desirable sweet components, complex extraction and purification processes must be used, adding to the cost, and yet still, many stevia extracts today do not meet the standards for taste and consistency that consumers demand.

Canadian researchers at Agriculture and Agri-Food Canada were among the first to discover and characterize the natural biochemical pathways that are involved in the production of the sweet components of the stevia leaf. Using this knowledge, it has become possible to produce stevia extract through fermentation-based technologies. These methods are capable of converting low-cost plant materials into sweet steviol glycosides through controlled fermentation methods, a process that could bypass or significantly diminish the need for stevia leaf production. Vineland currently controls IP related to this technology.

Through a worldwide license to Stevia First by Vineland, the Company will have exclusive rights to an IP portfolio derived from a patent titled, “Compositions and methods for producing steviol and steviol glycosides.” Stevia First is commencing fermentation-based stevia development efforts at its Yuba City, CA, facility, which first involve process optimization studies and completion of pilot-scale stevia extract production.

⁵²¹ Stevia First Corp. licenses fermentation-based Stevia intellectual property from Vineland Research and Innovation Centre, Aug 29, 2012, Development Efforts Aim to Bypass Traditional Stevia Farming, Create Superior Products at Lower Cost; http://www.steviafirst.com/news/news_releases/2012/08/stevia-first-corp.-licenses-fermentation-based-stevia-intellectual-property-from-vineland-research-and-innovation-centre.

4.2.4 What royalty rate should you expect to receive?⁵²²

In licensing agreements, the owner of the right is generally remunerated through lump-sum payments and/or through recurring royalties, which may be based on the sales volume of the licensed product (per unit royalty) or on net sales (net sales-based royalty).

In many cases, the remuneration for a patent license is a combination of a lump-sum payment and royalties.⁵²³

Sometimes, an equity stake in the enterprise of the licensee may replace a royalty.

While industry standards for royalty rates exist for particular industries and may usefully be consulted, it must be remembered that each licensing agreement is unique and the royalty rate depends on the particular and very distinct factors being negotiated. While industry standards may provide some useful guidance, placing too great a reliance on such standards would be inappropriate, as the value of each IPR is different.

4.2.5 When should one start think about licensing a patent?⁵²⁴

There is no best time to license an invention, as the timing will depend on a variety of factors that are specific to the situation of the licensor. For instance, an independent an agri-food R&D institution/enterprise should start its search for prospective licensees as early as possible in order to guarantee a revenue stream to cover the costs of patenting. There may not be any need to wait for the patent to be granted. But before considering the timing, one has to consider whether to assign or license the patent, and if the latter, then whether to grant a sole, exclusive or non-exclusive license.

More than anything else, it is critical to find the right partner(s) to generate profits from the commercialization of the patented invention and/or reap other benefits.

Box 4.12: KeyGene's SBG patent portfolio strengthened

KeyGene is a privately owned, innovative molecular genetics Agri Biotech company with a primary focus on the improvement of 6F (Food, Feed, Fiber, Fuel, Flowers and Fun) crops. KeyGene's passion is a Green Gene Revolution approach to explore and exploit natural genetic variation in vegetable and other 6F crops. KeyGene delivers sustainable responses to the world's needs for yield stability & quality of vegetable and field crops. KeyGene supports its strategic partners with cutting edge breeding technologies and

⁵²² *Inventing the future*, cit., p. 47.

⁵²³ In general, the lump-sum payment is a sort of minimum guarantee payment while the royalties have to be paid if sold units exceed a fixed amount.

⁵²⁴ *Inventing the future*, cit., p. 46.

plant-based trait platforms, with more than 135 employees from all over the world, with state of the art facilities and equipment.⁵²⁵

KeyGene has its headquarters in Wageningen, The Netherlands, a subsidiary in Rockville, the United States and a Joint Lab with the Shanghai Institute of Biological Sciences in Shanghai, China.

In the 1980s a number of Dutch seed companies realized that plant biotechnology could significantly contribute to their further development. As a result, in 1989 KeyGene was founded. At the time it was a unique collaboration between Royal Sluis, Cebeco Trade Council, RZ Research, De Ruiter Seeds and Enza Seeds.

The goal of the collaboration being to create synergy and enhance efficiency in molecular breeding and research programs of these seed companies. KeyGene started with offices at the Keijenbergseweg in Wageningen. In 1991 KeyGene moved to larger premises at the Agri Business Park where in 1991 KeyGene's unique AFLP marker technology was invented. This technology makes it possible to generate a unique DNA fingerprint of a plant, so breeders of commercial crops have interesting information from these plants at their disposal. Over the years, the composition of the group of shareholders has changed. In 2001 the strategic decision was made to work only on vegetable crops with the shareholders.

Now, 25 years later, there still is this unique partnership concept between the shareholders. KeyGene conducted innovative research for its shareholder from the outset: Enza Seeds and also for RijkZwaan, Vilmorin & Cie (France) and Takii & Co (Japan). KeyGene is proud to be part of this consortium of major players in the seed industry: together they produce vegetable seeds for a significant part of the world market. In addition KeyGene has expanded its innovative power outside vegetable crop seeds and now works with a wide range of breeding, agri and "food" companies. Doing molecular genetic research still represents the heart of the company. The route which KeyGene has chosen is that of the green gene revolution. Of the two directions that are known in plant biotechnology, genetic modification, i.e., improving crops by inserting the DNA of another organism and the natural way, KeyGene has chosen the latter. KeyGene's strength lies in improving crops by "marker assisted breeding," by making use of the genetic diversity that is present already in nature and following the genes at DNA level, breeders can make crosses quicker and more directly.

KeyGene recently announced that its Sequence-Based Genotyping (SBG) patent portfolio has been strengthened by the grant of United States Patent US 8,460,866, entitled "High throughput sequence-based detection of SNPs⁵²⁶ using Ligation Assays,"

⁵²⁵ KeyGene celebrates its 25th anniversary with festive jubilee year from startup company to global player, Wageningen, June 16, 2014; http://www.keygene.com/wp-content/uploads/2014/06/140616-PRESS-RELEASE-25-KeyGene_EN-final.pdf.

⁵²⁶ A Single Nucleotide Polymorphism (SNP, pronounced snip; plural snips) is a DNA sequence variation occurring commonly within a population (e.g., 1%) in which a single nucleotide — A, T, C or G — in the genome (or other shared sequence) differs between members of a biological species or

protecting sequence-based SNP genotyping methods. The patented methods are used to detect target sequences with probes containing identifier sequences and to circumvent limitations of competing genotyping assays relying on interpretation of fluorescence signals. The SBG methods are fully customizable in terms of numbers of SNPs and samples. The grant of this patent strengthens KeyGene's leading position in the competitive field of SBG for breeding. The granted patent is one of several SBG patents and patent applications the company owns related to *next-generation sequencing*⁵²⁷ (NGS)-based discovery and detection of genome variants.

"We are very pleased with the addition of this patent to our steadily growing portfolio of proprietary NGS-based breeding applications," states Michiel van Eijk, CSO of KeyGene. "SBG is rapidly gaining momentum over more conventional genotyping methods and the market requires products capitalizing on the power and pricing levels of NGS. We are dedicated to providing such products to our clients and partners in the Agriculture and Life Sciences fields."

KeyGene offers its clients all over the world competitive genotyping solutions to improve and accelerate the development of new crop varieties. Highly accurate and cost-efficient methods for genotyping of known polymorphisms represent an important part of the genotyping market in all species. SBG is an important product of KeyGene's Advanced Molecular Breeding platform. The company also provides licenses for commercial or research purposes with accompanying training and consultancy to its licensees.

Box 4.13: Byron Food Science, Commonwealth of Australia⁵²⁸

Byron's heritage dates back to the 1850's with the development of one of Australia's earliest ice-making plants to provide the gold fields with fresh fish. The business expanded into the next generation, developing into a company which was to become a household name, "Masterfoods." In 1973, a new direction was taken to research and develop new food products and food processes.

paired chromosomes. For example, two sequenced DNA fragments from different individuals, AAGCCTA to AAGCTTA, contain a difference in a single nucleotide. In this case we say that there are two alleles. Almost all common SNPs have only two alleles. The genomic distribution of SNPs is not homogenous; SNPs occur in non-coding regions more frequently than in coding regions or, in general, where natural selection is acting and "fixing" the allele (eliminating other variants) of the SNP that constitutes the most favorable genetic adaptation. Other factors, like genetic recombination and mutation rate, can also determine SNP density; http://en.wikipedia.org/wiki/Single-nucleotide_polymorphism.

⁵²⁷ Next-generation sequencing refers to non-Sanger-based high-throughput DNA sequencing technologies. Millions or billions of DNA strands can be sequenced in parallel, yielding substantially more throughput and minimizing the need for the fragment-cloning methods that are often used in Sanger sequencing of genomes; <http://www.nature.com/subjects/next-generation-sequencing> Refer also for a more detailed introduction to NGS to An introduction to next generation, by Illumina, 2013; http://res.illumina.com/documents/products/illumina_sequencing_introduction.pdf.

⁵²⁸ Creating the technologies behind the brands, Byron Food Science; <http://byronfood.com/research-and-development/>.

Byron is a privately owned and operated R&D facility headquartered in Sydney, Commonwealth of Australia with clients in many parts of the world. Byron has a thirty-year record of success in innovative R&D programs and out-licensing its numerous technologies and patents. Whilst Byron itself does not manufacture food products, Byron's founders have extensive experience in agriculture, food processing and marketing, having founded and operated the MasterFoods Company in post-war Australia for over twenty years.

Byron researches and develops innovative solutions to food processing and manufacturing problems. Byron then licenses the Technologies to Clients all over the world for Manufacture and Marketing. Forming a Strategic Partnership with our Clients allows Byron to continually assist Clients in the commercialization of its products and technologies. This enables companies to bring new products to the market smoothly and speedily with reduced risks.

With an impressive portfolio of successful scale-up and full manufacturing success stories with Byron food technologies around the world, Byron continues actively to place its new and existing processes and products into production with Licensees. Patents or patent applications apply to almost all of Byron's technologies and products, and a high level of importance is placed on patent protection and maintenance.

Many companies consider and use Byron as an outsource R&D facility developing private innovation work. This not only lowers the risk of R&D but allows Clients to keep internal R&D costs down, increases the creativity around the problem, and allows the Client to concentrate on its core business whether that be manufacturing or marketing.

The Business Development team works closely with Clients offering a range of support functions, in a strategic partnership ensuring sustainable commercialization of its technologies. Business Development and Byron Technical work together in spearheading innovative solutions for the food industry.

Box 4.14: Tara Minerals acquires disruptive packaging technology⁵²⁹

HENDERSON, NV -- (Marketwired) -- 05/29/14 -- Tara Minerals Corp. (OTCQB: TARM) (BERLIN: 6T3) is pleased to announce the diversification of its opportunities through the acquisition of IP for the preservation and protection of fresh fruit, vegetables and flowers during extended periods of shipping and storage. The acquisition is comprised of patents, trademarks and other intellectual property in the United States, Europe, the United Mexican States, Canada, the South Africa, Japan, and the Chile regarding systems and methods for packaging of bulk quantities of fresh produce and flowers incorporating modified atmosphere packaging. The acquisition also includes pending applications throughout the world regarding the active treatment of modified atmosphere packaging.

⁵²⁹ Tara Minerals Acquires Disruptive Packaging Technology, Firma holdings corporation, 2014; <http://www.taraminerals.com/English/News/PressReleases/PressReleaseDetails/2014/Tara-Minerals-Acquires-Disruptive-Packaging-Technology/default.aspx>.

The patented solution, the **SmartPacn** system, has been demonstrated commercially and provides for immediate opportunities to license towards its worldwide adaptation and for use with Tara branded fresh produce. The solution caters to the quality needs and wants of the end user, opens up new distribution channels, improves the logistics service to customers and enables lower system-wide costs. The **SmartPac** solution will be made available for the packing, storage and shipment of bulk quantities of produce to growers, packers and end-users. Examples of generic industry applications include avocado, tomato, iceless broccoli, *dsoluti* pears, cherries, stone fruits and flowers.

Deterioration and vulnerability to pathogens (food safety) are serious and growing problems for the fresh bulk produce industry. The **SmartPaca** system is referred to as ability to pathogens (food safety) are serious and growing problems for the fresh bulk produce industry. The . Examples of generic industry applications include preserves produce in virtually the same condition it was in when newly picked, for up to one month during shipment or storage. This means produce can be picked when ripe, flavorful and at peak weight, and enjoyed by the consumer in the same condition. The packaging system reduces spoilage considerably, extends market reach and opens up cheaper (ship/rail vs. air) transportation options. The **SmartPacn** system also has an efficient mechanism for the distribution of anti-microbial agents, which deter mold, disease and infestation while in transit or in storage.

Mr. Francis Biscan Jr., President of Tara Minerals, stated: “We believe this technology can dramatically impact and disrupt the way fresh produce is shipped and stored around the world. For the benefit of all shareholders, we could not ignore this strategic, rapid growth opportunity presented by the advanced technology in the international produce and packaging supply industries. The sourcing of produce from around the world is increasingly assisted by a reduction in trade barriers. The acquired patented bulk packaging system positions Tara with a key competitive advantage in the food industry. We will aggressively build this business and I look forward to sharing our progress. At the same time, we recognize that our mining assets have considerable unrealized value and we will continue to progress these properties towards their potential. The revenue generated from **SmartPac™** will be used to advance both our mining and packaging assets and results in significant potential added value and risk diversification to Tara.”

Tara Minerals has signed a definitive agreement with FreshTec, Inc. for the acquisition of the above mentioned IP. Closing is subject to delivery of appropriate documentation and warranties by FreshTec and contractually limited to no more than 40 days from signing. The Company will pay FreshTec a total of 500, 000 USD upon closing. The Company will also pay royalties to FreshTec related to licensing fees and packaging system unit sales. To complete this transaction and market the technology, the Company has raised 750, 000 USD which will be released to the Company upon closing.

*The patented **SmartPace** bulk produce packaging system is available for generic industry applications and for licensing towards its world-wide application.*

Box 4.15: Patent Valuation

There are many different reasons why it might be beneficial or necessary for a company to conduct a patent valuation, including for accounting, licensing, mergers or acquisitions, assignment or purchase of IP assets or fund-raising. While there is no single patent valuation method that is suitable in all circumstances, the following are widely used:

- **Income method.** Focuses on the income stream that the patent holder expects during the lifetime of the patent.
- **Cost method.** Calculates the cost of developing a similar asset either internally or externally.
- **Market method.** Looks at comparable transactions made in the market.
- **Option-based methods.** Employs models initially developed for use in pricing stock options.

There are factors that are difficult to quantify that may also impact on the value of a patent, such as the strength of the patent claims or the existence of close substitutes.

It may not always be easy or affordable to obtain authorization to incorporate technology owned by a competitor into your products/processes. However, if your competitor is also interested in your company's patents, then you should think of cross-licensing. Cross-licensing is very common in industries where a number of patents covering a wide range of complementary inventions is held by two or more competitors. Such competing companies often seek to ensure their freedom to operate by granting rights to their patents in return for the grant of similar rights by competitors.

Box 4.16: Summary Checklist

- ✓ **Commercialization.** Consider the different options for commercializing your invention and make sure you have a convincing business plan.
- ✓ **Licensing.** Royalty rates and other features of license agreements are a function of negotiation so you should seek expert advice.
- ✓ **Exclusive vs. Non-exclusive.** Consider the exclusivity of license rights in the light of the maturity of the technology and your company's business strategy.
- ✓ **Cross-licensing.** Consider whether you can use your patent(s) to access useful technology owned by others.
- ✓ **More information.** See IP PANORAMA™ Module 06, Learning Point 4 and Module 07 at www.wipo.int/sme/en/multimedial.

4.2.6 Trademark licensing⁵³⁰

Trademarks can be licensed to other businesses. In such a case, the trademark owner continues to be the owner of the licensed trademark and merely agrees to the use of the trademark by one or more other businesses. This is usually done on payment of royalties and involves the consent of the trademark owner, which is usually specified in a written licensing agreement. Depending on the nature of the agreement, the licensor (that is, the owner of the trademark) often retains some degree of **control** over the licensee (authorized user) to guarantee that a certain quality is maintained.

In practice, trademark licenses are frequently granted within broader licensing agreements, for example, franchising agreements or agreements including the licensing of other IP rights such as patents, know-how and some degree of technical assistance in the production of a given product.

4.3 Franchising⁵³¹

Franchising is one of the fastest growing and most popular strategies for cost-effective and rapid expansion of a business, especially in cases where the business does not have or does not wish to use its own financial capital.

A franchisee runs a legally separate business (which is neither a joint venture nor a legal partnership with the franchisor), which replicates the successful business operations of the franchisor in other locations.

In a franchise agreement, a person (franchisor) who has developed a certain way of doing a business agrees to expand his/her business by granting to other entrepreneurs (franchisees) the right to use his/her business model in another location for a defined period of time in exchange for payment of initial and ongoing fees. Along with providing the right to use the business model, the franchisor will license to the franchisee the right to use the franchisor's IP and know-how as well as provide training and support. In essence, a successful business is replicated and run by entrepreneurs, the franchisees, under the supervision and control of and assisted by the franchisor.

The permission (i.e., the license) to use the IPRs associated with the franchised business is granted to the franchisee to enable the latter to successfully run a replica of the franchised business. The IPRs licensed in a franchising arrangement almost always include trademarks and copyright, and often include trade secrets, industrial designs and patents – depending on the nature of the business (in other words, a franchise may involve the entire spectrum of IPRs).

⁵³⁰ Making a mark, cit., p. 50.

⁵³¹ In good company - Managing intellectual property issues in franchising, WIPO Publication No. 1035E, 2012, cit., pages 7-8; http://www.wipo.int/edocs/pubdocs/en/sme/1035/wipo_pub_1035.pdf.

4.3.1 Franchising and trademarks

The licensing of a trademark is central to a franchising agreement.

In franchising agreements, the degree of control of the trademark owner over the franchisee is generally greater than in a standard trademark licensing agreement.

Example: A restaurant selling chicken meals operates under the trademark NANDO'S[®]. It has developed a system for preparing and selling these products, which are sold in large volumes and in a uniform manner. The system includes various factors that contribute to the success of NANDO'S[®] restaurants, including recipes and methods of preparing meals that result in a product of consistent quality, the design of employees' uniforms, the design of the buildings, the design of packaging and management and accounting systems. NANDO'S[®] imparts its knowledge and experience to its franchisees and retains the right to supervise and control. As a crucial component of the franchising agreement, the franchisees are also authorized and obliged to use the NANDO'S[®] trademark.



Courtesy Nando's International Holdings Ltd.⁵³²

4.3.2 Types of franchising models⁵³³

For the vast majority of businesses that can be franchised, there are three main types of franchise model, which are the following:

- (i) **Product or Distribution Franchise.** A product manufactured by a franchisor (or manufactured on its behalf by another company) is sold to a franchisee who, in turn, sells it to consumers under the trademark of the franchisor. In such franchise systems, no ongoing royalties are paid to the franchisor for the right to do business under the trademark. Instead, the franchisor derives a stream of revenue from the mark-up on sales to the franchisee;
- (ii) **Manufacturing, Production or Processing Franchise.** The franchisor sells the franchisee an essential ingredient, or provides some specific know-how which, along with ongoing quality controls by the franchisor, enables the franchisee to manufacture or process the final product and sell it to retailers, or in some cases, to end consumers. Coca-Cola operates in many markets throughout the world in this manner, supplying franchisees with the essential ingredient of Coca-Cola (which is protected as a trade secret), thus enabling the franchisees to produce the final product, which is then sold to retailers who, in turn, sell it to end consumers;

⁵³² Making a mark, op. cit., p. 53.

⁵³³ In good company - Managing intellectual property issues in franchising, WIPO Publication No. 1035E, 2012, p. 9; http://www.wipo.int/edocs/pubdocs/en/sme/1035/wipo_pub_1035.pdf.

(iii) **Business Format Franchising.** The owner of a business (franchisor) licenses to another (franchisee) the right to use the particular business model, including the IPRs associated with it, notably the trademark. Internationally known brands such as McDonald's and 7-Eleven are examples of companies that use this model. Because business format franchising is the most widely used model, the rest of this guide will be focused on this type of franchising. In many countries, business format franchising is the only type of franchising that is regulated.

Business format franchising comprises four key elements:

- The franchisor allows the franchisee to use, under license, its IP, principally its trademarks, but also its designs, patents, copyrights and trade secrets. The trademark is usually the most important element because it is the foundation on which the brand has been built. Brand recognition is what draws customers and stimulates demand. This makes the franchise attractive to would-be franchisees. For example, if someone opened a hamburger outlet and named it John's Hamburgers, success and annual sales would be difficult, if not impossible to predict. On the other hand, a franchise for the right to operate a McDonald's franchise would be an almost guaranteed success and would generate an estimated 2.3 million USD in annual sales;
- The franchisor controls the way the business is run and managed by the franchisee. Typically, this is done by providing the franchisee with a comprehensive operations manual which reinforces and provides greater detail on all areas covered during the initial training program. Field visits, "mystery" shoppers or operational audits are the most common ways for a franchisor to ensure that its system is being adhered to;
- The franchisor provides training, mentoring and ongoing assistance to the franchisee;
- The franchisee makes both initial and periodic payments to the franchisor. In short, franchising is a special type of licensing arrangement where the right to use the business model is supported by a license to use all the IPRs associated with that business.

4.3.3 Master Franchise Agreement⁵³⁴

A franchisor may enter into a master franchise agreement whereby another entity is given the right to sub-franchise the franchisor's business concept within a given territory in accordance with a development timetable. These rights are usually secured by an initial development fee charged by the franchisor. The fee may range anywhere from several hundred thousand dollars to several million dollars. The grant of a master franchise enables a franchisor to expand without substantially increasing the size of its management team. Here, the franchisee, in effect, acts as the franchisor in the target country. The disadvantage of this approach is the loss of control over sub-franchisees (with whom the franchisor has no contract), coupled with the franchisor's heavy reliance on another business entity over which it has no direct control other than through the

⁵³⁴ In good company - Managing intellectual property issues in franchising, cit., p. 12; http://www.wipo.int/edocs/pubdocs/en/sme/1035/wipo_pub_1035.pdf.

master franchise agreement. For this reason, international franchisors, such as McDonald's and 7-Eleven, choose their master franchisees very carefully.

Box 4.17: From ice cream parlor to fast food empire: Tony Tan Caktiong's Story⁵³⁵

Tony Tan Caktiong, president and CEO of Jollibee® Foods Corporation, the biggest fast food restaurant chain in the Philippines, was born into a poor family which migrated from southeastern China to the Philippines in search of a better life.

At the age of 22, inspired by a visit to an ice cream plant, he set out to gain his own foothold in the restaurant business: relying on family savings, he seized a franchising opportunity with Magnolia Dairy Ice Cream and opened two ice cream parlors. In response to customer requests, he added hot meals and sandwiches to the menu, which soon proved a lot more popular than ice cream. Three years later, in 1978, he decided to capitalize on this development, discontinued the Magnolia franchise and converted his parlors into fast food outlets.

Realizing that he needed a brand name and logo for his new business, Mr. Caktiong and his family decided on using a smiling red bee. They chose a bee because of its association with hard work, and because honey represents the sweet things in life. The jolly prefix was intended to connote happiness and enjoyment. Jollibee invested millions of pesos to register the bee trademark in the Philippines and other key countries.



There are now nearly 2,000 restaurants worldwide representing the Jollibee Foods Corporation.

Jollibee Foods Corporation relies on a franchising model for the exploitation of about half of its outlets in the Philippines. In order to protect the company's high quality and service standards, potential franchisees have to conform to a specific profile (self-driven entrepreneurs with good management skills, good community standing and excellent

interpersonal skills).

Successful franchising applicants undergo a 3-month full time Operations Training Program at a designated training restaurant, supplemented with other programs that will enrich the franchisee's management and analytical skills needed in the operation of the restaurant.

However, support for franchisees does not end there. Jollibee provides advice for and assistance with restaurant layout and design, equipment specifications, furniture and fixtures, and construction management. Field personnel render consulting services once the outlets are operational. Creative advertising and marketing programs, product

⁵³⁵ Cf. <http://www.wipo.int/ipadvantage/en/details.jsp?id=2531> and <http://www.jollibee.com.ph/>.

development, manufacturing and logistics facilities provide further support to franchisee restaurants.

From November 1 until November 30, 2103, Jollibee offered Jollibee Kids Meals with Pokemon Battle Gear, the world's cutest pets from the hit animated TV show, Pokemon. As trainers of the lovable "pocket monsters" toys— Pikachu, Tepig and Oshawott, kids could enjoy a whole day of fun and exciting battles while munching on their favorite Jollibee treats.⁵³⁶

At Jollibee, you can be flexible and Create-Your-Own-Package when it comes to kiddie parties. Aside from Hello Kitty you can also choose between Batman, Jollitown, and My Best Friend Jollibee as your theme. It's completely hassle-free because you can do all the planning and preparations online at <http://www.jollibeeparty.com.ph/>.⁵³⁷

An example of innovative/creative marketing by Jollibee may be seen the linked website of Jollitown Kids Show.⁵³⁸

The company is also present in Brunei, China, Hong Kong, Indonesia, Saudi Arabia, the United Arab Emirates, the United States and Vietnam. By 2020, the group plans to roughly double the number of restaurants to 4,000 outlets worldwide. Jollibee's business success relies on its smart branding strategy, complemented by strong customer orientation, superior menu line-up, innovative new products, creative marketing programs and efficient manufacturing and logistics facilities.

4.3.4 Laws that apply to franchising⁵³⁹

It is important to bear in mind that not all countries have specific legislation on franchising.

Depending on the country, various types of legislations, including laws related to agency, employment, commercial codes, anti-trust, competition, consumer protection and trademark – as well as other IPRs – may also contain provisions that apply to franchising agreements.

4.3.4.1 Franchise disclosure laws

Disclosure laws and registration requirements are those that apply before a franchise relationship is entered into. Some countries have disclosure laws that require information to be provided to prospective (new and renewing) franchisees before any contract is signed or any money is paid. Sometimes, as is the case in the United States, the disclosure requirements are extremely detailed.

⁵³⁶ Avail Jollibee Kids Pokemon Meal, Amazing Jing;
<http://amazingjingforlife.blogspot.ch/2013/11/hurry-avail-jollibee-kids-meal-pokemon.html>.

⁵³⁷ Hello Kitty Party Kit; <http://animetric.blogspot.ch/2013/07/jollibee-hello-kitty-kiddie-party.html>.

⁵³⁸ <http://jollitown.com.ph/>.

⁵³⁹ In good company - Managing intellectual property issues in franchising, cit., p. 28;
http://www.wipo.int/edocs/pubdocs/en/sme/1035/wipo_pub_1035.pdf.

In many countries, there is no legislative obligation on the franchisor to disclose specific information to the franchisee before signing a franchise agreement. In such countries, and even in countries that require disclosure, a sensible prospective franchisee would seriously consider the information provided and obtain expert advice, where appropriate.

4.3.4.2 Registration requirements

A number of countries require a variety of legal arrangements to be registered. In such countries, franchisors may be required to register their disclosure documents and all exhibits (e.g., contracts, audited financial statements, list of franchise owners, and other relevant materials) with a government agency. In these countries, if registration is not completed correctly, franchisees may be prevented from operating their franchise business(es). Similarly, these laws may also require the registration of IP licenses in order for them to be effective. Independently of a requirement to register the franchise agreement, some countries require the specific record of IP licenses to be held at a prescribed government agency.

4.3.4.2 Franchise relationship laws

Whereas franchise registration and disclosure laws are relevant for dealing with actions carried out before a franchise relationship is formed, franchise relationship laws deal with conduct after a franchise contract is signed, such as, for example:

- (i) **Unjust terminations.** In general, the law requires that there should be good cause for terminating a franchise. Good cause is usually defined as failing to follow a contractual provision after receiving notice of default and not correcting (curing) the default. In the case of certain serious defaults, such as criminal conviction, abandonment and insolvency, no opportunity to correct (cure) is required to be given.
- (ii) **Altering or modifying the franchise relationship.** The law prohibits a franchisor from materially modifying any existing franchise before it has filed an application with the relevant state institution and received approval. The process also requires the franchisor to give all franchisees a mini-disclosure document outlining the proposed changes.
- (iii) **Renewal rights.** The franchisor must have good cause for refusing to renew a franchise. This is designed to protect franchisees from being unable to capture the benefits of the business that they have developed.
- (iv) **Encroachment.** Franchisees may be protected against franchisors establishing a new unit within *unreasonable proximity* of an existing franchise. If this happens, the existing franchise must be given either (a) a right of first refusal to the proposed new site, or (b) compensation for market share lost to the new unit.
- (v) **Other practices.** The following may also be regulated by franchise relationship laws:

- a. obtaining general releases from liability, or waiver of any written or verbal representations;
 - b. restricting the right of free association among franchisees;
 - c. discriminating among franchisees;
 - d. imposing unreasonable standards of performance on franchisees.
- (vi) **Anti-competitive practices.** Such practices limit, distort or prevent free competition and are often prohibited by national laws (e.g., anti-trust laws in the United States, or unfair competition law or policy, fair trading or anti-monopoly law in many other countries). The superior bargaining power of the franchisor can be abused in many ways that may cause harm to the franchisee and, ultimately, to consumers. Franchise agreements are subject to the purview of various competition laws.

The following clauses, if included in a franchise agreement, may be considered anti-competitive:

Resale price maintenance. This is a type of price fixing where the franchisor imposes a minimum resale price for goods and services supplied by the franchisor to a franchisee. The franchisor may generally recommend a resale price or impose a maximum price, but may neither require nor attempt to induce compliance with it nor set minimum prices or fixed prices. In some jurisdictions, it is mandated that where a resale price is recommended, it must be accompanied by a statement that there is no obligation to comply.

Territorial exclusivity. Franchisors often demarcate the areas in which the franchisees are allowed to operate; this may serve to create monopolies in that market. While in most cases, competition from substitutable products will result in preventing any adverse effect on competition, it is recommended that franchisees seek the advice of local experts.

Exclusive dealing. Franchisors typically require certain goods and services to be acquired by the franchisee from the franchisor or from a supplier approved by the franchisor. The franchisor has an interest in maintaining the quality of the goods or services provided by the franchisee. To that extent, the franchisor may determine the suppliers to be used, as long as it is not an illegally tying arrangement (see below). A franchisee should have the right to source the required supplies from elsewhere, as long as the consent of the franchisor is obtained. The consent of the franchisor is usually contingent upon the results of the testing and evaluation of the new supplier, and is granted once satisfied that the image, quality and goodwill of the franchisor are maintained.

Tying arrangements. A tie is an arrangement whereby a firm makes the sale of a product conditional on the requirement that the purchaser also buys a second product that, if it were not for the requirement, it would not buy at all, or it would buy elsewhere on different terms. In a franchising context, the franchisor sells one product to the franchisee on the condition that the franchisee buys another product (goods or services) from the franchisor or its associates.

Selling via the Internet. This is regarded as passive selling. Usually, franchisors are not allowed to prevent their franchisees from having their own

websites, as long as such websites comply with the requirement of maintaining the image of the franchise.

Other laws. A variety of other laws, such as labor laws, tax laws, exchange control laws, insurance laws, food safety and other consumer protection laws will also have a bearing on a franchise relationship.

4.3.5 Managing a franchise relationship⁵⁴⁰

4.3.5.1 Operations Manual

The operations manual is at the very heart of the franchise system and is critical for its success. As well as reinforcing training procedures, it serves as a useful reference tool. It should guide the franchisee through most of the steps involved in operating the business, and provide answers to routine questions.⁵⁴¹

In addition to dealing with specific details relating to the business or industry in question, the operations manual will generally contain the following chapter headings and content:

- (i) The operations manual should contain information on everything a franchisee needs to know in order to successfully operate the franchise;
- (ii) It should ensure that the essence of the franchise i.e. the business model is operated in a uniform and consistent manner by all franchisees, so that consumers have the same experience in every franchise location and the image and reputation of the franchise is consistently maintained.⁵⁴²

4.3.5.2 Improvements

Inevitably, during the course of the franchise, both the franchisor and the franchisee will develop improvements. The franchise agreement will require the franchisor's improvements to be implemented by the franchisees and may also require the franchisees to pass on, assign and/or license to the franchisor any improvements that they develop.

4.3.5.3 Training

Initial training must be provided by the franchisor because, usually, franchisees will have no knowledge of the franchised business. In addition, the franchisor must provide continuing and ongoing training.

⁵⁴⁰ In good company - Managing intellectual property issues in franchising, cit., p. 45;
http://www.wipo.int/edocs/pubdocs/en/sme/1035/wipo_pub_1035.pdf.

⁵⁴¹ For details of what should be in the contents of the Operations Manual, refer In good company - Managing intellectual property issues in franchising, cit., p. 45;
http://www.wipo.int/edocs/pubdocs/en/sme/1035/wipo_pub_1035.pdf.

⁵⁴² Every day millions of consumers go to McDonald's restaurants, not necessarily because they make the best hamburgers, but because, for the consumer, the hamburger is the same every day in every McDonald's restaurant, irrespective of geographical location. It is the consistency of experience that draws the consumer: Ensuring such consistency is one of the more important tasks of the operations manual.

The initial training is usually provided *free of charge* in the sense that the cost is included as part of the initial franchise fee. Initial training consists of both classroom training and on-the-job training. Continuing training should be provided at cost and not at a profit to the franchisor, given that a well-trained franchise network is in the interest of all. Today, more and more of this training is carried out using the Internet, where learning materials including training videos and podcasts are made available to the network as a whole.

4.3.5.4 Quality Control

The core of a franchise agreement is the licensing of a trademark which (together with other IPRs such as trade secrets, copyright, design rights and patents) underpins a brand.

The brand is the lifeblood of the franchise. Protecting it and strengthening it are of crucial importance to both the franchisor and the franchisee. In the case of both parties, their success depends on the brand maintaining and, hopefully, strengthening its appeal.

In order to maintain its appeal, a brand must deliver on the quality and consistency of experience expected of it. A franchisor, having granted another party (the franchisee) the right to use the brand, must not and cannot divest itself of the responsibility of controlling the quality of the goods and services that are offered under the brand. It must also ensure that the entire visual and emotional experience of interacting with the brand remains consistent for the consumer. As a result, irrespective of which franchised outlet the consumer engages with, their experience of the product must be the same. The franchisor cannot divest itself of this responsibility because quality control is vital for maintaining the appeal of the franchise and the value of the goodwill associated with the brand. If quality standards fall in one franchise outlet, it will affect the whole franchise. Another reason why the franchisor cannot divest itself of this responsibility is because, as a trademark owner, it has a legal obligation to ensure that quality control is maintained by a trademark licensee (which in this case is the franchisee). If a franchisor does not continuously discharge this responsibility, then he may be deemed to have abandoned his/her trademark and may lose his/her trademark rights.

As illustrated above, the franchisor exercises considerable control over the way the franchisee operates the franchise so as to ensure that the entire franchise system adheres to certain predefined quality standards. Controlling quality begins at the point of franchisee selection, and continues throughout the lifetime of the operation of the franchise. The operations manual is the basis for the franchise operation and thus provides an objective basis for the quality standard against which the performance of the franchisee is measured. To ensure quality control, compliance with the requirements and standards set out in the operations manual must be guaranteed. Initial and on-going training, followed by regular scheduled and random visits to the franchisee's business, are important ways of ensuring that the franchise system is being followed in every respect and that the reputation of the brand remains intact.

4.3.5.5 Company, business and domain names

A franchisor should give due consideration to whether franchisees will be entitled to incorporate the name of the franchise in a company name, business name, or domain name. Generally, this should be avoided, although local legal requirements might prescribe that the franchisee should register as a business name, the name under which it will be trading. Franchisors should also control domain names incorporating the name of the franchise if these are to be used by a franchisee.

4.4 Enforcing IPRs

4.4.1 Why is it important to detect infringements?⁵⁴³

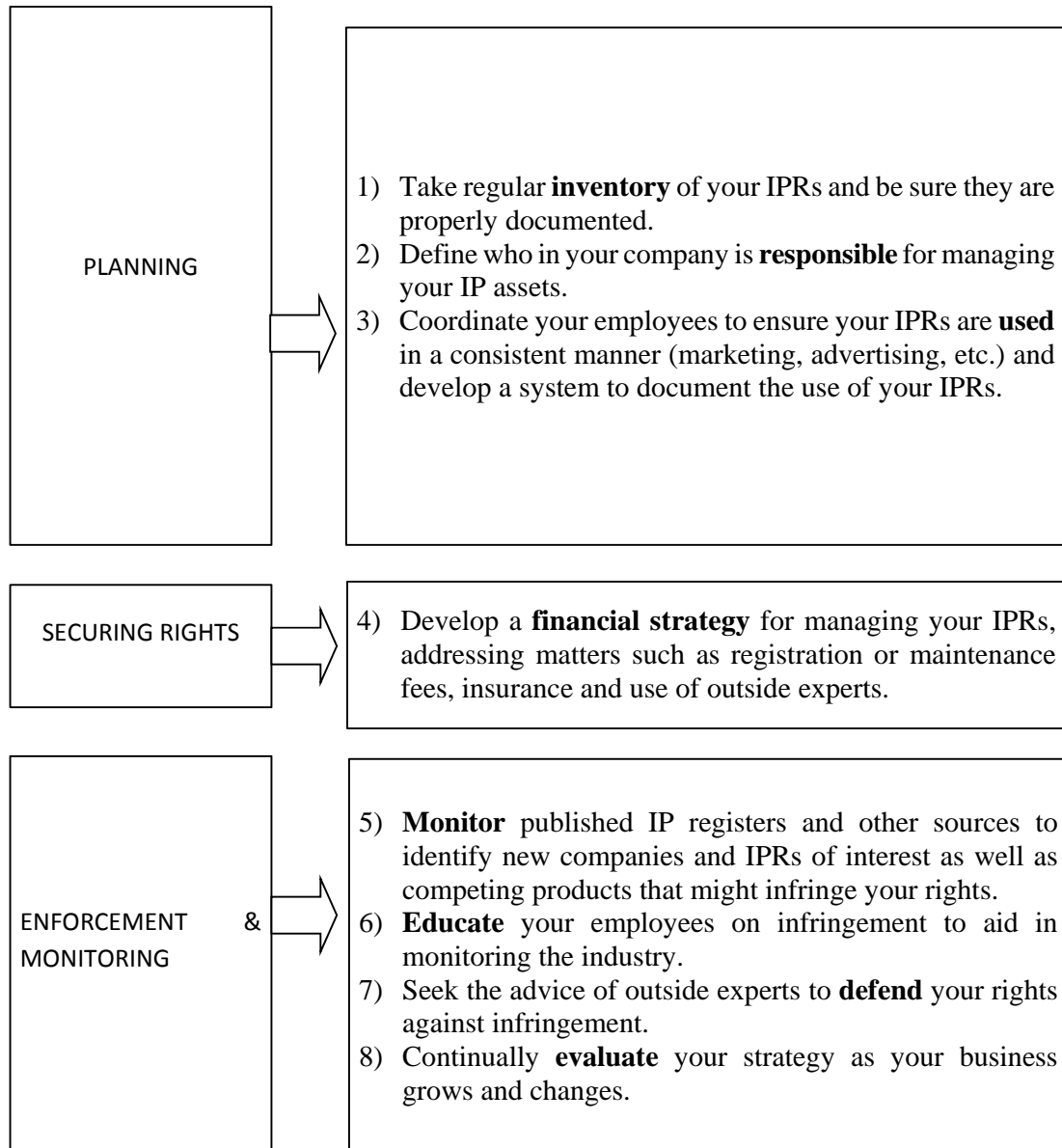
A competitor may try to pass off its products as yours by using a similar trademark or may try to make products with technical features that are identical, or very similar, to those of your product, without having had to spend the resources or take the risks that you have. This puts unfair competitive pressure on your business.

IPRs give you, the owner, the opportunity to prevent or stop competitors from infringement and to seek compensation for damages. Enforcing your rights may be crucial to maintaining your competitive edge, market share and profitability.

⁵⁴³ Making a mark, cit., p. 53.

Box 4.18: IP Risk Management⁵⁴⁴

Enforcing IPRs is just one aspect of risk management to protect the time and money you have invested in your overall brand or innovative technology. Developing a strong strategy before infringement occurs can minimize the costs of enforcement later.



⁵⁴⁴ Inventing the future, cit., p. 49.

4.4.2 What should your business do if its IPRs are being used by others without authorization?⁵⁴⁵

If you believe that others are using your patented technology or another IPR without authorization, then, as a first step, you need to collect information about who is infringing, how they are doing it, and the effect of the infringement on your business. You should engage a lawyer to assist you in analyzing this evidence and in making a decision on what to do about the infringement.

In some cases, an IP owner may choose to send a letter (commonly known as a **cease and desist letter**) informing the alleged infringer of a possible conflict between their rights and the other company's business activity. This procedure is often effective in the case of non-intentional infringement, since the infringer will either discontinue such activities or agree to negotiate a licensing agreement. In case of a patent infringement, much greater care is needed before sending a cease and desist letter as the infringer may choose to attack the validity of your patent.

Sometimes, however, surprise is the best tactic in order to avoid giving the infringer time to hide or destroy evidence. In these circumstances, it might be appropriate to go to court without giving notice to the infringer and to ask for an **interim injunction** in order to surprise the infringer by a raid, often with the help of the police, at his/her business premises. The court may order that the alleged infringers stop their infringing action pending the outcome of a trial (which may take many months or years). However, the question of whether an IPR has been infringed may be very complex and the court may decide that the matter must await a trial on the merits.

Where the company decides to initiate **civil proceedings**, the courts generally provide a wide range of remedies to compensate aggrieved owners of patent rights. A lawyer will be able to provide the relevant information.

The infringer may be compelled by the court to identify persons involved in the production and distribution of the infringing goods or services and their channels of distribution. As an effective deterrent to infringement, the court may also order, upon your request, that infringing goods and materials be destroyed or disposed of without compensation.

Sometimes, the infringement is deliberate and may have other undesirable links to organized crime. This may manifest in the form of counterfeit goods on the market. In the supply chain, counterfeit goods are defined as adulterated and/or illegitimately manufactured goods by someone other than the brand owner or third-party operating on behalf of the brand owner.

Diverters can be authorized or unauthorized buyers or sellers of manufacturers' (brand owner) products. In the consumer goods market, these diverters are typically the middle person who may buy quantities of products from manufacturers, retailers and

⁵⁴⁵ Inventing the future, cit., p. 52.

wholesalers and sell the inventory as a secondary source for distribution to retailers. The “diversion” of authorized branded products to unauthorized geographic regions or retail outlets is typically described as the sale of “gray goods,” which are distinct from counterfeits that were never authorized by the brand owner. Diverters, by way of their function as a source of legitimate goods (like overruns, closeouts, etc.) to the secondary retail market, are also an important potential entry point for counterfeit goods.⁵⁴⁶

The F&B industry suffers significant economic losses every year due to counterfeiting activities. In the experience of the industry, products that are most affected by counterfeiting are typically the simplest to replace with passable substitutes such as tea, rice or alcohol. In these situations, the food or beverage item is easily substituted with cheaper and usually inferior products. Counterfeiters attempt to maximize their ability to reproduce product packaging so that the counterfeit items are indistinguishable from the authentic products.⁵⁴⁷

The F&B industry is estimated to lose approximately 3 billion USD annually due to fraudulent activities. Alcohol products are considered prime targets for counterfeiters because of their relatively high retail value. In fact, the most common infringement was the refilling of original bottles with inferior substitutes. Since F&B products are ultimately intended for human consumption, sub-standard counterfeit products can have harmful effects on their victims, ranging from headaches to even death. The F&B industries also implement technological solutions into their brand protection strategies. Unfortunately, these industries also struggle to stay a step ahead of the counterfeiters as improvements in technology make manufacturing, computing and printing technologies more readily available and less costly to criminals.⁵⁴⁸

Box 4.19: The study, “Brand protection and supply chain integrity: methods for counterfeit detection, prevention and deterrence”⁵⁴⁹⁵⁵⁰

The study includes guidelines for manufacturers and retailers based on a survey of consumer packaged goods manufacturers across the globe and retailers across the United States, as well as input from a committee of industry leaders in manufacturing and retailing.

Through the study, FMI and GMA found that retailers and manufacturers should take the following steps to prevent counterfeit products from reaching consumers and

⁵⁴⁶ Brand protection and supply chain integrity: Methods for counterfeit detection, prevention and deterrence a best practices guide, FMI / GMA Trading Partner Alliance prepared by Inmar and Authentix, 2014, p. 5; http://www.gmaonline.org/file-manager/Collaborating_with_Retailers/GMA_Inmar_Brand_Protection.pdf.

⁵⁴⁷ Arjobex security, protect your brand, wine and beverages, 2015; <http://arjobexsecurity.com/alcohol>

⁵⁴⁸ *Ibid.* 544; <http://arjobexsecurity.com/alcohol>.

⁵⁴⁹ <http://smartblogs.com/food-and-beverage/2014/04/09/8-ways-manufacturers-and-retailers-can-protect-themselves-against-counterfeiting/>.

⁵⁵⁰ *Ibid.* 543; http://www.gmaonline.org/file-manager/Collaborating_with_Retailers/GMA_Inmar_Brand_Protection.pdf.

minimize the cost and reputational damage associated with counterfeit branded products:

- develop and implement a tool that assesses counterfeit risk that includes risk categories and the potential effects of counterfeiting;
- develop a counterfeit protocol that includes notifying stakeholders and law enforcement, withdrawing and isolating counterfeiting products and preparing call centers for consumers;
- establish a dedicated group that includes members who are well-versed in law enforcement, supply chain and packaging technology;
- include anti-counterfeit and brand protection in product designs that can be used to authenticate branded products;
- add anti-counterfeiting audits to corporate risk management and audit procedures that check for authentication measures, package quality and shipping quality and integrity;
- establish material oversight security measures at warehouses and distribution centers that include employee background checks, cameras, motion detectors and pallet tracking collaboration;
- educate retailers and consumers by informing them about the products that are most likely to be counterfeit through product awareness programs that include examples of authentic and counterfeit products and steps to take to validate products;
- create a counterfeit playbook that specifies what steps retailers and manufacturers should take in the event of product counterfeiting.

Box 4.20: Food and food packaging security and brand protection⁵⁵¹

TruTag Technologies Inc.⁵⁵² provides product authentication and brand protection solutions for multiple industries. It uses customized and proprietary nanotechnology solutions using spectrally coded silica microtags branded **TruTag®**. Its ground breaking technologies are covered by a number of patents.⁵⁵³⁵⁵⁴

⁵⁵¹ Food and food packaging security and brand protection, A World Economic Forum 2014 Technology Pioneer, TruTag Technologies, 2015; <http://www.trutags.com/market-applications/food-beverage/>.

⁵⁵² TruTags is one of the companies nurtured by venture accelerator Skai Ventures in Honolulu, owned by Hank Wuh, an orthopedic surgeon and inventor and founder of Cellular BioEngineering, which makes bioengineered corneas; <http://www.inc.com/articles/201106/trutags-stymie-drug-counterfeiters.html>.

⁵⁵³ <http://www.fags.org/patents/assignee/trutag-technologies-inc/>.

⁵⁵⁴ United States Patent no. 8,511,557 issued on Aug. 20, was assigned to TruTag Technologies Inc. (Honolulu). "Labeling and authenticating using a microtag" was invented by Timothy Learmonth (Oakland, California, United States.) and Ting Zhou (Orinda, California, United States.); <http://www.highbeam.com/doc/1P3-3049735701.html>. United States Patent no. 8,596,546, issued on Dec. 3, was assigned to TruTag Technologies Inc. (Honolulu). "System for verifying an item in a package" was invented by Timothy Learmonth (Oakland, Calif.), Michael P. O'Neill (Kaneohe,

The TruTag solution represents a breakthrough in the industry because these microtags are made of the highest purity silica, rendering them biologically inert, edible, and virtually invisible.

Each tag contains a unique code that can only be scanned using our proprietary instruments. With such a vast array of unique signatures, these codes can be associated with a wide variety of fields of information, similar to a traditional printed bar code, allowing TruTag microtags to serve as covert, heat-resistant, “edible bar codes.” As a result, the TruTag solution offers our clients a powerful business information tool as well as a leading edge product security measure.

TruTag microtags can help companies in the F&B markets by providing a customized technology solution. Its authentication solutions include specialized microtags that are manufactured of inert silica, also known as silicon dioxide (SiO₂). This material is “generally recognized as safe” (GRAS) by the United States FDA, is afforded similar treatment in Europe, and has been in wide use for many years in a range of food products. Its solutions can be used in or on F&B products in various application techniques (in Powders and Granules, in Coating Process on Foods, in oils or liquids, inside or outside packaging, on labels).

Benefits of Implementing Food Product Identification

- No changes to manufacturing equipment required – integrate directly into SOP
- Minimal change to manufacturing SOP
- Made of 100 per cent silicon dioxide (silica), which is FDA affirmed as GRAS (generally recognized as safe)
- Each product, manufacturing plant, or lot/batch can be separately coded with a unique ID
- Field readability allows inspectors to confirm provenance and genealogy of product without sending to lab
- Cost effective to implement

In order to prevent the importation of infringing goods, measures at international borders may be available in some countries through the national customs authorities. Many countries, however, provide for such measures only in cases of importation of counterfeit trademark goods and pirated copyright goods.

As a general rule, if you identify infringement, you should seek professional legal advice.

Box 4.21: Bowlz Chips Don't Dip Into Frito-Lay's Patents, Jury Says
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Law360, New York (March 04, 2013, 8:47 PM ET) -- Frito-Lay, which is owned by PepsiCo, sued Ralcorp Holdings and its Arkansas-based subsidiary, Medallion Foods, over the design and branding of Medallion's counterfeit trademark goods and pirated copyright a lawsuit against Medallion Foods for allegedly trademark infringement, trade dress

infringement, unfair competition, and dilution under the United States Trademark Act. Frito-Lay also alleged willful patent infringement under the patent laws of the United States.

Frito-Lay alleged the bowl-shaped corn chips, sold as a Wal-Mart store brand (private label), infringed on the patents and trademarks of its Tostitos SCOOPS! brand. The February 2012 lawsuit alleged that Bowlz brand chips not only had a bowl-shaped design identical to the one Frito-Lay had patented for its Tostitos Scoops!, but also had a similar packaging design and colors intended to confuse customers.

"Frito-Lay's Tostitos Scoops! design has acquired distinctiveness through extensive use and tremendous commercial success, and the other [marks and trade dress] are inherently distinctive, serving to identify and indicate the source of Frito-Lay's products to the consuming public, and to distinguish Frito-Lay's products and services from those of others," the complaint said.

Frito-Lay sent Medallion a cease-and-desist letter on February 8, 2012, giving the company two days to stop making "Bowlz" chips because of the alleged infringement, according to court documents.

Ralcorp had responded to the lawsuit by saying it used different manufacturing process and made a better chip at a lower cost. Medallion, "armed with the knowledge that Frito-Lay's claims were baseless, refused to comply or otherwise negotiate with Frito-Lay," it said. After the cease-and-desist deadline passed, Medallion sued Frito-Lay in an Arkansas federal court, seeking declaratory judgment that their chips didn't infringe

⁵⁵⁵ Bowlz chips don't dip into Frito-Lay's patents, jury says, by Beth Winegarner, Law360, New York March 04, 2013; <http://www.law360.com/articles/420508/bowlz-chips-don-t-dip-into-frito-lay-s-patents-jury-says>.

⁵⁵⁶ <http://www.bizjournals.com/stlouis/news/2013/03/04/ralcorp-frito-lay-settle-bowl-shaped.html>.

⁵⁵⁷ St. Louis company wins suit over bowl-shaped chip, by Jim Salter, March 7, 2013; <http://www.insurancejournal.com/news/midwest/2013/03/07/283988.htm>.

Frito-Lay's patents or marks. In response, Frito-Lay filed its infringement suit in a Texas federal court, according to Medallion's motion to dismiss.

The Arkansas suit was dismissed last year, according to court records. Medallion argued that Frito-Lay's case should be dismissed because the company had no business ties to the state, and suggested it be moved to Arkansas if the Texas judge didn't dismiss it outright for lack of jurisdiction.

But the U.S. District Court Magistrate Judge Amos Mazzant declined to dismiss the case, finding Medallion's arguments unpersuasive, and that the Eastern District of Texas' "streamlined" patent process would help both sides prepare for trial.

In its amended complaint, Frito-Lay alleged that Medallion Foods' tortilla chips result from processes, which infringe one or more claims of United States Patent No. 6,610,344 either literally or under the doctrine of equivalents. The patent (in fact, various patents were issued from July 2002 to October 2003) covers the manufacturing process for the TOSTITOS SCOOPS! product. Additionally, Frito-Lay contends that Medallion Foods is liable for infringing the '344 Patent under U.S.C. § 271, as well as the infringement being willful, entitling Frito-Lay to enhanced damages under Section 284.

During the trial, Frito-Lay alleged that Medallion infringed its trade dress rights to the SCOOPS! design, as well as the chip packaging. Both Frito-Lay and Medallion had product packages that are blue and feature a black name on a geometric background – while having a see through panel that gives the illusion that the chips are being dipped in salsa. One of the requirements to succeed on a trade dress claim is “a plaintiff must show that its trade dress is distinctive and non-functional and that a defendant's product would confuse customers as to the source of the product.” After a nine-day trial focusing on Frito-Lay's claims that Medallion infringed its patent and trade dress on the scoop-shaped chips, a jury universally found Medallion and Ralcorp had done nothing wrong.

Frito-Lay failed to prove that Medallion infringed its design or packaging trade dress, that the Bowlz chip design was likely to dilute the SCOOPS! design trade dress, or that Medallion had competed unfairly by misappropriating the designs, according to the verdict, which also did not find Medallion financially liable for any wrongdoing.

“Frito-Lay is disappointed with the jury's verdict, but committed to continuing innovation for our consumers and protecting our IPRs,” the company said in a statement Monday. “The jury's finding simply means that Ralcorp/Medallion found a way to make bowl-shaped tortilla chips using a process sufficiently different than our patented process that it was deemed to not infringe, and that their process makes chips different enough that consumers will not confuse their chips with Tostitos SCOOPS!”

Medallion had initially challenged the validity of the Frito-Lay patent at the center of the case, but dropped that challenge during the trial, according to attorneys with Baker Botts

LLP. As a result, Frito-Lay's patents and trade-dress rights remain valid and enforceable, they said.

Texas law firm Ward & Smith co-counseled with St. Louis-based Armstrong Teasdale LLP to defend Medallion Foods. Ward & Smith's Wesley Hill, assisted by firm founder, T. John "Johnny" Ward Jr., led the firm's trial team on behalf of Medallion and Ralcorp. Both companies also were represented at trial by lead counsel David W. Harlan from Armstrong Teasdale, along with firm attorneys B. Scott Eidson, Zachary C. Howenstine and Mark A. Thomas.

St. Louis-based Ralcorp Holdings Inc., the nation's largest private-label food maker, reported fiscal 2012 net income of 73.4 million USD on net sales of 4.32 billion USD. The company was sold to Omaha, Nebraska,-based ConAgra Foods for 6.8 million USD at the end of January 2013.

"We are pleased with the jury's decision in our favor," ConAgra said in a statement. "We believe private brands offer a strong value to consumers, and we are delighted to bring terrific choices to shoppers. We will continue to develop and make distinctive, high-quality food like this chip."

Frito-Lay spokesman Chris Kuechenmeister countered with a statement saying the verdict showed his company's chips were superior.

The jury "agreed with the Defendants" own argument that their product is not comparable to the design of the great Tostitos SCOOPS! products that tens of millions of Americans have come to love," Kuechenmeister said.

Box 4.22: NTB to spend 15m USD on swine genetics firm⁵⁵⁸

NINGBO, August 18, SinoCast: Ningbo Tech-bank (NTB, SZSE: 002124) intended to subscribe for newly-issued shares by Choice Genetics SAS (CG) from France through its wholly-owned subsidiary to work together with CG's existing shareholders such as Groupe Grimaud La Corribere (GGC) to co-run the target company.

NTB's subsidiary and GGC make investment of 15 million USD and 2 million CNY to take 40.69 per cent and 54.20 per cent shares, respectively.

CG, a global swine genetics company, has subsidiaries in France, Germany, Poland, the United States, Canada, Brazil and Vietnam and promoted breeding stock in more than 25 countries.

However, CG is in loss. In February 2014, CG in the United States received an adverse arbitration ruling due to patent dispute with Scidera and applied for bankruptcy protection. Affected by this, France CG lost 190 million CNY in 2013, and net assets hit negative 77.48 million CNY by the end of 2013.

⁵⁵⁸ http://www.hispanicbusiness.com/2014/8/18/ntb_to_spend_usd15mn_on_swine.htm.

Therefore, about 15 million USD of the aforesaid investment will be used for the restructuring of the US CG and about 2 million USD will be used to set up a wholly-owned subsidiary in China, Choice Genetics China.

It is one of targets of NTB to expand to the breeding business from pure feed business.

Box 4.23: Supreme Court passes on tiger trademark dispute⁵⁵⁹

WASHINGTON, Oct. 16, 2014 by Anne Gearan

The Supreme Court stayed out of a cat fight involving two well-known cartoon trademarks: cereal-maker Kellogg Co.'s Tony the Tiger and the old Exxon "Put a Tiger in Your Tank" ad campaign.

The court, without comment today, let stand a lower court ruling that Kellogg did not wait too long before trying to stop Exxon Mobil Corp. from using its own cartoon tiger. That means Kellogg's trademark lawsuit can go to trial in Tennessee.

Exxon had argued that Kellogg only complained "after more than 30 years of peaceful coexistence" between Tony and the "Tiger in Your Tank" cartoon.

Kellogg's suit says Exxon discontinued the tiger gasoline ads during the 1980s, but then came out with new ads in the 1990s featuring a cartoon tiger promoting various food and convenience items sold at Exxon gas stations.

Mature trademarks

Tony the Tiger debuted in 1952 and has appeared on every box of Kellogg's Frosted Flakes since. The cereal sold 5.3 billion USD between 1952 and 1995, Kellogg said. Millions of children also knew the tiger as the cereal's gruff-voiced television pitchman during Saturday morning cartoons.

Exxon, then known as Standard Oil, introduced its tiger in 1964. The trademarked cartoon figure was used in advertising and in promotional giveaways, such as juice glasses offered with a fill-up. Later, a real tiger was used in many ads.

Four years ago, Kellogg filed a federal lawsuit claiming that the new Exxon tiger promotions for soda, coffee and other products violated the Tony trademark because Exxon was now using a tiger to sell food.

The oil company has been known as Exxon Mobil since its merger with Mobil Co. last year.

"Tony the Tiger is not only famous in the cereal and breakfast food market, but his fame and recognition permeate the entire food category," Kellogg's lawyers said in court papers.

⁵⁵⁹ Supreme court passes on tiger trademark dispute, Washington, Oct. 16, 2014 by Anne Gearan; <http://abcnews.go.com/US/story?id=95371>.

Food branding at Issue

A federal judge in Memphis threw out the case in 1998, meaning Exxon could continue using its tiger. The 6th U.S. Circuit Court of Appeals resurrected the case and sent it back to the judge for trial.

In the appeal acted on today, Exxon's lawyers said Kellogg lost the right to sue by waiting so long to do so. Exxon cited a doctrine of law that generally says that even a valid claim can be voided by negligence or laxness in pursuing it.

Exxon argued that other federal courts have interpreted the standard differently in trademark cases, and asked the Supreme Court to settle those differences.

In its court papers, Kellogg's lawyers said Exxon exaggerated the differences among the appeals courts. Kellogg said taking the case to the Supreme Court will only further delay a trial on the basic question of whether Exxon is violating the Tony trademark.

Box 4.24: The Kit Kat trademark dispute in India⁵⁶⁰

On 22 April, 2013, the Intellectual Property Appellate Board (IPAB), India, ruled on a trademark dispute between Swiss multinational *Société des Produits Nestlé S.A* (hereafter Nestle) and Kolkata based Kit Kat Food Products over the use of the trademark "Kit Kat".



Two applications for the registration of the Kit Kat trademark in India were made by Nestle in 1987. However, these were opposed to by Kit Kat Food products. Consequently, the trademarks could not be registered. In 1991, Kit Kat Food products attempted to register the trademark Kit Kat for their various products including *chanachur* by filing three trademark applications. However, these trademark applications were rejected because of Nestlé's opposition.

The issue to be decided by the IPAB was essentially, whether Nestle or Kit Kat Food Products had the right to use the trademark "Kit Kat" and consequently, whose application could be rightfully rejected under the Trademarks Act, 1999.

The IPAB noted that Nestle had been using the "Kit Kat" trademark outside India since 1935. They had got the mark registered in 1942. The applications filed by Nestle which are at the center of this dispute have been filed in 1987. The applications had been filed with respect to a number of products which includes cereals, which is used to make the highly popular wafer chocolate, Kit Kat. Although registration does not automatically translate to use, the 1987 application was filed such that it could be used since 1987. The IPAB noted that Nestle had provided evidence in the form of an export sales invoice that they were users since 01/11/1987. It had been conceded by Kit Kat Food Products

⁵⁶⁰ The Kitkat trademark dispute by L.Gopika, Spicy IP, 2013; <http://spicyip.com/2013/04/the-kit-kat-trademark-dispute.html>.

that they had been using the trademark since 1991 only. Therefore, the IPAB ruled that Nestle was the prior user of the trademark. By establishing that they were the prior user of the trademark, the IPAB noted that Nestle had discharged its burden of proving that any confusion or deception would be a result of the use of the mark by Kit Kat Food Products and not by Nestle as Nestle is the prior user. As a result, the IPAB ruled that the public will identify the Kit Kat trademark with Nestle and not Kit Kat Food Products.

Moreover, the IPAB noted that Kit Kat Food Products was unable to satisfy their burden of proving that they were a prior user of the trademark and that their use of the Kit Kat trademark would not cause any confusion or deception of the common public. Additionally, as the marks are identical, the goods and trade channels similar and especially as the class of customers are more or less the same, in the form of small children, the IPAB noted that there was “every possibility of confusion being caused” because of the use of the mark by Kit Kat Food Products. Therefore, the IPAB ruled that Kit Kat Food Products’ adoption of the trademark was not *bona fide* and that it was merely an attempt on their part to ride on the goodwill of Nestle. Thus, the IPAB held that Nestlé’s application be accepted as it was the rightful user of the trademark.

Box 4.25: Colorado Springs-based edibles firm settles suit over Hershey look-alike candy⁵⁶¹

The small Colorado Springs-based producer of marijuana edibles, sued in June by candy giant The Hershey Company for allegedly breaching a number of design and name patents, quietly settled the dispute.



In a settlement penned in late September, TinctureBelle agreed to recall and destroy all edibles it sold that looked like the famed chocolate company’s products, or with names that played on their brands.

Although the edibles company said it had stopped making products that appeared like those produced by Hershey – including well-known names such as Reese’s, Almond Joy and Heath – long before the federal lawsuit was filed in June in U.S. District Court in Denver, the settlement makes sure it won’t happen again.

⁵⁶¹ Colo. Springs edibles firm settles suit over Hershey look-alike candy, subtitle byline, By David Migoya, The Denver Post, 2014; http://www.denverpost.com/business/ci_26741590/colo-springs-edibles-firm-settles-suit-over-hershey.

Neither TinctureBelle owner Char Mayes nor a Hershey spokesman could be reached Thursday for comment.

The settlement also requires TinctureBelle not to use the product names Hashees, Ganja Joy, Hasheath, Hasheats, Thingamajiggy or Reefers, nor to use the name Reefer for any candies that contain either peanut butter or its flavorings. The company also agreed not to make packages with brown, yellow and orange colors, which are those used by the Reeses brand, according to a copy of the settlement.

Hershey had said TinctureBelle's products harmed their brand name and could be confused for regular candy by children.

TinctureBelle neither admitted nor denied any of the allegations in the lawsuit as part of the settlement.

Box 4.26: Doctrine of exhaustion of patent rights and self-replicating products⁵⁶²

When the US Supreme Court decided in favor of Monsanto in its case against a soybean farmer, it clarified the patent status of certain self-replicating technologies. In Europe, the result would probably have been the same, say Steven Zeman and Heike Vogelsang-Wenke.

Under the doctrine of patent exhaustion, a patentee should have the chance to exercise its monopoly just once per patented product.

After the product comes to market, then the patentee's rights are exhausted. But exhaustion is item-specific: it applies only to the specific articles the patentee has allowed on to the market, and does not apply to identical articles that have not been expressly allowed.

Sounds simple enough, right? But exhaustion becomes less clear-cut when the patented product can self-replicate. For instance, a patented seed grows into a plant producing more of the same (also patented) seeds. Can the doctrine of patent exhaustion apply here too? Consider it: virtually limitless quantities of "patented" daughter seeds can be obtained from just one purchased seed.

Strictly applying the exhaustion doctrine here would prevent the patentee from claiming infringement, because all progeny seeds originate from material which the patentee willingly sold.

In this scenario, the patentee stands to fall victim to its own innovation, a result quite at odds with the guiding principle that the patentee should be rewarded for publicizing an

⁵⁶² Patents for self-replicating products: not so exhausting after all, LSIPR, 2013; <http://www.lifesciencesipreview.com/article/patents-for-self-replicating-products-not-so-exhausting-after-all>

invention and advancing technology. Considering this, legislators around the world have developed special exhaustion rules for self-replicating subject matter.

Section 9(b) of the German Patent Law (GPL) defines an exception. When the patentee markets self-replicating biological material (first generation) in the European Union or European Economic Area, and this biological material replicates to produce further biological material (second generation), the patentee's rights are exhausted when the first generation was marketed for the purpose of such replication.

But Section 9(b) of the GPL limits this exception to the second generation material, and the patentee's rights remain enforceable for third generation products and beyond.

In Germany, Sections 9(a), 9(b) and 9(c) of the GPL represent the national implementation of Articles 8 to 11 of the European Biotech Directive 98/44/EC. Section 9(a) of the GPL defines the general rule that when a patent covers inventive biological material, the patentee's rights extend to products of its self-replication, as long as these products have the same characteristics as the parent material.

Section 9(c) of the GPL is even more specific. Among other things, it states that a farmer who has produced second generation seeds may continue to use them for replication in his/her own business, as long as this use matches the purpose for which the seeds were originally marketed.

But even in this case, Section 9(c) of the GPL requires that the farmer continues to pay reasonable compensation to the patentee for each subsequent generation, albeit at a lower rate than for a normal license.

"Monsanto argued that its patent protection must apply anew to each seed generation, and that applying the doctrine of exhaustion would undermine any patent to self-replicating subject matter."

Overall, in Sections 9(a), 9(b) and 9(c) of the GPL, the legislator seeks to strike an equitable balance between the patentee's legitimate right to a reward for innovation and the farmer's equally legitimate expectation to profit from his/her own labor. Similar considerations of equitability recently occupied the US Supreme Court in a dispute between farmer Vernon Bowman and Monsanto. For years, Bowman bought Monsanto's patented soybean seeds, which are engineered to resist Monsanto's herbicide.

Monsanto's purchase agreement prohibits farmers from replanting second generation seeds, but allows them to sell such seeds as animal feed. One year, Bowman purchased such feed seeds and used them for a late-season planting. These included second generation Monsanto seeds previously sold as feed, per the agreement.

These seeds proved resistant to Monsanto's herbicide, so Bowman grew them and saved progeny seeds for later plantings. Monsanto sued Bowman for patent infringement, and Bowman's defense invoked patent exhaustion. He argued that he

was free to do what he liked with the seeds, since they had already been allowably sold (as feed) per the agreement. Since Monsanto's rights to the second generation seed were exhausted, Bowman argued that his activities could not infringe.

Monsanto argued that its patent protection must apply anew to each seed generation, and that applying the doctrine of exhaustion would undermine any patent to self-replicating subject matter.

The particular article

The Supreme Court decided in favor of Monsanto. The court generally acknowledged the doctrine of exhaustion, but stressed that it is limited to the "particular article" sold. The doctrine does not allow the creation of new infringing articles by copying a legitimately acquired patented product. Monsanto had received its reward for the initial seeds bought, but had been deprived of its reward for the soybeans Bowman had grown and reused.

If a purchaser of a patented product could make and sell endless copies of that product, then the patentee's legal monopoly would disappear beyond the first sale. Applying Bowman's interpretation of exhaustion would have flooded the market with replicated soybeans from a single sale, nullifying Monsanto's patent protection and discouraging innovation. Bowman was found guilty of patent infringement.

Had the Monsanto case been tried before a German court, one might have expected a similar ruling. The exceptions of Sections 9(b) and 9(c) of the GPL, which exhaust the patentee's rights for the second generation seeds (Section 9(b)) and allow further (compensated) use of second and later generation seeds in the farmer's own business (Section 9(c)), depend on the purpose for which the patentee marketed or allowed marketing of the seeds.

The farmer-friendly exceptions apply if—and only if—the defendant's use remains congruent with the original purpose for which the patented material was marketed.

In the Monsanto case, the seeds which Bowman (re)planted were sold under the Monsanto agreement for feed purposes having nothing to do with replication; the seeds were for eating, not planting, and the patentee's consent to their existence in the *public domain* was subject to this limitation.

By planting these seeds, Bowman departed from this limiting purpose, so Sections 9(b) and 9(c) of the GPL would not likely have applied, and the general rule of Section 9(a) would likely have prevailed, and there would be no exhaustion for the copies of self-replicating subject matter.

The US Supreme Court interpreted patent exhaustion for self-replicating seeds in line with what one would have expected in the European Union. This bodes well for companies seeking unified patent scope for self-replicating subject matter worldwide.

Box 4.27: General Court confirms that chocolate cookie design is invalid⁵⁶³

In *Biscuits Poult SAS v Office for Harmonization in the Internal Market (OHIM)* (Case T-494/12), the General Court has upheld a decision of the Third Board of Appeal of OHIM finding that a registered Community design was invalid due to the fact that it lacked individual character.

On March 25, 2009, the applicant, Biscuits Poult SAS, filed an application for registration of a Community design with OHIM. The design in respect of which registration was sought, intended to be applied to “cookies,” was represented as follows:



The design was registered as Community design No 1114292-0001 and published in *Community Designs Bulletin No 75/2009* of April 22, 2009.

On February 15 2010, the intervener, Banketbakkerij Merba BV, applied to OHIM for a declaration that the design was invalid pursuant to Article 25(1)(b) of the Council Regulation on Community Designs (6/2002), alleging that the design was not new and lacked individual character, and that its appearance was dictated by its technical function within the meaning of Articles 5, 6 and 8 of the Regulation.

In support of its application for a declaration of invalidity, the intervener provided, to support its contention that the contested design was not new and lacked individual character, the earlier designs set out below:



⁵⁶³ <http://www.worldtrademarkreview.com/daily/detail.aspx?q=6fd1e838-98a2-4af4-85e8-036770b0b6a5>.



By decision of February 28, 2011, the Cancellation Division of OHIM dismissed the application for a declaration that the contested design was invalid.

On April 22, 2011 the intervener filed an appeal with OHIM against the decision of the Cancellation Division. By decision of August 2, 2012, the Third Board of Appeal of OHIM declared that the contested design was invalid pursuant to Article 25(1)(b) of the Regulation on the ground that it lacked individual character within the meaning of Article 6 of the Regulation. The Board held that the layer of filling inside the cookie could not be taken into consideration for the assessment of the individual character of the contested design, as it did not remain visible during normal use of the product. Further, the board considered that the outer appearance of the contested design was the same as the three earlier designs below:



Lastly, the Board held that the contested design did not produce on an informed user who regularly consumes that type of cookie a different overall impression from that produced by the three earlier designs, given the broad margin of freedom of the designer of this type of product.

On August 2, 2012, the applicant filed an appeal with the General Court, claiming that the Board had incorrectly refused to consider the internal appearance of the contested

design, thereby failing to take account of the differences as compared to the earlier designs, which gave the contested design individual character.

The applicant submitted that a cookie cannot be considered to be a “complex product” within the meaning of Article 3(c) of the Regulation and that, therefore, the filling inside the cookie is not a component of such product.

Alternatively, the layer of filling inside the cookie was visible when the product is put to normal use, since it would be broken at the time it was put to normal use. Moreover, this type of representation of a cookie reflected the advertising practices prevalent in the relevant sector. Accordingly, the appearance of the filling ought to have been taken into consideration even under Article 4(2) of the Regulation. Given all the characteristics of the design, including its appearance, lines, contours, colors, the contrast between the inside and the outside, the golden surface, the number of chocolate chips on the surface and its texture, the Board ought to have acknowledged the contested design’s individual character in relation to the earlier designs submitted by the intervener.

The General Court stated that the protection of a design for the purposes of Article 4(1) of the Regulation consists in the protection of the appearance of a product. The protection of an industrial design was thus restricted to the visible elements.

The applicant’s argument to the effect that the layer of chocolate filling inside the cookie became visible during “normal use” of the cookie was based on a misunderstanding of Article 4(2) of the Regulation. Under this article, the design is protected only if the component part, once it has been incorporated into the complex product, remains visible during normal use of that product. Since the chocolate filling was to be considered as a non-visible characteristic of the cookie, which did not relate to its appearance, it could, therefore, not be taken into account in the determination of whether the contested design could be protected.

Against this background, the court found that the board had not erred in stating that the non-visible characteristics of the product, which do not relate to its appearance, could not be taken into account in the determination of whether the design could be protected.

In conclusion, the General Court stated that the irregular rough surface on the outside of the cookie, its golden color, round shape and the presence of chocolate chips were characteristics which were common to the conflicting designs and decisive for the overall impression produced on an informed user. Therefore, the contested design could not be regarded as having individual character.

The smoother surface of the contested design as compared to the earlier designs, together with the differences relating to the number, specific dimensions and somewhat prominent presence of the chocolate chips on each of those earlier designs and on the contested design did not confer individual character on the latter. Given the designer’s

considerable freedom, those differences was not liable to produce a different overall impression on an informed user in such a way as to benefit the contested design.

Against this background, the General Court stated the board had been right in finding that the contested design was invalid due to its lack of individual character, and dismissed the action.

Box 4.28: 10 years in jail for Rudy Kurniawan⁵⁶⁴

July 28, 2014: After weeks of delay, convicted wine counterfeiter Rudy Kurniawan was finally sentenced to 10 years in jail yesterday.

The judge in the case - Richard Berman - was not swayed by defense attorneys' pleas that the 37-year-old should only serve the two-and-a-half years already spent in jail since his arrest, and said he wanted to send a strong message to others involved in wine fraud.

Sentencing hinged on the value of the wine that Kurniawan counterfeited and sold from the Los Angeles home he shared with his 66-year-old mother, and prosecutors were reportedly conducting test on samples even in the hours before sentencing was due to try to secure the longest custodial term possible.

He will be deported to his native country (Indonesia) after serving his sentence, and has also been ordered to pay 28.4 million USD in restitution to his seven victims on top of the 20 million USD forfeit imposed last month, although his legal representation claims he has few assets left.

Prosecutor Stanley Okula described Kurniawan as a "kingpin" amongst counterfeiters and dismissed suggestions by the defense that sentencing should be lenient because his victims were rich and materially unharmed by the fraud.

Kurniawan was convicted last December in the first federal prosecution for wine fraud brought by the US federal authorities, after a trial which heard he had faked bottles of rare and vintage Bordeaux and Burgundy wines at his home in Arcadia.

He blended lower-priced wines so that they would mimic the taste and character of expensive vintages, poured his creations into empty genuine bottles that he procured from various sources. He then created a finished product by sealing the bottles with corks and outfitting them with counterfeit wine labels he created.

Among the copycat wines produced by Kurniawan were a 1934 Romanee-Conti and magnum of 1947 Chateau Petrus.

Through his actions he caused losses close to 30 million USD to victims, including billionaire William Koch who settled a separate civil lawsuit with the defendant in July.

⁵⁶⁴ 10 years in jail for Rudy Kurniawan by Phil Taylor, 2014; <http://www.securindustry.com/food-and-beverage/10-years-in-jail-for-rudy-kurniawan/s104/a2108/>.

Kurniawan also devised and carried out a scheme to fraudulently obtain a 3 million USD loan from a financing company located in New York City that specialized in extending loans that are secured by valuable collectibles, such as art and wine.

Preet Bharara, US Attorney for the Southern District of New York, where Kurniawan's trial and sentencing took place, said: "Now, Kurniawan will trade his life of luxury for time behind bars."

Box 4.29: Police foil 1m EUR counterfeit wine scam in Italy⁵⁶⁵

Sept 11, 2014: Italian police have smashed a counterfeiting ring, seizing thousands of liters of fake wine with an estimated value of around 1m EUR. The counterfeiters targeted Brunello and Rosso di Montalcino wines from Tuscany in the Italy, which feature among the country's most prestigious varieties alongside the likes of Barolo, Barbaresco and Amarone.

All told, 75,000 liters of Brunello di Montalcino and 90,000 liters of Rosso di Montalcino were uncovered, along with more than 2,000 fake labels, according to the Brunello di Montalcino Consortium representing the producers. None of the fake wine had entered the supply chain.

The operation by police and Italy's Inspectorate for the Suppression of Fraud resulted in several arrests, including that of a wine consultant based in the Montalcino area and other individuals working in the local wine industry.

The President of the Consortium, Fabrizio Bindocci, said counterfeiting "is a serious issue that could cause significant damage to Brunello di Montalcino, to its producers and its territory." The illicit activity was discovered thanks to a discrepancy between the production and sales recorded by one of its producers.

"This is a case of fraud against the consumer and most of all against the producers of Brunello," he continued. "If and when the investigations confirm the various parties responsible, the Consortium will immediately submit a civil claim and will use all means necessary to combat similar behavior."

In May, Brunello fakes were among 30,000 counterfeit bottles seized in an operation carried out by police in Siena. At the time, Bindocci said that the case highlighted the serious problems facing the region's wine growers, despite the implementation of controls such as traceability of each bottle and monitoring the sale of grapes and wine sold in bulk.

⁵⁶⁵ Police foil Euro 1 million counterfeit wine scam in Italy, by staff reporter, 2014; <http://www.securindustry.com/food-and-beverage/blank/s104/a2128/>.

4.4.3 What are your options for settling an infringement claim out of court?⁵⁶⁶

If you have a contract (e.g., a license agreement) with the infringer, first check whether there is a clause calling for mediation or arbitration, an alternative (and often less costly) form of dispute resolution. Even if there is no such clause in the contract, or there is no contract at all, it may still be possible to take advantage of these private procedures, so long as both parties agree to submit to such a procedure.

Arbitration is generally shorter and less expensive than court proceedings, and, if the other party is foreign, an arbitral award is more easily enforceable internationally. An advantage of mediation is that the parties can keep the process informal and find an agreed solution that takes account of their interests. As such, it can help to preserve good business relations. The WIPO Arbitration and Mediation Center provides non-profit services for alternative dispute resolution. More information on arbitration and mediation can be found at: www.wipo.int/amc.

4.5 IP as an instrument for raising capital⁵⁶⁷

The growing inter-linkages between the financial sector and the agri-food sector have shaped to a large extent the prevailing dynamics of the latter, from land ownership to food retail. IP has emerged as a key driver of shareholder value creation and risk mitigation, while providing a recognized and transferable asset class for generating incremental income, optimizing taxes and raising capital. In recent years, there is an increasing awareness and appreciation of the strategic role of IP assets in knowledge-intensive businesses, including agribusinesses.

The food processing industry, and in particular, SMEs within this industry, are challenged in areas of global competitiveness, innovation, investment in capital equipment, R&D, labor shortages, debt financing and export funding, knowledge and assistance. In addition to R&D tax incentives⁵⁶⁸ and other tax incentives, considerable government, or so-called public sector, direct funding support for the agri-food sector's R&D, innovation and marketing/exporting⁵⁶⁹ needs is available in a very large number of countries, worldwide. For example, in the sources and types of assistance available in Europe may be seen at the link in the footnote.⁵⁷⁰ Funding support is also available for clean energy in food production and water management. However, most countries do

⁵⁶⁶ *Inventing the future*, cit., p. 53.

⁵⁶⁷ Bodenham P., *IP and Finance: Accounting and valuation of IP assets: IP-based financing*, WIPO Training of Trainers Program on Effective Intellectual Property Asset Management by Small and Medium-sized Enterprises (SMEs), Istanbul, 2011.

⁵⁶⁸ *The R&D Tax Incentive, Agrifood Guidance*, Australian Government Department of Industry & Science, 2015; [http://www.business.gov.au/grants-and-assistance/innovation-rd-TaxIncentive/Eligibility/Documents/AgrifoodSectoralGuide.pdf](http://www.business.gov.au/grants-and-assistance/innovation-rd/TaxIncentive/Eligibility/Documents/AgrifoodSectoralGuide.pdf).

⁵⁶⁹ An illustrative example: The exports promotion project for Argentine agrifood (PROARGEX) is an initiative of the Ministry of Agriculture, Livestock and Fisheries and the International Development Bank (IDB). Its goal is to increase, in a sustainable form, small and medium size enterprises foreign sales of differentiated products with high added value, trying to expand the exportation destinations; <http://www.proargex.gov.ar/en/>.

⁵⁷⁰ <https://www.euresearch.ch/en/project-funding/industry-sme/agrofood-industry/>.

not have cohesive food-water-energy nexus strategies; rather, interconnected issues are handled by multiple agencies with unclear lines of responsibility and decision making processes, each working on the basis of proprietary data. SMEs in most cases lack strong representation among decision makers. Governments can do more to ensure that policy frameworks and incentive schemes, government-funded R&D, and national standards for services and technologies are tailored toward SMEs.⁵⁷¹

Middle East and North African countries have adopted bold agri-industrial programs tailor-made to fit their socio-economic situation and resource endowments. Egypt, Jordan, Morocco, Syria and Tunisia, for example, are implementing agri-industrial development programs to climb up the value-chain ladder, such as agri-industrial technopoles, special economic zones (with an agribusiness component), and agri-based clusters.⁵⁷²

In addition, a wide variety of financial players are involved in the agri-food sector, such as individual investors, institutional investors including pension funds, commercial and investment banks, insurance companies, hedge funds, private equity funds, stock exchanges, agricultural exchanges and other trading venues for agricultural commodity derivatives, fund managers, financial advisors, etc..⁵⁷³

However, many farmers, especially small and medium holding farmers, do not receive sufficient financing from the financial sector. They often have to resort to alternative forms of financing, most of which are under unfavorable terms. Farmers can turn to agribusinesses for financial and hedging services, to contract farming, to long-term contracts with buyers and supermarkets or to the derivatives markets (see below) in order to hedge against the risk of price changes. In none of these options do farmers have a strong bargaining position vis-à-vis the counterparty, making it difficult for them to protect their own interests. In addition, most of these alternative forms of financing have the effect of obscuring pricing as well as the division of income along the FSC. This further weakens (small) farmers' bargaining power.⁵⁷⁴

Protecting IP assets through litigation is not always profitable. IP assets, in fact, not only play a defensive role in protecting the competitive advantage of an enterprise's products and/or services, but also can be *monetized*, that is to say, turned into a further source of revenue for businesses. Therefore, the traditional legal (or defensive)

⁵⁷¹ The Renewable Energy and Energy Efficiency Partnership (REEEP) is calling on governments to help small and medium enterprises in the food-producing agriculture sector to integrate water and energy concerns in their business approaches. REEEP is an international non-profit organization that advances markets for clean energy in developing countries; <http://www.reeep.org/nexus> and http://www.reeep.org/sites/default/files/REEEP_Making_The_Case.pdf.

⁵⁷² P. 11; <http://www.fao.org/docrep/016/ap292e/ap292e.pdf>.

⁵⁷³ How finalization influences the dynamics in the food supply chain, Myriam Vander Stichele, 2014, p. 3; http://farmlandgrab.org/uploads/attachment/Discussion_Paper_-_Myriam_Vander_Stichele_-_final_for_print.pdf.

⁵⁷⁴ Refer to p. 6 of *Ibid.* 571, http://farmlandgrab.org/uploads/attachment/Discussion_Paper_-_Myriam_Vander_Stichele_-_final_for_print.pdf.

approach can now be complemented by a business-oriented approach to management of IP assets.

Methods of monetizing IP assets, other than by assignment or license agreements, have become common. Increasingly, IP assets are being used to gain access to new forms of finance such as financial *leasing* or structured finance solutions tailored specifically to an enterprise's need (e.g., securitizations of license agreements).

4.5.1 How IP rights could be exploited to raise funds?

The strategic relevance of IPRs has led enterprises to identify additional ways of extracting value from them.⁵⁷⁵

An enterprise can monetize its IP assets through different methods, especially securitization and collateralization.

4.5.2 What is IP securitization?⁵⁷⁶

Securitization is a useful option if an agribusiness enterprise has a substantial stream of revenue attributable to IPRs, such as royalty revenue.

In a securitization transaction, funding is generally obtained by creating a Special Purpose Vehicle (SPV) to issue securities (debt or equity certificates) based on given receivables, such as license royalties or other cash flows from IP.

The receivable is generally transferred to the *Issuer* (and the funding generated is paid after the offering of bonds) by the *Issuer* to the *Originator* (the entity whose receivable was transferred to the *Issuer*).

Security interests in the assets generally secure the commitment of the *Originator* to pay the debt (bond or equity holders have recourse to seize the securitized assets in the event of a default).

IP securitization, however, may raise further issues. In particular, the first issue is linked to risk evaluation: It is quite difficult (due to lack of generally accepted methodology) to predict with a sufficient degree of certainty the exact future cash flow originated from an IP or other intangible asset.

Secondly, since securitization may involve the transfer of IP assets to an *Issuer* during the term of the loan, the type of IPRs that the enterprise owns may create problems vis-à-vis the securitized transaction (ownership transfer, particularly for trademarks, may raise trademark-specific legal issues).

⁵⁷⁵ Munari F., Odasso C., Toschi L., IP-backed finance in *The economic valuation of patents. Methods and applications*, Cheltenham, 2011.

⁵⁷⁶ cf. Alma R., Bodenham P., et al., *La Ricchezza Intangibile*, 2011, for a detailed analysis of IP securitization.

4.5.3 What is IP collateralization?⁵⁷⁷

IP collateralization is significantly less complex and less costly than securitization, since it requires a substantial revenue stream derived from IP assets, rather than an IP asset portfolio.

Collateralization will thus make growth capital available to more enterprises. Enterprises are, in fact, beginning to capitalize on the previously unlocked potential that patents, trademarks, copyrights and other forms of IP deliver (when and if growth capital is needed).

The monetization of IP assets through collateralization is a new financing approach which involves lenders, rather than investors. Traditionally, a lender will extend credit based on the tangible assets that an enterprise owns (for example, accounts receivables and inventory).

The IP is taken as collateral to minimize losses in the event of a borrower's default (there is no transfer of IP assets to an *Issuer*; there is no issuance of securities).⁵⁷⁸

Credit enhancement firms which specialize in IP transactions give *comfort* to traditional asset based lenders, who generally are still *uncomfortable* with IP as collateral as compared to traditional assets (lands or buildings) as collateral. These lenders are reassured by the syndication of the risk with a credit enhancement firm (the latter essentially guarantee the repayment of the loan to the lender: credit enhancement firms are more sophisticated in valuing the underlying IP than are traditional asset-based lenders).⁵⁷⁹

4.5.4 What is a Business Angel network?⁵⁸⁰

Business angels are private individuals who invest their own money in high potential start-ups to help them grow and achieve success in return for shares in the enterprise, and also contribute their expertise in business management and their personal network of contacts.

Business angels play a crucial role as providers of early stage, informal, venture capital and skills at the seed and/or development stages of the business lifecycle. Angel intervention is long-term, active, and may take a variety of forms.

The role of business angels is especially important in view of both the decreasing levels of formal venture capital investment at these stages and the growing average amount of individual deals. Angel investors typically invest at an earlier stage of growth and

⁵⁷⁷ Savio M. A., Kaden J. M., Monetizing your intellectual property: the trend in financing. 2010.

⁵⁷⁸ Savio M. A., Kaden J. M., cit.

⁵⁷⁹ Typically, a credit enhancement firm will conduct a valuation to provide a lender with an analysis of the collateral and with information about the rationale of a particular loan. Their involvement in a deal may even allow borrowing from the enterprise's preferred lender, who might have otherwise not issued financing based on collateralized IP.

⁵⁸⁰ Cf. Wittbank, R., Siding with the angels: Business angel investing - Promising outcomes and effective strategies, 2009.

provide more business guidance than venture capital providers. Therefore, angel investors are key players in generating high-growth enterprises essential to regional economic development.⁵⁸¹

4.5.5 How could business angels help agri-food SMEs and microenterprises in the start-up phase?

After entrepreneurs develop an opportunity, and use up their own resources, they often turn to business angel investors for early investment to keep the venture growing.

At this point in the development of new ventures the risk of failure is significant (many aspects of the business including customer relationships, pricing strategy, talent, and other key factors are quite unclear). Business angels are usually willing to invest at this point.

Business angels have become an increasingly important source of equity finance over the last decade for new and nascent businesses as venture capital investors are not able to accommodate a large number of small deals with their attendant due diligence and oversight needs.

In particular, business angels can overcome the information problem plaguing banks and venture capital funds, because they can make investment decisions using their knowledge of the field, and their appreciation of the potential of the enterprise they are investing in.⁵⁸²

4.5.5.1 But what is the specific contribution of a business angel to the growth of a micro-sized enterprise?

The type of financing that firms need and receive varies according to the different stages of their financial growth cycle.

Indeed, firms may be analyzed through a lifecycle (defined by different stages of development: seed, start-up, early stage, growth and maturity) in which financial needs and options change as the business grows, gains experience, and becomes less *opaque*.

Proceeding along this cycle, in the early phases, the value of an innovative, small and young enterprise is generally represented by its intangible assets such as technology, which are characterized by high levels of risk and uncertainty.

⁵⁸¹ Formal venture capital operators usually invest a minimum of 2.5 million EUR in enterprises, which leaves a market gap or failure in smaller amounts of equity. Individual business angels usually invest between 20, 000 and 250, 000 EUR. The average amount invested per individual in Europe is 80, 000 EUR and up to 250, 000 EUR, depending on the business type and the region. These amounts can increase when business angels co-invest with other investors or through a co-investment fund.

⁵⁸² Cf. European Commission, Benchmarking business angels, Final report, 2002. Business angels are often viewed as preferring local projects because they want to be in regular contact with the manager of the enterprise. The enterprises into which the angels invest have often been within two or three-hour drive from the base of the business angel, and although some of this might be attributed to difficulties gathering information, it is also related to risk management. The business angels can exert closer control over the activities of an enterprise when they are geographically close.

After an initial phase in which funding typically from insiders (start-up team, family, and friends), innovative firms may seek to access intermediated finance on the equity side, such as the venture capital market.

In addition, for young enterprises with growth potential, equity financing provides the advantage of strengthening their balance sheet and unlocking their access to bank loans for subsequent phases.

Lacking managerial experience is a problem for growing start-up enterprises, and contributes to their high mortality rate (more than half of European enterprises cease activities within five years of their creation). Furthermore, angels have usually a wide network of contacts that can benefit a start-up enterprise.

As business angels are experienced entrepreneurs, they can provide crucial hands-on managerial experience, which reduces the risk of failure.

In conclusion, business angels are becoming more important as an investor class that is able to bridge the investment gap that exists between the proximity financing of family and friends, and formal venture capital.

4.5.6 Venture capital in the agri-food sector⁵⁸³

Venture capital (VC) is a typical example of equity financing, based on an exchange of money for a share in a business.⁵⁸⁴

In essence, VC is a financial intermediary that raises equity capital from different types of investors (pension funds, financial institutions, corporations and individuals) and invests it directly in the portfolios of private enterprises.

A VC fund is typically organized as a limited partnership, where the venture capitalist acts as the general partner of the fund and the other investors as limited partners.⁵⁸⁵

A venture capitalist is not a mere financial intermediary that only provides capital to the enterprise but is also an active investor that monitors and supports the enterprise's growth through strategic and managerial support.⁵⁸⁶

Finally, a venture capitalist has the primary goal of maximizing its financial returns by exiting investments after a certain period of time.

⁵⁸³ Munari F., Odasso C., Toschi L., IP-backed Finance in The economic valuation of patents. Methods and applications, Cheltenham, 2011.

⁵⁸⁴ According to the National Venture Capital Association, Venture Capital (VC) can be defined as [...] money provided by professionals who invest alongside management in young, rapidly growing enterprises that have the potential to develop into significant economic contributors.

⁵⁸⁵ Cf. Munari F., Odasso C., Toschi L., cit.

⁵⁸⁶ To do this, VCs generally take a seat in the board of the enterprises to give advice and help at the highest level of the organization and also takes an important role in the professionalization of the enterprises.

The venture capitalist sells its stake in the portfolio enterprise through different mechanisms (such as a sale or an initial public offering), returning the money to its limited partners and starting the same process with a different enterprise.

4.5.6.1 How does venture capital operate?

The VC cycle is articulated in several steps:

- (i) **Deal Origination.** During this phase, enterprises are considered as investment prospects.
- (ii) **Screening.** Some of these proposals are immediately rejected if they do not fit with the focus of the VC strategy.
- (iii) **Due Diligence.** The VC analyzes these proposals in depth through a set of key policy variables which reduce investment prospects to a more manageable number for in-depth evaluation.
- (iv) **Deal evaluation.** VC managers assess the levels of perceived risk and expected return of the potential investee enterprise to decide whether or not to invest.
- (v) **Deal contracting.** The price of the deal and the covenants which limit the risk of the investor are negotiated.
- (vi) **Investment and post-investment activities.** VCs monitor and assist the investee enterprise along its growth by strategic planning, providing further financing through various financial rounds and organizing a merger, acquisition or public offering to exit and liquidate the investment.

4.5.7 Private equity and enterprises⁵⁸⁷

Private equity is the provision of equity capital by financial investors - over the medium or long term - to non-listed enterprises with high growth potential.⁵⁸⁸

Private equity covers not only the financing required to create a business, but also includes financing in the subsequent development stages of its life cycle. When financing is required by a management team to buy an existing enterprise from its current stakeholders, such a transaction is called a buyout.⁵⁸⁹

⁵⁸⁷ Bodenham P., IP and finance: Accounting and valuation of IP assets: IP-based financing, WIPO training of trainers program on effective intellectual property asset management by small and medium-sized enterprises (SMEs), Istanbul, 2011.

⁵⁸⁸ Venture capital is, strictly speaking, a subset of private equity and refers to equity investments made for the launch, early development, or expansion of a business. It has a particular emphasis on entrepreneurial undertakings rather than on mature businesses (cf.

http://www.evca.eu/uploadedfiles/home/toolbox/introduction_tutorial/evca_pevcguide.pdf).

⁵⁸⁹ Private equity and venture capital may refer to different stages of the investment but the essential definition remains the same: it is the provision of capital, after a process of negotiation between the investment fund manager and the entrepreneur, with the aim of developing the business and creating value.

Private equity firms have a main goal: seek out enterprises with the potential for growth and with the aim to put in place the capital, talent and strategy needed to permanently strengthen the enterprise and raise its value.

What does a private equity firm bring to an enterprise?

- Long-term capital, solidly underpinning an enterprise's growth;
- Increased visibility with bankers, suppliers and clients;
- A partnership, sharing the risks and the rewards;
- An investment fixed within the framework of a negotiated contract;
- The adoption of high-performance management standards;
- Strategic and operational support along with financial advice in times of crisis;
- Assistance with subsequent financing operations;
- Alliances due to the investor's network of contacts and portfolio of investments;
- A partial or total exit strategy.

Box 4.30: Commercializing patented CRISPR-Cas9 technology⁵⁹⁰

In April 2014, the USPTO issued the first patent, No. 8,697,359, for the CRISPR-Cas9 system to the **Broad Institute**, granting it patent rights over a technology that, through its rapid adoption in the biotech space, is setting off what could be a scramble for IPRs over the technology and its applications and muddying the implications for both researchers and industry players using the technology. The Broad may have received the first patent covering the CRISPR-Cas9 technology, but others may be forthcoming. In addition to Zhang, Editas' co-founders include University of California, Berkeley researcher Jennifer Doudna, and the school has filed an application with the USPTO for CRISPR-Cas9 technology that she and Charpentier invented. Doudna and Charpentier are also listed as co-inventors on the CRISPR-Cas9 technology being leveraged by **CRISPR Therapeutics**.

The financial stake around the CRISPR-Cas9 technology could be enormous. No dollar figure on the size of the market for the technology exists, but since late 2013, two firms have been launched to leverage CRISPR-Cas9 for therapeutic development, suggesting the technology's market opportunity. In November 2013, **Editas Medicine**, which Zhang co-founded, was launched with a 43, 000, 000 USD Series A investment round. Then, in April, shortly after the '359 patent was issued, Swiss biopharma firm **CRISPR Therapeutics** launched with a 25, 000, 000 EUR Series A investment to leverage CRISPR-Cas9 technology developed by Emmanuelle Charpentier, a professor at the Hannover Medical School in Germany.

In the meantime, numerous firms, including **Thermo Fisher Scientifics firms, including , Sigma-Aldrich, and Origene** offer products based on the CRISPR-Cas9 system, and in late May, Taconic launched a CRISPR gene editing technology

⁵⁹⁰ <https://www.genomeweb.com/rnai/crispr-cas9-technology-sets-take-uncertainty-swirls-around-ip-landscape>.

for mouse and rat models after securing a license from the Broad for Zhang's technology.

Most recently, **Horizon Discovery** licensed Zhang's technology, following a similar deal in May 2014 with **ERS Genomics** for Charpentier's technology.

While the Broad is pursuing licensing deals with industry players for Zhang's CRISPR-Cas9 system, it is also making reagents for the method available through a non-profit called **Addgene**,⁵⁹¹ which runs a repository offering plasmids to scientists in academia and non-profit organizations. The Broad is not charging **Addgene** for the reagents although **Addgene** charges a fee to researchers for the tools. Additionally, Zhang said that his lab has provided CRISPR-Cas9 plasmids directly to researchers for free.

As UC Berkeley awaits the USPTO's decision on its CRISPR-Cas9 application, IP lawyer Loughran said that whether a patent issued for the technology would duel with or complement the Broad's patent could determine how the CRISPR-Cas9 field evolves.

Loughran questioned whether the field would evolve in such a way that the different IP holders would fight with each other, or whether they would coalesce their IP "under some licensing curve" that will then be available to researchers. At the moment, there are clear issue claims and pending claims with no way of telling what will be complementary or competitive claims, she said.

Both the Broad and UC Berkeley are pursuing similar patent protection for CRISPR-Cas9 for basic genomic editing purposes, but as UC Berkeley's application goes through the USPTO review, the scope of its claims could be narrowed. The result is that what gets patented could be very different from what the university and its researchers sought, Loughran said.

"That is going to be the big question: Will it be possible for Berkeley to get claims issued that overlap with [the Broad's], and if they do, then how is that going to play out?" she added. "Will there be a dispute between those two entities regarding who invented the subject matter first?"

She also pointed out that numerous other CRISPR-related patent applications were filed prior to the issuance of the Broad's '359 patent – in some cases, several years before – but that the USPTO had yet to prosecute some of the applications. For example, Dupont's Danisco business, which focuses on food ingredients, has applications for the use of CRISPR technology for food products and dietary supplements going back to at least 2005.

Writing in The Bureau of National Affairs earlier this year, Loughran and her colleague Patricia Granahan noted that published patent applications and issued patents that do not directly relate to genomic editing may, nevertheless, be cited as prior art to later-filed

⁵⁹¹ Broad Institute, Information about licensing CRISPR Cas9 system; <https://www.broadinstitute.org/files/shared/osap/licensinginformation8697359.pdf>.

pending patent applications. They noted Danisco's patent applications, as well as US Patent No. 8,546,553, issued to the University of Georgia Research Foundation and titled "Prokaryotic RNAi-like system and methods of use." That patent includes claims around an isolated polynucleotide comprising at least 23 nucleotides, a psiRNA-tag, and guide sequence.

While such patent applications and/or issuances were filed before it was determined that CRISPR-Cas9 could be used in gene editing, "you wonder what kind of claims [the filers will] ultimately get from" their patent applications now that the Broad has been issued the '359 patent, Loughran told GWDN.

And now that it's been demonstrated that the CRISPR-Cas9 system has use in therapeutic development, parties have started seeking IP protection for the technology around such purposes, including Sangamo Biosciences, for example, which has several patent applications with the World Intellectual Property Organization.

Last fall, just as the buzz around the technology was starting to build, Loughran started looking into the CRISPR-Cas9 IP space and found only a limited number of recent patent applications covering the technology. Since then, however, "the landscape has changed drastically and has drastically started to develop," she said, adding that she anticipates much of the same in the near term.

"Over the next eight to 10 months, I think we're going to have even more patent applications, potentially more patents issued, and hopefully, the outcome is positive for research and for technology in this area," Loughran said.

Box 4.31: The APSE Business Development Strategy⁵⁹²

APSE, LLC, along with our partners is dedicated to being the manufacturing cost leaders in RNA.

RNA along with DNA and proteins is one of the three essential macromolecules of life. Understanding the critical roles RNA plays in life is expanding greatly and currently there are at least 30 different functional RNA families. These roles have often been difficult to study because of the instability and transient nature of RNA. However, it is now recognized that using designer RNA might be the best method to control gene expression, treat cancer and control pests (RNAi), make vaccines (RNA Vaccines), synthesize biomolecules (Ribozymes) and measure the presence and concentrations of small molecules (RNA Aptabodies).

APSE's patent-pending technology dramatically lowers the cost of producing, stabilizing, protecting and delivering RNA, thereby opening new, cost-effective approaches in a wide range of life-science applications. We have chosen agricultural pest control as our initial focus. APSE's core technology is based on proprietary, protective containers called "ARCs" and methods that can be used for the manufacture of RNA. APSE will be

⁵⁹² The manufacturer course leaders; <http://www.apsellc.com/#who>.

able to reduce the current cost of RNA production by 100 to 1,000 fold depending on the application.

Technical Promise and Market Opportunity of RNAi

RNA interference (RNAi) is a natural phenomenon ubiquitous to all eukaryotes (Animals, Plants, Fungi and others). RNAi occurs when small stretches of RNA inhibit gene expression mainly by interfering with the function of “messenger RNA.” Discovered about 15 years ago RNAi is considered a major recent breakthrough in biological science. In 2006, Andrew Fire and Craig C. Mello shared the Nobel Prize for this discovery published in 1998.

There is enormous interest among life-science researchers across many disciplines in RNAi as a tool for research and as the basis of life-science products offering a wide range of potential benefits. RNAi promises the ability to control gene expression in a highly targeted way without genetically modifying the target organism. Unlike traditional life-science products, RNAi works in such a specific way – typically targeting a single gene – that it promises the ability to promote highly specific desirable biological effects with greatly reduced “off target” effects. This might include insecticides that target only crop pests and which have no effect on benign insects; and new non-GMO approaches to boost agricultural productivity without having to make genetic alterations to the genome of the crop plant. Scientists in all the life-sciences are working on product development strategies based on harnessing this natural regulatory mechanism. By blocking the expression of specific genes, RNAi is a highly targeted and effective way to impart desired traits without genetic modification. In short, RNAi can deliver much of the promise of the biotech revolution without having to create genetically modified organisms (GMOs).

There are two fundamental problems with RNAi approaches as a practical matter, however:

- One is the enormous cost of making RNA – when made with synthetic chemistry approaches it currently sells for well over 12, 000 USD per gram. This high-cost puts RNAi well out of reach for the vast majority of its potential product applications, especially in agriculture.
- A second fundamental problem is the effective delivery of RNA to the target tissue within the target organism. Precisely because RNA is potentially so powerful, most life forms have developed one or several defense mechanisms to protect themselves from exogenously produced RNA, most importantly enzymes called “RNAses” that cut up or otherwise destroy exogenously produced RNA on contact.

APSE is devoted to addressing both these problems with the same core technology. APSE’s approach (patents pending) allows our licensees to make RNA using large-scale fermentation approaches reducing the cost to produce these valuable chemicals by 100 to 1,000 fold. Our approach is based on small containers called APSE RNA Containers™ (or ARCs) that protect RNA from degradation by RNAses during the

fermentation process. The ARCs also provide a stable delivery mechanism protecting RNA from RNAses in the environment – and from other environmental hazards such as UV light. Because these ARCs are made up of proteins in configurations known to be taken up preferentially by specific organisms and to target specific tissues within those organisms, the APSE approach holds out the promise of effective delivery of RNA to where it can have its desired biological effect.

APSE's Business Development strategy consists of three fundamental thrusts:

- **Internal Technology Development** – The Core of APSE's business development strategy are the technical efforts and patent prosecution work in support of the company's IP portfolio and related proofs of principle. This work will be supported by invested capital plus overhead contributions from the company's collaborators. This thrust may involve collaborations with academic and not-for-profit institutes. A good example is the company's ongoing collaboration with the US Department of Agriculture, Agricultural Research Station at Columbia Missouri. The APSE technology was invented by Dr. Juan Arhancet, Ph.D. A chemical engineer by training, Dr. Arhancet has spent most of his career in industry, first at Shell and later at Monsanto. He is an inventor on 30 issued US patents and several significant marketed products are currently manufactured by processes he invented. Dr. Arhancet became interested in biology while at Monsanto. He has completed his training in biology through an MA degree earned at Washington University. All of the patents that describe the APSE technology are assigned directly, exclusively and irrevocably to the Company. The Company plans on filing patents regularly including refinements to its methods and, significantly, on compositions of matter including: genetically transformed fermentation organisms and specific ARC formulations. Patent file 13-725,184. All other patent filings plus Freedom to Operate and Patentability opinions commissioned by BioGenerator, our lead, pre-seed investor, are available only under benefit of confidentiality agreement.
- **Product Development Collaborations** – An important aspect of the company's business development strategy involves entering into revenue-bearing product development collaborations with large agricultural product companies. Each collaborative project is designed to demonstrate the utility of the APSE technologies while carefully retaining most rights by narrowly defining the scope of such alliances. Because the funding partner in each collaboration pays the full incremental cost of the program plus a significant contribution to overhead, this strategy has the effect of greatly leveraging invested capital with non-dilutive funding greatly increasing capital efficiency for APSE investors.
- **Monetization through Serial Asset Sales** – The ultimate aim of APSE's business development strategy is to provide highly lucrative monetization events for our investors and shareholders. We will accomplish this by structuring the company for the creation and sale of legal entities each holding exclusive licenses to product development, manufacturing, and commercialization rights within a distinct industrial category.

Business Strategy

APSE is in partnership discussions under CDA with six large agricultural product companies. APSE estimates by late 2014 that it will have entered into industrial collaborations leading to out-license of specific product applications and/or company acquisition.

The company has raised roughly 795, 000 USD in convertible notes to date. It is currently raising seed round financing of 2, 000, 000 USD. This raise will fund the company through the end of 2015.

Given the intense interest in low-cost RNA manufacture among Agri input companies, the company expects a monetization event involving the sale of rights in crop agriculture in late 2015 through 2016. The company will then stage a series of additional “exits” by rights acquisitions in other life science application areas including: non-agricultural insecticides; production animal applications; anti-fungal applications and human health applications.

Box 4.32: GIC Group

GIC Group was established in 1980 to provide investment, financial and more recently, carbon credit services to agribusiness enterprises, financial institutions, and public sector clients worldwide. Since then, its services have expanded as biotechnology, consolidation, vertical integration, and carbon emissions have become so strategically important to commercial agriculture. GIC Group’s core activity is agribusiness but the expanded range of their services reflects the structural changes in the industry.

Based in Alexandria, Virginia, the GIC Group also has partner offices in Beijing, Sao Paulo, and Moscow. It maintains a close association with agribusiness professionals worldwide who provide GIC Group with regional industry and market information and support for GIC Group in-country activities.

GIC Group integrates experience and strength in research, analysis, and marketing with financial services, asset management and carbon credit indexes. It offers agri-food biotech industries a complete skill set to provide access to global and domestic markets, add value to current agribusiness activities, and identify new market opportunities.

It also provides financial institutions with specialized agricultural industry insight and works closely with them on deal pipelines and executions.

For public sector clients, GIC provides research, evaluations, and policy advisory assistance.

Current GIC Group initiatives and activities include:

- investment advisory and capital raising services for agri-industries, including private placements, M&A, and divestitures;
- the launch of GIC-ACI (Agri Carbon Index) for valuing the carbon footprints and offset credits of individual agri enterprises and their products and for hedging carbon credit positions in international markets;

- management of GFSF (Global Food Safety Forum), a food and feed certification and quality control industry organization for China and other Asian markets;
- trusteeship services for large-scale agri industries;
- management of small biotech enterprises;
- trade services, including management of export trading enterprises and sales agent representation in targeted markets;
- turn-key contractor services for start-up enterprises in emerging market countries.

In the course of recent transactions, GIC has provided services:

- developing suitable financials and business plans for presentations to corporate investors and institutional lenders;
- structuring the deal;
- developing a financing strategy;
- sourcing equity and debt financing.

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Box 4.33: Latin American Agribusiness Development Corporation SA

The Latin American Agribusiness Development Corporation S.A. (LAAD) is a financial intermediary founded in 1969 by a group of leading international agribusiness and financial enterprises to finance agri-food enterprises SMEs in Latin America and the Caribbean.

LAAD has built a successful track record of financing mostly family owned agri-food SMEs across 15 Latin American countries.

Agri-food SMEs are typically considered to be a difficult market, often underserved by established local financial institutions.

LAAD provides loans of less than 3, 000, 000 USD to small and medium-sized farmers to help modernize and expand their operations.

LAAD operates entirely under market conditions, lending on a secured basis at prevailing market rates.

Box 4.34: Intellectual ventures spins off new “Coffee Flour” startup by Todd Bishop on April 3, 2014 at 7:42 am⁵⁹⁴

A new Seattle-area startup called CF Global⁵⁹⁵ has been spun out of Intellectual Ventures (IV), aiming to develop a market for a new product called Coffee Flour, a food ingredient derived from discarded coffee cherries.

IV, the patent holding firm and technology company run by former Microsoft technology chief Nathan Myhrvold, says CF Global is the first spin-off from its Invention

⁵⁹³ International Finance Corporation, The Latin American Agribusiness Development Corporation (LAAD): A case study of the development impact on rural enterprises in Latin America, 2009.

⁵⁹⁴ Intellectual Ventures spins off new nCoffee Flour Ventures spinTODD BISHOP on April 3, 2014; <http://www.geekwire.com/2014/intellectual-ventures-spins-new-coffee-flour-startup/>.

⁵⁹⁵ Coffee Flour, Global Impact; <http://www.coffeeflour.com/>.

Development Fund, which works with outside inventors on patents and product development.

Coffee Flour inventor turned CF Global executive, Dan Belliveau, envisioned the creation of a new billion-dollar market and invented a patent-pending process for converting a global agricultural byproduct into a food ingredient. But he couldn't make it happen all by himself. Another Starbucks veteran, Ken Poppe, has been leading the project at Intellectual Ventures, which paid for and managed the patenting process for the Coffee Flour inventions.

The product is created by drying and milling the coffee cherry, the pulp that gets separated from the coffee bean and is normally discarded as part of the coffee production process. Coffee Flour can be used in baked good, pastas, energy drinks and other recipes that would normally call for flour. IV says it will provide a new revenue source for small coffee farmers. Early users include Jason Wilson, head chef and co-owner of the restaurant Crush in Seattle.

Other partners in the project include NohBell Corporation and global coffee companies ECOM Agroindustrial Corp.⁵⁹⁶ and Mercon Coffee Corp.⁵⁹⁷ IV declined to disclose the size of its equity investment in CF Global.

4.5.8 Gaining access to public funding

Public funding is a key factor to the growth and the competitiveness of the agri-food sector, especially in developing countries.

For many of these countries, agriculture is the largest sector in terms of its share in GDP and employment. More importantly, the majority of the world's poor live in rural areas and depend upon agriculture for their livelihood. Agriculture is, therefore, critical both for economic development and poverty reduction. It follows that in developing countries spending to agriculture is one of the most important government instruments for promoting economic growth and alleviating poverty in rural areas.⁵⁹⁸

For these reasons, it is crucial for enterprises in the agri-food sector to seek public funding projects (and in this case the IP assets could be helpful for gaining access to such funding).

It is equally important, however, that – apart from providing public funding – public entities put agri-food SMEs in the position to be able compete in modern FSCs (cf. Chapter 7 in the annexes).

⁵⁹⁶ <http://www.ecomtrading.com/en/our-products/coffee/about-ecom-coffee-113.html>.

⁵⁹⁷ The world of coffee in one place, Mercon, 2014; <http://www.merconcoffeegroup.com/>.

⁵⁹⁸ Akroyd S., Smith L., Review of public spending to agriculture, A joint DFID/World Bank study, Min Study & Country Case-Studies, 2007; <http://www1.worldbank.org/publicsector/pe/pfma07/OPMReview.pdf>.

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