

Sustainable Global Food Systems

9 April 2021, 15:30 – 16:45 CET on Zoom
ETH for Development & World Food System Center

Welcome & Goals of the Meeting

Goals

- **Mutual Learning**
 - Learn about pressing issues for practitioners regarding sustainable food systems
 - Learn about current research at ETHZ
- **Planting the seed for future collaboration**
 - Funding opportunities with ETH4D and WFSC

Agenda

15:30: Welcome, Goals & Agenda

15:35: Pitches (max 5 min. per pitch + max 5 min. Q&A)

Dr. Fisnik Reçica (Swisscontact, Private Sector Innovations & Market Development)

Dr. Christian Andres (Sustainable Agroecosystems, D-USYS)

Oliver von Hagen (Barry Callebaut, Global Ingredients Sustainability)

Prof. Rachael Garrett (Environmental Policy Lab, D-GESS)

Stefanie Kägi (Helvetas, Sustainable Agriculture)

Prof. Jan Dirk Wegner (Ecovision Lab, D-BAUG; Data Science for Sciences, UZH)

16:35: ETH4D and WFSC Funding Opportunities and Wrap-Up

16:45: End

Dr. Fisnik Reçica, Swisscontact

Innovation Diffusion for Sustainable Agriculture Development

SWISS
FOUNDATION
FOR TECHNICAL
COOPERATION



Presented by:
Dr. Fisnik Reçica

Sustainable agriculture – Swisscontact approach

Economic dimension:

Strengthening Farmers' Livelihood

Environmental dimension:

Increasing environmental health, climate change mitigation and adaption

Social dimension:

Increasing social well-being of women and men farmers

Relevant Projects:

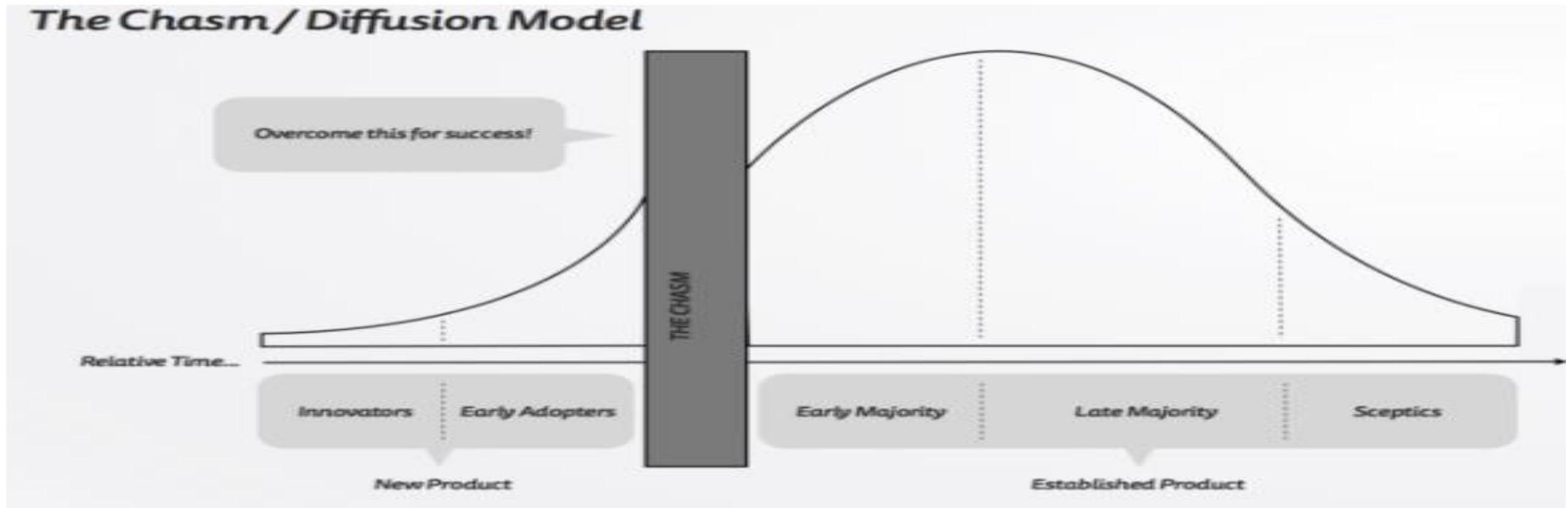
- BMMDP (Bangladesh)
 - ISA (Cambodia)
- Mercados Inclusivos (Bolivia)
 - PPSE (Kosovo)
 - SCPP (Indonesia)

- **Collaboration with HAFL (School of Agricultural, Forest and Food Sciences), Switzerland.**

Research Rationale

Sustainable agricultural productivity growth and modernization is affected *through adoption of innovations* (in *technology, inputs or production practices*).

Innovation diffusion often fails so *most of innovations end up in early adoption* and never reach the critical mass.



Research area/focus



Research area	Focus and objective	System actors	Reason
Diffusion of innovation	To validate and identify factors that incentivize innovation adopters, from early adopters to late majority and sceptics	NGOs, Companies, Policy Makers	Improve understanding of innovation diffusion models for effective implementation of development initiatives in sustainable agriculture;

Research area/knowledge gaps

- *Uncovered research area* that could *serve the system actors*.
- The *role of adopters* in influencing the *success and the speed of diffusion* in agriculture sector is *not well explored*.
- *Scarcity of research* on *obstacles to innovation diffusion* and *factors accelerating the diffusion process in sustainable agriculture*.
- *Differences in contextual related factors across countries* are *under-examined*, such as *traditional norms and practices* which usually prevail in the agriculture societies.

Opportunities for research collaboration



Cambodia

(Timeline 2021-2024)



**PROMOTING
PRIVATE SECTOR
EMPLOYMENT**

Kosovo

Initial key research questions:

What are the key drivers of innovation diffusion in sustainable agriculture (e.g. organic agriculture)?

What is the characteristic of an influential early adopter?

What are the roles of the different actors in promoting innovation diffusion?

What are the pain points in such diffusion?

What are the key steps to influence the diffusion?

Does the context matter?

Thank you for your attention!

Questions?

Dr. Christian Andres, Sustainable Agroecosystems, ETH Zurich

Research Focus

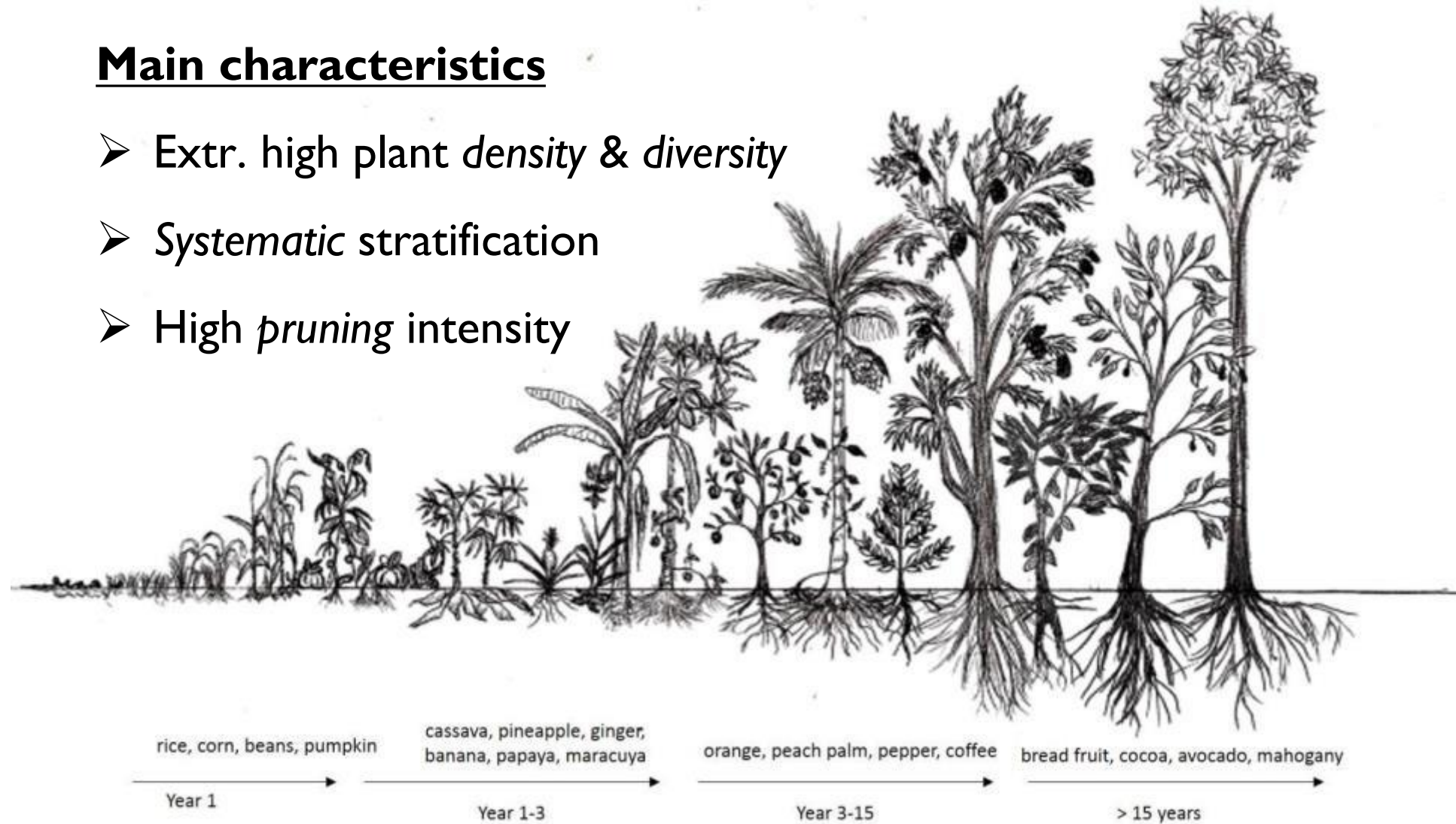
Dynamic agroforestry (DAF) to grow sustainable cocoa in Ghana

- > ½ of the world's cocoa grows in monocultures in WA that are vulnerable to climate change (CC)
- DAF: novel, high plant diversity, planting density & pruning intensity, systematic stratification, organic

What is dynamic agroforestry (DAF)?

Main characteristics

- Extr. high plant *density & diversity*
- *Systematic* stratification
- High *pruning* intensity

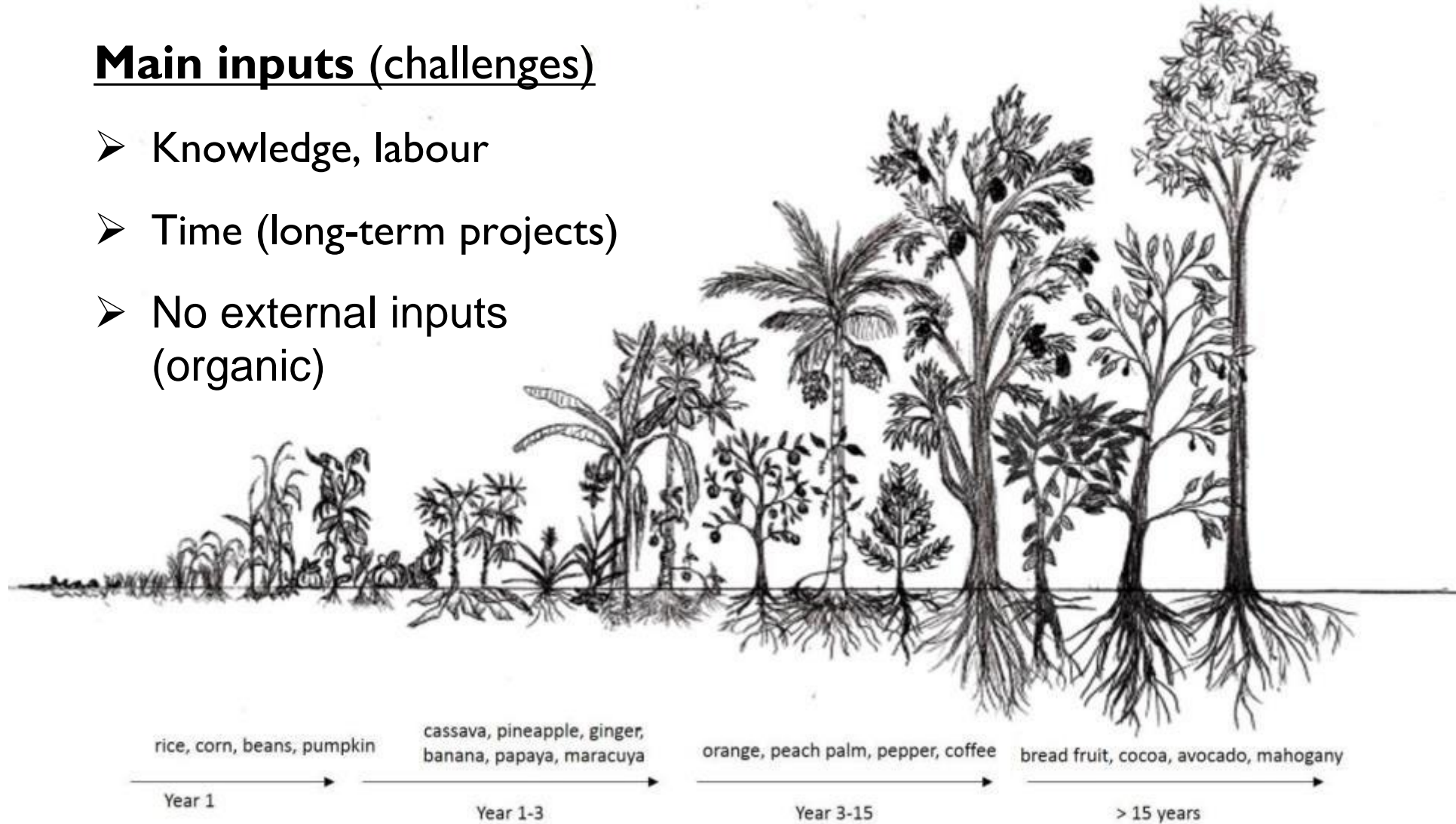


Source: Andres *et al.* (2016)

What is DAF?

Main inputs (challenges)

- Knowledge, labour
- Time (long-term projects)
- No external inputs (organic)



Source: Andres *et al.* (2016)

Agroforestry ≠ DAF

Main difference to “normal” agroforestry systems (AF)

- AF mostly **spontaneous/natural** systems, established from secondary forests with relatively minor interventions by humans
- DAF mostly **systematic/intentional**, established from scratch with relatively major interventions by humans

Agroforestry \neq DAF



Spontaneous/natural, often established from secondary forest

Agroforestry \neq DAF



Systematic, intentional, often established from scratch

Research Focus

Dynamic agroforestry (DAF) to grow sustainable cocoa in Ghana

- > ½ of the world's cocoa grows in monocultures in WA that are vulnerable to climate change (CC)
- DAF: novel, high plant diversity, planting density & pruning intensity, systematic stratification, organic
- Potential to restore soil fertility, mitigate and adapt to CC, improve livelihoods of smallholders
- We know little about the feasibility and socio-economic sustainability of DAF for Ghanaian farmers

- SANKOFA project (first SECO Call for Private Sector Co-Financing Facility by the Swiss Platform for Sustainable Cocoa) is setting up DAF plots in Western Ghana, which I monitor scientifically (biophysically, socio-economically and culturally)
- Non-academic partners: Chocolats Halba (Petra Heid), Ecotop Swiss GmbH (Dr Joachim Milz), Kuapa Kokoo Cooperative Cocoa Farmers and Marketing Union Limited (KKFU, Nelson Adubofour), International Trade Centre (ITC, Larry Attipoe)

Opportunities for Collaboration with Non-Academic Partners

- **Obtaining further** biophysically and socio-economic data to better understand DAF in the WA context (includes different type of data and access to practitioners (transdisciplinary on-farm research))
- Eventually engage in the necessary socio-cultural activities needed to unlock the transformative potential of DAF (transdisciplinary processes to bring DAF to a system-relevant scale)

- Is there interest from the non-academic partners to collaborate on DAF or also AF in general in order to improve the sustainability of the cocoa value chain?

Oliver von Hagen, Barry Callebaut

Your Organisation: Barry Callebaut Group

- Barry Callebaut sells about 2 million tons of chocolate and cocoa products in a year. These are produced in 61 factories worldwide.
- Barry Callebaut serves chocolatiers, pastry chefs, bakeries, hotels, restaurants as much as global, regional and local food manufacturers, which use our products as ingredients in their consumer products.
- We have launched Forever Chocolate, consisting of 4 key commitments:
 - More than 500,000 cocoa farmers will have been lifted out of poverty
 - Eradicate child labor from our supply chain
 - Become carbon and forest positive
 - Have 100% sustainable ingredients in all of our products
- We are already working with ETH on developing a highly automated tool to monitor land use change and stop deforestation.

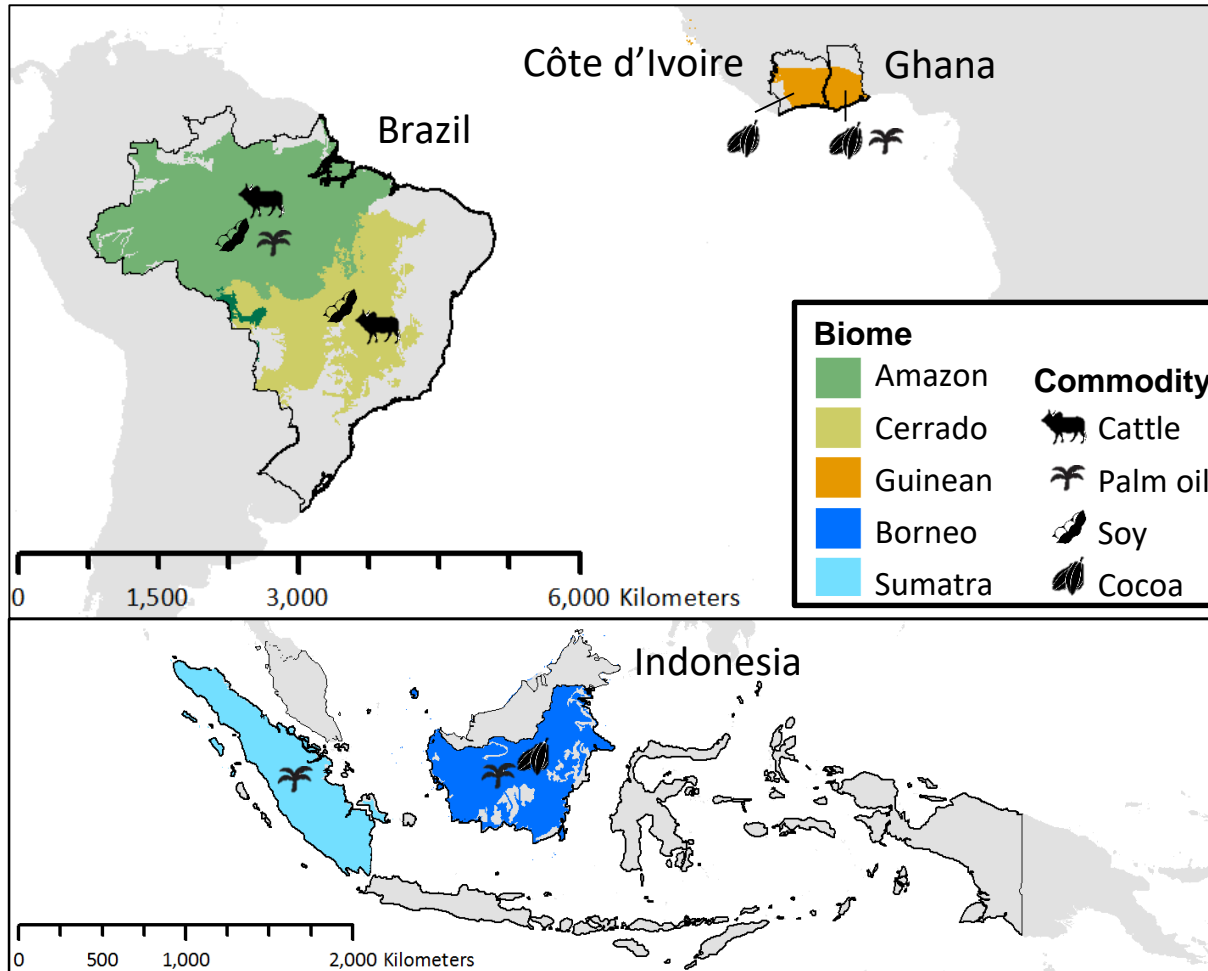
General Research Gaps

- What makes industries reach a tipping point in sustainability, whereby adhering to certain sustainability principles becomes a license to operate?
- How do regulatory approaches need to be designed & implemented to achieve sustainability impacts, such as stopping child labour or deforestation? How do these approaches need to be linked to other policies (developmental, agricultural, trade) to be effective? How do we overcome potential contradictions in these policy fields?
- How do we get true cost accounting approaches into mainstream?
- How do we make the 88% of companies that do not have a commitment to stopping deforestation in all of their supply chains, develop one, because it makes economic sense to them?

Opportunities for Collaboration with Researchers

- How can we overcome the multiple approaches to monitoring deforestation and make use of the developments in AI and the topic awareness to create a single point of truth in deforestation monitoring?
- What makes supply chains / sectors / industries apply a harmonized framework of «Defining – Monitoring – Reporting – Incentivizing – Sanctioning» to address sustainability issues? How could this be applied to the recently launched Sustainable Coconut Charter?
- Carbon negative supply chains: how do you develop a credible carbon negative supply chain, from incentivizing and certifying carbon sequestration on farm to consumer marketing?

Prof. Rachael Garrett, Environmental Policy Lab, ETH Zurich



- **Focus:** Understanding how to make sustainable supply chain initiatives in food supply chains more effective and equitable
- **Collaboration examples:**
 - Working with **Rainforest Alliance** to understand impacts of certifications in context of broader supply chain and regional governance
 - Working with large soy and oil palm **traders** to test the impacts of new policies

Opportunities for Collaboration with Non-Academic Partners

Providing data:

- For traders, manufacturers and retailers, data on:
 - Supply chains (esp. to sourcing regions), volumes already meeting certain criteria, policy implementation schedules
- For NGOs, data on:
 - Baseline and impact evaluation data on farm characteristics or land cover within current projects related to zero-deforestation or farmer livelihoods

Partnerships:

- For traders, manufacturers and retailers:
 - Collaborating on piloting new policies & examining impact
- For NGOs, data on:
 - Working together on fieldwork/data collection (farmer lists, contacts, etc.)

Stefanie Kägi, Helvetas

Helvetas

Objectives related to sustainable food systems:

2.5 million smallholders have increased **agricultural productivity or income** based on sustainable agricultural practices; 300,000 people, of which 170,000 women have improved their **consumption of nutritious food**

Collaborations with academic partners:

- ETH World Food System Center: research on methane gas emissions in a Helvetas / COOP organic rice project in India
- Collaboration with Remei in the frame of the Syscom project in India
- Advisory services from research institutes e.g. collaboration with IRRI in the frame of the Water productivity project



General Research Gaps

General research topics:

- **Incentives and tools to trigger investments** into sustainable food systems
- Measurement of **resource productivity** taking into account agro-ecological outputs and «external» costs of production - > Internalisation of «external» costs and ecosystem services
- **Comparison of incentive systems** to reduce food waste and enhance consumption of sustainable food

What are the open questions in my work?

- What are reliable and efficient **methods to measure climate** gas emissions in agricultural production so that climate smart agriculture can benefit from climate finances?
- General **effects of agricultural practices** on climate gas emissions:
 - How to quantify the effect of organic materials in soils for CO₂ sequestration
 - Effect of AWD and SRI on climate gas emission in rice production
- Resilient supply chain management: how to create **supply chains** that enable direct sourcing while at the same time engage multiple suppliers and buyers to manage risk on both sides.

Opportunities for Collaboration with Researchers

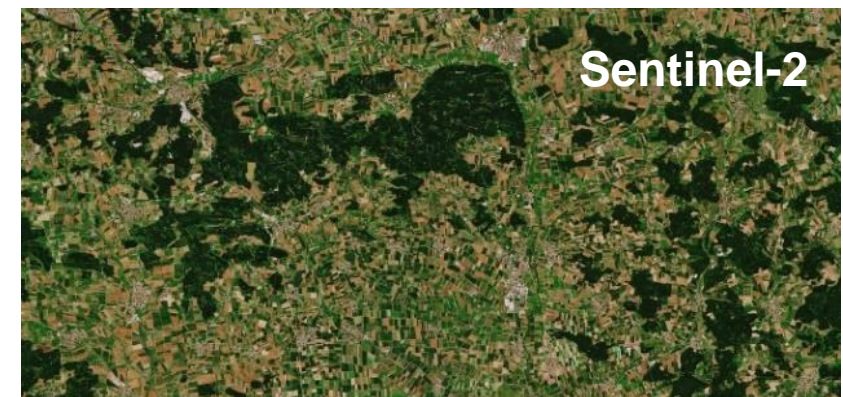
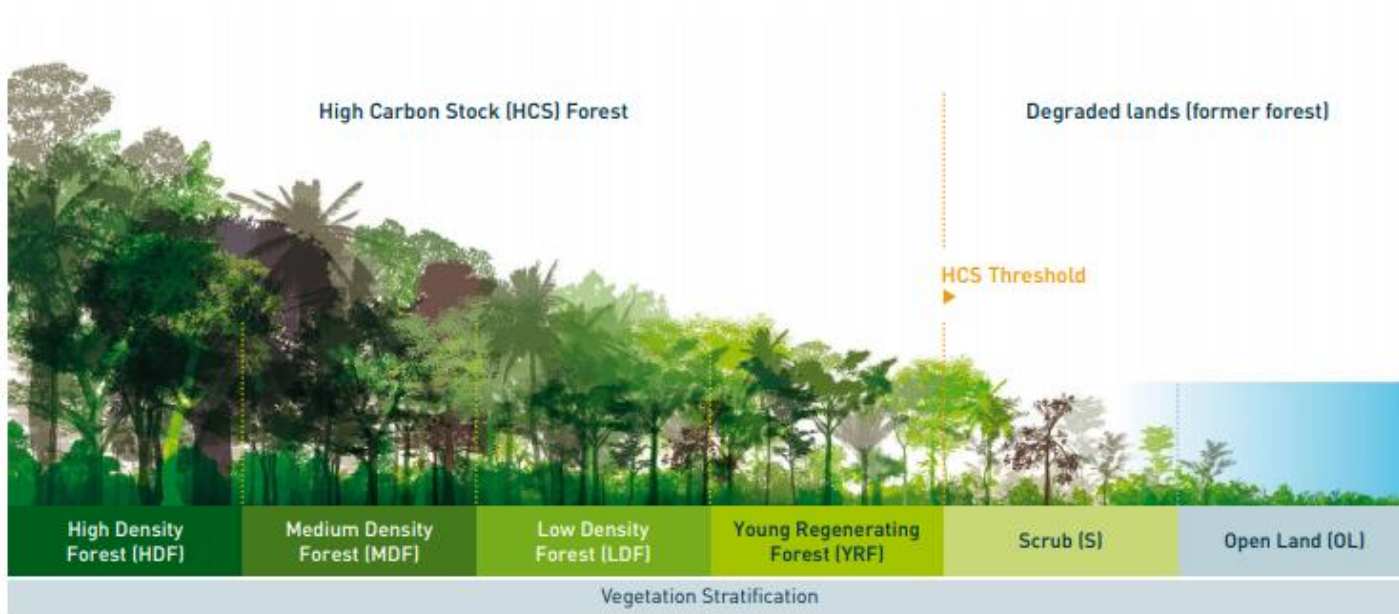
- **Specific ideas for collaborations with researchers (e.g. Master Theses)**
 - WAPRO project (Myanmar, Pakistan, Madagascar, India): **Measurement of climate gas emissions** of different rice production technologies that allow businesses, policy actors or civil society actors to inset their climate gas emissions
 - **Supply chain analyses**: How to manage competition if multiple actors (suppliers and traders) shall be involved in the same supply chain to enhance resilience of the market system?
 - **Integration of sustainability costs** into product prices: What are benefits and disadvantages of covering sustainability investments from CSR budgets vs. Integrating these costs into the product price

Prof. Jan Dirk Wegner, Ecovision Lab, ETH Zurich, Data Science
for Sciences, UZH

Research Focus: AI & Environment

Example: high-carbon stock mapping at global scale → sustainable supply chains

Project partner: *Barry Callebaut (Oliver von Hagen)*



Opportunities for Collaboration with Non-Academic Partners

- ✓ *Any other applications for global biomass & land cover maps in near-realtime? → think **sustainable finance, re-insurance, carbon offsetting and compensation, market analysis...***
- ✓ *More projects:*
 - ✓ *Fine-grained crop mapping*
 - ✓ *Cocoa mapping in Ghana & Ivory Coast*
 - ✓ *Oil palm mapping and counting*



Website: <https://prs.igp.ethz.ch/ecovision.html>

email: jwegner@ethz.ch

World Food System Center

Member Opportunities

Research:

- [Future Food Fellowship](#): educating new talents- *applications due 31 March 2021*
- [Flagship projects](#): Enhancing Resilience in Food Systems, Novel Proteins for Food and Feed, Digitalization in Agriculture- *organized in collaborative bottom-up approach*
- [Nestlé Agricultural and Food System Sciences Program](#)- *yearly applications*



«The Mercator project funding changed my whole life trajectory. It allowed me to make a contribution to the important issue of nutrient cycling and engage with work that is fulfilling and impactful in the continuation project RUNRES.»

Ben Wilde,
Mercator Research Program Alum and
RUNRES postdoctoral researcher



World Food System Center

Member Opportunities

Education/Outreach:

- [WFS Fund](#): supports education and research in fields relevant to the world food system- *applications due 30 April 2021*
- [Mercator Ambassador Program](#): support for small projects and short-term educational or professional development activities- *rolling applications*
- WFSO Outreach Services- *contact us*



«It has been very interesting for me to see that the common motivation among all alumni are the same: we want to keep in touch and keep learning and discussing about sustainable food systems. With the alumni support, we have the perfect time and space to learn and contribute.»

Nora Bartolomé Gutiérrez,
WFSO Alumni Network Community Coordinator
(2019-2020)



ETH for Development (ETH4D)

Research & Innovation

Regular Matchmaking
Research Challenges

...

Learning @ETH and in Sub-Saharan Africa

ML for Global Development
MA in Ghana

...

Exchange Opportunities

Doctoral Fellowships
Visiting Fellowships

...



ETH4D Research Challenges

Project-based research collaborations between ETH researchers and practitioners from NGOs, policy or industry with impact in low/lower middle-income countries (10 - 100 kCHF).

Twice per year: open on 1 July & 1 December

More information: <https://eth4d.ethz.ch/funding-opportunities/eth4d-research-grants/ETH4D-Challenges.html>

ETH4D Research Challenges

Climate Adaptation through Improved Storage, Kenya

Challenge: Climate change is expected to lead to higher fluctuations of yields, which adversely affects livelihoods, food security and human health.

Innovation: Affordable hermetic storage bags could allow farmers to store their produce longer and reduce losses.

Research: Testing storage bags in a real world setting and measuring to what extent they improve income and food security.

By Prof. Thomas Bernauer, Institute of Science, Technology and Policy (ISTP)



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