INdoDutch **TA**skforce against **F**ood **LO**ss and **W**aste (INTAFLOW)

Project report Seed Money Project 2020

Heike Axmann (Project- and Expertise Leader Supply Chain Development Group)

Ilse van Dijl (Agricultural Attaché of the Dutch Embassy in India)

December 2020

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Topsector Agri& Food

TOPSECTOR TUINBOUW & UITGANGSMATERIALEN

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1. The INTAFLOW project: aim and activities

Aim

Explore the potential of establishing a National Task Force in India against Food Loss and Waste

Activities

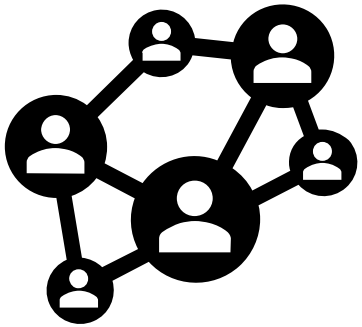
- ✓ Identification of: potential first mover stakeholders, priority crops, focus area's/hotspots
- ✓ Quick scan literature review
- ✓ Seek opportunities for external funding
- ✓ (Digital) roundtable in India with key stakeholders
- ✓ Matchmaking
- ✓ Identification and formulation of concrete first mover projects

1. Profile of the frontrunners reducing Food Loss and Waste

Characteristics of frontrunners

20-25 'first mover companies' are typically companies who are already active on one of the below issues:

- ❑ Achieving 'zero hunger'
- ❑ Reduction of Food Loss and Waste
- ❑ Reduction of Greenhouse Gas Emissions
- ❑ Climate smart agriculture
- ❑ Resource use efficiency
- ❑ Sustainable Agriculture



and have the internal capacity to run such a project.

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2. Selected INTAFLOW first movers

Taranjeet Singh Bharma
AgNext

Dr. Rahul Mirchandani
Aries Agro

Anbu Sezhiyan
Broekman Logistics

Uschi Kölzer
Bayer

Pankaj Sharma
Bayer

Alok Divatia
Himalayan Essence

Dr. Srikanth Rupavatharam
ICRISAT

Rajashri Sai
Impactree

C Sashidhar
ITC Limited

Ashutosh Kumar Sinha
Lt Foods

Angshuman Siddhanta
NCCD

Brajendra Singh
NCCD

Ashutosh Upadhyay
NIFTEM

Bhairavi Jani
SCA Group

Dr. Arava Bhagwan
SKLTHU

Sudhir Sitapati
Unilever

Cheryl E. Van Seventer Harrison
Vivia

Edwin Willemsen
vQm Packaging B.V.

Karthik Jayaraman
Waycool

Bishow Parajuli
World Food Programme

Pradnya Paidhankar
World Food Programme

Claire Kneller
WRAP

Raman Ahuja

Shri Nanda Kumar

Marten van den Berg
Ambassador of the Netherlands to India, Nepal and Bhutan

Ilse van Dijl
Acting Agricultural Counsellor – India and Sri Lanka

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3. Roundtable

Agenda:

- Food Loss and Waste (FLW) and FLW-induced Greenhouse Gas Emissions in India (Heike Axmann)
- Literature study on FLW hotspots (Hilke Bos-Brouwers)
- Sharing experience from establishing a National Agenda on Food Loss and Waste (Toine Timmermans)
- Breakout Sessions
    - 1) Building the strategic framework for action in India
    - 2) Rice and Grains & Service providers
    - 3) Perishables & Service providers
- Funding options for next steps (Heike Axmann)

3. Roundtable: Food Loss and Waste (FLW) and FLW-induced Greenhouse Gas Emissions in India

Heike Axmann

The vicious cycle: although sufficient production hunger and undernourishment

194 million Indians are **undernourished** and about **7 million children** died because of **hunger or malnutrition.**

India is **producing sufficient food** to feed everyone, but over **40%** of the food produced is **lost or wasted.**

India **drains** from the national economy every year **€ 6 billions** because of **food that's produced and never eaten.**

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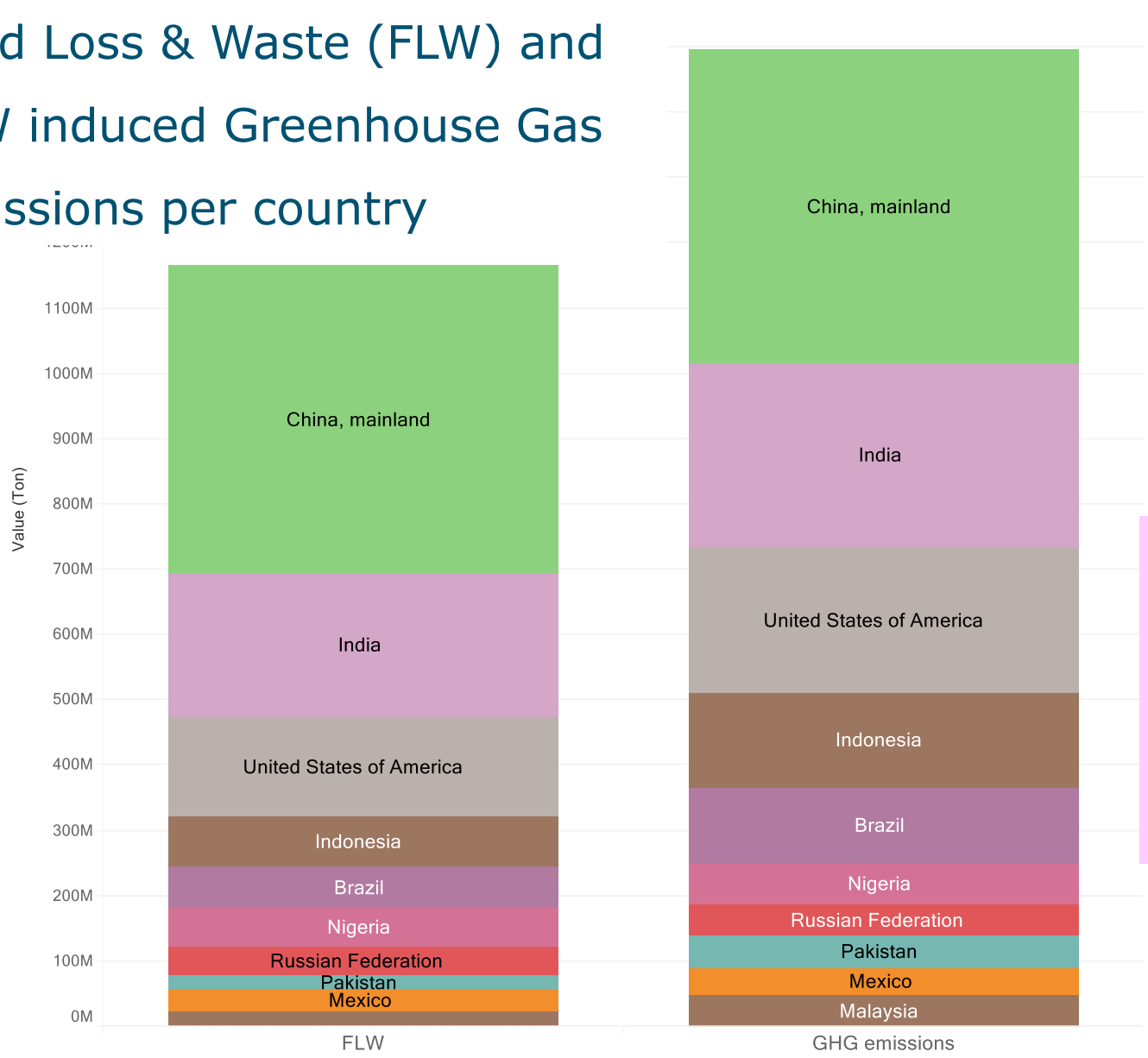
Top 10 countries total amount (2017)

Food Loss & Waste (FLW) and FLW induced Greenhouse Gas Emissions per country

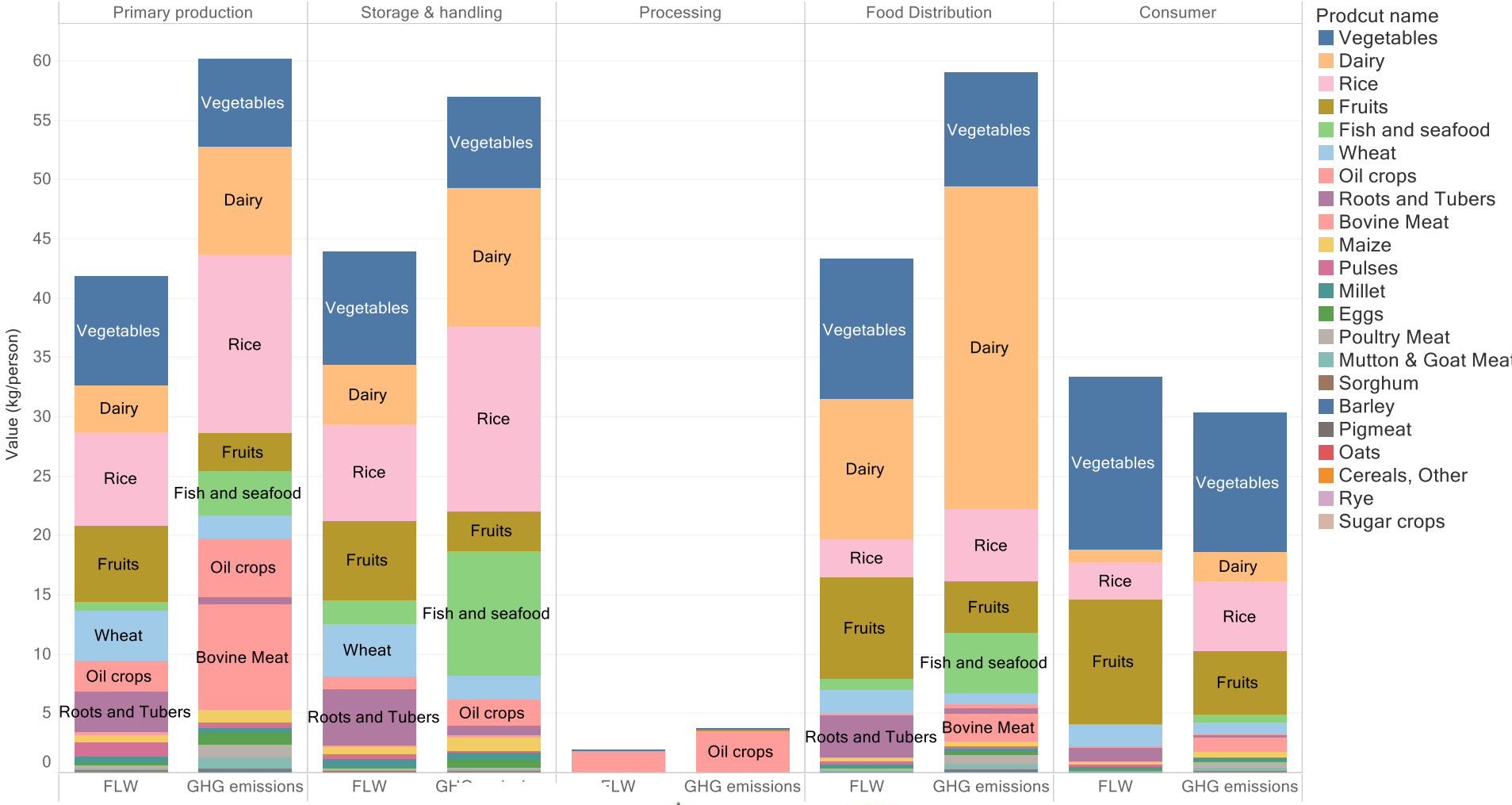


India, after China, has the highest amount of Food Losses and Waste (FLW) and FLW induced Greenhouse Gas Emissions **in the world**.

Guo et al 2020

Hotspot crops and hotspot chain stages in India: Food Loss & Waste and FLW induced Greenhouse Gas Emissions per chain stage and crop

India on all items by chain stage (2017)



Guo et al 2020

The opportunities to break through the vicious cycle

- ✓ The setting up a **Taskforce** with the goal to **reduce food loss and waste in India** by
  - developing and implementing a national strategy, and
  - building strong public private partnerships (PPPs)
- ✓ **Turning the € 6 billions** per year due to lost and wasted food into **new business opportunities**
- ✓ Deliver to SDG 12.3 in India (halving food losses & waste by 2030)

What's in it for YOU?

1. **Improved Return of Investment** due to the reduction of losses and waste and efficient chain collaboration.

2. Bring forth **New Business Opportunities** e.g. via the valorization of waste & side streams and access to new markets.

3. **Risk Reduction** due to the increase of transparency, resilience, and sustainability of supply chains.

4. **Increase Social Impact** by contributing to SDG 12.3 and many other SDG's related to the sustainable production of food, climate action and food security.

5. **Part of powerful coalition** enabling change and catalyzing game changing innovations by breaking through silos.

6. **Profile** as innovation partner.

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Hotspots for FLW generation

STRATEGIC LEVEL

- Complex market system
- Inefficient distribution network
- Inefficient procurement channels
- Inefficient transportation networks
- Lack of cooperation
- Lack of coordination
- Lack of supply chain contracts
- Lack of trust
- Lack of cold chain & storage
- Lock of processing facility

OPERATIONAL LEVEL

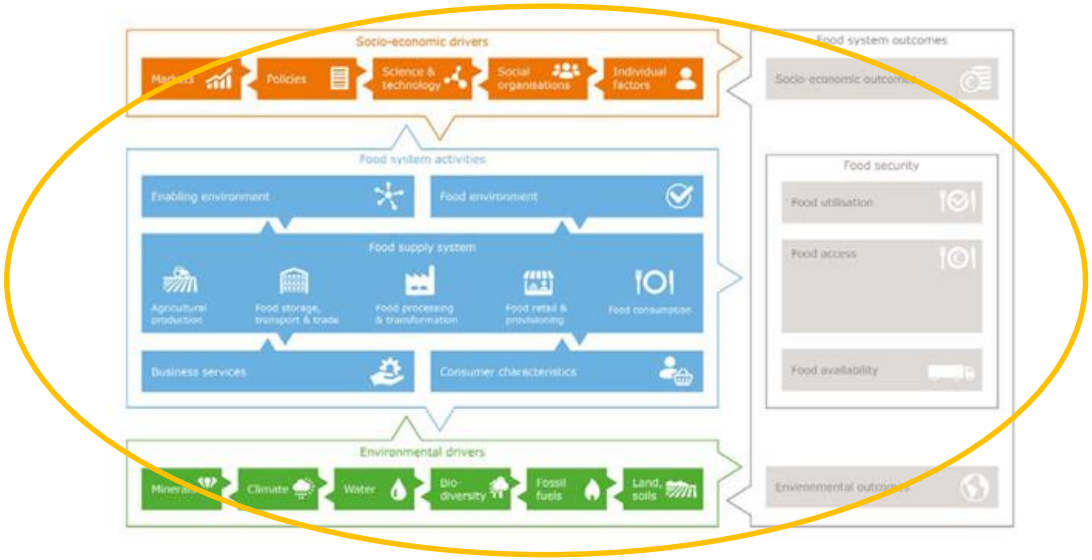
- Lack of traceability
- Lack of technical expertise
- Lack of technical support
- Lack of communication
- Poor harvesting planning
- Poor packaging efficiency
- Poor storage facility
- Poor transportation planning

Source: Gokarn & Kuthambalayan, 2017

CONSTRAINTS

- Bulkiness (size)
- Consumerism
- Consumer attitude
- Consumer habits
- Demand uncertainty
- Inadequate food policy
- Lack of Quality & Safety measures
- Lack of awareness
- Perishability
- Poor regulatory framework
- Price uncertainty
- Quality variation
- Seasonability
- Supply uncertainty

There are three different levels to address FLW reducing interventions



Micro-level approach: single intervention by actors involved in the concerned stage e.g. technical solution

Meso-level approach: supply chain intervention from 'farm to fork', several actors are working together, this includes R&D to identify innovative solutions, awareness raising, investment etc. e.g. new market with new variety

Macro-level approach: addresses the systematic causes of FLW in a Food System approach includes policy and regulatory framework, supports actions at meso- and macro level, e.g. national strategy for a sector to reduce FLW

3. Roundtable: Literature study on FLW hotspots

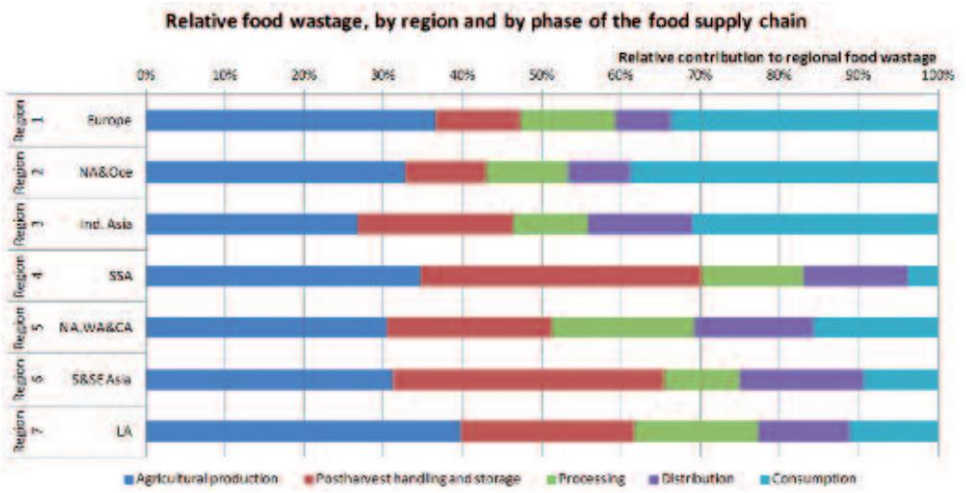
Hilke Bos-Brouwers

Backdrop Food Loss & Waste issue

META-TRENDS

- Rapid Urbanisation
- Climate change and resource scarcity
- Shift in global economic power
- Demographic and social change
- Technological breakthroughs

FLW: 1/3rd of all food produced gets lost among the food value chain: 3.3 Gtonnes/year globally FAO, 2011



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FLW in India

FW generation can be expressed as the total weight of FW per year (tons/year) and per capita (kg/year or kg/day), or by associated/indirect effects on environmental / social / economical parameters.

FLW in India: Approx. 71.95 Mtonnes / year; approx. 21.9 kg/pppy

Source: Bao et al., 2015

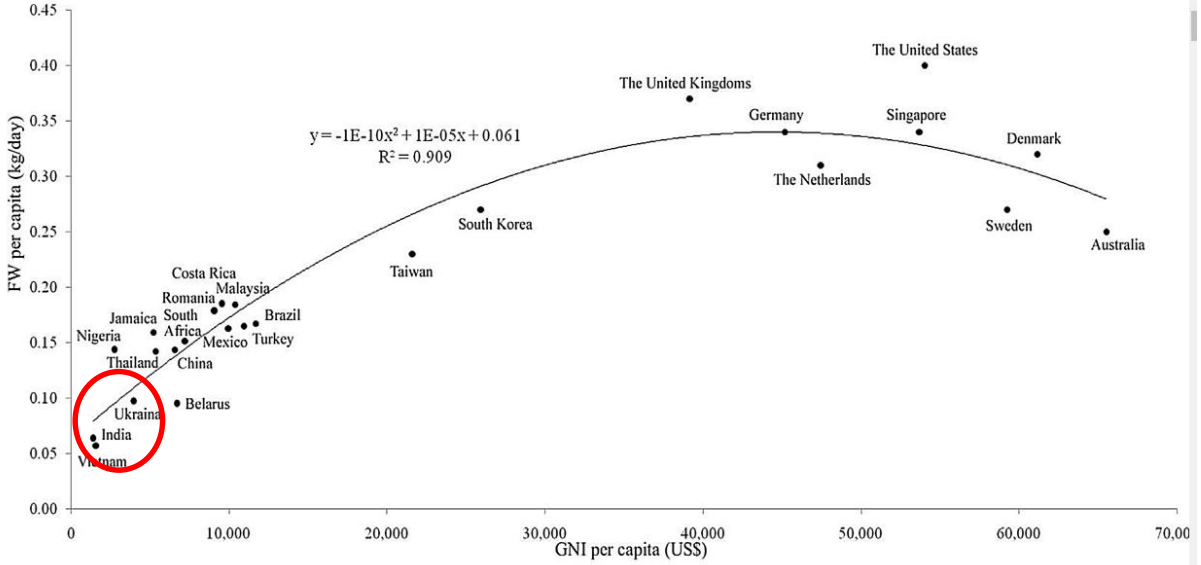


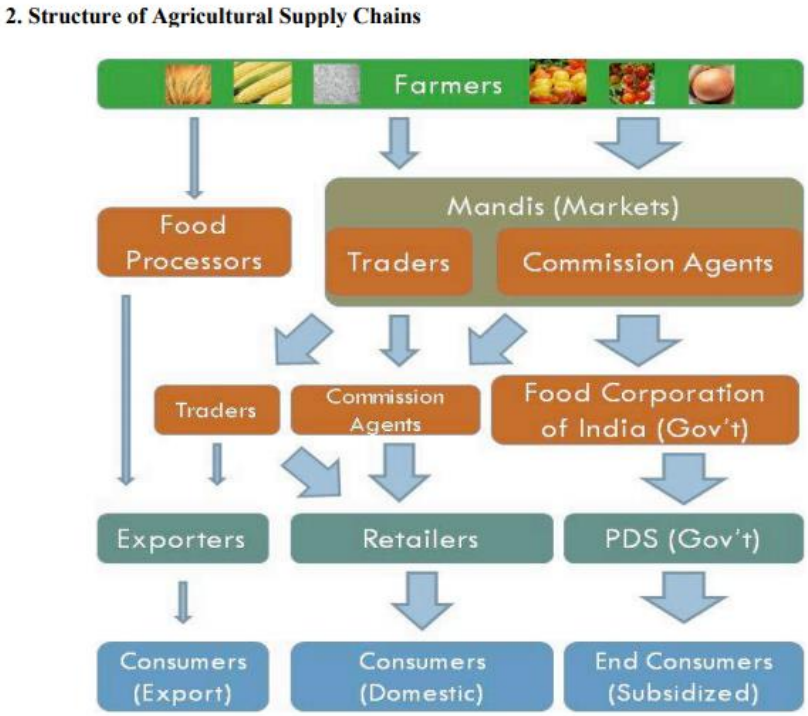
Fig. 1. Relationship between GNI per capita and FW per capita in some countries.

FLW includes by-products and waste products from the FSC, derived from agricultural residues and MSW generation

Source: Yadav et al., 2016

Hotspots for FLW generation

- Infrastructure
  - Storage
  - Roads & transportation
- Government purchase &
- distribution schemes
- Tradesmen, bargaining power & price transparen
- Price Volatility
- Financing, Education & training



Source: Artiuch & Kornstein, 2012

Hotspots for FLW generation

- Post-harvest unit operations, e.g. threshing, winnowing, drying, packaging, tranpsoration
- Food wastage at subsidized large wet markets for further distribution to retailres and supermarkets due to problems of poor cold storage facilities, particularly for fruits & vegetables

Source: Jha et al., 2015

- Infrastructural incapacities
- Primivite technology
- Absence of refrigeration facilities
- Lack of space
- Other logistic issues

Source: Khanna, 2016

Hotspots for FLW generation

At weddings, religious festivals, restaurants, other festivities:

- Surplus from buffets: more on offer than consumed
- High plate waste: more on plate than consumed
- Low frequency of surplus donation to NGOs/charitable organisations although foodie-bags are common phenomenon.
- Incorrect freezing / refrigeration practice in the kitchen

Source: Bharucha, 2017

Hotspots for FLW generation: Post-harvest losses

1. Lack of proper storage facilities
2. Improper handling of the products at farm & market place
3. Lack of proper packaging facilities
4. Insufficient infrastructure
5. Lack of processing facilities
6. Lack of linkage among the farmers and processing units
7. Lack of backward-forward integration from farmer to consumer
8. Lack of linkages between institution, industry and government
9. Lack of linkages in the marketing channel
10. Lack of proper record keeping, tracking, and traceability facilities
11. Lack of knowledge of post-harvest technologies
12. Lack of knowledge about quality seeds
13. Insufficient food processing technologies
14. Lack of knowledge regarding demand in the market
15. Climate and weather conditions
16. Large number of intermediaries

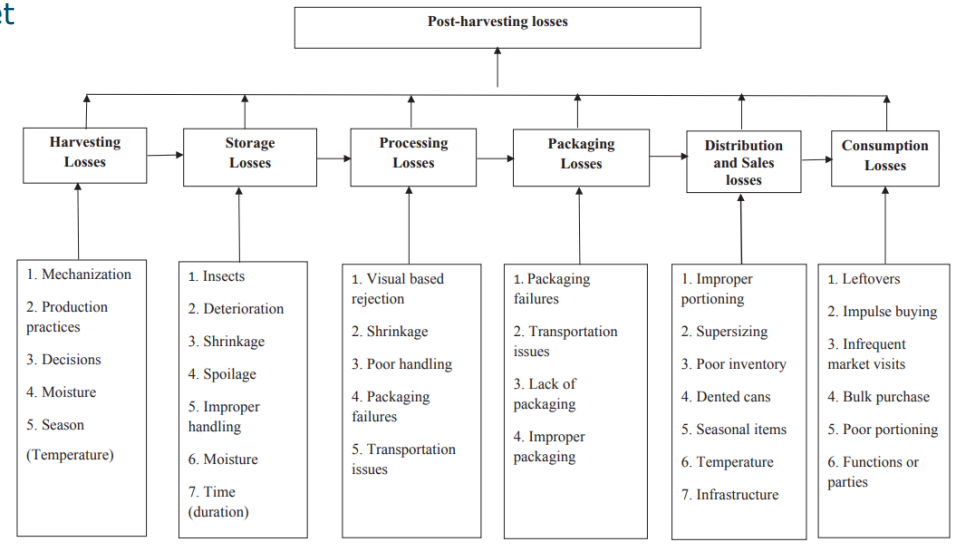


Fig. 1. Post-harvesting losses conceptual model (modified from Accorsi et al., 2014; Aulakh and Regmi, 2013; Gardas et al., 2017a; Papargyropoulou et al., 2014).

Source: Bhaskar et al., 2018; Raut et al. 2018

Hotspots for FLW generation: Post-harvest losses

- **Cold chain** – lack of cold chain infrastructure from producer until consumer (incl. storages, transport, refrigeration equipment);
- **Post-harvest handling** - absence of knowledge and equipment, and poor methods for sorting and grading of product; poor pre- and post-harvest crop protection;
- **Packaging** – inadequate packaging of product in storage and during transport;
- **Infrastructure & connectivity** - poor quality of roads and of public utilities (water, energy) hampering the movement and storage of food;
- **Market** – poorly functioning marketing systems with a lack of information on market supply/demand and prices; fragmented market structure creating market inefficiencies;
- Processing capacity - lack of adequate facilities for processing of second and third quality produce;
- **Quality standards** – poor product quality, but also a lack of knowledge (understanding) of food safety standards, product quality and quality monitoring;
- **Education / R&D** – workers in post-harvest chains lack skills and training to operate technology in accordance with post-harvest (quality) protocols; lack of R&D facilities for local post-harvest research; poor extension and information services;
- **Investment capacity** – absence of (affordable) capital for investment in PHM measures.

Van Gogh et al., 2017

Hotspots in FLW management

- Poor recycling activities, mainly landfill of organic wastes, approx. 6% is composted
- AD pilot plants experience technical failures, inadequate operations or management regulations

Source: Bao et al., 2015

- Focus on biofuel production leads to underutilization for value-added products from agro-waste streams
- Legislation for efficient disposal & source separation for MSW is affected by paucity of resources, lack of in-house capabilities, inability to outsource activities, and insufficient funds and staff, resulting in poor compliance.

Source: Ong et al. 2018

3. Roundtable: Sharing experience from establishing a National Agenda on Food Loss and Waste – Food Waste Free United

(shortened version)

Toine Timmermans

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NL

TOPSECTOR
TUINBOUW & UITGANGSMATERIALEN

FOOD WASTE FREE UNITED

Sharing experience from establishing a National Agenda on Food Loss and Waste

toine.timmermans@wur.nl

www.samentegenvoedselverspilling.nl

Refresh

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Samen Tegen Voedselverspilling: Pillars for action

1. Monitoring progress and impact:

United Against Food Waste measures the effects of its individual and joint approach.

2. Joining forces to combat food waste across the food supply chain:

Stakeholders and leaders combine their strenghts, network and knowledge to develop innovative solutions.

3. Joining forces to combat food waste by consumers:

United Against Food Waste aims to achieve sustainable changes in behaviour through campaigns, interventions and living labs.

4. Changing the rules:

United Against Food Waste promotes the legislation and instruments needed to create a circular economy.

FOOD WASTE FREE UNITED

SAMEN TEGEN VOEDSELVERSPILLING

FOUNDING FATHERS

Provincie Noord-Brabant

MEIERIJSTAD

Ministerie van Landbouw, Natuur en Voedselkwaliteit

Rabobank

FOODTECHBRAINPORT

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STAKEHOLDERS

Google

Stichting Albron

SCELTA

Hutten
Altijd meer aandacht

Unilever Food Solutions

MAISONVANDENBOER

PEPSICO

HORECAVA

Nature's Pride

WE DESIGN FOOD

MAGIE CREATIONS

GROENTE & FRUIT BRIGADE

JUMBO

milgro
the recircle company

NVAD

NATUUR & MILIEU

COV

VNV

oost nl

BILDERBERG EVENTHOTELS

MVO NEDERLAND

soupa licious

IntelligentFood

MOONEN packaging

AgriFood Capital

Hello FRESH

KRUSH

Kleine Parties

vanRijsingen green
the vegetable circle

BOM

IQ

LambWeston
SEEING POSSIBILITIES IN POTATOES

Leanpath

Vion

orcado

onethird

eerlijk over eten
Voedingscentrum

KIPSTER

KEEP IT
The Indicator

LIOF

eyeon
YEARS AHEAD

INSTOCC

ABN·AMRO

milieu centraal

Cosun

TUTTIFOODI

oerlemans packaging group
the sustainable innovator

VOEDSELBANKEN.NL

Orbisk

NO FOOD WASTED

CONTRONICS
dry misting

PROTIX

wasteless
Reducing food waste.

DARLING INGREDIENTS

winnow

wastewatchers

SFYN

RIJK ZWAAN

Too Good To Go

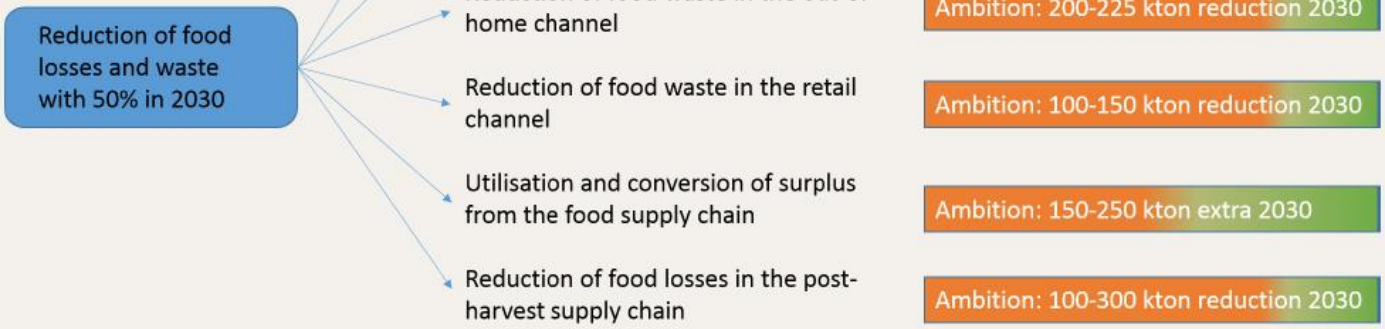
Nevedi

NOM

Sligro

6 Roadmaps en portfolio analysis

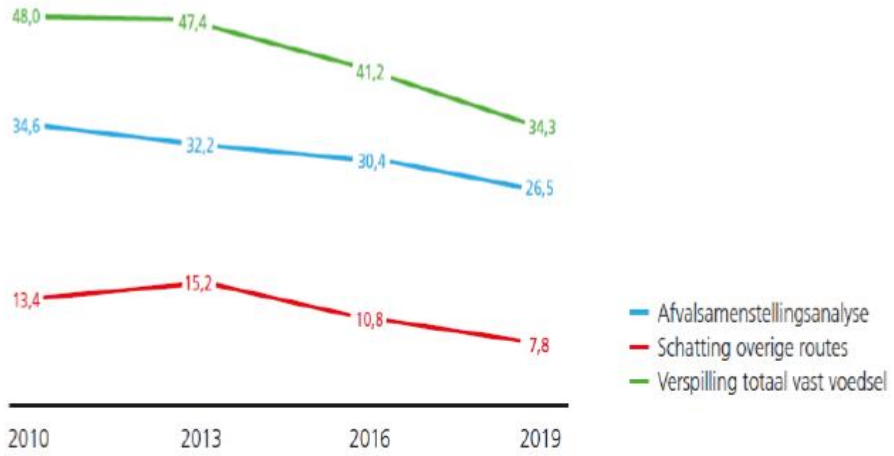
Roadmaps, routes towards impact in 2030



SAMEN TEGEN VOEDSELVERSPILLING
PURE WINST

Food waste at consumption stage

Dutch are on the front food in the fight against food waste. In 2019 the rate of food waste per person was 34.3 kg: nearly 7 kg less than in 2016.



Bron: Voedingscentrum, Syntheserapport Voedselverspilling bij huishoudens in Nederland in 2019

SAMEN TEGEN VOEDSELVERSPILLING

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3. Roundtable: Breakout Session 1

Building the strategic framework for action in India

Breakout Session 1 – Building the strategic framework for Action in India

Facilitators:

Toine Timmermans

Bob Castelein

Dr. Srikanth Rupavatharam (ICRISAT)

Rajsashri Sai (Impactree Data Technologies)

Sritanu Chatterjee (Ministry of Foreign Affairs, Netherlands)

Ashutosh Upadhyay (NIFTEM)

Angshuman Siddhanta (NCCD)

Bhairavi Jani (SCA Group)

Arava Bhagwan (SKLTHU)

Rene van Berkel (UNIDO)

Bishow Parajuli (World Food Programme)

Pradnya Paithankar (World Food Programme)

Claire Kneller (WRAP)

Raman Ahuja

Shri Nanda Kumar

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Setting priorities: What should be prioritized on the agenda ('low hanging fruits'/more advanced steps)? Which objectives and actions can we define together?

- Drivers:
  - Inadequacy of (perishables) storage (climate change context)
    - Solar energy/renewables for cold storage?
    - Packhouses
    - Reduce SHF losses
  - Markets: Farmers' access to market (see storage), price stability
  - Transportation – reefers
  - Not lack of technology
  - COVID19 as gamechanger: farmers adapt (entrepreneurship), skills awareness (farm management)
  - New ways to reach local markets
  - > entrepreneurship, skill development

2. Operationalization: How can we operationalize what is said? Which actions can we define together? What are important elements? How would you like it to function? What would work best in India?

- Problems of storage and market access in context of supply chain
  - What are gaps?
  - Cold storage to farm gate
  - Involve intermodal transport (reefers)
- Financing
- Standards: food safety, hygiene
- Technology, e.g. early warning systems

3. Getting started: How to start? Who else should be on board?

Where to generate funds? **Next concrete steps?**

- E.g. World Bank funding for cold chain development
    - Starts with entrepreneurship, competences
- Initiative of government/private sector?
- Training solutions
- Processing to mitigate seasonality/risk

Roundtable: Breakout Session 2

Rice and Grains & Service Providers

Participants Breakout Session 2 – Rice and Grains & Service Providers

Facilitators:

Hilke Bos-Brouwers

Melanie Kok

Taranjeet Singh Bharma (AgNext)

Pankaj Sharma (Bayer AG)

C Sashidhar (ITC Limited)

Ashutosh Kumar Sinha (LT Foods Limited)

Cheryl E. Van Seventer Harrison (Vivia)

Edwin Willemsen (vQm Packaging B.V.)

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Setting priorities: What are your priority areas to be focused on ('low hanging fruits'/more advanced steps)? Which objectives and actions can we define together?

Discussing PRE-harvest & POST-harvest priority areas

PRE-harvest

- Production losses in India are high (yield gap), also influenced by climate conditions (drought/moist), pests and diseases
- Better seeds, agricultural practices, packaging for higher yields, but also to match the demand from the market/consumers + allowing for maintaining quality really create cross-supply chain interaction

POST-harvest issues

- Improving storage conditions & monitoring, at facility and with packaging options
- Necessity that solutions have a business case: it must be affordable and profitable
- Packaging for quality & handling as priority issue
- Improving transportation (incl. shortening of lead-times) between farm and storage (and beyond).
- Replacement of jute bag as packing material.
- Access to markets, especially international markets. Regulations, packaging, certification.
- Improve on funding & payment systems (inefficiencies in the banking system)
- Political system is often difficult to navigate
- Role of insurance claims

2. Getting started: How to start? Who else should be on board? **Next concrete steps?**

Very ACTION oriented! Let's start

- Much interest in piloting a SUCCESS STORY on the Rice case: to encourage collaboration, showcasing solutions, and making use of existing opportunities of the Members to the taskforce.
- Attract more stakeholders to the taskforce, including government and finance/insurance sector
- Establish initial funds for the initiation phase, now that there is building momentum.

→ Also: Bring attention for building the taskforce, attracting more frontrunning Members, to work on shared ambitions & creating a portfolio of appropriate action (inclusing measurement)

3. Roundtable: Breakout Session 3

Perishables & Service Providers

Breakout Session 3 – Perishables (fruit and vegetables, milk) and Service Providers

Facilitators:

Han Soethoudt

Swathi Vurrakula

Dr. Rahul Michandani (Aries Agro)

Uschi Koelzer (Bayer AG)

Anbu Sezhiyan (Broekman Logistics)

Alok Divatia (Himalayan Essence)

Brajendra Singh (NCCD)

Sudhir Sitapati (Unilever)

Thea Koning (Unilever)

Karthik Jayaraman (Waycool Foods and Products)

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Setting priorities: What are your priority area's to be focused on('low hanging fruits'/more advanced steps)? Which objectives and actions can we define together?

- Make the supply chains faster and shorter.
- Better predictive models for matching demand with supply and transfer of this info to farmers to produce accordingly.
- Increase agri productivity as this is the root cause of FLW to ultimately increase food processing levels for consumer accepted processed commodities.
- Give better inputs like seeds with increased productivity and better shelf life.
- Capacity building of small and marginal farmers and promoting agri entrepreneurship on pre and post harvest aspects as well.
- Focus on maintaining quality of produce, starting with on-farm practices.
- Dedicated areas where expensive processing can be connected to export markets.

Operationalization: How can we operationalize what is said? Which actions can we define together? What are important elements?

- Logistics part the Breakout Session partners can take care.
- Would like supply models from WUR.
- Contract farming is an important element.

3. Your role: What will be your own role? What do you need to continue on this collaboration?

- Can contribute with inputs – Right breeds and varieties from Bayer and nutrient inputs from Aries Agro.
- Needed- is better legal frameworks for contract farming.

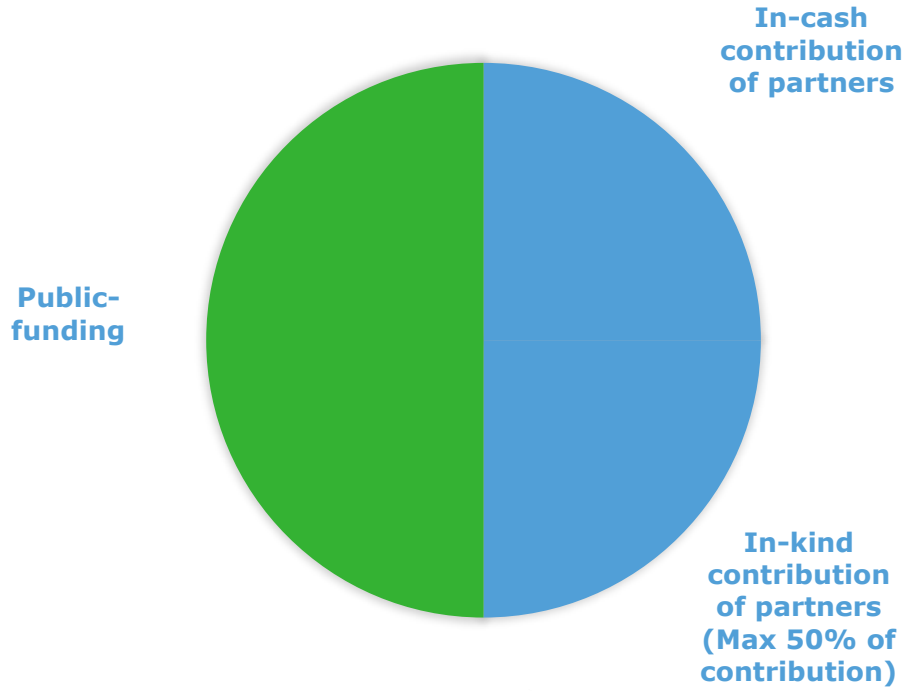
4. Getting started: How to start? Who else should be on board? **Next concrete steps?**

Continue the discussions of this group to further discuss next steps.

3. Roundtable: Funding options for next steps

Heike Axmann

Public-Private-Partnerships (PPP) via the Dutch Topsector for Knowledge and Innovation (TKI)



- Public-Private-Partnerships (PPP) are projects with a **financial (in-cash**) and **in-kind** contribution of industrial partners in pre-competitive research with public funding from the Dutch Government
- Projects must fit within the Dutch Knowledge, Innovation Agenda
- **Most have: strong Dutch consortium**
- Proposal 2021, funding earliest 2022

Topsector Agri& Food

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Seed money project via the Dutch Topsector for Knowledge and Innovation

- Seed Money Projects (deadline ~ Dec 2020)
- Projects must fit within the Dutch Knowledge, Innovation Agenda
- Set up a consortium, follow up project
- A precondition: strong Dutch consortium

Topsector Agri & Food

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India-EU Cooperation on Research & Innovation

- Subtopic E. [2021] Reducing food losses and waste at every stage of the food chain including consumption, while also avoiding unsustainable packaging (IA)
- Deadline for proposal submission: 26 January 2021 17:00:00 Brussel

4. Discussion and next steps after Roundtable

- Discussions during the roundtable highlighted what should be the first priorities.
- First movers are very motivated to set up a National Task Force against FLW.
- However, such a National Task Force does need around the world substantial public and private funds.
- Those funds will need to get generated over time, right now they are not available.

4. Discussion and next steps after Roundtable

- Follow up will take place in a 'step-by-step' approach:

  1. Pilot projects to build success stories with a limited group of first movers in a supply chain approach, focus crops likely rice and tomatoes

  2. Building momentum for more stakeholders to join the initiative e.g.:

  - show case successes
  - highlight need for FLW reduction e.g. via high level missions like incoming mission of minister Kaag in 2021, the annual plan 2021 of the Dutch embassy in India
  - Integrate FLW in other planned projects like e.g. fresh for e-commerce

5. Wins for the Dutch Embassy in India

- Showcased to the Indian participants Dutch knowledge and leadership in this field.
- Intensified existing relations and established new relationships in India, the Netherlands, and beyond.
- Better idea of the drivers and challenges related to this subject matter in India.
- Demonstrated that the Dutch embassy, and therefore the BV Netherlands, is not only a partner for technical solutions, but moreover for achieving circular food chains and progress on SDG 12.3.

Thank you for your attention!

Contact details:
heike.axmann@wur.nl

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