



WG2 Transformation and transition steps towards zero pesticide based value chains

Danilo Christen, Agroscope, Switzerland

CA21134, MC meeting, Zagreb, 23-24.05.2024



WG2 scientific seminar agenda

Feedback and summary of the scientific seminar held in Nyon (November 2023)

Open discussion about the opinion / position paper

- **In common with Alliance?**
- **Common decision on title and structure**
- **Common decision on target audience, contributors/writers, journal to publish**

Future activities of the WG2



WG2 scientific seminar feedback

Block 1 – Theoretical perspective of transformation and agroecological transition

Review on agroecological transition and transformation concepts (based on D1.2) (30')

Iulia-Sorina Dan, University of Agricultural Sciences and Veterinary Medicine, Cluj, Romania

The multi-level perspective on sustainability transitions (30')

Christian Huyghe, INRAe, Paris, France

Concrete examples of disruptive innovation in agriculture and procedure for successful implementation (30')

Camille Aouinaït, Agroscope Conthey, Switzerland

Analysis of transformation drivers



COST Action - Towards zero Pesticide AGRiculture

WG1. Identify research gaps and needs

Iulia Sorina DAN - PhD student

University of Agricultural Sciences and Veterinary Medicine
Cluj-Napoca, Romania



Nyon, November 2023



Task 1.1 Results

The functions of the innovative system for a pesticide-free agriculture

Barriers

- the availability and know-how of free-pesticides alternatives;
- the costs in time and money to produce and to use alternative methods;
- and the capacity and the adaptability of business to changes (especially for farm business).

Function 1 –Entrepreneurial activities *farmers, suppliers, distributors, processors*

Needs

- the availability and know-how of free-pesticides alternatives;
- the financial support for the transition towards zero pesticides agriculture;
- implementation of a participatory research method (living labs).

Barriers

- the lack of resources to develop research related to methods and alternatives for pesticide-free agriculture;
- low research prioritization to the real needs of the key value chain actors;
- lack of advisory services;
- poor dissemination of research results.

Function 2 –Knowledge development and Function 3 –Knowledge exchange *education, academic, advisers, researchers*

Needs

- collaboration between farmers and researchers;
- to create platforms for disseminating results to the general public;
- public and private advisory services so that the exchange of knowledge and information.

Needs

Barriers

- lack of clarity, consistency and coordination between EU, national and local policy makers;
- sometimes EU policy maker's vision is too ambiguous and therefore not sufficiently clear for the actors involved at the local level;
- lack of cooperation between the key actors of the value chain and policy makers.

Function 4 –Guidance of the search *policy makers, farmers, researchers*

- the creation of a clear and concise legislative framework;
- the financial support, to be able to implement projects based on which to establish priorities and the real vision;
- more effective cooperation between policy makers and the other actors of the value chain.

Task 1.1 Results

The functions of the innovative system for a pesticide-free agriculture

Function 5 – Market formation

farmers, suppliers, distributors, processors, consumers

Barriers

- the willingness to pay a premium price for products obtained from pesticide-free agriculture;
- lack of a specific label developed for pesticide-free product;
- lack of communication/cooperation between the actors of the value chain

Needs

- to create organizations/associations
- Creating a payment-based market for environmental services
- the creation of a quality brand and its labelling
- Improving product traceability and stimulating the development of short supply chains

Function 6 – Resource (human, material, financial) mobilisation

all actors in the chain

Barriers

- lack of financial resources to use alternatives to pesticides, new technologies and to bear the additional costs or losses incurred due to the non-use of pesticides (risk mitigation).
- (HR) lack of education regarding alternatives in pesticides use,
- (HR) the high age of farmers that makes difficult the adaptations to changes.

Needs

- development of financial support measures for all levels (farm, market, research) through CAP;
- the efficient management of resources by prioritizing needs;
- (HR) to attract young farmers and educate them.

Function 7 – Counteract resistance to change

all actors in the chain

Barriers

- conceptual clarity, lower productivity, and feasibility of such farming system;
- This approach would be too ambitious for most farmers.

Needs

- creating regional living lab to promote resilience;
- develop public-private partnership;
- clear and explicit national legal framework for all levels.

Source: after Hekkert et al., (2007)

➤ **WG1 paper as a base for the ‘opinion paper’ of WG2**

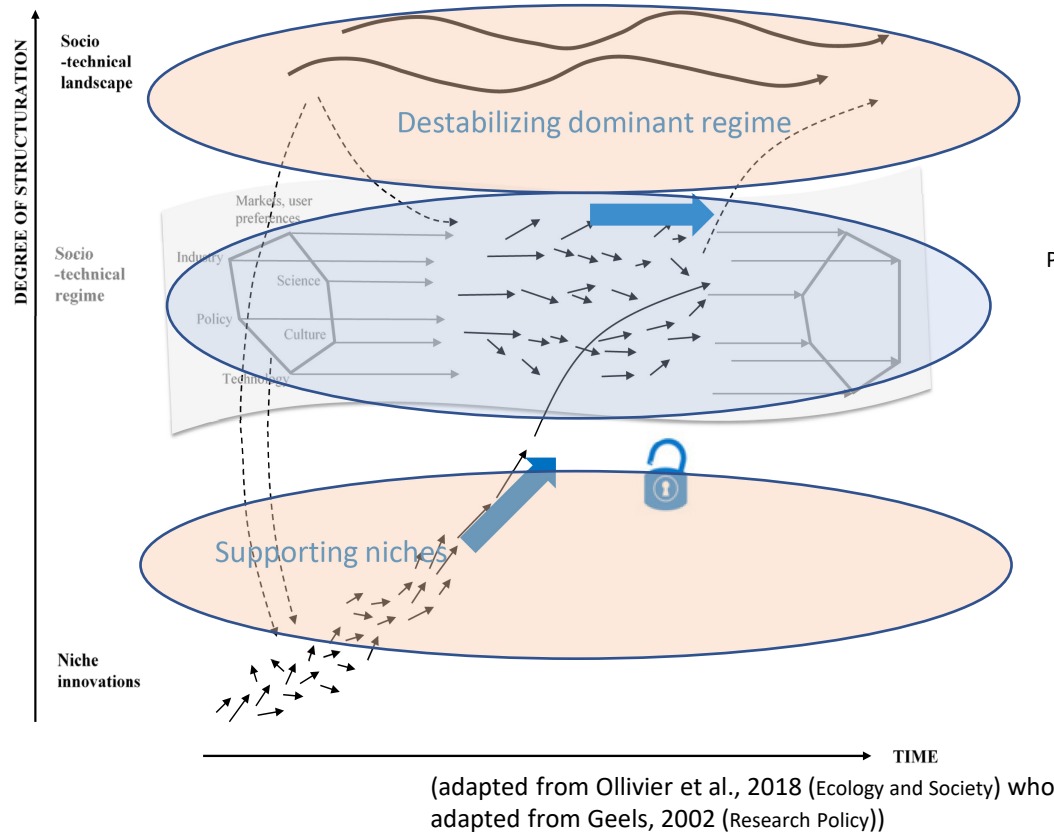
21 November 2023,
COST-WG2
Nyon, Switzerland

The multi-level perspective on sustainability transition

*Christian HUYGHE, Scientific Director Agriculture,
INRAE, France*

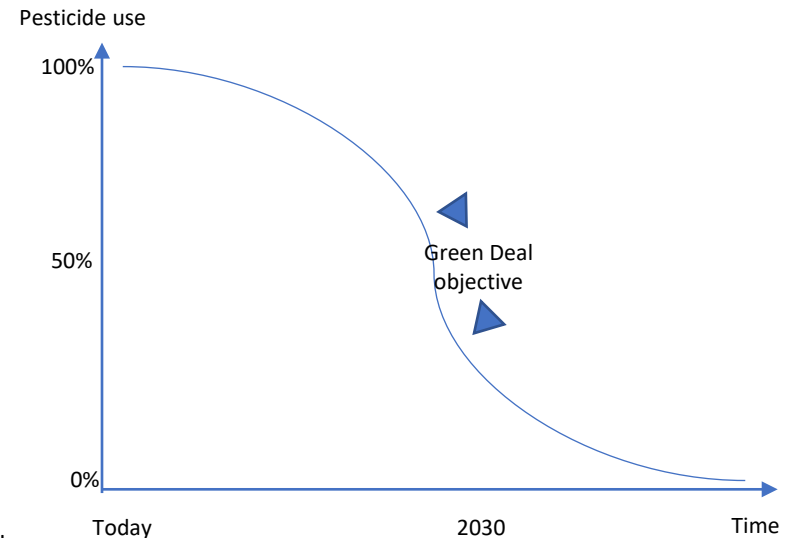


Crop protection: how to move out from the lock-in situation



How to achieve the Green Deal objectives?

- Incremental innovations into the existing cropping systems (**E** and **S** according to Hill and Mc Rae)
- AND/OR
- Disruptive innovations based upon paradigm shifts (**S** and **R** according to Hill and Mc Rae)



➤ **Science and research to educate political decision-makers**



Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Département fédéral de l'économie,
de la formation et de la recherche DEFR
Agroscope

Concrete examples of disruptive innovation in agriculture and procedure for successful implementation

Camille Aouinaït

21.11.2023

Changins, Switzerland

**COST Action CA21134
TOWARDS ZERO PESTICIDE
AGRICULTURE : EUROPEAN NETWORK
FOR SUSTAINABILITY (T0PAGRI-Network)**



Examples of disruptive innovations in agriculture

- **Automated processing** to reduce tasks (robots, plot processing machines, harvesting, picking, sorting, packaging technologies)
- **Novel food** (alternatives to meat consumption)
- **Data collection technologies** (in situ, remote sensors)
 - **Internet of Things** devices, softwares to optimize decision-making by providing real-time data (e.g., determine weeds, classify and count insects, recognize diseases, analyze leaf's damages, detect crop stress, assess crops' nutrients status)
 - **Artificial intelligence** to monitor crops and optimize conditions (e.g. maximum yield)
 - **Radio frequency identification** (RFID) sensors to track and monitor produce harvest, packaging, livestock, traceability
 - **Augmented Reality** (addition of information by computers or sensors to the real world) (e.g. identifying pathogenic bacteria in the food chain)
- **Blockchain technology** to gather, interpret and share information (e.g. where was grown the food product, how it was processed, stored and transported)

➤ **Mostly technological innovation**

➤ **Social innovation to renew production systems?**



WG2 scientific seminar feedback

Discussion and take-home message of Block 1 – Theoretical perspective of transformation and agroecological transition

- **At national level, we are losing the niche system with its social and relationships aspect**
- **Innovation to be scaled up is challenging**



WG2 scientific seminar feedback

Block 2 – Success stories in transformation and agroecological transition in different EU countries

The use of bacterial endophytes in biological control of diseases and pests and increasing the plant growth - A case study in Turkey (20'). Hatice Ozaktan, EGE University, Turkey

How cultivation of organic medicinal aromatic plants accelerates transition to sustainable farming in Kosovo (20'). Arben Mehmeti, University of Pristina, Kosovo

The use of bacterial endophytes in biological control of plant diseases and pests and increasing the plant growth: **A case study in Turkey**

Ozaktan H., Aslan E., Gül A., Şanver U., Ozsari P.

University of Ege Faculty of Agriculture Department of Plant Protection, 35100,
Bornova-İzmir/Turkey
hatice.ozaktan@ege.edu.tr

SOME LIMITATIONS AND CHALLENGES (NEGATIVES)

- Local companies do not invest enough in bioformulation production and do not attach enough importance to R&D.
- Large-scale of production problems for microbial products couldn't be solved yet in Turkey.
- Commercialization and legislation problems cannot be overcome in Turkey.
- Obtaining a biopesticide license in Turkey is a bureaucratically long and expensive process.
- So, it is easier to obtain a license for bioformulations as a biofertilizer or biostimulant in Turkey
- The Ministry of Agriculture is insufficient to encourage and support farmers in the use of biological products.

➤ **Challenges: financial, technical, market and regulation**



"How the cultivation of organic medicinal aromatic plants accelerates the transition to sustainable farming in Kosovo"

Introduction

Organic
production

Summary



Prof.Dr. Arben Mehmeti

Faculty of Agriculture and Veterinary, University of Prishtina

www.uni-pr.edu

***Towards zero Pesticide AGRiculture: European
Network for sustainability
WG2 scientific seminar***

21.11.2023

Nyon, Switzerland

Recommendations

5 key ways which can accelerate the transition to sustainable agriculture

- To strengthen the **partnership** between academia, business and other stakeholders for the innovation projects.
- Increasing **cooperation** between local research institutions and the international research community.
- Improving the **legal framework** for innovations and **transfer of knowledge** and technology and for financing scientific research activity.
- Involve all main **stakeholders** (producers, researchers, processors, traders and distributors) in development of the organic sector towards sustainable farming;
- Become a member of the regional organic agriculture network and join other **networks** and research centres;

➤ **Challenges: collaboration, education, knowledge transfer, advisory, research funding and regulation**

Introduction

Organic
production

Summary



WG2 scientific seminar feedback

Block 3 Policy – The governance and empowerment perspectives on agroecological transitions

Financial incentive for organic conversion and encouragement for good agricultural practices: examples from Switzerland (30')

Simon Peter, Department of Agricultural Policy and Strategy, Federal Office for Agriculture, Switzerland

How to influence policy and support political courage towards zero pesticide agriculture? (30')

Bernard Lehmann, Chair HLPE, Former director of Federal Office for Agriculture, Switzerland

How to reform policies to be outcome-based and to bring innovation to the farmers? (30')

Christian Bogen, Policy Advocacy Manager, Bayer CropScience, Germany



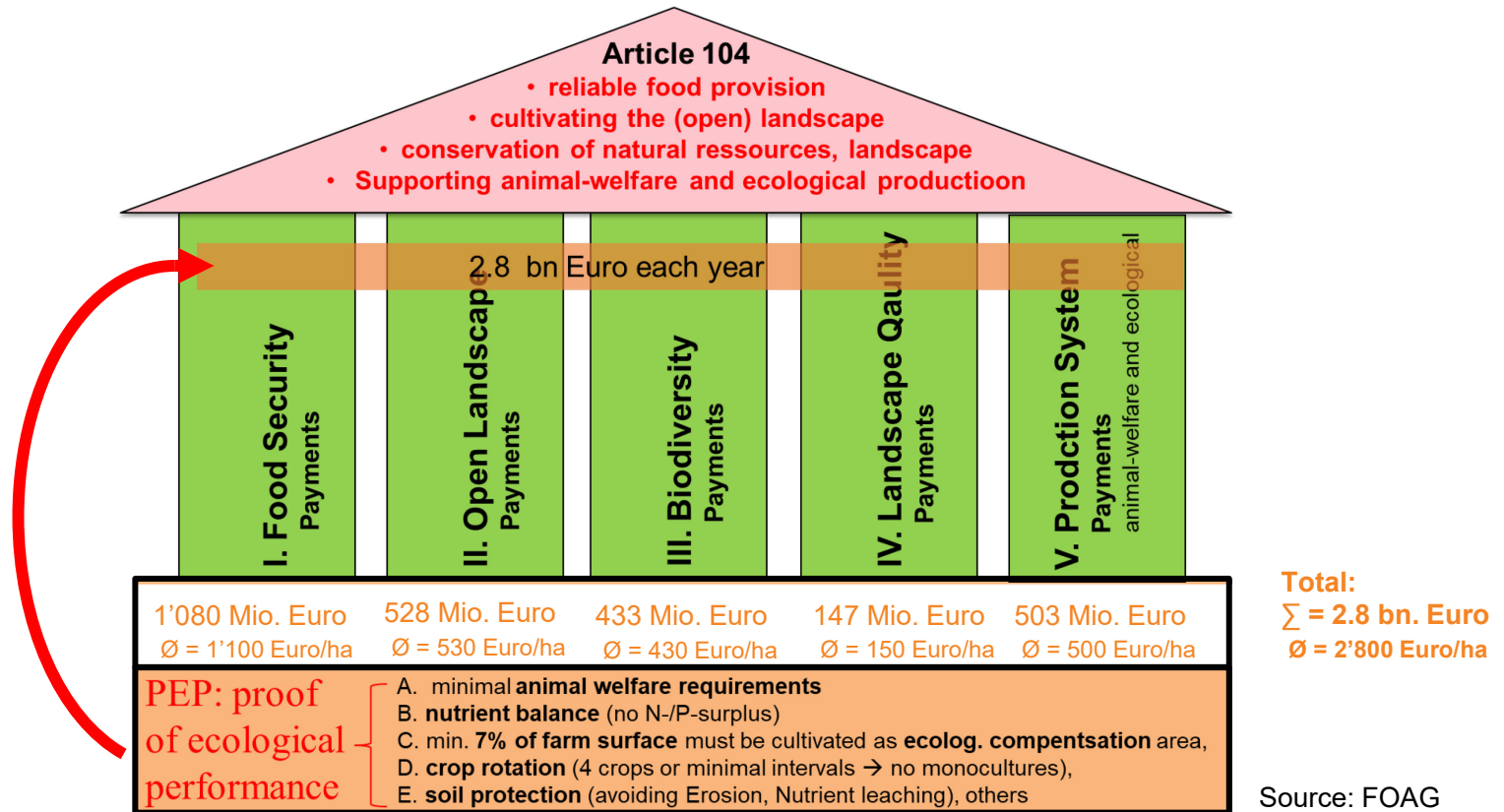
Financial incentive for organic conversion and encouragement for good agricultural practices: examples from Switzerland



Simon Peter, FOAG (Federal Office for Agriculture)

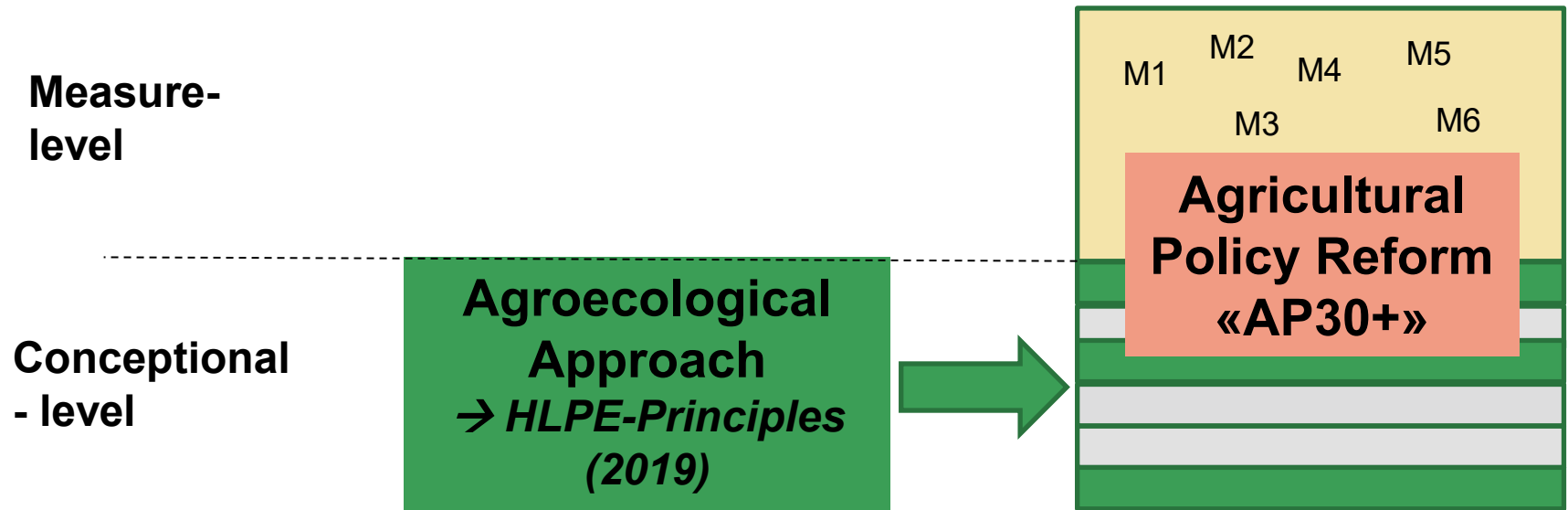


1. Proof (PEP) of ecological production





6. Outlook II: How to incorporate the agroecological approach into Swiss agricultural policy?



- Large differences of the incentives depending on the countries?

How to influence policy and support political courage towards zero pesticide agriculture?

COST- WG2 scientific seminar of 21-22 November 2023

Bernard Lehmann, Prof. Dr. Sc. ETH

HLPE-FSN / CFS, (2019-2023), Chairperson

Global Crop Diversity Trust, Executive Board, Member (2020-2023)

Research Institute of Organic Agriculture, FIBL, Chairperson Foundation Council

Swiss Academy of Sciences, Chairperson of Science-Policy Platform

HLPE-FSN Report on Agroecology

«It is now widely recognized that

- a **major transformation of food systems is needed to achieve food security and nutrition (FSN) globally**, and that
- this will profoundly affect what people eat as well as how it is produced, processed, transported and sold».

Transitions to sustainable food systems (SFSs) that **reconcile human and ecosystem health with social welfare** will not happen without **major shifts in policies** at international, national and local levels and the **active encouragement of innovation** across these scales.

...and without major shifts in market rules!

Personal conclusions

A radical renunciation of pesticides, a realistic pathway:

- More innovation with **radical transformation** than with incremental adjustments
- Global level: **Agroecology** currently as the biggest possible step
- **Intensification of research** into zero pesticide methods
- Zero pesticides as part of **national (EU-wide) targets**. With deadline
- Conversion to zero pesticides as part of **incentive schemes** with safeguards
- With scientific monitoring as a **confidence-building measure**
- Intensive science-policy-private sector-society **dialogue**.



Industry perspective

*How to reform policies
to be outcome-based
and to bring innovation
to the farmers*



Dr. Christian Bogen
Policy Advocacy Manager
EMEA Public Affairs,
Science and
Sustainability,
Bayer AG
November 2023



Challenges for market participants to deliver solutions



- Very **comprehensive regulatory frameworks** and extensive testing requirements, though for selected pesticides (e.g. in the form of living microorganisms) there are new rules aimed towards facilitation ([link](#)) – however, not including other biological solutions (e.g. plant extracts)
- **Selective hazard-based approach** instead of risk-based or alternatively cost-benefit approach
- **Limited regulatory openness** to new technologies and alternatives
- **Uncertainties in regulatory processes** and political decision-making steps
- Efficacy, **required application knowledge** by farmers and costs of solutions
- **Very high costs, comparatively long timelines** (especially in regard to evolving regulations and guidances) and rigid time slots for registrations to bring new solutions to the market
 - Current system pushes towards focus on global and major markets to compensate for increasing costs and efforts, **often deprioritizing smaller markets**



WG2 scientific seminar feedback

Discussion and take-home message of Block 3 Policy – The governance and empowerment perspectives on agroecological transitions

- **Our strategies will not be effective as the population increases. The government must help farmers to implement disruptive models in order to guarantee food security**
- **Food security: we have part of the solution to improve the cropping systems and we need to base new strategies on that**



WG2 scientific seminar – challenges

‘Don’t talk about alternative to pesticides, but about alternative systems without pesticides’ Christian Huyghe

- **Challenge: Are all CA21134 participants aware of this?**
- **Which conceptual approach should we choose (agroecology)?**

‘Status quo is not any more an option’ Christian Huyghe, Bernard Lehmann

- **Challenge: Are all policy makers aware of this?**
- **Challenge: How to influence incentive schemes?**

‘Paradigm shift’, incl. suppl. social issues of the 13 HLPE principles

- **Challenge: Are supply chain players ready to take social aspects and communication innovations into account?**
- **Challenge: How to align multiple points of view (e.g. country differences)?**



WG2 scientific seminar feedback

Block 5 - Parallel sessions: 'Focus groups' discussions

- Based on the WG1 identified barriers in the different dimensions of the innovative system
- **What can be proposed to break through the barriers and to meet the needs?**

Focus group 'business / market' – Moderation: Alain Gaume

Focus group 'policy' – Moderation: Sarah Milliken

Focus group 'knowledge' – Moderation: Danilo Christen



WG2 scientific seminar feedback

Focus group 'business / market' – Moderation: Alain Gaume

Business is another world

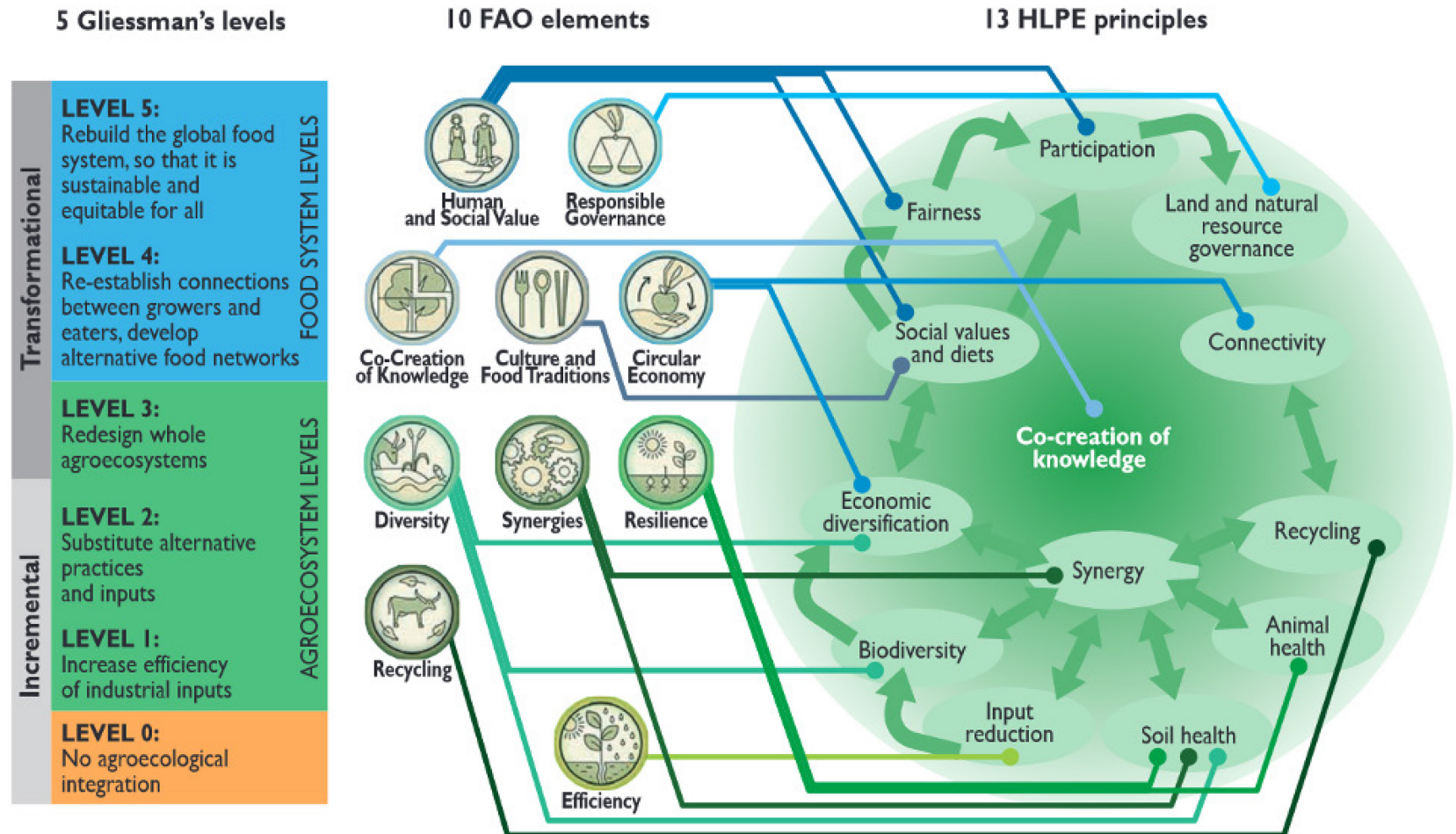
How to integrate social values and fairness in actual business models?

How to promote a higher agroecological 'willingness to pay' by the consumers?

- **Integrate business partners in agroecology (new business models, promotion of social values and fair relationship in business)**



Social aspects generally sidelined (e.g. sustainability pillar)



▲ Linking FAO's 10 elements, Gliessmann's 5 levels of food system transformation and the 13 HLPE principles



WG2 scientific seminar feedback

Focus group 'policy' – Moderation: Sarah Milliken

Discussion about the impact of EU and national policies on the transition pathways

Distribution of EU subsidies is perceived to be unfair

Farm to Fork Strategy proposes to reduce chemical pesticide use by 50% by 2030, but no real solutions for how this is to be achieved

- Add different transition pathways and timelines for selected countries (not EU, recent EU, established EU states) for position paper



WG2 scientific seminar feedback

Focus group 'knowledge' – Moderation: Danilo Christen

We need more money for more technologies, for systemic approaches, for multi-stakeholder cooperation

We need to create a bridge between universities, researchers, advisers, farmers and consumers to fulfil the numerous gaps

We need to develop channels of communication for society

We need to enable research to be adapted to each stakeholder: farmers, advisors, consumers...

➤ Create a map representing knowledge transfer in Europe?

Open discussion about the opinion / position paper

<u>Task</u>	<u>Deliverables/activities</u>	<u>Timing (moving)</u>
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Task 2.1 D2.1	Scientific opinion paper	
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Q6 -> **postpone until June 2024**

Proposition

Join forces and produce a single paper with the 'Alliance position paper' and the 'CA21134-WG2 opinion paper'

YES / NO

Open discussion about the opinion / position paper

Common decision on title and structure

Proposed title:

Pesticide-free agriculture and agroecological transition: From theory to practices

Proposed content:

Policy and Research Position Paper

OK for you?

Open discussion about the opinion / position paper

Common decision on title and structure

Structure:

- Introduction: outline actual policy on agroecology (1 page)
- Presents argument/research/innovative solutions to support policy (2 pages)
- Outline potential drivers and barriers for agroecology adoption in practice, including multi-level perspectives (4 pages)
- Propose strategies for activating the drivers and overcoming the barriers (e.g. Strategic recommendations for policy, Strategic Research and Innovation Agenda) (2 pages)
- Conclusion: design of a roadmap for wider adoption of agroecology (1 page)
- **OK for you?**
- **Missing one topic?**

Open discussion about the opinion / position paper

Common decision on title and structure

Structure:

- Introduction: outline actual policy on agroecology (1 page)
- **Define the geographical level: EU, country, region?**
- **Who wants to contribute? Leader of this part?**

Open discussion about the opinion / position paper

Common decision on title and structure

Structure:

- Presents argument/research/innovative solutions to support policy (2 pages)
- **Based on theoretical or empirical perspectives?**
- **Who wants to contribute? Leader of this part?**

Open discussion about the opinion / position paper

Common decision on title and structure

Structure:

- Outline potential drivers and barriers for agroecology adoption in practice, including multi-level perspectives (4 pages)
- **Based on theoretical or empirical perspectives?**
- **Who wants to contribute? Leader of this part?**

Open discussion about the opinion / position paper

Common decision on title and structure

Structure:

- Propose strategies for activating the drivers and overcoming the barriers (e.g. Strategic recommendations for policy, Strategic Research and Innovation Agenda) (2 pages)
- **Who wants to contribute? Leader of this part?**

Open discussion about the opinion / position paper

Common decision on title and structure

Structure:

- Conclusion: design of a roadmap for wider adoption of agroecology (1 page, **not enough?**)
- **Define key milestones, concrete actions and identified actors**
- **Add different transition pathways and/or timelines for selected countries (not EU, recent EU, established EU states)?**
- **Who wants to contribute? Leader of this part?**

Open discussion about the opinion / position paper

Common decision on target audience, contributors/writers, journals

- **Target audience: Policy makers and HorizonEurope**
- **OK for you?**
- **Journals to publish:**
- **Proposition: publish under the EUROPEAN ASSOCIATION FOR AGROECOLOGY (<https://www.agroecology-europe.org/about/>)**
- **Are you editor of a journal?**
- **Deadline for the paper: August 2024**
- **OK for you?**

Open discussion about the opinion / position paper

Common decision on target audience, contributors/writers, journals

- Presentation in congress?
- **Proposition: Landscape 2024, Berlin (however deadline already over!!!)**
- **Other propositions?**
- Coordination for the paper:
- **Do we need a coordinator? If yes, who?**



Future activities of WG2 and involvement of participants

Good news...

Prof Christian ANDREASEN (Denmark) accepts to be co-leader of WG2 (larger involvement in the future)

Don't forget... CA21134 website (and LinkedIn) is activated !

- Inform about CA21134 related activities in your country**
- Email to Silke DACHBRODT-SAAYDEH**

silke.dachbrodt-saaydeh@julius-kuehn.de



Future activities of WG2 and involvement of participants

<u>Task</u>	<u>Deliverables/activities</u>	<u>Timing (moving)</u>
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Task 2.1 International scientific conference Q8 -> **Nov. 2024?**

Reminder: Task 2.2 Using a Transformation Lens to develop suitable economic and ecological methodological approaches applied to the two studied supply chains

➤ **Common decision about...**

- location (other symposium?)
- Model IOBC, protected crops (mixture scientific meeting and meeting with stakeholders)
- content (testing and validating innovation? Living Labs?)
- Contact with stakeholders and practionners, incl. 'field' visit



Future activities of WG2 and involvement of participants

➤ Common decision about...

- Location

1. Symposium, Berlin, Landscape 2024 conference, 17-19.9.24

Theme Agroecosystems in transformation

2. Together with WG4 workshop (redesign systems), Santarem, North Lisbon (tbc) Jan 2025

> Discussion with WG leaders and MC members



Future activities of WG2 and involvement of participants

<u>Task</u>	<u>Deliverables/activities</u>	<u>Timing (moving)</u>
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Task 2.2 D2.2.1	Scientific synthesis paper	Q8 -> Nov. 2024?
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- **Linked to the International scientific conference?**
- **Content (practical): large-scale adoption and implementation of zero pesticide food chains**



Future activities of WG2 and involvement of participants

Task	Deliverables/activities	Timing (moving)
Task 2.2	D.2.2.2 Commentary and information brochure	Q9 -> Feb. 2025
	<ul style="list-style-type: none">➤ ‘Translate’ the opinion paper into practical message➤ Like practical abstract of EU projects (max 4 pages)	
Task 2.3	Training School on transition towards zero pesticide agriculture	Q9 -> Feb. 2025 (with other WG?)
	<ul style="list-style-type: none">➤ Discussion with other WG leaders and MC members	

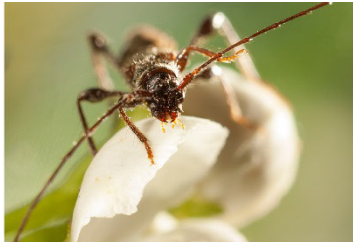
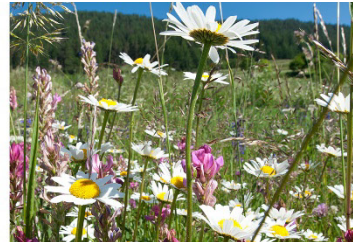
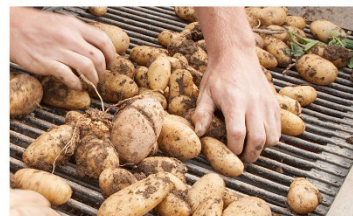
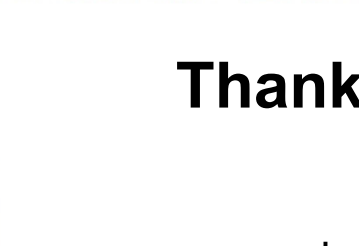
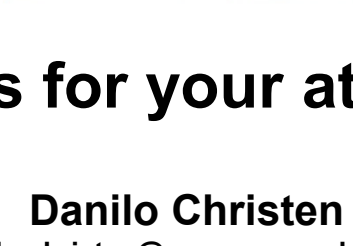
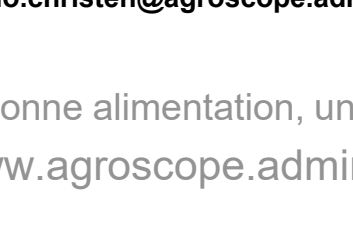
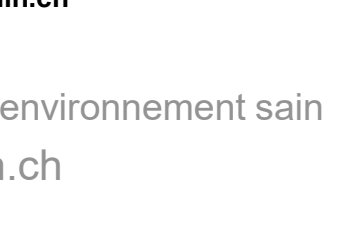
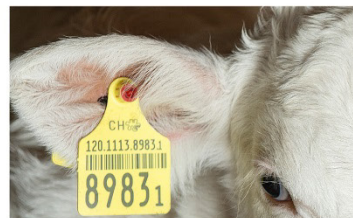
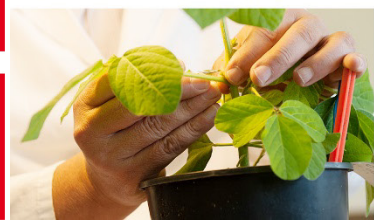


Future activities of WG2 and involvement of participants

<u>Task</u>	<u>Deliverables/activities</u>	<u>Timing (moving)</u>
Task 2.3 STSMs		Q10 -> still running

We offer Short-Term Scientific Missions for students/PhDs...

- Call have been published
- Use the STSMs (e.g. for D2.1 scientific opinion paper)
- Email from Elisabete FIGUEIREDO elisalacerda@isa.ulisboa.pt
and Christian HUYGHE christian.huyghe@inrae.fr



Thanks for your attention

Danilo Christen

danilo.christen@agroscope.admin.ch

Agroscope une bonne alimentation, un environnement sain
www.agroscope.admin.ch