Scalability of organic agriculture (OA): insights from Europe

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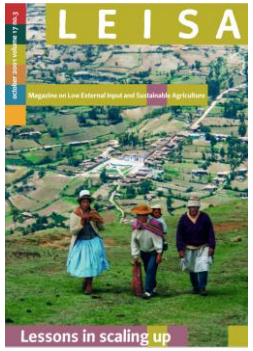
Introduction



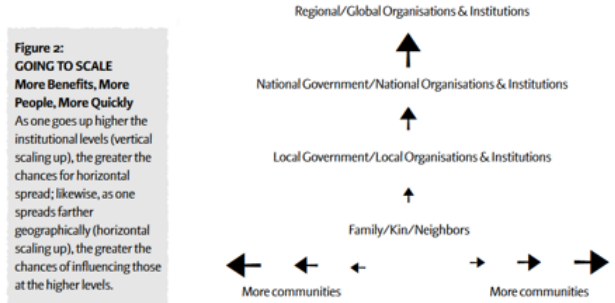


Figure 2: GOING TO SCALE More Benefits, More People, More Quickly
As one goes up higher the institutional levels (vertical scaling up), the greater the chances for horizontal spread; likewise, as one spreads farther geographically (horizontal scaling up), the greater the chances of influencing those at the higher levels.

VERTICAL SCALING UP is higher up the ladder. It is institutional in nature that involves other sectors/ stakeholder groups in the process of expansion - from the level of grassroots organizations to policy-makers, donors, development institutions and investors at international levels.

HORIZONTAL SCALING UP is geographical spread to cover more people and communities and involves expansion within same sector or stakeholder group. Others refer to it as a scaling out process across geographical boundaries. Achieving geographical spread is also realized through scaling down - increasing participation by decentralization of accountabilities and responsibilities particularly in breaking down big programs into smaller programs/projects.


Article | Published: 09 March 2023

Factors influencing farmer intentions to scale up organic rice farming: preliminary findings from the context of agricultural production in Central Vietnam

Nguyen Cong Dinh, Takeshi Mizunoya, Vo Hoang Ha, Pham Xuan Hung, Nguyen Quang Tan & Le Thanh An

Asia-Pacific Journal of Regional Science (2023) | Cite this article

346 Accesses | Metrics

Abstract

The Vietnamese government encourages organic farming (OF) as a move toward safer and more eco-friendly agricultural practices. To achieve the goal of popularizing OF, besides encouraging the participation of newcomers, the government should also focus on farmers already involved because their production decisions are the most effective means for communication. By blending quantitative and qualitative approaches, this study investigated smallholder farmer intentions to scale up organic rice farming (ORF). Data were obtained through direct interviews with 325 farmers in the Phu Vang, Phong Dien and Huong Thuy Districts of Thua Thien Hue Province, Central Vietnam. The results revealed the ineffectiveness in demographic characteristics, including gender, age, education, number of laborers, OF experience, percentage of organic rice area, non-farm jobs and involvement in community-based organizations to predict farmer intentions to expand ORF. The findings


Sri Lanka's organic farming disaster, explained

A shift to better farming practices is possible, but Sri Lanka's abrupt switch to organics offers a bitter lesson in how to change food systems in a sustainable way.

By Kenny Torrella | @KennyTorrella | Jul 15, 2022, 10:37am EDT

- About « scalability »…

The need to build a collective subject to boost and lead bottom-up agroecological transitions goes on throughout the discussion which oppose **upscaling** (as a top-down process promoted by administrations, which can easily derive to conventionalization) and **outscaling** (as an outreach process which keeps and extend the bottom-up approach along a territory, through horizontal alliances) (Giraldo and Rosset 2017).

In fact, the participatory processes are called on to create hybrid forums (López-García et al. 2018) where local administration, civic organizations and organic farmers meet and realize the need to cooperate, in order to fulfill each one's aims within a common project of transition to social, economic, and ecological sustainability (González de Molina 2013).

In contrast, for Tsing (2017) , scalability is the ability of a project to change scales smoothly without any change in project frames.

Outlook

1. **From niche to plateau or further extension : dynamics of OA in EU**

2. **Research contributions and agendas**

3. **European challenges in R&D: contribution of foresight exercises**

1. From niche to plateau or further extension : dynamics of OA in EU

Specificities and emerging development trajectories of the organic sector during the end of XXth century

Part A: Michelsen's (2001) path	Part B: WBC sequence
Step 1: organic movement	
Step 2: political recognition	Step 2: political recognition
Step 3: payment support	Step 3: payment support
Step 4: non competitive relationship	Step 1: organic movement together with Step 5: organic food market
Step 5: organic food market	Step 4: non competitive relationship together with Step 7: issue of conflict
Step 6: committed institutional setting	Step 6: committed institutional setting
Step 7: issue of creative conflict (Moschitz et al. 2004)	

Table 1: Western Balkan Countries (WBC) sequence of Michelsen *et al.'s* (2001) path

Michelsen J., Lynggaard K., Padel S., Foster C. (2001): Organic farming development and agricultural institutions in Europe: A study of six countries. University of Hohenheim, Stuttgart. Organic Farming in Europe: Economics and Policy, 9.

Moschitz H., Stolze M., Michelsen J. (2004): The development of political institutions involved in policy elaboration in organic farming for selected European States. European Communities, Brussels. Development of organic farming policy in Europe with particular emphasis on EU enlargement, QLK5-2002-00

From niche to plateau or further extension : dynamics of OA in EU

A continuous growth. In the EU-27, the area devoted to organic farming was 9.4 million hectares in 2012, rising to 15.6 million hectares in 2021, an increase of 66% largely driven by France.

+ 748149 ha in Europe in 2021 (+4,4%)

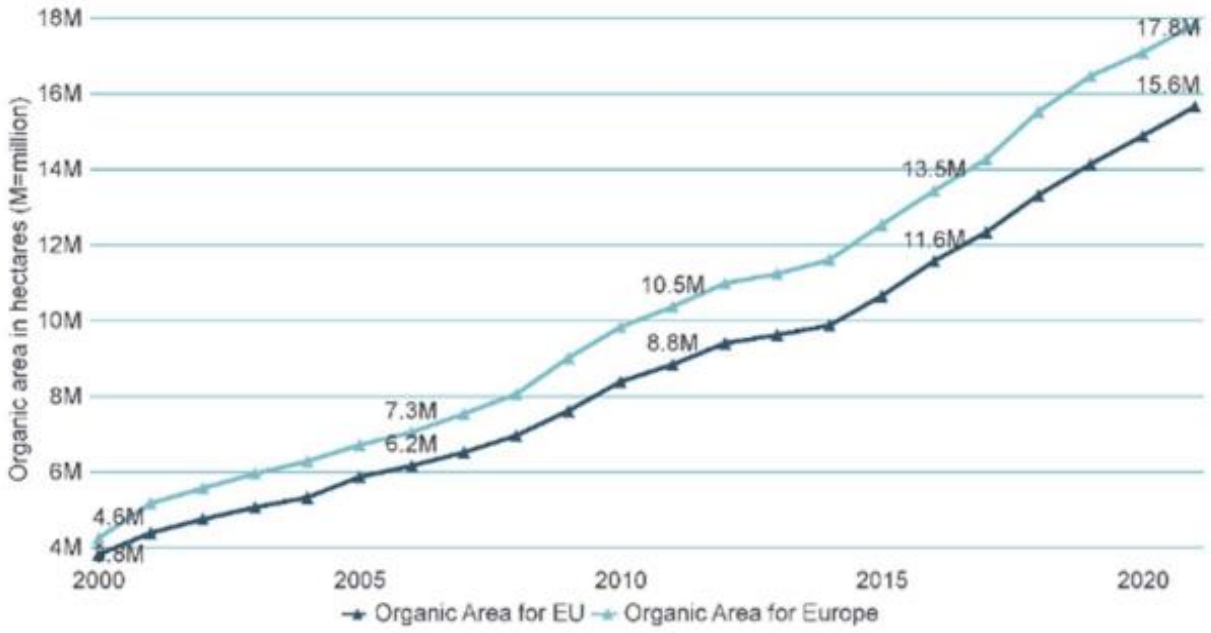


Figure 1 Growth of organic production area in Europe and the EU (Mha UAA; 2000-2021)

Source: Willer *et al.* (2023)

A plateau? The French case

- With almost 2.8 million hectares under organic cultivation, or 10% of the French agricultural area, France was in first place in the European Union (EU) by 2021, ahead of Spain, Italy, Germany, Austria and Sweden.
- At the same time, the number of organic farms in France has soared from 23,100 in 2011 to 58,400 in 2021 (or 13% of all farms).
- However, organic food sales have been slowing down in recent months.
- The signs of this slowdown, which began in 2020 or even slightly earlier for some products, are many: imbalance between supply and demand, resulting in organic products being reclassified as conventional; closure of specialist shops; de-certification or deconversion of producers, etc.
- The proportion of regular consumers of organic food fell by 16% between the end of 2021 and the end of 2022, and the proportion of people who have not consumed organic food products over a year reached 17% in 2022 - double the figure for 2021.

- https://theconversation.com/agriculture-pourquoi-la-bio-marque-t-elle-le-pas-en-france-207510

A glass ceiling (plateau)? The current situation can be explained by several factors

- **A jungle of labels**
- **Inflation and household income effects**
- **Other criteria for buying organics** (beyond environmental and health concerns)
- **Fair price for organics**
- **Public support lagging behind**
- **Long-term support… for long-term processes**

2. Research contributions and agendas (FR)

- In France, INRAE's formal commitment to organic farming began in 1999, based on three premises: interdisciplinarity, partnership, and system approaches (Bellon et al., 2000).
- This programme enabled various activities and specific support to 50 research projects.
- In 2020 INRAE launched a new program (Metabio) *"Moving to predominant organic agriculture".* It aims to explore the hypothesis that the domestic supply of organic products becomes predominant, which would entail a radical change in the entire value chains within the context of a strong demand and wider agroecological transition.
- Its objectives are to develop proposals, scientifically substantiated, to anticipate the consequences of and support the development of organic agri-food systems.
- Accordingly, **four topics** were prioritized: (i) Conditions for a large scale transition and its support measures, (ii) Resources to be mobilised for sufficient and sustainable production, (iii) Processing, storage, and product qualities, (iv) Coexistence of production systems.
- The first outcomes of this metaprogram are available (www.inrae.fr/metabio).
- INRAE was subsequently (in 2022) the leader organisation in terms of publications on OA.

RÉPUBLIQUE FRANÇAISE
Liberté
Égalité
Fraternité

INRAE

Metaprogram METABIO

Moving to predominant Organic Agriculture

Director
Françoise Médale

Project manager
Servane Penvern

To address scientific and societal challenges that require the mobilization of a wide range of disciplines, INRAE has set up cross-disciplinary research programs called "metaprograms".

The new metaprogram "Moving to predominant organic agriculture" aims to explore the hypothesis that the national supply of organic products would become the majority, in a context of strong demand and agro-ecological transition.

What are the issues, the levers and the consequences of such a change of scale of organic agriculture throughout the whole agri-food chain?

The metaprogram is based on:

- An approach including the whole agri-food system.
- Interdisciplinary scientific communities.
- INRAE experimental facilities that are partly or completely converted to organic agriculture.
- Close interactions with partners and stakeholders.

The aim is to develop proposals, scientifically substantiated, to anticipate the consequences and accompany the development of organic agri-food systems.

Redaction: Servane Penvern, Françoise Médale (INRAE Metabio)
Graphic design: INRAE
Layout: Plume & Sciences
Photo Shutterstock
January 2021

Priority 1. Conditions for a large-scale transition and its support measures

- Co-design of diversified and multi-performant systems
- Impact evaluation and trajectory analysis of different organic agriculture development scenarios
- Collective dynamics and individual commitments for radical transitions
- Public actions and market organization

Priority 2. Resources to be implemented for sufficient and sustainable production

- Loop of biogeochemical cycles and soil functionality
- Plant and animal genetic resources
- Feed resources for animals
- Natural resources for animal and plant health
- Know-how and Work

Priority 3. Processing, conservation, and product qualities

- Development of biocompatible conservation and processing techniques
- Management of the heterogeneity and the variability of raw materials in organic agriculture
- Impacts on product qualities, environmental and human health

Priority 4. Coexistence of production systems

- Managing the diversity of production models
- Access to resources (especially soil, water and work)
- Strategies and consequences on organic markets

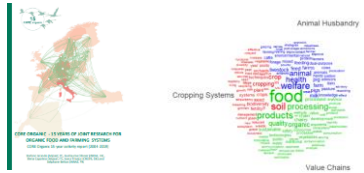
METAPROGRAMME
METABIO

Contact METABIO
metabio@inrae.fr

https://eng-metabio.hub.inrae.fr/

Research contributions and agendas (EU)

- In Europe, the ERA-NET CORE Organic (CO for ‘Coordination of European Transnational Research in Organic Food and Farming Systems’) was established in 2004.
- In 2020 it included 27 ministries and research councils from 19 countries and regions whose main purpose is to fund and support transnational organic research.
- These partners have been working together to increase innovation potential, knowledge accessibility, alignment of national research and international outreach.
- By joining forces, the network sustains focused and coordinated research and innovation efforts, covering the most important challenges at every link of the organic value chains.
- All together more than 50 projects were funded during the entire period, with an average contribution of 1M€/project (Grando et al., 2020).



- The network continues as CO Pleiades (https://projects.au.dk/coreorganicpleiades/about) and its integration in the uprising European agroecology and food systems partnerships.
- As a new approach under Horizon Europe, partnerships aim to deliver on global challenges and industrial modernisation through concerted research and innovation efforts, alongside EU and associated countries, the private sector, foundations and other stakeholders.

3. European challenges in R&D: insights from foresight exercises

- The EU's Farm to Fork Strategy target of a 25% organic share of agricultural land by 2030 is ambitious given that organically farmed land was just under 10% in 2020.
- With an amplification of OA in view, both knowledge syntheses and foresight exercises are used to assess possible benefits if the 25% target can be achieved (Sautereau et al., 2016; Lampkin & Padel, 2022).

Environmental impacts
of achieving the EU's
25% organic land by 2030 target:
a preliminary assessment

Report for IFOAM Organics Europe, Brussels

Prepared by Nicolas Lampkin and Katrin Padel

Organic Policy Consultancy

http://lampkinpadel.eu

Final version 18th July 2022

Revised 27th November 2022

Contribution of foresight exercises

- Foresight exercises such as Ten Years For Agroecology (TYFA) in Europe is an on-going project which started in 2014. A quantitative model simulating the agricultural functioning of the European food system was designed in order to develop an agroecological scenario for Europe in 2050

https://www.iddri.org/en/publications-and-events/blog-post/agroecological-europe-2050-scientific-work-progress

Due to the lack of data in agroecology, references from the organic sector were used to explore pesticide-free farming and extensification of crop production.

Other hypotheses explored in this exercise refer to: fertility management at a territorial level; redeployment of permanent grassland; livestock extensification (phase-out of industrial modes); healthy and sustainable diets; food first, then feed, then biodiversity, then non-food use.

- The CLINORG flagship project (as part of Metabio programme) aims at exploring to what extent organic farming expansion in Europe, combined with changes in food and feed consumption, may affect land use worldwide and related GHG emission, based upon the combination of two spatially-explicit models (Goanim and the GlobAgri).

At EU level

In the OT4EU project (EC funded) the EU targets are taken for granted (backcasting)
The focus is on development pathways and knowledge systems enabling their achievement.

Achieving the organic Farm-to-Fork targets

- 25% organic farmland in the EU by 2030
- Significant increase in organic aquaculture

- How?
  - Proper functioning value chains and markets, increase in demand
  - Sound farmer advice and strong innovation ecosystems
  - Strong policy support through CAP, organic action plans, research, public procurement...

Work Package structure

Take home messages

(i) the importance of both demand for organic products and public supports,

(ii) the need to modify diets to address the food security debate (balance between animal and vegetal protein sources),

(iii) the necessary links between various agricultural models (synergy and trade-off)

(iv) including time dimension (pace of change, trajectories, foresight..)

Thank you for your attention!

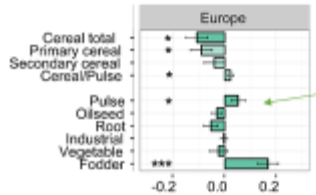
CLINORG project: 4 alternative options for livestock production and feed use

LFS to value non-edible feedstuffs	LFS to provide services to cropping	Patrimonial LFS for biodiversity conservation	Disappearance of LFS
Priority given to food production but from feed resources that are non competing with human food.	The provision of food is not central. Livestock aim at providing manure for both crop fertilization and biogas production.	Livestock is used to conserve biodiversity, both livestock biodiversity (local breeds) and landscape biodiversity.	Livestock systems completely disappear in this option → The aim is to explore the consequences on other dimensions.

Quantification of the different options considered

1. Definition and quantification of crop rotations characteristics

1. Crop category frequency trends

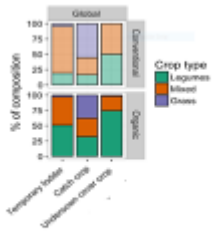


2. Crop species choices

Type of crops depending on the use type, i.e. for pulses :

- Focus on food production: lentils, chickpeas, etc.
- Focus on animal production: soybean, fava beans, etc.

3. Frequency of legumes in temporary fodders and of season crops

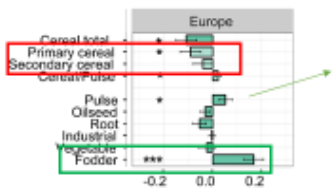


Barbieri et al., 2017

Quantification of the different options considered

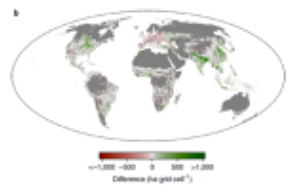
2. Spatial land-use simulation

1. Translation of frequencies into evolution ratio



$K_{Cereals}$	$K_{Sec.\ Cereals}$	K_{Pulses}	$K_{Oilseed}$	K_{Root}	$K_{Industrial}$	$K_{Fodders}$
0.751	0.716	1.915	0.317	0.651	1.585	2.103

2. Simulation and spatial distribution into land-use maps



Barbieri et al., 2019

MIX-ENABLE – Practice Abstract

Multi-species livestock farming

Problem

The livestock sector is being highly criticised for its environmental impacts. Moreover, this sector is not very attractive to the young generation. On the one hand, it requires hard work. On the other hand, making a decent living from livestock husbandry remains a challenge across Europe.

Solution

Multi-species livestock farming is proposed as a solution towards higher sustainability of livestock farms. It consists of keeping two or more animal species – or more generally combining different animal production units – on the same farm.

Impact

Multi-species livestock farming has the potential to improve the three dimensions of sustainability – economic viability for farmers, environmental soundness, and social acceptability – by being respectful of animals and humans, as long as locally relevant farming practices are implemented, especially an appropriate stocking rate during grazing.

If relevant practices are not observed, multi-species livestock farming may produce undesirable effects, such as competition for resource acquisition during grazing, parasitic cross-infection, and more intense work peaks.

Practical recommendation

- **Not all livestock species combinations are complementary. Reflecting on species features and expected benefits is essential to find a locally relevant combination.**
- **From the perspective of autonomy for fertilizers, complementarity takes place when livestock species produce different types of effluents.**
- **From the perspective of autonomy for feed, complementarity takes place when livestock species have different feed niches.**
- **From the perspective of livestock health, species should not be exposed to the same parasites and diseases.**
- **From the perspective of work, livestock species should not compete for human resources; instead, multi-species livestock farming allows spreading work peaks.**
- **From the perspective of farm economics, complementarity takes place when processing of one livestock species' products generate by-products usable to feed another species.**
- **Finally, productions have to be sufficiently different to stimulate economies of scope and to enlarge the basket of goods offered to consumers.**

Applicability box

Theme
Sustainable livestock husbandry

Keywords
Mixed farming; livestock farming; livestock husbandry; diversification; multi-species

Geographical coverage
Europe

Equipment
Specific equipment for secondary species, e.g. fencing, milking machine

MIX-ENABLE – Practice Abstract

Practice Abstract

Picture 1 (left): Beef cattle and meat sheep co-grazing in the French Massif Central
Picture 2 (right): Heifers and broilers raised on the same pasture in Central Germany

Further information

Video

- Check the following video for further instructions: https://www.youtube.com/watch?v=kdS6lyPA8zQ

Weblinks

- Check the Organic Farm Knowledge Platform for more practical recommendations.

About this practice abstract

Publisher: INRAE and IDELE, France; CRAW, Belgium; FiBL, Switzerland; BOKU, Austria; Thünen Institute and Forschungsring, Germany; Tuscia University, Italy; SLU, Sweden

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Contact person: Guillaume Martin, guillaume.martin@inrae.fr

Permalink: https://orgprints.org/42677/

MIX-ENABLE: This practice abstract was elaborated in the MIX-ENABLE project. The project is running from April 2018 to September 2021, as part of the CORE Organic Cofund.

Project website: https://projects.au.dk/coreorganiccofund/core-organic-cofund-projects/mix-enable/

Project partners: INRAE and IDELE, France; CRAW, Belgium; FiBL, Switzerland; Thünen Institute and Forschungsring, Germany; Tuscia University, Italy; SLU, Sweden

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GREENRESILIENT – Practice Abstract

Transfer mulch in organic greenhouse crops

Problem

In organic greenhouses, crop rotations are often intense and lack diversity, green fallows are rare, and production relies heavily on external inputs. Consequently, problems such as reduced soil health, nutrient imbalances, and a prevalence of pests and diseases are common.

Solution

Applying fresh mulch in greenhouses is a sustainable alternative to plastic mulches. Mulch material produced locally or on-farm is applied before planting, repressing weed growth, providing nutrients and boosting soil health.

Impact

Mulching helps to maintain humus levels and soil structure, enhancing biodiversity and biological activity in the soil. The mulch layer reduces thermal radiation and evaporation, providing homogeneous soil humidity, lowering irrigation needs, preventing salinisation problems and buffering temperature extremes.

Practical recommendation

- There are various appropriate materials to use as mulch. Materials like grass-clover, pulses, cereal-legume mixtures or silage are suitable as they can be produced on the farm.
- Harvest the green mulch around the flowering stage and cut into approximately 10 cm pieces.
- An initial mulch layer of 10-15 cm thickness (see picture 1) is required to ensure weed suppression until the end of cropping. For fresh mulch material, one can plan to use approximately threefold the amount of mulch in relation to the greenhouse area.
- Do not apply the mulch too early in the season, to ensure the soil has warmed up enough before application. Otherwise, nutrient availability can be limited.
- Fresh mulch material and particularly silage mulch can cause leaf burning due to gas emissions. Therefore, planting should be delayed for 1-2 weeks after mulching and the greenhouse should be well ventilated during this phase (refer to figure 1 for correct timing).
- Install drip irrigation on top of the mulch layer or use sprinkler irrigation (e.g. once a week), this provides more homogeneous soil moisture and mulch decomposition.
- Usually, a single mulch application is enough to ensure weed suppression. If the mulch layer decomposes too fast or weed suppression is insufficient, apply a second mulch layer.
- If the mulch layer has decomposed sufficiently, completely incorporate it into the soil at the end of the season. If too much mulch material remains for mechanical incorporation, dispose of some of the material in your compost.

Picture 1 (left): A 10-15 cm thick mulch layer impedes weed growth; Picture 2 (right): Insufficient ventilation after mulch application can lead to leaf burning Source: Hauenstein (FiBL)

Applicability box

Theme
Soil health and quality, soil management, weed management, horticulture

Keywords
Weed control, horticulture, greenhouse crops, soil quality, soil management

Geographical coverage
Suitable for summer crops in all regions

Application time
Summer

Required time
Approx. 5-10 fold time of plastic mulch

Period of impact
Summer: for weed, water and temperature management; long term for improving soil health

Equipment
The use of a field chopper and a compost spreader is recommended.