Climate Smart Coffee Sourcing

TKI SMP: Initial scan climate effects and further collaboration options
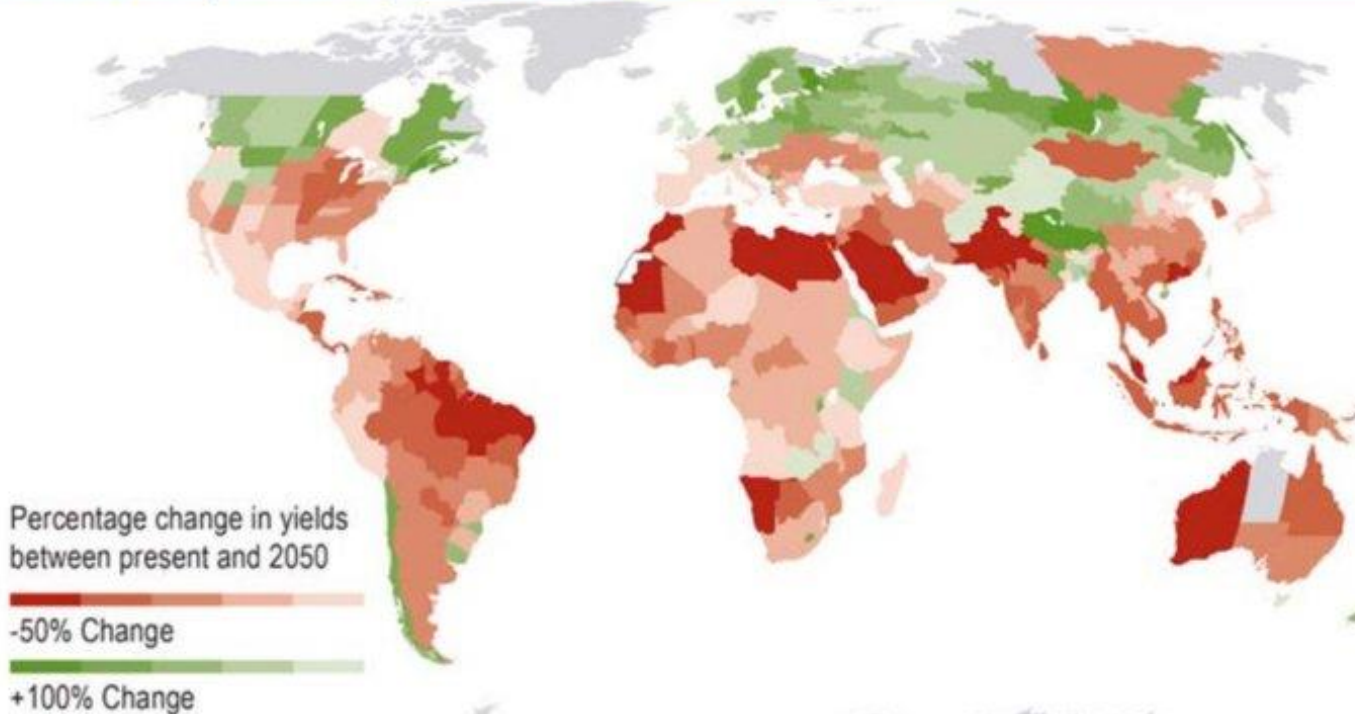
Willem Ruster, Marcel van Asseldonk, Wil Hennen, Niels Anten (WUR)
Giacomo Celi (Mercon B.V.)

12 Dec 2019 [*draft results*]

Crop production and climate change

Impact on crop yields of a 3°C rise in temperatures

Percentage change in yields between present and 2050

-50% Change

+100% Change

No Data

Source: WRI

However,

How to link these disruptive changes to your specific sourcing channel?

&

How to improve the climate resilience of Agri Sourcing?

In 2018, Dutch agri trade was €151bn, while also many Dutch F&B producers with local facilities abroad build upon multiple local agri sourcing channels

Intro Climate Smart Agri Sourcing

Agri sourcing is increasingly under pressure due to effects of climate change

- Longer drought periods, erratic rainfall, increasing temperature
- More and more research provide evidence of impact on agri production

This changes risk profiles stakeholders in agri supply chains, but also creating opportunities for new sourcing areas

Through climate-proof sourcing of agricultural products, agri-food sector has an opportunity to make its supply climate resilient including farm communities

Within this TKI seed money project (SMP), we further explored options for (international) collaboration on climate smart agri sourcing and executed a pilot on coffee in Ethiopia

Objective SMP Climate Smart Coffee Sourcing

1. Execute a pilot for coffee sourcing in Ethiopia

2. Explore international partnerships to develop a stepwise approach to adapt agro sourcing to climate change
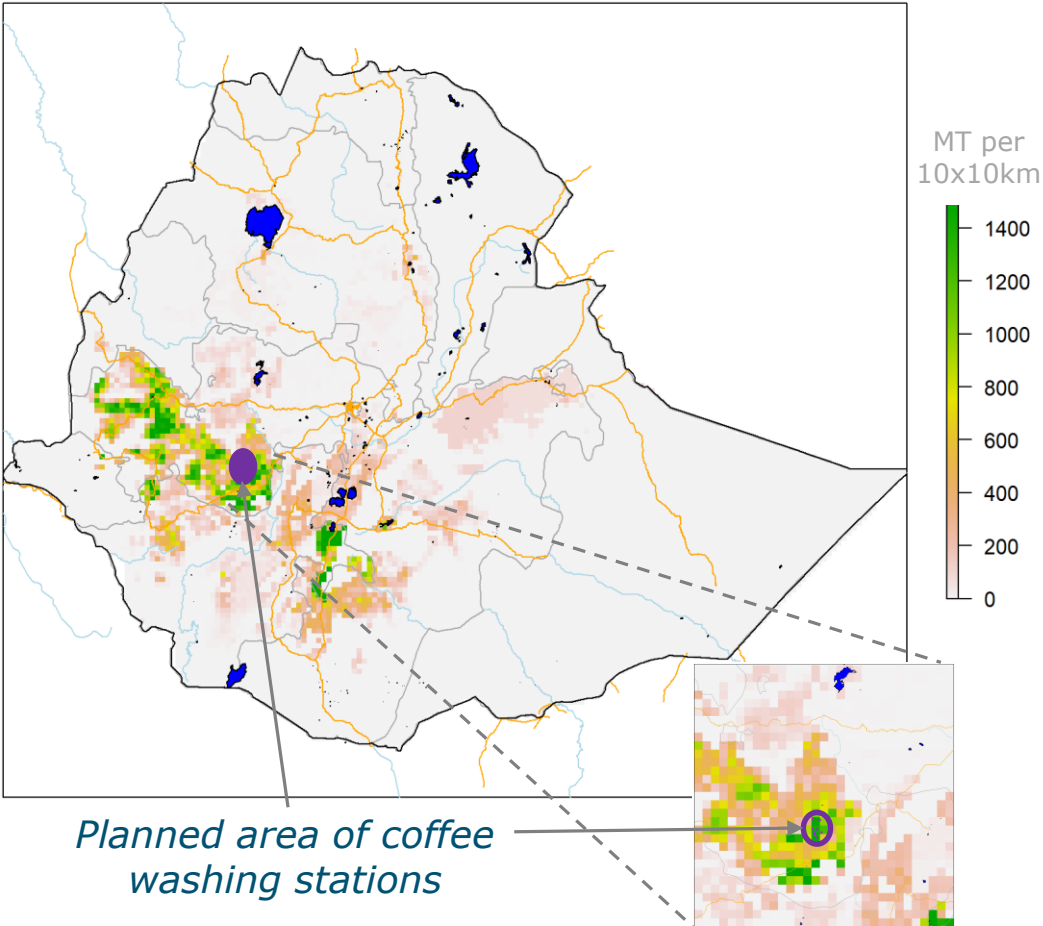
> → *From a sourcing perspective:*
> *What can buyers can do in current and new agri production areas?*

The research time available in the TKI SMP is limited, and therefore the focus is on an initial scan of effects based on available data and a selection of interviews

WAGENINGEN
UNIVERSITY & RESEARCH

100years
1918 — 2018

The Coffee Pilot (Ethiopia)

Case background

Coffee production in Ethiopia

MT per 10x10km

1400
1200
1000
800
600
400
200
0

Planned area of coffee washing stations

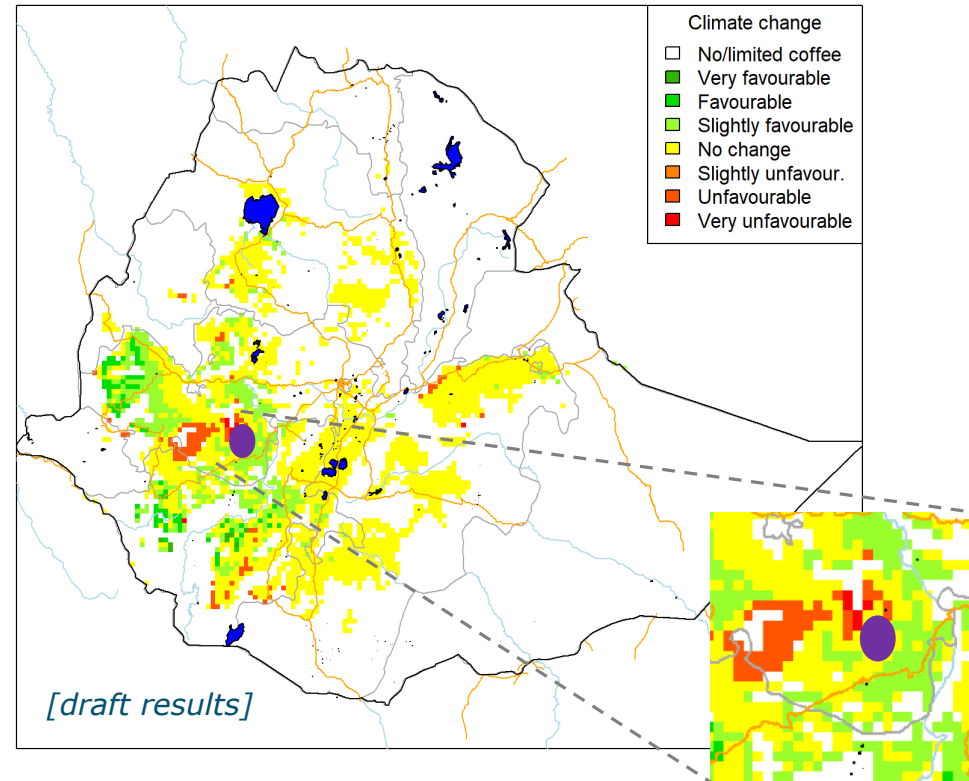Mercon is a vertically integrated global green coffee supplier with HQ in NL

It currently explores new operations in Ethiopia and has interest in future climate risks of Arabica coffee sourcing

Mercon considers 8 (potential) washing station options in Ethiopia (see map)

Note: coffee production estimates based on 10-year average of 0.7 MT/ha (2008-2017)

6

Is the optional area for washing stations at risk?

Climate opportunities/risks for coffee production

Climate change legend:
- ☐ No/limited coffee
- ■ Very favourable
- ■ Favourable
- ■ Slightly favourable
- ■ No change
- ■ Slightly unfavour.
- ■ Unfavourable
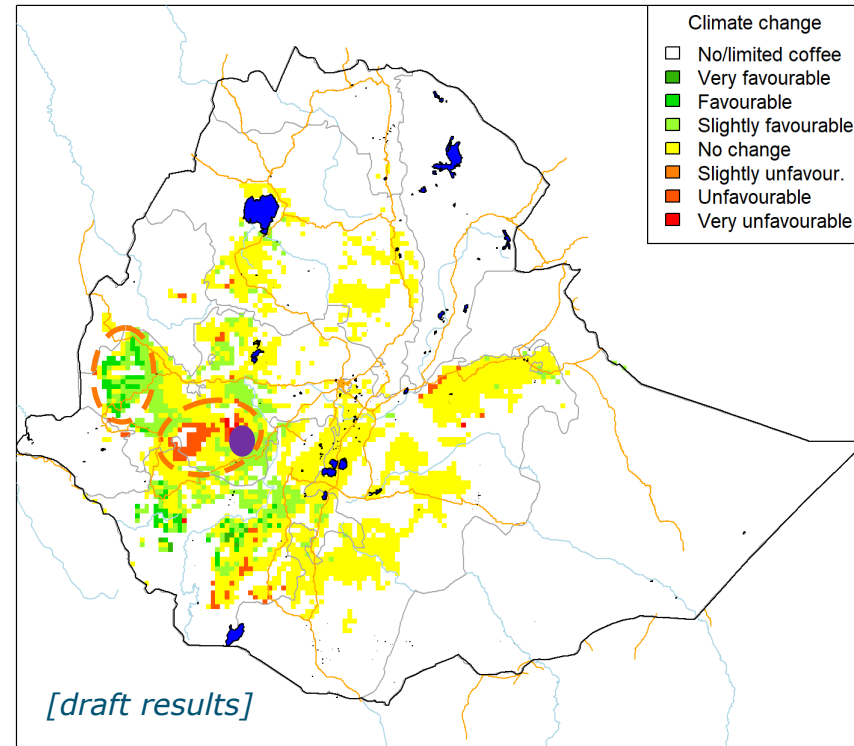- ■ Very unfavourable

[draft results]

Risks scanned in current Arabica coffee production areas based on 2019 and 2050 climate conditions (i.e. climate envelope approach)

The 8 potential locations are analysed as one area (i.e. not separately due to limited data detail)

Initial risk insights provide a mixed picture (see zoom in) with areas (slightly to very) unfavourable, no expected change and slightly favourable

7

What coffee areas will face climate risk?

Climate opportunities/risks for coffee production

Climate change
☐ No/limited coffee
🟩 Very favourable
🟩 Favourable
🟩 Slightly favourable
🟨 No change
🟧 Slightly unfavour.
🟧 Unfavourable
🟥 Very unfavourable

[draft results]

When considering all current production areas in Ethiopia, the scan highlights that most areas expect limited change or slightly favourable up to 2050

However, areas with largest concentrations of more unfavourable conditions are concentrated near the planned Mercon locations (i.e. est. range: 15-40 km)

Largest concentration of (very) favourable conditions up to 2050 are mostly concentrated in the far-West

Learnings of coffee pilot

The scan provides initial insights in coffee sourcing areas, which can be used for prioritization of further research (i.e. a longread is separately available)

To enable the identification of climate risk management options, further research should include more detailed:
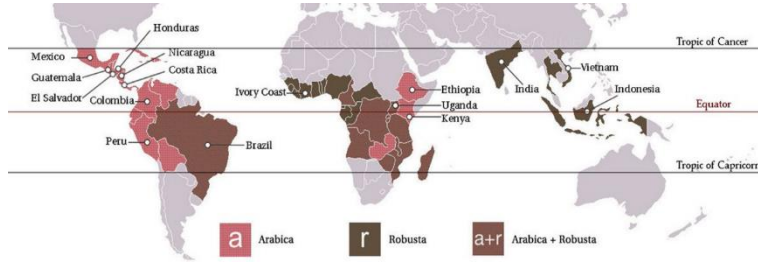
- Information (e.g. smaller grids, yield differences per region, etc.) and more detailed expert verification

- Climate modelling (incl. annual data) linked with plant growth models

Collaboration options Climate Smart Agri Sourcing

Much interest in climate smart agri sourcing

Will the coffee belt shift?

How will sourcing areas be affected by 2030?

Extreme drought causes EU vegetables 'most serious' crisis in 40 years

EURACTIV.com   📅 Aug 7, 2018

How to cope with climate effects on the short and medium term?

Significant reductions in field yields are reported for peas and beans ranging from 20% up to 50%. Europe's prolonged extreme drought has caused the most severe problems to the EU vegetable sector in the last 40 years, according to the European Association of Fruit and Vegetable Processors (PROFEL).

Collaboration options: TKI PPS

Aug 30, we submitted a PPS proposal 'Climate Smart Agri Sourcing' for 2020-23 at the Dutch topsector Agri & Food, indicating the following partners:

- VIGEF – fruit & vegetable in Western Europe
- Heineken – barley, rice, sorghum in Africa
- Mercon Coffee – coffee (country TBD)
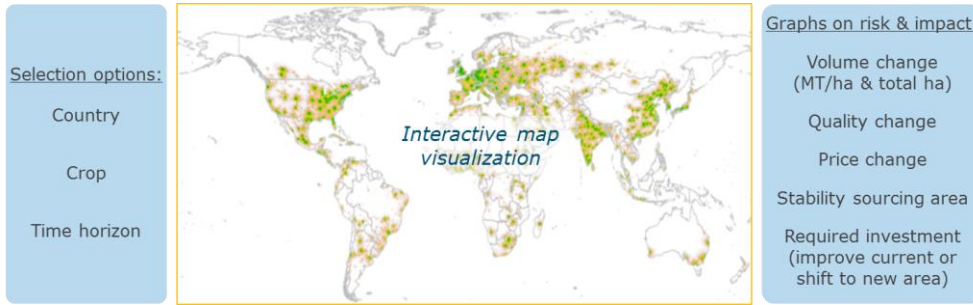- Rabobank and ICCO – grains in Ethiopia

Between Aug 30 – Nov 1, more parties indicated serious interest, a.o.: global initiative Coffee & Climate, Olam, ETG and the African Cotton Foundation (ACF)

Unfortunately, the PPS is declined early Nov based on the following feedback:
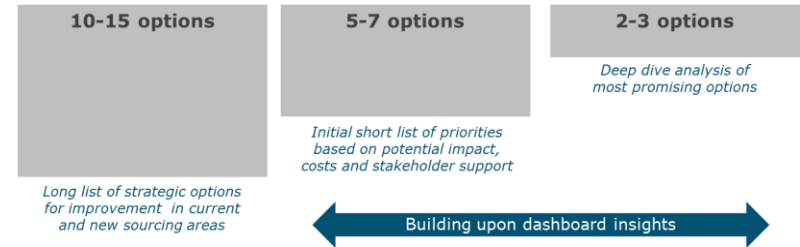
- High quality proposal & consortium, good description of knowledge development and its effect on the market
- Low suitability & impact, limited technological content (you could procure such application?), little innovation (more organizational), limited explanation of expected breakthrough

Development of PPS Climate Smart Agri Sourcing

1. Dashboard: insights in climate risks in current sourcing areas, and opp's in new areas

2. Strategic improvement options to manage climate risks

Selection options:

Country

Crop

Time horizon

Interactive map visualization

Graphs on risk & impact:

Volume change (MT/ha & total ha)

Quality change

Price change

Stability sourcing area

Required investment (improve current or shift to new area)

10-15 options	5-7 options	2-3 options
		Deep dive analysis of most promising options
Long list of strategic options for improvement in current and new sourcing areas	*Initial short list of priorities based on potential impact, costs and stakeholder support*	

Building upon dashboard insights

We aimed at two deliverables: (I) dashboard infrastructure for insights on climate change effects on agri sourcing, and, (II) improvement options for specific agri products / regions
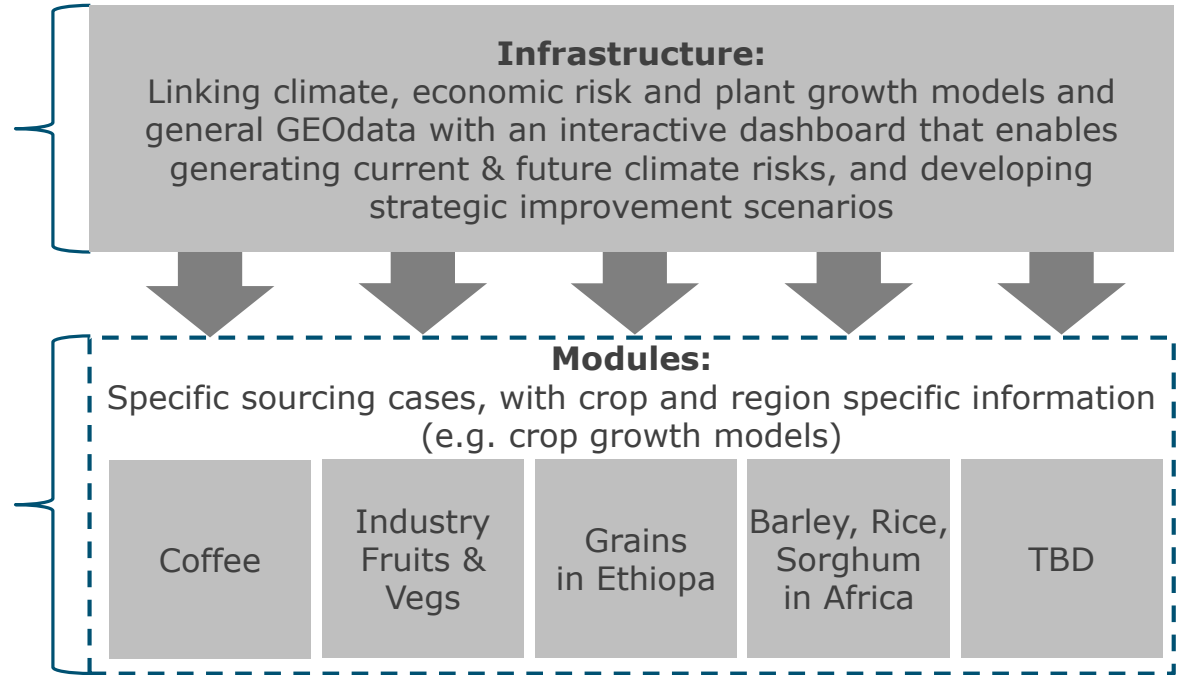
WAGENINGEN
UNIVERSITY & RESEARCH

100years
1918 — 2018

Overview of focus public & private involvement

Public sector funding:
Investment of Dutch government via Topsector institute Agri & Food (50% of PPS budget)

Infrastructure:
Linking climate, economic risk and plant growth models and general GEOdata with an interactive dashboard that enables generating current & future climate risks, and developing strategic improvement scenarios

Private sector funding:
either competitive or pre-competitive, (e.g. industry level) (25% budget in-kind, 25% cash)

Modules:
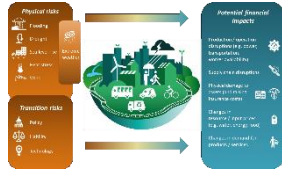Specific sourcing cases, with crop and region specific information (e.g. crop growth models)

| Coffee | Industry Fruits & Vegs | Grains in Ethiopa | Barley, Rice, Sorghum in Africa | TBD |

WAGENINGEN
UNIVERSITY & RESEARCH

100years
1918 — 2018

14

Suggested project approach

A — **User needs analysis:** actual and perceived climate risks

B — **Sourcing suitability scan** of agri sourcing areas based on economic, social and climate info

C — **Detailed climate trends** in agri production areas based on GEOdata & models

D — **Detailed crop effects** combining climate change insights with plant and soil conditions

E — **Improvement options climate smart sourcing**: Identify and prioritize options based on impact crop yield & quality, financial costs-benefits and support per actor.

What infrastructure?

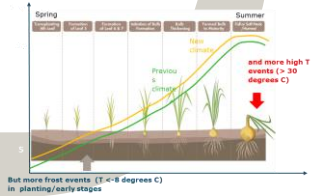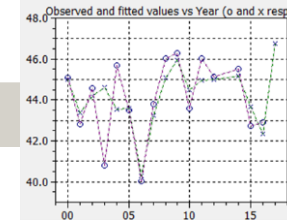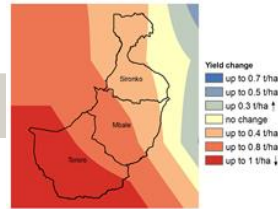Phase A

Climate risk identification

Phase B
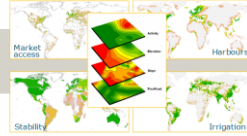
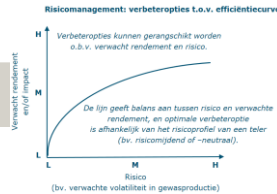*Risk prioritization per area and general agri suitability scan*

Phase C
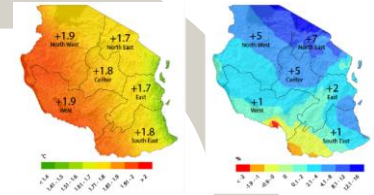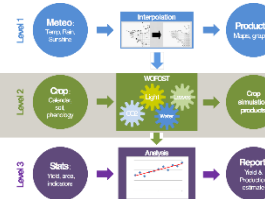
Linking climate modelling with crop production

Integrated in:
Monitoring Dashboard (I)
&
Strategic Improvement Scenarios (II)
for Climate Smart Agri Sourcing

Linking effects on crop production with climate risk management options

Phase E

Phase D

Connect different models, data, disciplines to enable efficient and thorough insights in climate risks and improvement

WAGENINGEN
UNIVERSITY & RESEARCH

16

Collaboration options: How to proceed?

Several parties are keen to explore alternative (pre-competitive) collaboration on better understanding climate risks & improvement options for Agri Sourcing:

- **Global Coffee**: Mercon, Coffee & Climate, Olam and other coffee parties. Draft proposal shared with interested parties on Dec 5 (i.e. start with ≥5 parties)

- **Sourcing in Africa**: Heineken, ETG, African Cotton Foundation, Olam: plan a meeting in January to discuss options and willingness to start 1st phase

- **Fruits & Vegs in Europe**: continue with VIGEF pilot, but more limited scope and continue exploring pre-competitive collaboration options

What institutions and instruments could support Climate Smart Agri Sourcing research to support both the public & private interest in more climate resilient agri sourcing channels?

Next steps

- Final SMP meeting with participants (Jan 2020): Mercon, Simon Lévelt, Orchid Coffee Export (local partner Mercon), Ethiopian Coffee & Tea Authority

- Further develop collaboration options on Global Coffee, Sourcing in Africa and Fruits & Vegs in Europe (incl. identification public funding opportunities)

- Develop a long term research agenda on Climate Smart Agri Sourcing

More info?

Willem Ruster

willem.ruster@wur.nl

+31 6 4383 5588

The research team

From Wageningen Research, the following key experts will be involved to be able to meet the multi-disciplinary competences and expertise required for this research:

- **Marcel van Asseldonk**: Climate change and economic risk management (https://www.wur.nl/en/Persons/Marcel-dr.ir.-MAPM-Marcel-van-Asseldonk.htm)
- **Sander Janssen**: Earth informatics, climate modelling (https://www.wur.nl/en/Persons/Sander-dr.ir.-SJC-Sander-Janssen.htm)
- **Jan Verhagen**: Plant research, climate impact on crop growth (https://www.wur.nl/en/Persons/Jan-dr.ing.-A-Jan-Verhagen-MSc.htm)
- **Rob Stokkers**, Economic and plant research in horticulture and arable crops (https://www.wur.nl/en/Persons/Robert-ir.-R-Robert-Stokkers.htm)
- **Roel Jongeneel**: Agricultural policy, economic agri commodity market analysis (https://www.wur.nl/en/Persons/Roel-dr.ir.-RA-Roel-Jongeneel.htm)
- **Tomaso Ceccarelli**: Geographical information systems and food security (https://www.wur.nl/en/Persons/Tomaso-dr.-T-Tomaso-Ceccarelli-MSc.htm)
- **Willem Ruster**, Sustainability Management in Agri & Food (https://www.wur.nl/nl/Personen/Willem-WJ-Willem-Ruster.htm)