2022-2024

The Organic Food System Programme Second Report

Full Report

A core initiative of the UN Sustainable Food Systems Programme in the One Planet Network

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Our Initiative

Chapter 01 >> Our initiative

The Organic Food System Programme (OFSP): Organic food systems as models and living laboratories for transformation processes towards sustainable food systems (Core Initiative #8)

The Organic Food System Programme (OFSP) is an initiative of the International Research Association for Organic Food Quality and Health (FQH) together with co-leads BERAS International (Building Ecological Regenerative Agriculture and Societies) and the International Federation of Organic Agriculture Movements – Organics International (IFOAM-OI).

OFSP was endorsed as one of eight Core Initiatives of the Sustainable Food Systems (SFS) Programme – now One Planet - of the United Nations' 10-Year Framework on Sustainable Consumption and Production (10YFP) in February 2017. For the first 5-year period 02-2017 until 02-2022 the OFSP took upon itself eight Deliverables with the active engagement of about eighty partners across five continents. The first OFSP report for the years 2017-2022 has been completed and provided to the SFSP coordinators.

Our second full report

Following on the first period and in exchange with the co-leads of the programme OFSP took upon itself a further five deliverables for a two-year extension of its core initiative status. This OFSP Full Report elaborates on the key achievements made during the 2022-2024 period on the five Deliverables and proposes an internationally extended continuation and intensification for the development of knowledge and exchange, as well as local projects for sustainable organic food systems worldwide.

Our objectives

OFSP facilitates the further development of organic food systems as pilot models and living laboratories for transition to more sustainable food systems. We use the organic food system as a model to understand drivers of sustainable food consumption and to link this to real-world examples of sustainable production and consumption. The OFSP uses the organic food system as a kind of window for exploration and evolution but not as a static or exclusive solution. The scope of OFSP is to identify, understand and describe transformation processes towards sustainable food systems and make lessons learned available in a globally systematized and contextually applicable way.

Our rationale

Organic food systems are understood as a model for sustainability and can serve as living laboratories for continued learning and improvement, integrating science and research with real-world examples. With our partner organizations and involved individuals on all continents OFSP helps share the benefits of organic practices with interested initiatives and across all of society.

Our reasoning

Organic food systems provide a set of unique experiences to learn from as they consist of well-defined principles and practice, regulations and certifications, in different environments as well as providing abundant sets of data for modelling and testing in different geoclimatic and socio-economic regions around the world – thanks to the system boundaries provided by the assurance system. Decades of real experience in production and processing provide empirical data and indications of the strengths, weaknesses, and improvement potentials of organic value chains. Furthermore, the organic sector is actively evolving into manifestly encompassing a full spectrum of sustainability issues, beyond what is sometimes seen as a limited scope focused on certification requirements. Organic principles and practices are thus also used outside of formal certification systems, having much overlap with aligned movements such as agroecology, permaculture, and others. Cultural and geopolitical contexts, however, go beyond the existing organic rules, a situation which challenges and often undervalues how much organic food systems can contribute to human well-being and sustainable development.

Our system

OFSP is inclusive of the entire value chain, including externalities. The overarching goal of OFSP implementation activity is to enable establishment of local sustainable food systems in potentially any location on the planet, under a unified model of co-creation among farmers, processors, traders, consumers, policy makers, educators, and researchers. Existing organic systems are enhanced by closing nutrient loops within the boundaries of any defined system and addressing waste as an inherent component to optimize production systems in closed loops. Human health is also considered as an integral part of the whole agro-food system.

Report I (full report, executive summary, report highlights):
https://organicfoodsystem.net/ofsp-report/

Our Partners

Chapter 02 >> Our partners

Who we are

The OFSP was developed with a bottom-up process by various acknowledged organic experts around the world. In order to work effectively, the OFSP is structured in the following groups.

Our Partners

Any person from an institution engaged in OFSP activities, projects or committees or its coordination can become a partner. A Partner may contribute via participation in OFSP meetings, leading tasks within projects or by sharing results and information from other (non-OFSP) projects. A formal agreement among the partners will be signed. More Partners may join by signing the Partner Agreement. In the five-year and subsequent two-year reporting periods we numbered over eighty partners around the world from diverse fields and sectors covering essentially all stakeholder groups of food systems. We are groups, networks, and individuals in science & academia, in companies, authorities such as local governments, organised in multi-stakeholder networks, farmer‘s associations, Civil Society Organisations (CSOs), as well as in education, and business. Partners can also be found on the partner map (see screenshot and link below).

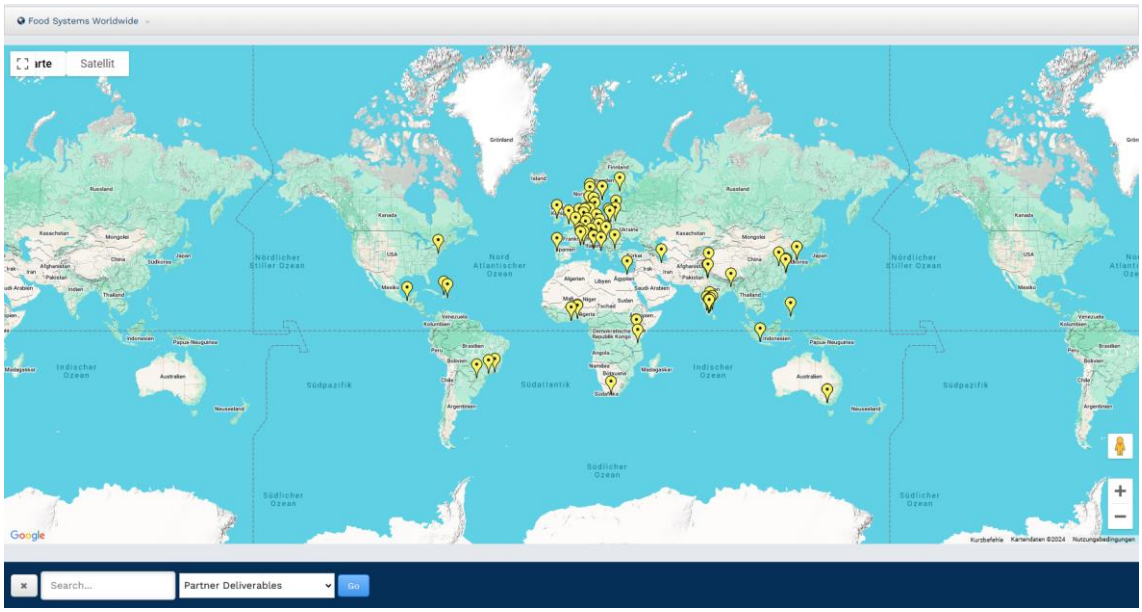

Figure 02-1: Screenshot of OFSP-Partner map (for the interactive more information see: https://directory.ifoam.bio/food_systems/map)

Our Steering committee

Active Partners form the Steering Committee which ensures the overall development of the OFSP including meetings of Partners, evaluation of project proposals, the contribution of all activities to achieving the goals of the OFSP with a special focus on communication with various target groups. The Steering Committee consists of the responsible Partners for each identified work area as well as the Coordinators. Steering committee members represent the OFSP in their interaction with other groups, networks and programmes.

Our Steering Committee members are:

>> Susanne Bügel, Copenhagen University, Denmark
>> David Gould, Sustainability Advisor, USA
>> Jostein Hertwig, BERAS International, Sweden
>> Denis Lairon, Aix-Marseille University, France
>> Ewa Rembiałkowska, Warsaw University of Life Sciences, Poland
>> Lilliana Stefanovic, University of Kassel, Germany
>> Carola Strassner, FH Münster University of Applied Sciences, Germany

Our Coordination

Our coordinators are:

>> Jostein Hertwig, BERAS International, Sweden
>> Carola Strassner, FH Münster University of Applied Sciences, Germany

Our Advisory board

The aim of the Advisory Board is to improve interactions and synergies between all individual actions and projects and to advise the Steering Committee. The board is composed of members with competence in science, stakeholder engagement and policy development. The members are nominated by the partners and formally linked via the Chair of the Advisory Board. Those representing the various stakeholder perspectives on the Advisory Board can be members of the Steering Committee.

Our advisory board members are:

>> Denis Lairon, France (Chair)
>> Alexandre Meybeck, Italy
>> Alison Blay-Palmer, Canada
>> >> Eve Fouilleux, France
>> Olivier de Schutter, Belgium
>> Rembert Biemond, Sweden
>> Roberto Azofeifa, Costa Rica
>> Shi Yan, China

Our Deliverables

Chapter 03 >> Our deliverables

From idea to programme

The International Research Association for Organic Food Quality and Health (FQH) was founded in 2003 as an international multi-stakeholder initiative to enhance research and knowledge transfer on organic food issues. The aim of FQH is to contribute to the development of the Organic Food System (OFS) as a global pilot model with regionally and culturally appropriate variations linking sustainable consumption and production. FQH organized two international conferences on this topic in Prague (2011) and Warsaw (2013) where representatives from FAO presented current findings such as the Sustainable Diet concept. Furthermore, FQH organized member workshops in various European countries developing the organic food quality model and the organic processing concept. In 2013 FQH identified the topic of sustainable diets and the contribution of the OFS to sustainable diets as a future challenge and objective. In 2024 FQH hosted the international conference *Organic food for a sustainable future* together with the University of Copenhagen, Faculty of Science.

Under the 10-Year Framework of Programmes on Sustainable Consumption and Production Patterns, FAO and UNEP jointly developed an UN program on sustainable food systems (SFSP). On September 15th and 16th 2014 FQH organized a joint workshop in Rome with Agricultural Research Council – Research Center on Food and Nutrition (CRA-NUT) and FAO to elaborate the potential contributions of the OFS to Sustainable Food Systems (SFS) with a special focus on sustainable diets. The outcome of this international workshop is described in the proceedings of the workshop (Meybeck et al. 2015). Based on this In addition to foregone endeavours, the OFSP was developed by bringing together international experts from various backgrounds. As part of the programme the development of an “Organic Diet Concept” was proposed to gather knowledge on, and identify and/or develop and test tools and indicators contributing to the SFSP of FAO/UNEP as well as IFOAM-OI’s Organic 3.0.

From programme to Deliverables

As a result of these various FQH activities, the idea of establishing the OFSP was developed. The path from Programme to Deliverables was described in the Fulle Report on the first set of Deliverables. By February 2016 we were ready to launch the OFSP officially in Nuremberg, Germany, at the BIOFACH, the leading trade fair for organic food, which takes place in combination with VIVANESS, the international trade fair for natural and organic personal care. During the ensuing period, the enterprise was advanced into a fully-fledged programme. By February 2017 we had connected with the global SFSP and by March 2017 we succeeded

in establishing the OFSP as a Core initiative of the 10YFP-SFSP. The OFSP was thus developed in consultation and exchange with several key experts and stakeholders over a period of years, culminating in the eight Deliverables of its first multi-year work programme.

For the second multi-year work programme OFSP has set five Deliverables. These five Deliverables (see below) pick up on the Outcomes of the Deliverables of the first work period to delve deeper into the information base about the OFSP partners, census of organic food systems around the globe, base of educational resources and programmes, scientific study of quality of organic diets and organic production systems as well as building data collection, sharing and reporting capabilities for increasing the support of the organic food systems.

>> Deliverable 1

Build information base about partners and their interests so that we can all know about and exchange with each other

>> Deliverable 2

Maintain a census of organic food systems around the world, in various stages of development

>> Deliverable 3

Expand the base of educational resources and programs so that knowledge, study and practice of food systems is more accessible to all kinds of stakeholders

>> Deliverable 4

Deepen the scientific study of the benefits of organic production systems and diets

>> Deliverable 5

Build the data collection, sharing, and reporting capabilities to demonstrate and advocate for increased support of the OFS

Nº 1

Chapter 031 >> Deliverable 1

To build the information base about partners and their interests so that we can all know about and exchange with each other

Through its format as an open, flexible multi-actor programme, as well as its global reach, the OFSP is well poised to connect and facilitate connecting between persons, organisations, projects and initiatives.

To further build the base of this programme, its three parenting organisations FQH, BERAS International, and IFOAM-OI have established stronger and more frequent channels for exchange. For FQH, its General Assembly held annually at the BioFach Organic Trade Fair in Nuremberg, Germany, has proven to be a central meeting point of the community, easily providing room for new interested persons as well as members and OFSP partners. Furthermore, the Seminar Series, now held on a monthly basis, is an additional format that provides short but regular opportunities for exchange between science and practice and within science.

Across the members and partners there have been a number of research & development as well as education & training projects, through which skills and interests could be pursued and deepened. Some of these can be found on the OFSP website under Activities (see link below) as well as later in this report. The general increase in interest and use of the sustainable food systems concept has served to support growing interest in the concept and study of organic food systems. This contributes to growing the community and its visibility.

The links between the OFSP and the GAOD (Global Alliance for Organic Districts), especially in persons and activities, have additionally brought opportunities to be in an iterative process, building, refining, improving and consolidating the nodes and relations in the networks. GAOD is an international web of networks built around applied transformation on a territorial basis facilitated by local governments. Regions aiming to transition to EcoRegions or BioDistricts join to share experiences and learnings en route to sustainable organic food systems. GAOD was founded in 2020 by the Asian Local Governments for Organic Agriculture (ALGOA), the International Network of Eco-Regions (IN.N.E.R.), Regeneration International (RI), and the League of Organic Agriculture Municipalities, Cities and Provinces of the Philippines (LOAMCP-PH). Through our initiative, the Organic Food System Programme (OFSP), FQH supports GAOD together with IFOAM-Organics International, IFOAM Asia, IFOAM EU, and the Baltic Foundation of Lithuania.

Figure 031-01: Networking across disciplines and practice

Figure 031-02: Further networking across disciplines and practice

Nº 2

Chapter 032 >> Deliverable 2

To maintain a census of organic food systems around the world, in various stages of development

Organic food systems connect organic farming with organic processing, distribution and consumption of organic foods in a web or network. These systems include the laws, controls, education, finances, structures, practices and so much more common to food systems but in this case related to, necessary for or arising from organic primacy. In the past years people in various capacities have come together to create regions that don't only promote organic agriculture but seek to develop organic territories where the principles and practices of the organic way are used to manage the regions sustainably. One of these approaches create what is known as biodistricts, or also eco-regions.

032.01 Biodistricts

Between 2022 and 2024, there were several newly established bio-districts in Europe and planned ones in Asia and South America, the establishment / planning of which was carried out in close collaboration with OFSP. These bio-districts are:

>> Biodistrict in Vidzeme, Latvia "Gaujas National Park"

>> Biodistrict in Međimurje, Croatia

>> Biodistrict Nordland, Norway

>> Biodistrict Maremma Etrusca e Monti della Tolfa – MET, Italy

>> Biodistrict "Sörmland", Sweden

>> Planning process for biodistricts in Asia

>> Planning process for biodistricts in Argentina

>> Biodistrict in Vidzeme, Latvia, Gauja National Park

Established: 25.10.2023

Contact: Inese Suija-Markova, Inese.Suija@cesis.lv

Gauga National Park is located in Latvia and takes its name from the River Gauga. The protected natural area falls within three municipalities (Cesis, Sigulda, Valmiera).

Figure 032-01: Gauja National Park location in Latvia (Figure from brochure https://www.entergauja.com/userfiles/files/EnterGauja_2020_ENG_web.pdf)

Figure 032-02: Signing ceremony of "The Memorandum of Good Will" 25 October 2023 in, bitte Segulda, Latvia creating a Bio-district in Gauja National Park (photo credit: Santa Sinka).

MEMORANDUM ON GOOD WILL
FOR THE CREATION OF A BIOREGION IN GAUJA NATIONAL PARK

Gauja National Park – the largest, oldest, and most renowned protected natural area in Latvia. It encompasses the municipalities of Cesis, Sigulda, Valmiera, and Saulkrasti. Historically known as an outstanding scenic area with significant biodiversity and a rich cultural heritage. Widely recognized as a recreational destination and an attractive scientific research site. Here, there are engaged communities and self-organizing groups valuing a harmonious coexistence with nature. Currently, within the park's territory, the area of biologically certified agricultural land exceeds the Latvia's average. Many small farms and businesses operate here, producing and processing high-quality food, maintaining traditional rural landscapes, lifestyles, and preserving the environment.

We, municipalities, government institutions, agricultural organizations, educational and research institutions, communities, associations, and foundations, residents, and other stakeholders who have signed below,

Feeling responsible towards current and future generations and the need to create an example for a new economy that is environmentally friendly, resource-efficient, socially inclusive, and promotes well-being,

Acknowledging that nature and its diversity sustain all life on Earth and, therefore, should be conserved and enhanced,

Implementing the rights of the region's residents to live in a clean and healthy environment,

Recognizing that sustainable development can only be ensured through collaboration and pooling resources, knowledge, and experience,
agree to jointly create a bioregion in the Gauja National Park area in accordance with the following principles:

1. Promoting organic farming in agricultural lands;
2. Managing natural resources – water, land, forests, etc. – sustainably, reducing the risk of ecological overload and resource depletion;
3. Protecting and preserving biodiversity, especially protected natural areas and natural landscapes;
4. Fostering empathetic and respectful relationships among people and their interactions with nature;
5. Supporting and promoting businesses that conserve natural resources, the climate, and cultural heritage;
6. Ensuring democratic decision-making for the bioregion's activities, based on the principles defined in this memorandum, research, evidence, and data.

We commit to working in the following priority areas:

1. Promoting a healthy lifestyle and increasing the consumption of healthy organic food in the region, especially in public institutions, including kindergartens, schools, nursing homes, and hospitals;
2. Developing cooperation between local farmers and entrepreneurs to create short food supply chains and a circular economy-based business;
3. Implementing nature capital management based on the ecosystem service approach;
4. Reducing waste generation in households and businesses;
5. Implementing energy efficiency and transitioning to renewable energy resources and production;
6. Creating educational events and programs that change residents' behaviour and promote the sustainable use of natural resources and cultural heritage;
7. Developing tourism based on inner peace and harmony, promoting authentic experiences for local and foreign travellers;
8. Strengthening community and youth engagement, fostering a sense of belonging and pride in living in the bioregion and serving as an inspiration to others.

Figure 032-03: Excerpt from the Memorandum on Good Will

>> Biodistrict in Međimurje, Croatia

Established: 26.09 2023

Contact: Dijana Posavec, dijana.posavec72@gmail.com

The first plans have been created in 2023 to establish a Bio-district in Međimurje County, Croatia. The initiative is coordinated by the Center of Dr. Rudolf Steiner and the Tourist Board of Međimurje County.

Figure 032-04: Signing the protocol for establishing the Bio-district in Croatia during the international conference in September 2023 (photo credit: Medimurje County)

An International Conference was held on the subject of ORGANIC DISTRICTS (Eco-Regions / Bio-Districts) and to celebrate EU ORGANIC DAY & WORLD TOURISM DAY 2023 on 26.09.2023 in the premises of the „Centar održivog razvoja“, Međimurje Polytechnic, ul. bana Josipa Jelačića 22f, Čakovec. The organizers were the Center of Dr. Rudolf Steiner and the Tourist Board of Međimurje County.

The conference is supported by: Ministry of Agriculture, Međimurje County, Croatian Chamber of Agriculture, IFOAM International, University „Sjever“, Faculty of Agriculture University of Zagreb, Međimurje Polytechnic, Leader Network of Croatia, LAG Međimurski doli i bregi, LAG Mura-Drava, Institution „Međimurska priroda“

The European Commission has defined an ORGANIC DISTRICT (Eco-Regions / Bio-Districts) as a geographical area where farmers, the public, tourist entities, associations and public authorities conclude an agreement on the sustainable management of local resources, based on ecological principles and practices (Action Plan for OA). The goal is to maximize the economic and social potential of the territory. Each "Bio district" includes lifestyle, diet, human relationships and natural resource management.

The Global Alliance for Organic District of IN.N.E.R. International Network of Eco Regions is a global transdisciplinary network and collaborative community launched in 2009 in Italy. Today it operates in more and more countries on different continents.

>> Biodistrict Nordland, Norway

Established: 14.09.21

Contact: Jostein Hertwig, jostein.hertwig@gmail.com

The newly established Organic District in Norway and as an integrated part of Bodø and the county of Nordland as the European Capital of Culture 2024. It is North of the Arctic Circle – at 67 degrees north – the land of the midnight sun and northern light. The Sami indigenous culture is central in the region together with small scale agriculture, gathering and harvesting in a close interaction with Artic nature. Also, this Organic District is the home of Professor Ove D. Jacobsen with his ground-breaking work of Ecological Economics. Flowing from this the core of the Nordland Organic District is within the theme of “Local food for local markets”.

Figure 032-05+6: Biodistrict Nordland location in Norway

Fig. 032-07: Norwegian impressions (photo credit: Dan Mariner)

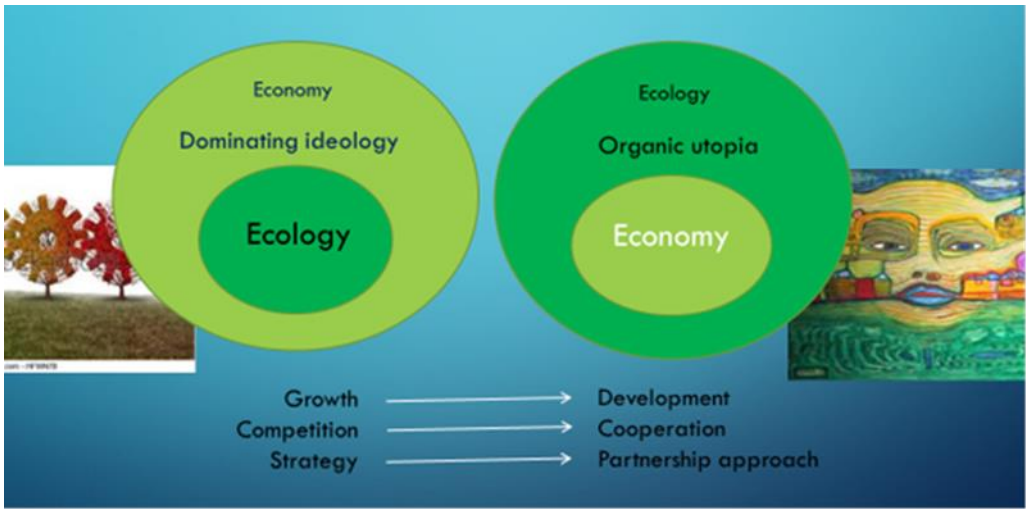

Figure 032-08: Concept of transformation by Professor Ove D. Jacobsen

Figure 032-09: Biodistrict Nordland team (photo credit: Nicole Natalie Furnes)

>> Biodistrict Maremma Etrusca e Monti della Tolfa (MET), Italy

Established: November 2021, Contact: Flavio Paoletti, flavio.paoletti754@gmail.com

Authors: Flavio Paoletti, Kim Assaël, Giuseppe Orefice

Background

The bio-district “Maremma Etrusca e Monti della Tolfa – MET” has been officially recognized in 2021. MET is in Central Italy (Lazio Region). Its organically cultivated land is about 16% of the total utilised agricultural area and consists of permanent grasslands, cereals, olive trees, vineyards, and vegetables. The territory has a long-time tradition of cattle breeding, mostly organic, and also beekeeping plays a significant role.

Aim

The main aim of the START UP MET BIO project was to lay the foundations for the accreditation of MET as a territory management body that promotes a sustainable and inclusive development.

In particular, the aims of the project were:

- improve the competitiveness of the local agricultural and agro-industrial sector;
- promote cultural and education activities to create greater social cohesion among the local communities and awareness about the link between food, health and environment;
- organize trade and distribution of the local organic food produce to facilitate the access of the local population to healthy and organic food and a decrease of the food waste;
- increase the sustainable accommodation and tourism offer;
- promote and valorise the local cultural and landscape heritage;
- reconnect policies at local regional and national levels;

Methods

- Action-research for an impact on the organization of the relationships among private and public actors.
- Creation of active supply chain groups.
- Collection and analysis of scientific and grey literature.
- Collection and analysis of data of the level of obesity in children.
- Meetings, interviews and focus groups with local operators.
- Food education activities.
- Networking with other bio-districts.
- Promotion of the visibility of the actions implemented in the territory through the organization of multiple meetings/events.
- Implement sustainable food policies on the multi-level.

Results

A logo of the bio-district MET was created and the guidelines for the use of the mark finalized. The website of the bio-district MET was designed and implemented. Information and data about the situation of the livestock, cereal and beekeeping chains at international, national and, when possible, local level were collected and analysed.

The needs of the local operators of the livestock, cereal and beekeeping chains were collected and elaborated in strategic lines for their development. In collaboration with the local authorities of the National Health System, the menu of a primary school canteen was changed to reduce the consumption of meat and increase the amount and variety of local food and recipes in the menu. Food education activities were carried out addressed to the teachers and students of the primary and secondary schools of the territory. An activity of surveillance and prevention of the obesity in children through the promotion of healthy lifestyle and nutrition was performed. Enlarging the social basis of MET Association. The Lazio Region Coordination Table was established and officially recognized including the 12 BDs currently present in Lazio Region. A representative of the Coordination Table was included in the Monitoring Committee of the CAP programming at regional level.

Discussion and conclusion

Some innovative elements have characterized the creation and management process of the MET bio-district:

- a multi-stakeholder participation in the governing bodies of the BD with an inclusive governance approach. This was possible by having shared the aims of the promoting Committee and building upon the socio-territorial responsibility;
- the improvement of vertical supply chains as element of cooperation between companies and for their territorial integration for the sustainability of the local agri-food system;
- the contemporary implementation of citizens organic lifestyle and consumption with the improvement of the value chains.

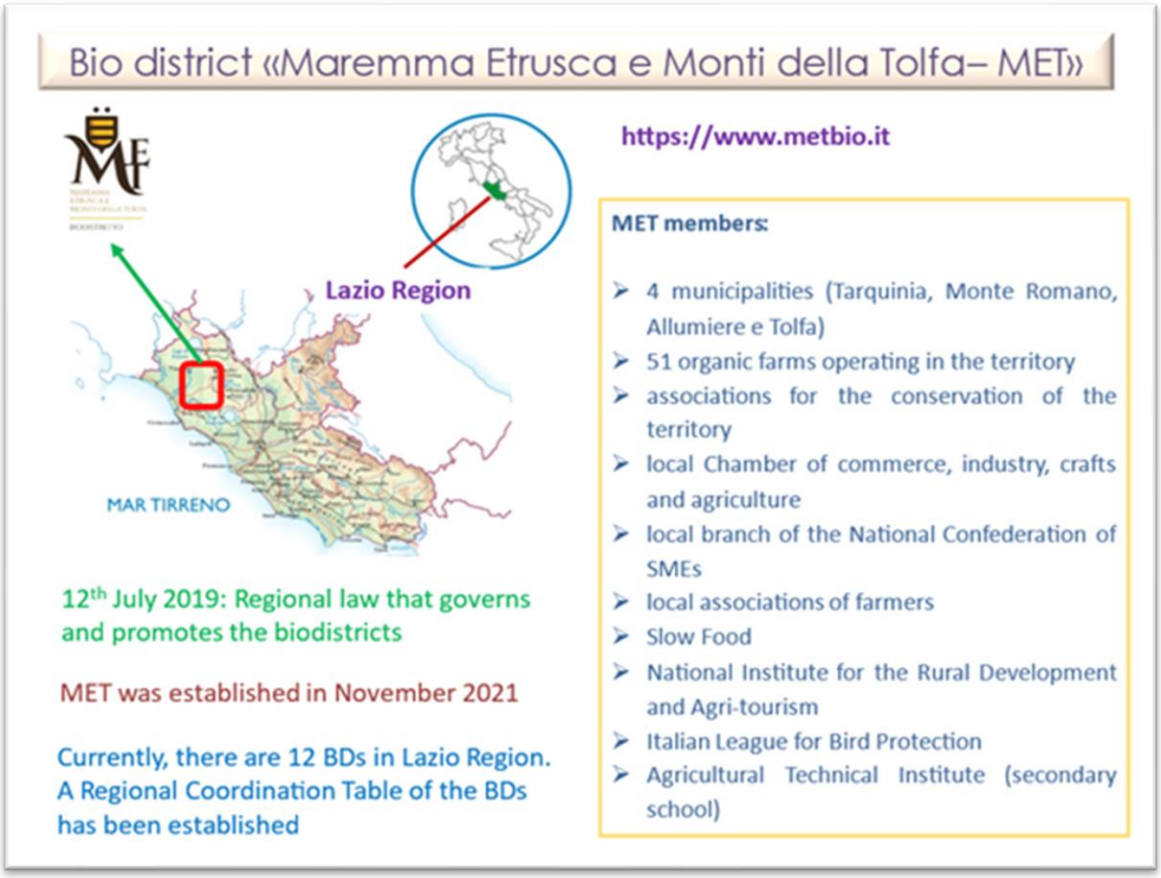

Figure 032-10: Bio-district Maremma Etrusca e Monti della Tolfa (MET) - basic facts

>> Bio-district Sörmland, Sweden

Established: 01.01. 2024

Contact: Sofi Gerber, sofi@berasinternational.se

The region of Sörmland, otherwise known as Södermanland, lies on the south-eastern coast of Sweden and on the shores of the Baltic Sea (Fig. 11). Not far from Stockholm, there has been organic farming in the district since the 1940s. A special feature in the biodistrict Sörmland is the concept of “Diet for a Green Planet”, the criteria of which are displayed in Fig. 13.

Figure 032-11: Bio-district "Sörmland" - basic facts

Figure 032-12: Bio-district Sörmland was awarded the best Bio-district in the European Union 2024

Figure 032-13: Criteria of the Diet for a Green Planet (photo credit: Södertälje municipality)

Figure 032-14: Working with food following the "Diet for a Green Planet" criteria: Södertälje municipality as a key actor

>> Planning process for biodistricts in Asia

Contact: Jennifer Chang, jchang2011@gmail.com

Around 2.000 participants from 31 countries and areas gathered for the Summits and the 6th Organic Asia Congress. Representatives from Organic Food System Program were David Gould and Jostein Hertwig. At the Summits, discussions focused on good examples of organic districts around the world from Asia to Europe and Africa. The ALGOA and GAOD members shared their initiatives and diverse organic agricultural and food programs related to organic districts, governance, ecological, economic, cultural and social sustainability perspectives. Such initiatives have huge scopes to disseminate in different parts of the world. The speakers highlighted the democratic and all-inclusive process of decision-making in the implementation and management of the organic districts.

Figure 032-15: 9th ALGOA & 4th GAOD Summits: Manifesting Organic Districts in Asia, June 5th - 6th, 2023, Kauswagan, Lanao de Norte, Philippines

Figure 032-16: Planned Organic Districts in the Philippines

Planned Organic Districts in **India**

- Ooty, the hill region of Tamil Nadu
- Inba Seva Sangam, Karur region in Tamil Nadu
- Leh Ladakh in the Himalya region

Contact: Dr. Perumal Karuppan, Beras India berasindiaperumalk@gmail.com

>> Planning process for biodistricts in Argentina

Contact: Juan Pablo Sciurano, jpsciurano@yahoo.com

In 2021, as part of the Strategic Plan 2030 for the Organic Production sector and developed within the framework of the Advisory Commission for Organic Production, the **Biodistricts Initiative** was launched. The objective was to promote its nationwide implementation, with significant involvement from the Ministry of Agriculture, Livestock, and Fisheries (MAGYP), provincial and municipal governments, universities, producer groups, INTA (National Institute of Agricultural Technology), INTI (National Institute of Industrial Technology), MAPO, ICCA-CIAO, CFI, and other institutions.

The first activity associated with this initiative was the organization of **10 Workshops** on Biodistrict Creation, engaging more than 50 stakeholders, including representatives from the Ministry of Agriculture, municipal actors, entrepreneurs, universities, cooperatives, and rural development groups.

During these workshops, different territories were identified with the aim of selecting pilot or "witness" cases. These cases will serve as models for refining implementation practices, which can later be scaled up at the provincial, regional, and national levels.

Figure 032-17: Argentina's Strategic Plan for Organic 2030

Implementation of the Pilot project for supporting Bio-Districts implementation in Catamarca Province. Supported by the Argentinian Ministry of Agricultre

Throughout the province, several meetings were held to introduce and discuss the **Biodistrict model** with various stakeholders, including:

1. **Public Administrations and Programs** at the municipal, provincial, and national levels, particularly those related to territorial development in the food and tourism sectors.
2. **Farmers and Producers**, both individual and organized in associations.
3. **Consumers**.
4. **Educational, Research, and Extension Institutions**, including primary, secondary, and tertiary schools, universities, and national and regional research centers.
5. **Private Sector Companies**, ranging from suppliers of agricultural inputs, machinery, and processing services to distributors, marketers, transporters, hotels, tour guides, restaurants, retailers, and health centers.
6. **Territorial Associations**, especially those focused on sustainability, responsible consumption, and natural resource management.

After these territorial meetings, **three potential Biodistricts** were identified based on the following criteria:

- Interest from complementary actors in creating the Biodistrict.
- Proximity of territories.
- Existing collaborative experiences between municipalities.
- Experience with regional markets.
- Presence of technical support (e.g., INTA, INTI).
- Existing tourism routes and shared offerings.

Identified Biodistricts:

1. **Central Valley Region**:
    - San Fernando del Valle de Catamarca (Capital Department), and municipalities of: Valle Viejo, Fray Mamerto Esquiu, Capayán (Huillapima Department), Ambato (Las Juntas).
2. **West Region**:
    - **Belén Department**: Includes the municipalities of Londres, Belén, Puerta de San José, Pozo de Piedra, Hualfin, San Fernando, Puerta de Corral Quemado, Corral Quemado, Villa Vil.

3. **Tinogasta Department**:
    - Municipalities of Tinogasta and Fiambalá.

This initial identification is based on field visits, interviews, and meetings with local stakeholders and organizations. These three potential Biodistricts could be expanded or modified depending on future developments, including the formation of a **Promoter Committee** and further territorial promotion activities.

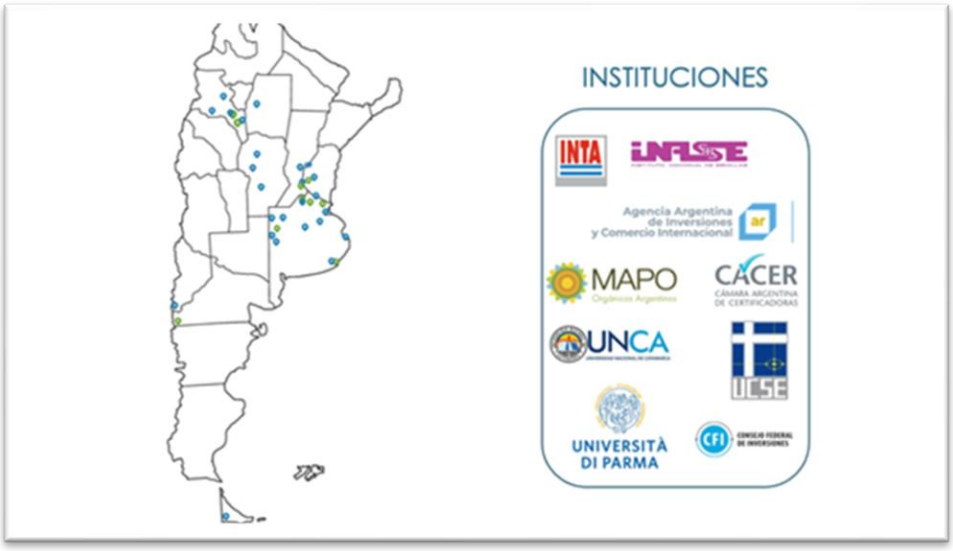

Figure 032-18: Map of Argentina's 23 provinces and one autonomous city (LHS) and involved institutions

Territorial Competitiveness Analysis: Cluster Approach with a Biodistrict Focus

Although **Catamarca** has a limited number of certified organic producers, the region has significant potential for both **external market development** (national and international) and **internal consumption growth**. A **neo-endogenous development process** focused on organic and agroecological production could be key to achieving inclusive development goals, such as:

- Improving the quality of life in rural areas.
- Enhancing the appeal of rural areas by linking sustainable development strategies with urban areas.
- Increasing employment opportunities and improving job quality.
- Promoting active engagement of young people in the ecological transition.
- Generating income through organic product marketing.
- Expanding the local consumption of healthy, organic, agroecological food.

- Connecting traditional provincial products with organic and agroecological practices.
- Promoting **sustainable tourism** and **rural tourism** based on organic production principles.

Through interviews and meetings, it was identified that **associative efforts** in organic and agroecological production are still limited. While there are some collaborations in **circular economy models** (e.g., in the wine and leather sectors, as well as hospitality and gastronomy in vineyards), these initiatives remain isolated.

Figure 032-19: Various stakeholders involved

Recommendations for Biodistrict Formation:

Given the limited grassroots association efforts, the following **integrated approach** is recommended for launching the Biodistricts:

1. **Top-Down Approach**:

   Given the lack of established associations from the ground level, it's suggested that the **Provincial Government** take the lead in facilitating coordination. This should involve the Ministry of Digital Inclusion and Productive Processes and the Ministry of Tourism, which would work together with municipal actors and organic producers, who could serve as "beacons of experience". Collaboration with the **University of Catamarca** could foster participatory governance, and technical support from **INTA** and **INTI** would help ensure that technical monitoring is in place.

2. **Centripetal Approach**:

   The approach should gradually move from the regions outward to a central coordination hub. Initially, the Biodistricts should be defined based on local

organic and agroecological production experiences, with potential actors and typical products identified in each territory. Cohesion should build from the periphery toward a unified center, which would ultimately be the **enogastronomic and tourism value** of the province.

Organic and Agroecological Production Integration

To scale organic production at the provincial level, it is crucial to create a **register** for producers interested in transitioning to agroecological practices. This could be done at each of the identified Biodistricts. Unlike certified organic production, this process would involve **research-action** approaches, allowing local and provincial actors to guide the transition.

This registry would also serve as a foundation for establishing **Participatory Guarantee Systems** (PGS), which are essential for differentiating organic products. These systems would allow for local market development, including **municipal and provincial public procurement** opportunities.

Next Steps for Biodistrict Formation:

It is recommended that the three identified Biodistricts register with the **INNER network** (International Network of Ecological Regions) and begin the methodological processes outlined by this international organization. This will help organize and establish each Biodistrict, with the elements identified in this initial stage forming the basis for a common approach moving forward.

032.02 Research being done in/on/with Organic Districts

Results of three impact studies of the municipal food project of Mouans-Sartoux municipality in France:

Since the very beginning of its food project in 2016, Mouans-Sartoux has committed itself to assess the initiatives driven by the municipality and their impact on the territory and beyond.

This process is quite important, as the issues tackled in the municipal food project are part of an innovative field, and quite recent in local public action even if the decision-making and executive organ remains mainly at state level. In this objective and in order to measure the effects of the territorial Food Project several assessment studies supported by researchers and academics were driven.

1. Observatory For Sustainable Canteens: started in 2013, this triennial survey aims to measure the effect of the sustainable canteens' project on children and families' food behaviour. The last investigation was conducted in 2022.

2. Impact assessment «Syalinnov» : this study, started in 2020 and conducted during 2 years, measured the food project's impact, since its creation in 2016, during the 5 year-period, in addition to the sustainable canteen's project. This method, inspired by the theory of change, was created specifically to answer the need of the assessment of local food initiatives, and has been tested on several other territories.
3. Environmental assessment : the Food Project of Mouans-Sartoux was selected to be a field study of a thesis (2021-2023), carried out both by the ADEME (French agency for ecological transition) and the Côte d'Azur University, willing to develop an assessment methodology of the environmental impact based of Territorial Life Cycle Approach. This method looks into all the environmental impacts of a territorial food system (ex. greenhouse gas emissions, land use, water consumption etc.) at each essential step: from the production, processing, distribution, consumption to waste disposal. It has led to a publication, attached.

032.03 Organic food system case studies

Organic food system case studies documented as part of Master student projects between 2022 and 2023

Prepared by L. Stefanovic and K. Velten

Between 2022 and 2023, the following OFS cases were documented as student projects within the study module "Principles of Organic Farming" at Section of Organic Food Quality, Faculty of Organic Agricultural Sciences at the University of Kassel in Witzenhausen (Germany):

1. Brenjonk Organic Community, East Java (Indonesia)

2. BSP Farm, West Java (Indonesia)

3. Eastern Black Sea Region (Turkey)

4. Organic Island of Gökçeada (Turkey)

For each case study, data secondary data collection was carried out, exploratory interviews with the informant(s) of the respective cases and semi-structured interviews with the key actors of the respective OFSs under study. The description presented here is largely based on the secondary data and, where applicable, informant interviews. The below sections provide the details about the geographical location, a brief overview the developmental stages, the range of organic products, organic certification, key actors and their relations, main drivers as well as the first outcomes of the four case studies.

>> Brenjonk Organic Community, Indonesia (adapted from Oktavianti, 2023)

Brenjonk Organic Community is located in Penanggungan Village, Trawas District, Mojokerto Regency in East Java, Indonesia (Fig. 20). Brenjonk Community currently consists of 109 farmers from Trawas and Pacet districts.

Figure 032-20: Brenjonk Organic Community, Indonesia (source: google.com/maps)

Brenjonk Organic Community was founded in 2007 after two years of greenhouse research. In 2008, it joined the Indonesian Organic Alliance (AOI), PAMOR certification and collaborated with MIK (distributor). In the following years, Brenjonk Organic Community won many prizes, in 2015 it started focusing on Organic Education and eco-tourism. In 2018, Refugia Garden and an organic foods culinary business was built by the community. The main target was to increase the income of the locals. Aside from serving as a tourist attraction, the Refugia Garden also as serves as a form of pest management control. This garden is filled with marigolds having beautiful colours, which attracts many tourists. The flowers produce nectar that can attract predators controlling pests in the field. In 2022, Brenjonk obtained the supervision of ten villages and focused on the Agropreneur (agriculture, tourism, trade). The products from Brenjonk are certificated by PAMOR Indonesia, PT BIOCert Indonesia, BPJPH (Halal) and by the Public Health Service (see Figure 031).

Figure 031-21: Certifications of Brenjonk Organic Community (Brenjonk Organic, n.d.-b)

The activities involve crop production and a farmer's association (BIOCert Indonesia, 2022). Furthermore, the community mainly assists and trains farmers regarding seed input, post-harvest processing, cultivation facilities, internal audits, knowledge transfer, entrepreneurship, and organic campaign program.

The farmers from the Brenjonk Organic Community produce a wide range of agricultural products, which include vegetables, fruits, rhizomes, tubers, herbs, and rice. In total, there 98 varieties of vegetables, 17 varieties of fruits, eight varieties of rhizomes and tubers, six herbs varieties, and five rice varieties (BIOCert Indonesia, 2022). Additionally, some crops are also grown in the greenhouses lent freely by the community to the farmers. Farmers also produce their own fertilizers, containing solid and liquid organic fertilizers and microbes from own laboratory. The main distribution channels for organic products from the Brenjonk Organic Community are distributors and retailers in East Java as well as hotels and restaurants.

Key actors in Brenjonk are farmers, Brenjonk Organic Community acting as processor and Media Inovasi Kita (MIK) acting as a distributor. Sales channels include different markets and consumers, at both local and regional levels. The Indonesian Government, Bank Indonesia, the Finnish Embassy and BRI Mojokerto act as investors, and the Indonesian Organic Alliance (AOI), Sanjana Institute, World Wide Day of Prayer (WWDP) and Brawijaya University are involved as NGOs. The investors played an important role in the community's development – especially for the tourism sector, due to a subsidy received from the government. In 2008, the Finnish Embassy conducted a one-year training program for greenhouse practices, in which the community joined the program. Furthermore, BRI Mojokerto supported the production facilities and the infrastructure, while Bank Indonesia assisted the community with the ecotourism and rice cluster (Mardiansyah, 2022). The main actors and their interactions are displayed on Figure 3. The values of the key actors are mainly cantered around food safety, farmers' welfare, and environmental health.

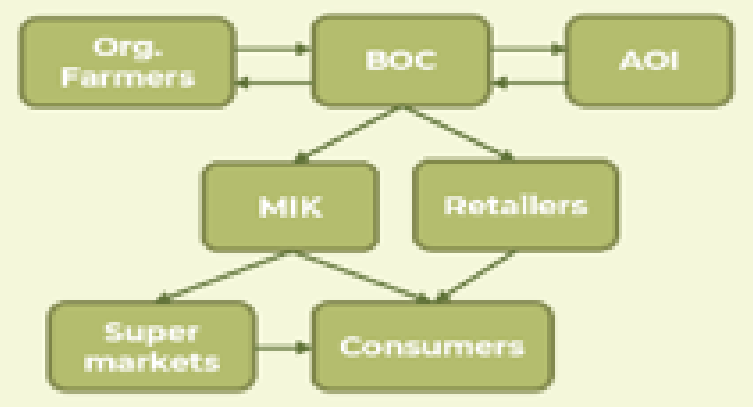

Figure 022-22: Key actors of the Brenjonk Organic Community and their interactions (Oktavianti, 2023)

There are three main drivers for organic farming in Brenjonk Organic Community. First, healthy and safe food for the (local) consumers. Health conditions of the locals who suffered from chronic diseases resulted in the idea to grow chemical-free food. The second driver was environmental health, and the third was farmers' welfare. While the costs of production and maintenance keep increasing continuously, the farmers were struggling to support their own daily needs. Selling organic products enabled them accessing markets with premium prices.

The are three most important outcomes of the Brenjonk Organic Community. Firstly, the stable income for small farmers from the harvested crops, Refugia Garden and the organic food culinary business. The ecosystem balance maintained through organic production practices can be considered another outcome, for which it is, however, too early to be able to measure the impact. Finally, maintained knowledge transfer between institutions, the community, and farmers can be considered the third outcome.

>> BSP Farm, West Java, Indonesia (adapted from Pranoto, 2023)

BSP Farm (Bumi Sanara Panorama Farm) is located in Kampung Loji, Pasir Jaya Village, Bogor Regency, West Java, Indonesia (see Figure 4), including an area of 40 ha comprised of 70 farm members. With an altitude of 750 – 1100 above sea level and a micro-climate of tropical climate (BSP Farm, 2022). This village has an area of 7.99 km^2, with a total population of 8209 people and a density of 1027 people/km^2, where the percentage of males is 51% and females are 49% (BPS Kabupaten Bogor, 2020; BPS Kabupaten Bogor, 2022). The profession that is dominant in the village is entrepreneur, casual labourer, and farm worker (Pemerintah Desa Pasir Jaya, n.d.), and the population in the village is mostly Muslim in religion (BPS Kabupaten Bogor, 2022).

Figure 032-23: BSP Farm, West Java, Indonesia (source: google.com/maps)

BSP Farm is located at the edge of the forest directly bordering the national park. The water source that irrigates the farm comes from Mount Salak. Therefore, the air is clean and free from pollution (Bumiku Satu, 2021). The farm's philosophy is "healthy living is the practice of health-enhancing behaviors, or put simply, living in a healthy way, where it implies the physical, mental, and spiritual capacity to make healthy choices" (BSP Farm, 2022).

In 1985 Mr. Pranoto bought the farm as a conventional plantation. In the 1990's, after a medical intervention, Mr. Pranoto started to slowly convert to organic farming, and in 2013 all products of his farm including tea and coffee were certified organic. The farm also developed eco-tourism. In 2017 and 2019, BSP Farm obtained further organic certifications of USDA, Europe and Canada (Figure 032-24).

a) b) c)

Figure 032-24: Certifications of BSP Farm (a - Organic Federation of Canada, 2021; b – USDA Agricultural Marketing Service, n.d.; c – EU 2024)

In BSP Farm natural spring water directly from mount Salak is used. Organic products from the BSP farm include:

- Vegetables: kale, spinach, lettuce, bok-choy, broccoli, tomatoes, carrots, etc.
- Fruits: pineapples, snake fruits, papaya, lemons, banana, beetroots, etc.
- Herbs: thyme, lemongrass, sage, peppermint, etc.
- Animal products: Free-range chicken eggs.
- Other products: organic Mixed white, brown, red, and black rice, organic raw honey (BSP Farm x Beema Honey Project), organic fine robusta coffee (roasted), organic teas (organic green tea, organic red tea, organic white peony, and organic silver needle), ready-to-cook fried cassava (400 grams/pack), etc. (BSP Farm, 2022).

The main distribution channels for organic products from the BSP farm are the distributor "Tuku-Tuku Natural" and resellers, including supermarkets and hotels, restaurants and canteens (see Figure 6).

Key actors of BSP Farm are producers and processors, consisting of Mr. Pranoto and farmer groups. “Tuku Tuku natural” works as distributor, who sells the products to different retailers. BSP Farm also offers a direct delivery service for fresh organic products to its customers. The mechanism of actor interactions is shown on Fig. 032-25.

Figure 032-25: Key actors of the BSP OFS (Pranoto, 2023)

The motivations for the members of BSP farm are knowledge-sharing for spreading practices based on sustainable principles, teaching to live healthy while maintaining the local culture/ nature by opening livelihoods for residents. The most important outcomes for the organic farmers are having a regular income enabling their families to have a healthy life and gaining knowledge. Furthermore, BSP farm got more chances to try new organic breeding products.

>> Eastern Black Sea Region, Turkey (adapted from Onerbay, 2023)

The Eastern Black Sea Region is located in the North-East of Turkey and consists of the six provinces Trabzon, Ordu, Giresun, Rize, Gumushane and Artvin (Fig. 032-26). An area of 9.247 ha is used for organic farming and currently there are about 10.365 organic farmers.

In 1985, the first farmers turned to organic agriculture, in the following 15 years directives about ecological farming were enacted and contracts were made. In 2004, an Organic Farming Regulation came into force to create national standards. In 2015, EU-funded and regional development programs (IPARD, DOKAP) were initiated to support organic agriculture in the Eastern Black Sea Region. The development plan covering the years from 2014 to 2018 was announced as part of the DOKAP project. As a result of the implementation of this action plan for five years, organic agriculture was further developed. Organic training, seminars and meetings were organized for organic producers to promote organic production in the Region. Potential organic production lands were identified throughout the region, and a clustering study was conducted on the

growing environments and soil requirements of plants. As of 2011, the government has started to support organic farmers all around the country through CATAK – a project to support organic agriculture.

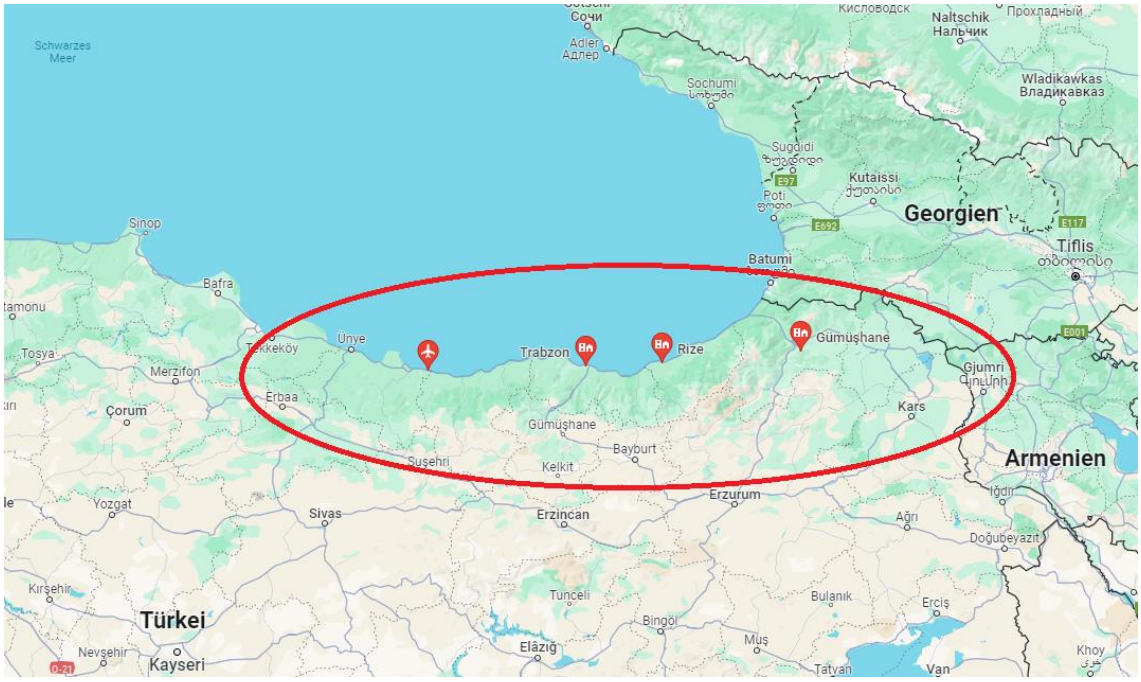

Figure 032-26: Eastern Black Sea Region, Turkey (source: google.com/maps)

In the Eastern Black Sea region organic hazelnuts and organic tea are the dominant organic products, followed by apples, walnuts, pears, and kiwi. Most prevalent organic field crops are corn, clover, sainfoin, meadow, and sunflower. Organic vegetables produced in the Eastern Black Sea Region include beans, tomatoes, cabbage, pepper, bell zucchini, eggplant, and parsley. Organic animal husbandry and beekeeping are limited compared to organic plant production, yet adequate for covering the domestic demand.

Organic products sold in Turkey must have the national organic logo on the label (Figure 032-27). The logo can be used only on organic products that underwent an inspection and certification by an approved Turkish certification company. The organic control and certification process in Turkey is carried out by private control organizations approved and supervised by the Department of Good Agricultural Practices and Organic Agriculture – a sub-unit of the General Directorate of Plant Production within the Ministry of Agriculture and Forestry. Certification bodies must be approved by the Ministry of Agriculture and Forestry and accredited to operate in Turkey.

The key actors in the organic food system in the Eastern Black Sea Region are the farmers, the certifiers providing organic quality assurance, the government issuing regulations and subsidies, regional organizations preparing and implementing development plans, public and private companies bringing dynamism to the economy, NGOs shaping movements, retailers and commission

agents having great importance in the supply chain, and consumers who generating organic production demand. The European Union and the Ministry of Food and Forestry have partnered in projects and regulations that have had a significant impact on the development of the Region's organic food system. CAYKUR, The Eastern Black Sea Development Agency (DOKA), DOKAP, IPARD, and CATAK projects have been instrumental in developing the regional organic food system. Foreign consumers and certification bodies also played an important role in the development of the organic food system in the Black Sea Region. The key actors and their interactions are displayed on Figure 032-28.

a) b)

Figure 032-27: a) Turkish Ministry of Agriculture and Forestry (source: Seekvectors, n.d.); b) Turkish organic agriculture certification (source: Başak Ekolojik, n.d.)

The motivations for farmers in the Eastern Black Sea Region are diverse. Income and employment can be seen as strong drivers, and so does the governmental support. Governmental support has been the driving force of the organic food system preparing a favorable environment for many of the further steps taken. Education and integration have been one of the most important aspects of the organic food system's development. Quality resources and a suitable environment for organic agriculture have increased the region's potential having become the starting point of the efforts made.

Positive outcomes of the organic food system in the Eastern Black Sea Region are low environmental pollution, high potential products, industrial diversity, and contribution to ecological tourism (Fig. 032-29). Environmental pollution in the region will be reduced to a minimum as a result of organic farming, thereby contributing to the preservation of an attractive natural landscape of the region and ecological tourism. The region has products with great potential, especially hazelnuts and tea. Organic production of these products will be a major point of differentiation for the organic food system of the Region. Negative outcomes of the organic food system in the Eastern Black Sea region are high certification costs, long conversion process. Additional challenges are posed by land ownership, lack of youth, low awareness, and higher labour costs. Furthermore, aging population of the region and the lack of youth to participate in the labour force represent significant challenges for further development of organic system.

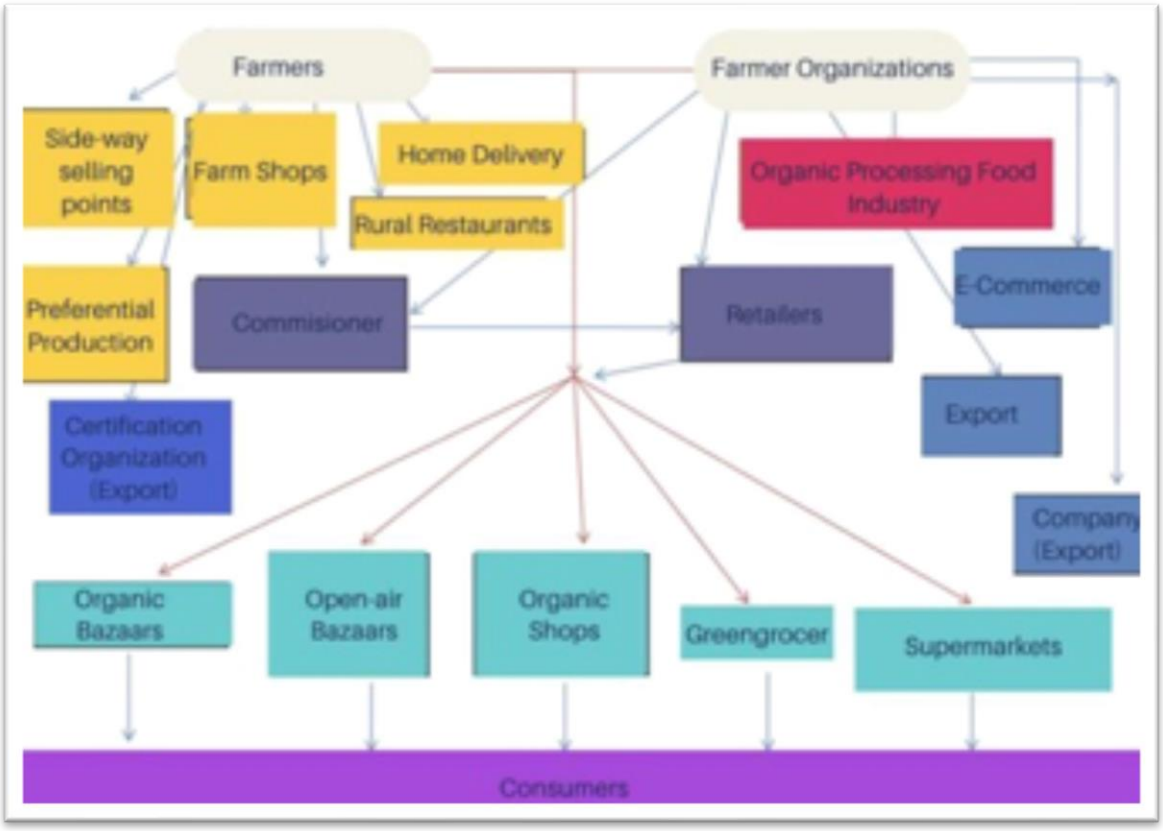

Figure 032-28: Key actors of the Eastern Black Sea Region and their interactions (Onerbay, 2023, adapted from Demiryurek 2016, p.80)

Figure 032-29: Outcomes of and challenges for the Eastern Black Sea Region (Onerbay, 2023)

>> Organic Island of Gökçeada, Turkey (adapted from Gübür, 2023)

Gökçeada Island belongs to the province of Canakkale on the Aegean Coast in the western part of Turkey (Fig. 032-30). It is the largest Turkish Island consisting of 29.000 ha, organic farming is carried out on 830 ha, and 200 farmers are engaged in organic agriculture.

Figure 032-30: Organic Island of Gökçeada, Turkey (source: google.com/maps)

In 1993, the Gökçeada and Bozcada Rural Development and Settlement Project was initiated with the aim of increasing agricultural production by making the best use of the natural resources available in Gökçeada and Bozcada districts, increasing the income levels of settled families and supporting new settlement (MoAF, 2023). In 2002, the Gökçeada Organic Agriculture Project was initiated as a continuation of the 1993 development project and as part of a harmonization plan with the EU. The aim of this project, which is still running today, is to diversify the organic production while ensuring the transition of the whole island to organic agriculture and converting the island into an Organic Agriculture Island (Sahin, 2014, p.356). The project is not limited to organic farming development, but it also supports other activities related to local food and protection of the culinary culture and islander recipes (Burkay, 2016, p.78). In 2010, sustainable gastronomic tourism was initiated, since 2011 Gökçeada belongs to Cittaslow following Slow Food philosophy. The Gökçeada Gastronomy Center was established, which reflects traditional cuisine of the island and offers seminars about how to present the gastronomy culture and tradition of Gökçeada. Certificate programs of Gökçeada Traditional Gastronomy Culture for tourists were arranged.

Organic farming is practiced on 830 ha of the 3350-ha agricultural area, making up approximately 25% of agricultural land. Agricultural land is predominantly occupied by olive trees: 773,5 ha of olive trees and approximately 70% of the olive plantations are part of the organic project. Olive trees grow almost everywhere on the island (Burkay, 2016, p.76; GMKA, 2019, p. 26). Another unique to the island feature rarely practised in Turkey is the breeding system, which is maintained under conditions that can be defined as "ancestral pastures": sheep and goats are left outside all year round as strays. The most common ovine

is the İmroz Sheep, which has a specific characteristic as a gene source and is a protected species (Konyalı et al., 2004). Wine production associated with viticulture has not developed due to the lack of production facilities on the island despite various support endeavours. Few enterprises are active in wine making and the production is mostly made of bottled homemade wines (Sahin, 2014, p.351).

Organic agriculture activities in Turkey are carried out in accordance with the Organic Agriculture Law No. 5262 and the "Regulation on the Principles and Implementation of Organic Agriculture" from 2010. The organic control and certification process is carried out by private control bodies approved and supervised by the Department of Good Agricultural Practices and Organic Agriculture. Control bodies must be approved by the Ministry of Agriculture and Forestry and accredited by the Turkish Accreditation Agency (TÜRKAK).

In Gökçeada, the key actors are very diverse. Producers and consumers, as in any food system, play a central role. European Union and the Ministry of Agriculture and Forestry of the Turkey provided important financial support, and tourism plays an essential role, giving a boost to the system. Local, national, transnational and international organizations also played a key role in the project 'Learning Organic Living on the Island': Mandas Municipality (Sardinia, Italy), ANCI (National Association of Italian Municipalities), Çanakkale Onsekiz Mart University, Gökçeada Vocational School, Gökçeada District Directorate of Agriculture, ETİS, Ekozey, ELTA Tarım A.Ş., Gökçeada Birlik A.Ş., South Marmara Development Agency (GMKA), Slow Food Convivium and Cittaslow National Network (Sahin C. 2014 p.363-364). Other than these actors, basic value chain actors (e.g., processors, retailers, etc.) are also part of the Gökçeada OFS (Fig. 032-31).

The motivations of the organic farmers in Gökçeada seem be centered around traditional and cultural values of producers as was confirmed by Yurtseven and Dilek (2016) in the interview with the island natives:

> " (…) *I have been making wine for ten years, but we know winemaking from our family. It means we already know how they make it. I don't use any pesticide or something else. I make it with traditional methods. We make this craft exactly in the same way as our fathers and grandfathers* (...)" (Yurtseven and Dilek, 2016, p.181).

With conversion to the organic island, other motivations for the development of organic farming came into play: higher income expectation, government support and subsidies, increasing recognition and reputation of the island and agrotourism.

The most important outcomes are the reduced rural poverty and the increased ecotourism potential. Further outcomes are less reduced environmental pollution.

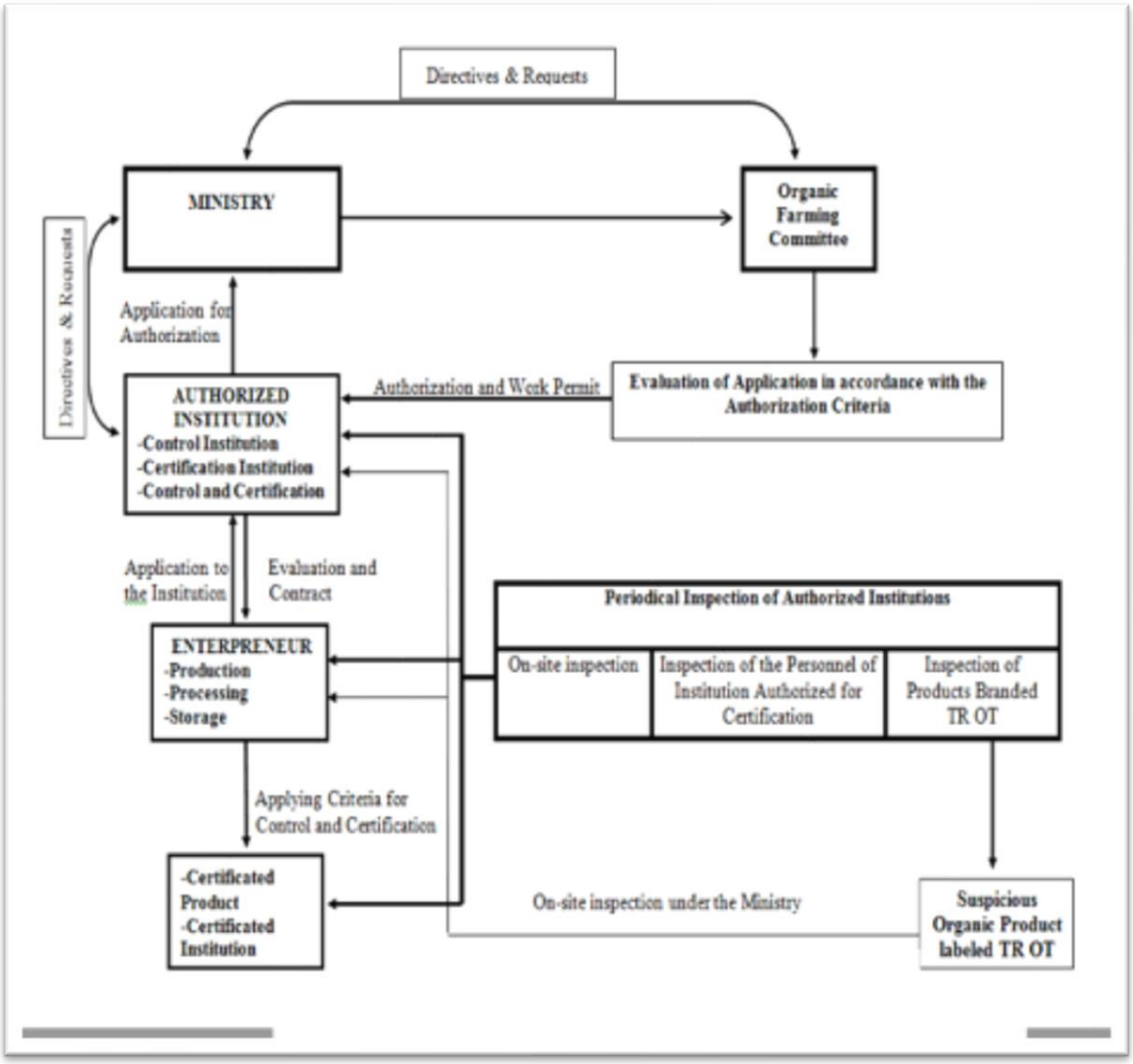

Figure 032-31: Key actors of the Organic Island of Gökçeada and their interactions (MoAF, 2023).

Literature used for this section see Annex 032

Nº 3

Chapter 033 >> Deliverable 3

To expand the base of educational resources and programs so that knowledge, study and practice of food systems is more accessible to all kinds of stakeholders

The report on the first OFSP work period contained a comprehensive course catalogue listing courses about organic and/or sustainable agriculture; food systems and diets has been compiled – in total more than 500 courses from 24 countries targeting all levels of education including pupils and students, farmers, consumers, politicians (see Annex 035 of the report 2017-2022). Here we provide a closer look at a few courses and seminars offered in collaboration with/support of OFSP and/or with a strong involvement of at least one of the Steering Committee members.

033.01 IFOAM-OI Academy Project

Contact: Patricia Flores p.flores@ifoam.bio

The Agroecology Promotion Programme (APP) is funded by the Swiss Agency for Development and Cooperation (SDC) and set to run for four years (2024-2028). The overarching goal of the APP is that agroecology and other similar approaches are broadly promoted as a pathway for food systems transformation to sustainable, resilient, and dynamic food and farming systems, worldwide and particularly in Sub-Saharan Africa and Southeast Asia. Of the three components IFOAM-OI is the project partner managing the global component. Central to this is the IFOAM-OI Academy which provides effective and comprehensive training programs, including leadership courses and training trainer courses.

033.02 Diet for a Green Planet (Sweden)

Contact: Hans von Essen, email: hans@berasinternational.se

Official course title

Diet for a Green Planet. Managing transformations in the Food System

Organisation(s) offering the course

BERAS International / Novia University of Applied Sciences

Aims of the course

The program aims to provide a grounded understanding of the food system from farm to fork and how the food system is connected to climate change mitigation and eutrophication, support biodiversity, rural development, human health, and rural development.

Another aim is that the student should develop an ability to suggest feasible and relevant methods to promote a transformation towards a sustainable food system.

Furthermore, the program also aims to empower individuals who are active in the food system to become conscious actors through a holistic understanding of the food system. The student will also develop skills in leadership and interventions for enhanced sustainability that could be applied in professional work in public food, tender, catering, and restaurants. The student should acquire the competence necessary to take on the role of a change agent.

Course description

The program consists of three courses (5 credits each):

1) Understanding Sustainability in the Food System - from Global Vision to Local Reality containing the following subtopics:

- Introduction to the concepts: Planetary Boundaries, Agenda 2030, Baltic Sea Region Strategy, and Ecological Footprints.
- Introduction to the ecosystem on a farm - what makes it regenerative?
- Introduction to the Building Ecological Regenerative Agriculture and Society (BERAS) concepts: Diet for a Green Planet, Ecological Regenerative Agriculture, and Sustainable Food Societies.
- Tracing of food products from fork to farm
- Local food in season.
- Visit to a farm and description of a farm in a systems perspective.

2) Interventions to support Healthy and Sustainable Food and to minimize Waste, containing the following content:

- Study visits including a farm, a food processor and a catering or large kitchen
- The art of listening training
- Assignments for a) healthy and environmentally sound food; b) protein shift and (c) with minimizing waste
- The Baltic Sea Region Strategy will be consulted in the work with the assignments.

3) Project Development - Managing Transformation in the Local Food System, containing the following exercises and tasks:

- Leadership exercises to deepen self-awareness and listening skills

- The exam project defines the whole third course. A template is offered as a guidance. The project is a transformation that the student has a real drive to accomplish and it is a real-life issue in the students' work place. The studies are arranged to support the work preparing the transformation.
- Stakeholder interviews
- Deep listening and constructive feedback.

Target group

Change Leaders in the Food system - teachers, actors in the food chain, social entrepreneurs, environmental strategists, and government personnel at local to national levels

Format: digital

Number of participants

In the cohorts 2022/2023 - 9, from Sweden, Ukraine, Uganda, Senegal and South Africa and 2023/2024: 22 from Sweden, Finland, Ukraine

The first cohort 2021-2022 had participants from Sweden, Finland, Estonia, Poland and Uganda. In the second cohort the scope was extended to include also Senegal, South Africa and Ukraine. With the ongoing third cohort the South Africa group has been extended and a cooperation with the organisation Farm and Garden Trust has been established.

Covered content/curriculum

As part of the project “Diet for a Green Planet Flagship” financed by the Swedish Institute, a one-year digital course “Diet for a Green Planet Change Leader” BERAS International was hosted in cooperation with Stensund Folk High School, with chefs and municipal Diet Unit Managers as its main target group. The course was then translated to English and transformed to global university carried out together with Novia University of Applied Sciences offering 15 credits standard.

The course is divided into three parts: “Understanding Sustainability in the Food System”, “Interventions to promote healthy and sustainable food” and “Project development”.

The concepts of Planetary Boundaries, Agenda 2030, Baltic Sea Region Strategy, and Ecological Footprints are introduced. Furthermore, the following aspects are incorporated:

- Introduction to the ecosystem on a farm - what makes it regenerative?
- Introduction to the Building Ecological Regenerative Agriculture and Society (BERAS) concepts: Diet for a Green Planet, Ecological Regenerative Agriculture, and Sustainable Food Societies
- Tracing of food products from fork to farm
- Local food in season
- Visit to a farm and description of a farm in a systems perspective.

- Introduction to the concepts: Planetary Boundaries, Agenda 2030, Baltic Sea Region Strategy, and Ecological Footprints
- Introduction to the ecosystem on a farm - what makes it regenerative?
- Introduction to the Building Ecological Regenerative Agriculture and Society (BERAS) concepts: Diet for a Green Planet, Ecological Regenerative Agriculture, and Sustainable Food Societies
- Tracing of food products from fork to farm
- Local food in season
- Visit to a farm and description of a farm in a systems perspective
- Competence objectives of the study unit.

After the course the student should have an ability to suggest feasible and relevant methods/improvements to:

a) promote a sustainable local food system
b) improve the healthiness and impact on the environment, and
c) to reduce food waste.

A better understanding of and deepening the capacity for listening and perspective-taking.

Content of the study unit: study visits including a farm, a food processor, and a catering or large kitchen.

Assignments for:

a) healthy and environmentally sound food
b) protein shift and
c) with minimizing waste.

The Baltic Sea Region Strategy will be consulted in the work with the assignments.

Results

The projects produced in the third part are designed to plan for real life improvements. A few examples of how students' projects were implemented / transferred to practice with some examples of such projects are listed below:

Siyabonga Mngoma, Johannesburg, South Africa is the owner and MD of the small business Wholesome Abundance Foods that buys organic products from local farmers and sells to mainly middle-class consumers in Johannesburg. During the course she discovered that since the market is highly niched the farmers can sell only a part of their production, and much goes to waste. She took the initiative to discuss with a local shop in Alexandra Township, where unemployment rate is extremely high, to buy these overshoot products to produce an affordable nutritious meal. In this way, three important problem areas are addressed in one blow - the organic farmers find a market for otherwise wasted products, job opportunities are created and the township inhabitants are offered

a chance to a healthy and nutritious meal and thus address a burning health problem.

Kaja Kesküla, agronomist by education, continues to work as project manager with organic food in the schools of Võru County in Southeast Estonia. This month, according to her, they already have 33 (out of 40) educational institutions using 20-50% of all raw materials from organic farming. However, the plan is to move forward and achieve the use of organic raw materials at the level of 20-50% in all educational institutions by the end of this year. To this end, trainings and round tables will be continued to provide information and knowledge to chefs. Also, in August, a study trip is planned for school cooks from Võrumaa and Latvia to learn about Swedish schools and the experience of using organic raw materials.

Hazel Salminen, Finland is working with integrating the ideas of Diet for a Green Planet in a popular youth camp movement in Finland, where one of the ideas is that the camp participants themselves take responsibility for the meals from deciding menus to cooking and serving.

Helena Pettersson is the dietician in a Swedish municipality near to Stockholm, where each school kitchen is managed by its head master and lacks a diet unit. She created a group for discussing diet and school food related issues in the headmasters' group to build a dialogue between headmasters, teachers and the school food staff and in this way work in the direction of Diet for a Green Planet.

Karolina Chomacka, Gliwice, Poland who works for Polish Ecological Club, after finishing the course, started an international cooperation with Sweden, Lithuania and Germany on sustainable food systems. The aim of this project is working on a common vision for the sustainable food system law in Europe and development of a bigger project (i.e. Life+) to make the change more significant. Right now, they are working on shaping the future of European food chains.

Brian Kibirige is a Ph.D. student at Tennessee State University, Nashville, USA, and serves as the Co-founder and National Coordinator for the Youth Future Farmers for Africa (YoFFA) Uganda. He is passionate about fostering agricultural education and spearheads a transformative project that integrates gardening into the curriculum of 100 secondary schools across Uganda. This project provides students with hands-on learning experiences in agri-science, enriches career education, and contributes to the production of organic vegetables that supplement school cafeterias. This offers a sustainable solution to both educational and nutritional challenges faced by many students ultimately reducing school dropouts in Uganda and creating strong farming communities since students work as change agents in their households

Yury Lukovenko was a biodynamic goat farmer and project leader near Odessa in Ukraine until the start of the war and is now a refugee. During the course the idea of a food club for refugees was developed. The Ukrainians have good food habits from home - but in a totally new environment in Sweden the only options

seemed to be food from the Supermarkets and finding food that was both healthy and affordable was a big challenge. In the food club they can together source wild food that costs only work, process together and help each other to grow eating habits inspired by Diet for a Green Planet. They can also discuss and plan for a more regenerative future for Ukraine food system after the war. After the end of the course the Food Club has built a cooperation with the kindergarten “Nyponkulla” in Järna around a greenhouse and drying machine, made an application to the Social Fund about preventing loneliness and is preparing an education initiative for Waldorf teachers partly inspired by Diet for a Green Planet.

033.03 Principles of Organic Farming (Germany)

Contact: Prof. Dr. Miriam Athmann: m.athmann@uni-kassel.de; Dr. Lilliana Stefanovic: l.stefa@uni-kassel.de (with a friendly support of Prof. Dr. Urs Niggli as a honorary Professor)

Official course title and code (university-internal)

Principles of Organic Farming – F17

Organisation(s) offering the course

University of Kassel, Faculty of Organic Agricultural Sciences, Section of Organic Farming and Cropping Systems & Section of Organic Food Quality

Aims of the course

Introduce frameworks and basic knowledge on the principles of organic farming and food systems; provide insights into organic farming practices as well as value chains and certification; discuss future ways for developing the organic sector further. Furthermore, the course describes and present the analysis of the real cases of existing organic food systems around the world, which draws on systems view. All kind of aspects around the course topics, from sustainability certification, farming, markets to essential elements of organic food systems will be brought together.

Type of course

Bridging module offered for international master’s students of a joint degree programme “International Food Business and Consumer Studies” (University of Kassel and Fulda University of Applied Sciences) and as of winter term 2023/2024 “Agriculture, Ecology and Society” (interdisciplinary master’s programme at the University of Kassel offered as a joint venture of multiple Faculties). The module is offered for students with no (organic) agricultural background, and students are assigned to it centrally by the dean’s office.

Course description

The program can be subdivided into a number of parts:

1) Organic and biodynamic farming and production systems, markets and consumption. The subtopics included in this block are:

- Introduction, the History, Principles of Organic Farming Systems, Organic Farming and Sustainability and Agroecology. The Standards and Certification of Organic Farming (EU, US; globally)
- Global Organic Farming Development – Land & Market Data
- Pathways of Innovation in Organic Farming Systems, Organic Farming and Food Security
- Two examples: Organic Farming at the Hessian State Domain Frankenhausen, Agroecology in Brazil
- Selected Practical Aspects of Organic Farming (Arable Crops, Hilly Grassland Farms, Tropical Cocoa Production, Vegetables)
- Principles of plant production in Organic Agriculture
- Biodynamic Agriculture and Innovative Case Studies

2) Food systems and the organic food system, its elements and aspects. Case studies. The subtopics included in this block are:

- Food systems approach and introduction to the Organic Food Systems
- Organic Food System Actor Relations & Case Studies
- (Organic) Food System Outcomes & Case Studies

3) Quality aspects in organic and biodynamic systems. The subtopics introduced in this block are:

- Process quality and product quality in Organic Agriculture
- Dairy Production, Milk Quality and Health in Organic Agriculture

Target group

International and German students of a joint master's degree programme "International Food Business and Consumer Studies" and as of winter term 2023/2024 – international and German students of an international interdisciplinary master's degree programme "Agriculture, Ecology & Societies" (AGES).

Format

In-presence weekly seminars in the first half of winter term, twice a week, 4 hours each

Number of participants

In the cohort 2022/2023 consisted of 15 students representing India, Turkey, Indonesia, Pakistan, Iran and Saudi Arabia. The 2023/2024 cohort consisted of 12 students, of which four were German students, and the remaining eight represented India, Pakistan, Turkey and Mexico.

033.04 Good Food in Embedded Food Systems

Contact: Assoc. Prof. Dominika Średnicka-Tober (Warsaw University of Life Sciences, Poland): dominika_srednicka-tober@sggw.edu.pl

Project name

Good teaching practices in experiential learning for effective education in embedded food systems (GoodFood)

Project affiliation/funding scheme

Erasmus+ Action 2: Strategic Partnerships for higher education

Project period: 1 November 2020 – 31 October 2023

Project partners

University of Gastronomic Sciences (Pollenzo, Italy), ISARA-Lyon (France), FH Münster University of Applied Sciences (Germany), Agricultural University – Plovdiv (Bulgaria) and University of Oradea (Romania).

Project background

The renewed EU Agenda for higher education identifies the necessity of tackling skills gaps and innovating education through:

- Designing and developing curricula relevant to the labour market and societal needs, i.e. through better use of open, online, blended, multidisciplinary learning
- Encouraging training and exchange to enhance the quality of teaching
- Supporting the use of digital technologies and online delivery to improve pedagogies
- Training of academics in new and innovative pedagogical approaches, new curriculum design approaches and sharing of good practices through collaborative platforms
- Building inclusive higher education systems, connected to surrounding communities
- Ensuring higher education and research institutes contribute to innovation by developing, implementing and testing the effectiveness of approaches to promote creativity, entrepreneurial thinking and skills for applying innovative ideas in practice
- Promoting internationalisation, recognition and mobility.

The project aimed at addressing the following needs

- Building a network of EU universities to develop, test and implement experiential learning activities and approaches, allowing students and lecturers to learn, explore and exchange knowledge about embedded food

systems and best practices of their future development and implementation

- The project activities and output plans have been shaped to increase the skills and capacity of participants to contribute towards permanent adaptation of resilient and sustainable embedded food systems in rural communities and territories, with the use of scientific and local, traditional knowledge.
- The project consisted of two four phases: analysis; development; e-learning and intensive study programmes; dissemination (see Figure 033-1).

Intellectual outputs

- Analysis of students' understanding of 'Embedded food systems' and expectations towards education within this subject area
- E-learning course on 'Embedded food systems in territories'
- Syllabus and educational materials of 2 Intensive Study Programmes 'Embedded food systems in territories'
- Collection of embedded food systems case studies from Europe as educational tools
- Catalogue of innovative teaching practices and best teaching tips for embedded food systems education.

Three educational activities were carried out during the course of the project – one in a virtual format and two in-presence courses (see Figure 033-2).

Website:

http://goodfood-project.eu/

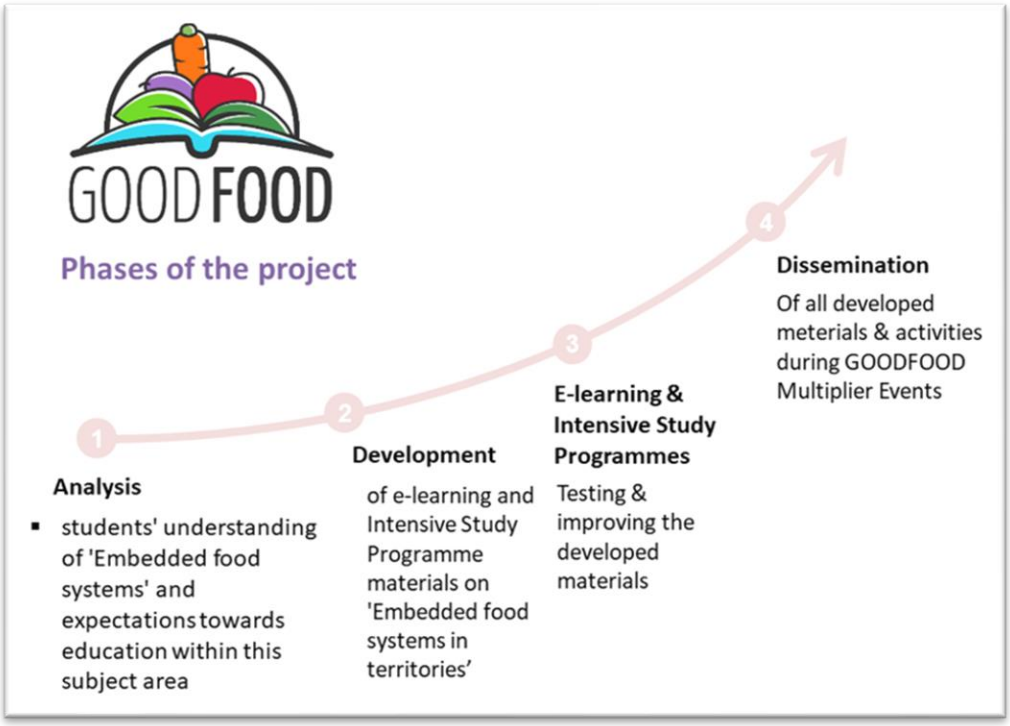

Figure 033-1: The four phases of the GoodFood project

Figure 033-2: GoodFood educational activities throughout the project term

033.05 Platform for Teaching Organic Agriculture in France

Contact: Julien Leroy julien.leroy@bergerie-nationale.fr

The platform is present in almost each region (about 20), with structures providing specific courses for training in organic agriculture methods. In part of agriculture chambers (about 90 in total), one can also find some dedicated trainings for farmers or farmer candidates. The Department of Education of the Ministry of Agriculture supervises agriculture education structures (agricultural baccalaureat, agricultural technician diploma) comprising experimental / teaching fields and farms: in the Formabio network, 123 (94%) have at least one organic part, teaching about 7,000 attendants, 26 (31%) are entirely organic farms (some with certifications), for a total of 4,200 hectares. Furthermore, 18 public and private high-level agronomic colleges offer engineer, master and PhD degrees, with some courses on organic agriculture and consumption.

Websites:

https://agriculture.gouv.fr/formabio-le-reseau-agriculture-biologique-de-lenseignement-agricole

https://agriculture.gouv.fr/portrait-de-lenseignement-agricole-edition-2024

033.06 FQH/OFSP online seminars once a month (Denmark and international partners)

Contact: Prof. Dr. Susanne Gjedsted Bügel: shb@nexs.ku.dk

FQH is an international network of research institutions with an interdisciplinary and holistic approach that enables new perspectives to emerge in the way we understand and deal with food and health. Members of FQH include research institutions (universities, independent institutes) as well as companies and organizations that support the network, ensuring that the network's activities are closely linked to issues of practical relevance.

In addition to research, a key concern of FQH is networking and information exchange among FQH members, as a productive and effective scientific community. Therefore, FQH organize monthly international online seminars, thus enabling new knowledge to emerge. At these seminars, researchers get a chance to present and discuss new perspectives in the way we understand and deal with food and health. The seminars are held 9-10 a.m. CEST via Zoom the 3rd Friday of every month and is announced on the website.

An overview of the seminars that took place so far include:

2024

23rd Seminar: November 15th – Dr. Anita Frehner, Senior Researcher , Department of Food System Sciences, FiBL, Switzerland: *Organic food in dietary scenarios and food system models: examples and challenges*

22nd Seminar: October 18th – Prof. Dr. Fabian Weber, Head of Section, Department of Organic Food Quality, Universität Kassel, Germany: *Temperature-optimized and Sustainable Fruit Juice Processing*

21st Seminar: September 20th – Prof. Dr. Christian Herzig, Institute for Business Administration in Agriculture and Food Economy, Justus Liebig University Gießen, Germany: *Higher education for social innovation in the organic food sector – learning from CoopFoodLab*

20th Seminar: May 17th – Machteld Huber, MD, PhD, Strategic advisor / founder, Institute for Positive Health, Netherlands: *How following agricultural research projects changed my medical perceptions of 'health' and 'food quality'*

19th Seminar: April 19th – Jens-Otto Andersen, PhD, research coordinator at Biodynamic Research Association, Denmark: *From single compounds to vitality and resilience*

18th Seminar: February 23rd – Marja van Vliet, PhD, senior researcher, Institute for Positive Health, Utrecht, the Netherlands: *Positive Health as a Framework for Investigating the Impact of an Organic Diet: Concept, Interventions, and Methodological Insights*

17th Seminar: January 19th – Konrad Stępnik, Assistant professor, FOOdIVERSE project, Jagiellonian University: *Alternative and Civic Food Networks as the bases for creating Living Labs - opportunities and challenges*

2023

16th Seminar: December 15th – Nicolas Lampkin, Researcher, Thuenen Institute of Farm Economics: *Environmental and food security implications of reaching the EU's target of 25% organic farmland*

15th Seminar: November 17th – Adrian Müller, Dr. sc. nat., Department of Food System Sciences, FiBL Switzerland: *Diets and dietary scenarios in food system modelling*

14th Seminar: October 20th – Friederike Elsner, Ph.D fellow, FH Münster: The role of initiatives in sustainability transitions of food systems

13th Seminar: September 15th – Patricia Flores, Senior Global Academy Manager of IFOAM Organics International: *How Nutrition Sensitive Agriculture unfolds the potential of Agroecology in developing countries. Study case: Peru.*

12th Seminar: May 19th – Dr. Lilliana Stefanovic, Post-Doctoral Researcher, Dep. of Organic Food Quality, University of Kassel, Germany: *Individual and communal outcomes of Organic Food Systems*

11th Seminar: April 21st – Lisa M. Borghoff (M.Sc.), cand. PhD, FH Münster University of Applied Sciences, Germany: *Designed quality of organic food processing - The case of milk and juice*

10th Seminar: March 17th – Young Researcher Beatriz Philippi Rosane, PhD, Copenhagen University, Denmark: New methodology to compare and evaluate health and sustainability aspects of diets across countries

9th Seminar: February 24th – Prof. Youssef Aboussaleh, Ibn Tofail University of Kenitra, Morocco: *Overview of the Organic farming and current nutrition status in Morocco*

8th Seminar: January 20th - Prof. Carola Strassner, FH Münster University of Applied Sciences, Germany: *Environmentally and climate-friendly food in public and private canteens*

2022

7th Seminar: November 18th – Prof. Axel Mie and Prof. Kristian Holst Lauersen, Stockholm University, Sweden: *Cadmium in wheat in relation to organic and conventional production in the DOK trial*

6th Seminar: October 28th – Prof. Flavio Paoletti, Italy, Research Centre for Food and Nutrition of the Council for agricultural research and economics – CREA: *Organic food processing. The challenges of a fast-growing sector.*

5th Seminar: May 27th – Dr. Wahyudi David, University Bakrie in Indonesia: *The transition toward sustainable organic food systems in Indonesia – A case study of organic rice*

4th Seminar: March 25th – Prof. Raymond Auerbach, South Africa, SA Organic Sector Organisation & SA Agricultural Research Council: *African leaders adopt organic food systems*

2021

3rd Seminar: November 26th – Ewa Rembiałkowska, Division of Organic Food at Warsaw University of Life Sciences, Poland: *Organic feed changes rat physiology*

2nd Seminar: September 24th – Denis Lairon, Emeritus Research Director at INSERM, France: *BioNutriNet Study*

1st Seminar: May 18th – Machteld Huber, MD, PhD, and one of the founders of FQH: *The Dutch Chicken Project*

033.07 Ecological economics and Bio-Districts

Ove Jakobsen, Professor Nord University (course manager)

(ECO5030) Ecological economics for sustainable social development

Module 3. Ecological economy "The Great Transition" and Eco-regions (Case Italy, Sweden and Norway)

Ecological economics - Business perspective (Ove Jakobsen)

The company's environmental and social responsibility includes a number of different subject areas related to

how economic activity affects people, society and the environment. In order to find solutions that safeguard economic, social and ecological values and interests, the company must collaborate with actors within business, culture, voluntary organizations and local, regional and national authorities.

- Partnership economy
- Corporate social responsibility (hierarchy of responsibility)
- Stakeholder theory
- Three-part bottom line
- The value compass
- Change management

Literature:

Chapter 10, Ecological economics – A perspective from the future

Bio districts (Jostein Hertwig)

Introduction

A "Bio district" (Organic District) is a geographical area where farmers, the public, tourist operators, associations and public authorities enter into an agreement for the sustainable management of local resources, based on organic principles and practices. The aim is to maximize the economic and social potential of the territory. Each "Bio district" includes lifestyle, nutrition, human relations and nature considerations (European Commission, Brussels, 25.3.2021 COM (2021) 141 final, modified by COM (2021) 141 final/2, Brussels, 19.4.2021).

The vision of Global Alliance for Organic Districts (GAOD)

"The vision of GAOD is to co- create a global network able to support the local development of Organic Districts in different territorial contexts and scaling out examples of practical solutions; the transformation of global food and farming systems as key towards achieving the United Nations Sustainable Development Goals (SDGs) in general and Sustainable Food Systems in particular."

Further content

- Some background on where we stand today - climate, environment, health, food security (self-sufficiency)
- The EU's investment in Bio districts based on the "Green Deal" and "Farm to Fork"
- Overview of Bio districts in Europe and globally
- The first Bio district, Cilento in Italy
- "Tool kit" for the establishment and operation of Bio districts.
- EU project "KISMET", Bio district Sörmland and "Diet for a Green Planet"
- Plans to establish a Bio district in Bodø/Nordland "local food for local markets"

Literature:

"Action plan for the development of organic production" https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52021DC0141R%2801%29

A long-term Vision for the EU's Rural Areas - Towards stronger, connected, resilient and prosperous rural areas by 2040 https://eur-lex.europa.eu/legal-

Nº 4

Chapter 034 >> Deliverable 4

To deepen the scientific study of the benefits of organic production systems and diets

As part of this Deliverable, five main activities attributed to various projects were carried out over the course of the second OFSP work period, with each of them described in more detail in the following sections.

034.01 Indicators for assessment of health effects of consumption of sustainable, organic school meals in Ecoregions (INSUM)

Contact: Susanne Bügel, shb@nexs.ku.dk

Ecoregions are territories devoted to organic, where farmers, citizens, public authorities, realize an agreement on sustainable management of local resources, based on the principles of organic farming and agroecology. Research to determine physical and mental health and well-being and sustainability in such systems needs suitable indicators and biomarkers. Biomarkers are a topic of intensive research and new biomarkers are evolving fast. Their use and the interpretation of data needs careful and informed knowledge; therefore, it is necessary to bring together scientists from a wide range of fields in order to establish a catalogue of suitable biomarkers and other indicators useful for different fields of research.

The aim of the INSUM project was to systematically review available research results and biomarkers/indicators used to study the health impact of organic vs. non-organic foods/diet and environment. The goal was to create a strong, multidisciplinary network of experts covering fields such as child nutrition and health, organic and sustainable food and health, psycho-social research areas, and various areas of biomarkers, including microbiome and different omics techniques.

By this, the aim was firstly to reach consensus on the best markers for future monitoring and research on the societal and mental health effects of dietary transitions towards more sustainable and organic diets. Secondly, it was to reach consensus on the best markers for future monitoring and research on the somatic health effects of dietary transitions towards more sustainable and organic diets. Based on the above, the objective was to develop publications with guidelines to be used worldwide.

For this, two international workshops were organized and held in Münster and Warsaw, with invited experts, followed by the development and publication of the workshop proceedings with consensus statements and guidelines.

The first international workshop in Münster was on indicators of societal and mental health, where researchers and experts from different scientific disciplines, comprising both experts in child nutrition and health, experts in organic and sustainable food and health, as well as experts in the psycho-social research areas, discussed and reached consensus on the best markers for future monitoring and research on the societal and mental health effects of dietary transitions towards more sustainable and organic diets. From this workshop, a paper was developed titled “Identifying Future Study Designs for Mental Health and Social Wellbeing Associated with Diets of a Cohort Living in Eco-Regions: Findings from the INSUM Expert Workshop”. This paper described commonly applied research methods on the nexus between diet and mental health and social wellbeing as presented by the experts and summarized key points from the discussions.

The second international workshop held in Warsaw was on indicators of somatic health. The aim was to bring together researchers and experts in child nutrition and health, experts in organic and sustainable food and health, as well as experts in the various areas of biomarkers, including microbiome and different omics techniques, to discuss and reach consensus on the best markers for future monitoring and research on the somatic health effects of dietary transitions towards more sustainable and organic diets. A systematic literature review on organic food and health will also be carried out, with an analysis of indicators differentiating consumers of organic vs. conventional food. All the project outcomes and networking actions aim to set a strong background for a multicentre Horizon Europe project about dietary transition, consumption of organic and sustainable food, health and wellbeing of inhabitants in ecoregions.

Publications:

Średnicka-Tober, D., Góralska-Walczak, R., Kopczyńska, K., Kazimierczak, R., Oczkowski, M., Strassner, C., Elsner, F., Matthiessen, L. E., Bruun, T. S. K., Philippi Rosane, B., Zanasi, C., Van Vliet, M., Dragsted, L. O., Husain, S., Damsgaard, C. T., Lairon, D., Kesse-Guyot, E., Baudry, J., Leclercq, C., ... Bügel, S. G. (2024). Identifying Future Study Designs and Indicators for Somatic Health Associated with Diets of Cohorts Living in Eco-Regions: Findings from the INSUM Expert Workshop. Nutrients, 16(15), 2528. https://doi.org/10.3390/nu16152528.

Elsner, F., Matthiessen, L. E., Średnicka-Tober, D., Marx, W., O'Neil, A., Welch, A. A., Hayhoe, R. P., Higgs, S., van Vliet, M., Morphew-Lu, E., Kazimierczak, R., Góralska-Walczak, R., Kopczyńska, K., Steenbuch Krabbe Bruun, T., Rosane, B. P., Gjedsted Bügel, S., & Strassner, C. (2023). Identifying Future Study Designs for Mental Health and Social Wellbeing Associated with Diets of a Cohort Living in Eco-Regions: Findings from the INSUM Expert Workshop. International Journal of Environmental Research and Public Health, 20(1), 669. https://doi.org/10.3390/ijerph20010669 .

In preparation:

Two review papers (will be uploaded on the webpage of the International Research Association "Organic Food Quality and Health" (FQH) as well as the webpage of the Department of Nutrition, Exercise and Sports of the University of Copenhagen).

034.02 Organic agro-food systems as models for sustainable food systems in Europe and Northern Africa (SysOrg)

Contact person: project coordinator Dr. Lilliana Stefanovic (University of Kassel, Germany): l.stefa@uni-kassel.de

The project "Organic agro-food systems as models for sustainable food systems in Europe and Northern Africa" (SysOrg) aims to identify intervention and entry points to enable a transformation process to resilient, sustainable food systems, and to identify how pathways to increase sustainable consumption and food production could be successfully designed. For accomplishing this task, the project embarks on a mission to better understand food systems including the multitude of actors involved while identifying critical points within the system. The project hypothesis is that food systems have common intervention and entry points for enabling transformation processes, which are transferable, however must be adapted regionally. The SysOrg addresses the following questions:

- What are the food system common intervention and entry points to enable a transformation process to resilient and sustainable food systems?
- How can pathways to increase sustainable consumption and food production be successfully designed throughout the system?
- What are the reasons, motivations, or drivers for the actors to opt for the more sustainable solution?
- What are the intervention and entry points for the development, consolidation, and dissemination of enhancing organic food and farming, reducing wastage, and shifting towards sustainable diets? What are critical points when bringing these perspectives together in a system approach?

To answer the questions and the project maps and analyses five case study territories – Copenhagen municipality (Denmark), Cilento bio-district (Italy), North Hessia Federal State (Germany), Warsaw municipality (Poland), and Kenitra province (Morocco). All five case study territories are analysed from four perspectives:

- System transition (Transition perspective)
- Shifting towards sustainable and healthy diets (Diet perspective)
- Enhancing organic food and farming (Organic perspective)

- Reducing waste (Waste perspective).

The four perspectives are investigated in a transdisciplinary way. This trans-national multiple-case study encompasses a multi-stakeholder approach.

As the project approaches its end-date, a number of documents have been produced by the project consortium and the partners, including case Territory Reports (Copenhagen, Cilento, North Hessia, Warsaw and Kenitra), Cross-case Comparative Analyses report as well as a report on Outcomes and Recommendations. So far, these are project-internal documents, which, however, will be made public through the project webpage after the project end-date. Additionally, multiple publications have been submitted to peer-reviewed journals (to be displayed on the project webpage once published), and a number has published.

Project affiliation/funding scheme: Joint SUSFOOD2/CORE Organic Call 2019 within the H2020 ERA-NETs SUSFOOD2 and the CORE Organic Co-Fund

Project period: 1 January 2021 – 30 June 2024

Project partners: University of Kassel (Germany), Münster University of Applied Sciences (Germany), University of Copenhagen (Denmark), Warsaw University of Life Sciences (Poland), Council for agricultural research and economics (CREA) (Italy), International Centre for Advanced Mediterranean Agronomic Studies – Mediterranean Agronomic Institute of Bari (CIHEAM) (Italy), Ibn Tofail University (Morocco).

Publications:

Hindi, Z., Belfakira, C., Lafram, A., Bikri, S., Benayad, A., El Bilali, H., Bügel, S.G., Srednicka-Tober, D., Pugliese, P., Strassner, C., Rossi, L., Stefanovic, L., Aboussaleh, Y. (2024) Exploring food consumption patterns in the province of Kenitra, Northwest of Morocco. BMC Public Health 24, 1899. https://doi.org/10.1186/s12889-024-19335-7.

Di Veroli JN, Peronti B, Scognamiglio U, Baiamonte I, Paoletti F, Stefanovic L, Bügel SG, Aboussaleh Y, Średnicka-Tober D and Rossi L (2024) Food waste behaviors of the families of the Cilento Bio-District in comparison with the national data: elements for policy actions. Front. Sustain. Food Syst. 8:1385700. doi: 10.3389/fsufs.2024.1385700.

Peronti, B., Di Veroli, J.N., Scognamiglio, U., Baiamonte, I., Stefanovic, L., Bügel, S.G., Matthiessen, L.E., Aboussaleh, Y., Belfakira, C., Średnicka-Tober, D., Góralska-Walczak, R., Rossi, L. (2024): Household food waste in five territories in Europe and Northern Africa: Evaluation of differences and similarities as implication for actions. In: Journal of Cleaner Production, Vol. 452 (2024): 142086. https://doi.org/10.1016/j.jclepro.2024.142086.

Belfakira, C.; Hindi, Z.; Lafram, A.; Bikri, S.; Benayad, A.; El Bilali, H.; Gjedsted Bügel, S.; Średnicka-Tober, D.; Pugliese, P.; Strassner, C.; Rossi, L.; Stefanovic, L.; Aboussaleh, Y. (2024) Household Food Waste in Morocco: An Exploratory Survey in the Province of Kenitra. Sustainability, 16, 4474. https://doi.org/10.3390/su16114474.

Philippi Rosane, B., Matthiessen, L.E., Góralska-Walczak, R., Kopczynska, K., Srednicka-Tober, D., Kazimierczak, R., Rossi, L., Aboussaleh, Y. and Bügel, S.G. (2023): Development of a methodology to compare and evaluate health and sustainability aspects of dietary intake across countries. In: Frontiers in Sustainable Food Systems, 7:1147874. doi: 10.3389/fsufs.2023.1147874.

Project webpages:

https://www.uni-kassel.de/go/sysorg-eng

https://susfood-db-era.net/main/SysOrg

034.03 Bio-NutriNet Santé Studies

Contact: Emmanuelle Kesse-Guyot, e.kesse@eren.smbh.univ-paris13.fr, Coordinator

The studies by the Bio-NutriNet-Santé group reported here represent a collaborative work by:

- Emmanuelle Kesse-Guyot (with Julia Baudry, Serge Hercberg, Mathilde Touvier and others), Nutritional Epidemiology Research Team (EREN), Epidemiology and Statistics Research Center (CRESS), Sorbonne Paris Nord University and University of Paris, INSERM, INRAE, CNAM, Bobigny, France.
- Denis Lairon, Human nutrition team, Research center for nutrition and cardiovascular disease (C2VN), INSERM, INRAE, Aix Marseille University, Marseille, France.
- Most studies involved a cooperation with other OFSP members (Technical institute for organic agriculture and diet (ITAB, France): Bruno Taupier-Letage and Rodolphe Vidal) as well as SOLAGRO (Philippe Pointereau and Brigitte Langevin), Toulouse, France.

The studies are grouped according to different themes they are attributed to.

>> Consumers expectations and motives

Do individual sustainable food purchase motives translate into an individual shift towards a more sustainable diet? A longitudinal analysis in the NutriNet-Sante cohort. J.Brunin, B. Alles, S Peneau, A. Reuze, P. Pointereau, M. Touvier, S. Hercberg, D. Lairon, J Baudry, E. Kesse-Guyot. Cleaner and Responsible Consumption 5 (2022): 100062.

Background. Sustainable motives do not systematically translate into purchasing behaviour. The aims of this study were to identify a typology of dietary changes during the years 2014–2018, (considering nutritional quality, plant-based foods and organic consumption) were related to previous food purchase motives. Methods. In the French NutriNet-Santé cohort, 13,292 individuals completed a food frequency questionnaire in 2014 and 2018 and a validated food purchase motives questionnaire in 2013, with a particular focus on sustainability. A typology was built to identify clusters with differences in food consumption as predictor variables and a set of dietary scores (reflecting nutritional quality, plant-based food and organic consumption) as response variables. Associations between dietary changes and food purchase motives were evaluated using ANCOVA.

Results. Participants with the most sustainable diet in 2014 and that has continued to improve over time (increased healthy plant-based foods and organic consumption) showed higher sustainable food-purchase motives. These were more often women, young and graduates. Participants with the lowest sustainable motives had at the same time a rather unsustainable diet and changed to a greatly improved diet in 2018. Participants with strong motives related to price, innovation and convenience showed a decrease in diet quality over time (increase in unhealthy plant- and animal-based food, alcoholic drinks, decrease in organic consumption). This cluster had the highest proportion of men, less educated and older than 65. Discussion and conclusion. Our results indicate that a part of the population was interested in sustainable food purchase and improved the sustainability of their diet over a short period of time. Some participants, with specific socio-demographic characteristics, were unaware of their diet's sustainability. Therefore, targeting awareness of food sustainability to a certain part of the population is essential.

>> Human pesticides contaminations and health impacts

Prospective association between dietary pesticide exposure profiles and type 2 diabetes risk in the NutriNet Santé cohort. Rebouillat, P., Vidal, R., Cravedi, J.P., Taupier, B., Letage, L. Debrauwer, L. Gamet Payrastre, H. Guillou , M. Touvier, LK. Fezeu, S. Hercberg, D. Lairon, J. Baudry1 and E. Kesse Guyot. Environmental Health (2022) 21:57. https://doi.org/10.1186/s12940-022-00862-y.

Background: Studies focusing on dietary pesticides in population-based samples are scarce. Aim. To assess associations between dietary pesticide exposure profiles and Type 2 Diabetes (T2D) among NutriNet-Santé cohort adult

participants. Methods: Participants completed a Food Frequency Questionnaire at baseline, assessing conventional and organic food consumption. Exposures to 25 active substances used in European Union pesticides were estimated using the Chemisches und Veterinäruntersuchungsamt Stuttgart residue database accounting for farming practices. T2D were identified through several sources. Exposure profiles were established using Non-Negative Matrix Factorization (NMF), adapted for sparse data. Cox models adjusted for known confounders were used to estimate hazard ratios (HR) and 95% confidence interval (95% CI).

Results: The sample comprised 33,013 participants aged 53 y on average, including 76% of women. Median follow-up was 5.95 years. Positive associations were detected between NMF component 1 (reflecting highest exposure to several synthetic pesticides) and T2D risk increase on the whole sample: HR Q5vsQ1 = 1.47, 95% CI (1.00, 2.18) ie + 47% risk. NMF Component 3 (reflecting low exposure to several synthetic pesticides) was associated with a 69% decrease in T2D risk, among those with high dietary quality only (high adherence to French dietary guidelines, including high plant foods consumption): HRQ5vsQ1 = 0.31, 95% CI (0.10, 0.94). Conclusions: These findings suggest a role of dietary pesticide exposure in T2D risk, with different effects depending on which types of pesticide mixture participants are exposed to. This should have important implications for developing prevention strategies (regulation, dietary guidelines).

Complementary study by an OFSP member and co-author:

Quantifiable urine glyphosate levels detected in 99% of the French population, with higher values in men, in younger people, and in farmers. Grau D, Grau N, Gascuel, Q., Paroissin, C., Stratonovitch, C., Lairon, D., Devault, D.A., Di Cristofaro, J. Environmental Science and Pollution Research 2022, https://doi.org/10.1007/s11356-021-18110-0.

Background. Evaluations of the extent of Glyphosate herbicide contamination in humans are scarce. Aim. To evaluate the level and extent of exposure to Glyphosate in adults and children at national scale in France. This most important national citizen-supported survey provided glyphosate assay measurements (using ELISA) in stabilized first morning urine samples of 6848 volunteer participants between 2018 and 2020. Associated data include age, gender, location, employment status and dietary information.

Results. The results support a general contamination of the French population, with glyphosate quantifiable in 99.8% of urine samples with a mean of 1.19 ng/ml +/- 0.84 after adjustment to body mass index (BMI). This confirms higher glyphosate levels in men and children. Our results support glyphosate contamination through food and water intake, as lower glyphosate levels are associated with dominant organic food intake and filtered water. Higher occupational exposure is confirmed in farmers and farmers working in wine-growing environment. https://doi.org/10.1007/s11356-021-18110-0.

>> Organic food and human pesticides contaminations

Baudry J, Rebouillat P, Allès B, Cravedi J-P, Touvier M, Hercberg S, Lairon D, Vidal R and Kesse-Guyot E. Estimated dietary exposure to pesticide residues based on organic and conventional data in omnivores, pesco-vegetarians, vegetarians and vegans. Food Chem Toxicol. 2021 May 20; 153:112179, https://doi.org/10.1016/j.fct.2021.112179.

Background and Aim. This study examined dietary exposure to 25 pesticide residues in several diet groups including omnivores, pesco-vegetarians, vegetarians and vegans while accounting for the farming system (organic or conventional) of plant-based foods consumed. Methods. Organic and conventional consumption data in combination with data on pesticide residues in plant-based foods were used to derive estimated dietary exposure to pesticide residues. Pesticide residue exposure was estimated based on observed data, and using two scenarios simulating 100%-conventional and 100%- organic diets in 33,018 adult omnivores, 555 pesco-vegetarians, 501 vegetarians and 368 vegans from the NutriNet- Santé study.

Results. Exposure levels varied across diet groups depending on the pesticide studied. The highest exposure was observed for Imazalil in all groups. Vegetarians appeared to be less exposed to the studied pesticides overall. Compared to omnivores – apart from pesticides authorised in organic farming – vegetarians had lowest exposure. The 100%-conventional scenario led to a sharp increase in exposure to pesticide residues, except for pesticides allowed in organic farming and conversely for the 100%-organic scenario. Conclusion. Despite their high plant-based product consumption, vegetarians were less exposed to synthetic pesticides than omnivores, due to their greater propensity to consume organic.

>> Sustainable and Organic dietary pattern impacts on resources and GHGes within a sustainable food system approach

Key Findings of the French BioNutriNet Project on Organic Food–Based Diets: Description, Determinants, and Relationships to Health and the Environment (review). E. Kesse-Guyot, D. Lairon, B. Allès, L. Seconda, P. Rebouillat, J. Brunin, R. Vidal, B. Taupier-Letage, P. Galan, MJ. Amiot, S. Péneau, M. Touvier, C. Boizot-Santai, V. Ducros, LG. Soler, JP. Cravedi, L. Debrauwer, S. Hercberg, B. Langevin, P. Pointereau and J. Baudry. Advances in Nutrition 2021; 00:1–17.

Background. Few studies have investigated the relationships between organic food consumption, dietary patterns, monetary diet cost, health, and the environment. Aim. To address these issues, a consortium of French epidemiologists, nutritionists, economists, and toxicologists launched the BioNutriNet project in 2013. In 2014, an FFQ documented the usual organic and nonorganic (conventional) food consumption of approximately 35,000 NutriNet-

Santé adult participants. Then, individual organic and conventional food intakes were merged with price, environmental, and pesticide residue data sets, which distinguished between conventional and organic farming methods. Many studies were conducted to characterize organic consumers and their environmental impacts (i.e., greenhouse gas emissions, energy demand, and land use) and organic food consumption impacts on health.

Results. We observed that regular organic consumers had diets that were healthier and richer in plant-based food than nonorganic consumers. Their diets were associated with higher monetary costs, lower environmental impacts, and reduced exposure to certain pesticide residues. Regular consumption of organic food was associated with reduced risks of obesity, type 2 diabetes, postmenopausal breast cancer, and lymphoma. Several observations have been confirmed by several studies conducted in other countries. Conclusion. The main finding of the BioNutriNet project is that while organic food consumption could be associated with positive externalities on human health and the environment, organic-based diets should be accompanied by dietary shifts toward plant-based diets to allow for better planetary and human health.

Conservative to disruptive diets for optimizing nutrition, environmental impacts and cost in French adults from the NutriNet-Santé cohort. Seconda L, Fouillet H, Huneau J-F, Pointereau P, Baudry J, Langevin B, Lairon D, Alles B, Touvier M, Hercberg S, Mariotti F and Kesse-Guyot E. Nature Food. 2021 Mar 11;1–9, https://doi.org/10.1038/s43016-021-00227-7.

Background. Improving the sustainability of diets requires the identification of diets that meet the nutritional requirements of populations, promote health, are within planetary boundaries, are affordable and are acceptable. Aim. The study modeled the extent to which dimensions of sustainability could be optimally aligned and identify more sustainable dietary solutions, from the most conservative to the most disruptive, among 12,166 adult participants of the NutriNet-Santé cohort. Authors aimed to concomitantly lower environmental impacts (including greenhouse gas emissions, cumulative energy demand and land occupation), increase organic food consumption (especially to reduce pesticides impacts) and study departure from observed diets (considered as a proxy for acceptability).

Results. From observed diets, the most conservative to the most disruptive scenario (1 to 5), optimized diets were gradually richer in fruits, vegetables and soya-based products and markedly poorer in animal-based foods and fatty and sweet foods. The contribution of animal protein to total protein intake gradually decreased by 12% to 70% of the observed value. The share of organic food raised up to 90%. The GHGes from food production for the diets gradually decreased across scenarios (vs observed values) by 36–86%, land occupation for food production by 32–78% and energy demand by 28–72%. The results offer a benchmark of scenarios of graded dietary changes against graded sustainability improvements.

Environmental and nutritional analysis of the EAT-Lancet diet at the individual level: insights from the NutriNet-Santé study. Kesse-Guyot E, Rebouillat P, Brunin J, Langevin B, Alles B, Touvier M, Hercberg S, Fouillet H, Huneau JF, Mariotti F, Lairon D, Pointereau P, Baudry J. Journal of Cleaner Production 296 (2021) 126555, https://doi.org/10.1016/j.jclepro.2021.126555.

Background. The EAT-Lancet Commission has recently proposed a "universal" plant-based healthy reference diet. However, no study had specifically investigated its possible environmental benefits at the individual level based on observed data. The Aim was to characterize the environmental pressures and impacts related to the level of adherence to the EAT-Lancet diet among French adults in 29,210 NutriNet-Santé cohort participants (75% women, mean age 53.5y). The study estimated (i) the level of adherence to the EAT-Lancet diet through the EAT-Lancet diet index (ELD-I), (ii) the food production-related environmental impacts using 3 individual environmental indicators (GHGe, cumulative energy demand and land occupation) and (iii) the overall environmental impact using a validated aggregated partial score (pReCiPe).

Results. High ELD-I (Q5), compared to low (Q1), was associated with lower GHG emissions (-56%), cumulative energy demand (-31%) and land occupation, (-54%). The pRECIPE was 62% lower in high ELD-I than in low ELD-I but the range of pReCiPe in Q1 was large. Thus, as expected, strong adherence to the EAT-Lancet recommended diet led to lower environmental impacts.

Nutritionally adequate and environmentally respectful diets are possible for different diet groups: an optimized study from the NutriNet-Santé cohort. E. Kesse-Guyot, B. Allès, J. Brunin, H. Fouillet, A. Dussiot, F. Mariotti, B. Langevin, F. Berthy, M. Touvier, C. Julia, S. Hercberg, D. Lairon, C.Barbier, C. Couturier, P. Pointereau and J. Baudry. Am J Clin Nutr 2022; 0:1–13.

Background: Research has shown that vegetarian diets have a low environmental impact, but few studies have examined the environmental impacts and nutritional adequacy of these diets. Aim: To optimize and compare 6 types of diets with varying degrees of plant foods (lacto-, ovo-lacto-, and pesco-vegetarian diets and diets with low, medium, and high meat content) under nutritional constraints. Methods: Consumption data in 30,000 participants were derived from the French NutriNet-Santé cohort using an FFQ. Diets were optimized by a nonlinear algorithm minimizing the diet deviation while meeting multiple constraints at both the individual and population levels: non-increase of the cost and environmental impacts (as partial ReCiPe accounting for greenhouse gas emissions, cumulative energy demand, and land occupation, distinguishing production methods (organic and conventional), under epidemiologic, nutritional and acceptability constraints.

Results: Optimized diets were successfully identified for each diet type, except that it was impossible to meet the EPA (20:5n–3) + DHA (22:6n–3) requirements in lacto- and ovo-lactovegetarians. In all cases, meat consumption was

redistributed or reduced and the consumption of legumes (including soy-based products), whole grains, and vegetables were increased, whereas some food groups, such as potatoes, fruit juices, and alcoholic beverages, were entirely removed from the diets. The lower environmental impacts (as well as individual indicators) observed for vegetarians could be attained even when nutritional references were reached except for long-chain n–3 (omega-3) fatty acids. Conclusions: A low-meat diet could be considered as a target for the general population in the context of sustainable transitions, although all diets tested can be overall nutritionally adequate (except for n–3 fatty acids) when planned appropriately.

Associations between measures of socio-economic position and sustainable dietary patterns in the NutriNet-Santé study. J. Baudry, B. Allès, B. Langevin, A. Reuzé, J. Brunin, M. Touvier, S Hercberg, D. Lairon, S. Péneau, P. Pointereau and E. Kesse-Guyot. Public Health Nutrition: 2022, doi:10.1017/S1368980022002208.

Background and Aim. We aimed to explore the relationship between socio-economic characteristics of French consumers and sustainable dietary patterns. Methods: Dietary data were derived from a web-based FFQ. Diet sustainability was evaluated using a modified Sustainable Diet Index, comprising nutritional, environmental and cultural components (higher scores expressing higher sustainability) The socio-economic position markers were education, household income and occupation status. Multi-adjusted linear and Poisson regression models were used to assess the cross-sectional association of the markers of socio-economic status with a sustainable diet and sustainability subcomponents, respectively. 29 119 NutriNet-Santé adult participants were involved.

Results: Individuals with a more sustainable diet had slightly higher diet monetary cost, lower total energy intake and consumed less animal-based foods than their counterparts. Lower education level was associated with lower overall diet sustainability (βprimary v. postgraduate = -0·62, 95 % CI (-0·72, −0·51)) and nutrition, socio-cultural and environmental sub-scores. Manual workers and employees had a lower modified Sustainable Diet Index than intermediate professionals (βmanual workers v. intermediate professionals = -0·43, 95 % CI (−0·52, −0·33) and βemployees v. intermediate professionals = -0·56, 95 % CI (−0·64, −0·48)). Participants with the lowest v. highest incomes had a higher environmental sub-score but a lower sociocultural sub-score, whereas the results were less marked for occupational status.

Conclusions: Overall, the results documented associations between socio-economic status and the level of diet sustainability, arguing for the implementation of appropriate food policies to promote sustainable diets at lower cost.

Higher adherence to the EAT-Lancet reference diet is associated with higher nutrient adequacy in the NutriNet-Sante cohort: a cross-sectional study. F. Berthy, J. Brunin, B. Alles, A. Reuze, M. Touvier, S. Hercberg, D. Lairon, P.

Pointereau, F. Mariotti, J. Baudry, E. Kesse-Guyot. Am. J. Clin. Nutr., 2022, https://doi.org/10.1016/j.ajcnut.2023.03.029.

Background: In 2019, the EAT-Lancet Commission proposed a planetary and healthy reference diet but its nutritional quality has been rarely evaluated. Aim: Across different adherence levels to the EAT-Lancet reference diet, the following were the objectives:1) describe the food and nutritional intakes of the French population, 2) evaluate the nutrient quality, and 3) investigate the consistency between the French national recommendations and the EAT-Lancet reference diet. Methods: This cross-sectional study was conducted among participants of the NutriNet-Santé cohort, and the sample was weighted on the characteristics of the general French population. Adherence to the EAT-Lancet reference diet was estimated using the EAT-Lancet Diet Index (ELD-I). Usual nutrient intakes were obtained using the variance reduction method. The adequacy of the French food-based dietary recommendations [Programme National Nutrition Santé (PNNS)] according to adherence to the EAT-Lancet reference diet was studied.

Results: The weighted sample was composed of 98,465 adult participants. Except for bioavailable zinc and vitamin B12, we observed a decrease in the nutrient inadequacy prevalence when the adherence to the EAT-Lancet reference diet increased, particularly for vitamin B9 (Q1. 37.8% compared with Q5. 5.5%, $P < 0.0001$) and vitamin C (Q1. 59.0% compared with Q5. 10.8 %, $P < 0.0001$). However, inadequacy prevalence remained high in all ELD-I quintiles, particularly for fiber (95.9%), vitamin B1 (70.8%), iodine (48.4%), and magnesium (76.8%). Higher ELD-I score was associated with higher adherence for most components of the PNNS, except for food groups that are not specifically included in the EAT-Lancet reference diet and are typical of the French diet, including alcohol, processed meat, and salt. Conclusion: In the French context, although issues with the intake of certain nutrients may occur, a diet that remains within the planetary limits as theEAT-Lancet reference diet allows a favorable nutritional quality.

Sustainability analysis of the Mediterranean diet: results from the French NutriNet-Santé study. J. Baudry, F. Neves, D. Lairon, B. Allès, B. Langevin, J. Bruni, F. Berthy, I. Danquah, M. Touvier, S. Hercberg, MJ. Amiot, P. Pointereau and E. Kesse-Guyot. British Journal of Nutrition, 2023, doi:10.1017/S0007114523001411.

Background: the Mediterranean diet is often proposed as a sustainable diet model. Aim: this study aimed to evaluate the associations between adherence to the Mediterranean diet and sustainability domains in a cohort of French adults, using multiple criteria including nutritional quality, environmental pressures, monetary cost and dietary pesticide exposure. Methods: food intakes of 29 210 NutriNet-Santé adult volunteers were assessed in 2014 using a semi-quantitative FFQ. Adherence to the Mediterranean diet was evaluated using the validated literature-based adherence score (MEDI-LITE). The associations between the MEDI-LITE and various sustainability indicators were examined using ANCOVA models, adjusted for sex, age and energy intake.

Results: higher adherence to the MEDI-LITE was associated with higher nutritional quality scores, better overall nutrient profile as well as reduced environmental impact (land occupation: Q5 v. Q1: −35 %, greenhouse gas emissions: −40 % and cumulative energy demand: −17 %). In turn, monetary cost increased with increasing adherence to the Mediterranean diet (Q5 v. Q1: + 15 %), while higher adherents to the Mediterranean diet had overall higher pesticide exposure due to their high plant-based food consumption and only partial organic food consumption. Conclusion: In this large cohort of French adults, greater adherence to the Mediterranean diet was associated with nutritional and environmental benefits, but also with higher monetary cost and greater exposure to pesticides, illustrating the necessity to develop large-scale strategies for healthy, safe (pesticide- and contaminant-free) and environmentally sustainable diets for all.

Environmental pressures and pesticide exposure associated with an increase in the share of plant-based foods in the diet. E. Kesse Guyot, B. Allès, J. Brunin, B. Langevin, H. Fouillet, A. Dussiot, F. Berthy, A. Reuzé, E. Perraud, P. Rebouillat, M. Touvier, S. Hercberg, F. Mariotti, D. Lairon, P. Pointereau, J. Baudry. Nature Scientific Reports (2023) 13: 19317 https://doi.org/10.1038/s41598-023-46032-z.

Background. Diets rich in plant-based foods are encouraged for human health and to preserve resources and the environment but the nutritional quality and safety of such diets is debated. Aim: to model nutritionally adequate diets with increasing plant food content and to characterise the derived diets using a multicriteria approach including, nutrients intake, environmental pressures and exposure to pesticides. Using data of the NutriNet-Santé cohort (N = 29,413), we implemented stepwise optimization models to identify maximum plant-food content under nutritional constraints. Environmental indicators at the production level were derived from the DIALECTE database, and exposure to pesticide residues from plant food consumption was estimated using a contamination database.

Results. Plant-based foods contributed to 64.3% (SD = 10.6%) of energy intake in observed diets and may reach up to 95% in modelled diets without jeopardizing nutritional status. Compared to the observed situation, an increase in plant-based foods in the diets led to increases in soy-based products (+ 480%), dried fruits (+ 370%), legumes (+ 317%), whole grains (+ 251%), oils (+ 144%) and vegetables (+ 93%). Animal products decreased progressively until total eviction, except for beef (− 98%). Dietary quality (estimated using the Diet Quality Index Based on the Probability of Adequate Nutrient Intake) was improved (up to 17%) as well as GHGe (up to − 65%), energy demand (up to − 48%), and land occupation (− 56%) for diet production. Exposures to pesticides from plant-based foods were increased by 100% conventional production and to a much lesser extent by 100% organic production. This study shows that shifting to nutritionally-adequate plant-based diets requires an in-depth rearrangement of food groups' consumption but allows a drastic reduction of environmental impact. Increase exposure to

pesticide residues and related risks can be mitigated by consuming foods produced with low pesticide input.

Organic food consumption, a step forwards for more sustainable and healthy habits: key findings of the French BioNutriNet research project. D. Lairon, J. Baudry and E. Kesse-Guyot. Invited "special topic" lecture, Proceedings of the 4th International Conference Organic Rice Farming and Production Systems, 2023, Sendai, Japan. Journal of Integrated Field Science, Vol. 21, 2024, in-press.

Until 2010's no large scientific studies have been conducted on organic food consumers while agro-ecological farming methods are increasingly acknowledged for their sustainability and health potential. We thus aimed to evaluate the characteristics of organic food-based diets, with acknowledged production standards and well-identified logos for consumers. This was made possible thanks to the large French nation-wide prospective NutriNet-Santé cohort of adult volunteers initiated in 2009. This short review article summarizes the data obtained and published on dietary patterns, food consumption and nutritional quality, pesticide exposure, impacts on human diseases and environmental indicators. Overall, beneficial impacts have been observed in most regular organic food consumers.

034.04 True Cost Accounting

Contact: For more info on findings and dialogues please contact Jostein.hertwig@gmail.com

Global dialogue on True Cost Accounting (TCA) and potential positive contributions from organics to reduce hidden costs for health, climate and biodiversity.

The Food and Agriculture Organisation of the United Nations (FAO) and other renown institutions such as the Food and Land Use Coalition, The Food System Economics Commission, The Rockefeller Foundation, IFOAM Organics International and WWF have developed the concept of True Cost Accounting for the hidden cost of food (TCA). The stipulated monetary cost is estimated at 12 - 19 thousand billion USD on top of global food expenditure related to health, climate and biodiversity.

The UN Core initiative Organic Food System Programme and Global Alliance for Organic Districts invites a global dialogue on TCA and positive contributions from organics to reduce hidden costs for health, climate and biodiversity.

We kick off the dialogues in Stockholm, Sweden on Friday 17 November 2024, also presenting results from research in Sweden on organic regenerative agriculture.

In an initial phase, we have reviewed a number of research papers and such as from Tilman & Clark, the French BioNutriNet Sante study, the FiBL DOK Trial and Meta studies by Rahman and Jiang. Our findings are promising that organics may offer substantial positive contributions to reduce the hidden costs of food for health, climate and biodiversity and as follows:

- a dietary pattern with less refined sugar, fats and oils and meat and more plant rich food will significantly reduce health and environmental costs (Tillman & Clark in Nature 2014)
- eating organic/ an organic lifestyle is associated with significant less negative health risks such as for overweight and obesity (-23/ 31%), metabolic syndrome (-31%), type II diabetes (-35%) and risk of cancer (-25%) (The French BioNutrinetSanté study with 12 published research papers)
- organic food contains less residues of pesticides (Meta studies by Rahman et. al and Jiang et.al)
- organic/biodynamic farming systems have up to 60% less emissions of greenhouse gases and have more soil biodiversity (The Swiss based Research Institutes of Organic Agriculture (FiBL) and their 45-year DOK trial)

Contact: Anders Bergkvist, Jostein Hertwig, Astrid K. Hertwig, Bio district Sörmland

A review of scientific papers related to the concept of True Cost Accounting for hidden cost of food and potential positive impact by organic on health, climate and biodiversity was carried out within the Kismet study (Sustainable Food Environments KISMET circular economy – within the Interreg Baltic Sea Region Programme 2021-7).

Findings are presented from the Executive Summary here.

Our findings strongly advocate for organic agriculture and food.

The Food and Agriculture Organisation of the United Nations (FAO) and other renown institutions have developed the concept of True Cost Accounting for the hidden cost of food (TCA) and stipulated the monetary cost related to health, climate and biodiversity at global level to be bigger than for example the GDP of the EU.

We have reviewed around 50 scientific papers. Our findings are most promising and suggest a pathway and concrete measures to significantly decrease the hidden cost of food as follows:

- a dietary pattern with less refined sugar, fats and oils and meat and more plant rich food will significantly reduce health and environmental costs (Tillman & Clark in Nature 2014)
- eating organic is associated with significant less negative health risks such as for overweight and obesity (-23/ 31%), metabolic syndrome (-31%), type II diabetes (-35%) and risk of cancer (-25%) (The French BioNutrinetSanté study with 12 published research papers)
- organic food contains less residues of pesticides (Meta studies by Rahman et. al and Jiang et.al)
- organic/biodynamic farming systems have up to 60% less emissions of greenhouse gases and have more soil biodiversity (The Swizz based Research Institutes of Organic Agriculture (FiBL) and their 45-year DOK trial)
- It is assumed that Bio districts have a vital role in facilitating the inclusive process advocating for and implementing the transformation needed for farming, food, equal rights and lifestyle.

Main Observations

The price we as consumers pay for food in the shop does not reflect the true cost. We and the society at large “pay” in addition the negative impact on health, the climate and environment.

We have demonstrated that organic farming and food significantly can reduce the hidden costs. It is our opinion that the price of organic food, all aspects included, is less than food from monoculture agriculture with the use of herbicides, pesticides and mineral fertilizer.

The emerging understanding of the science and logic behind True Cost Accounting for the hidden costs of food will open the pathway to the next phase of organic.

It is assumed that Bio districts have a vital role in facilitating the transformation needed.

In their report published February 2019 “Full Cost Accounting to Transform Agriculture and Food Systems” IFOAM Organics International made this important statement:

> “Some people consider it unethical to value everything in monetary terms. In the organic sector, we recognize that the currency of nature is life itself and that many phenomena cannot be expressed through money alone. The value of biodiversity, for example, is more than the value of its ecosystem services, and the value of animal rights and welfare is more than the costs of installing management practices that promote animal health.
>
> Money, however, is universally understood as a way to assign value in societies across the world, it is a ‘language’ that politicians, businesses and consumers alike understand. Financial incentives and disincentives are

> powerful ways to influence what people and businesses do and how they do it. Notwithstanding its limitations in accurately reflecting societal costs and benefits, Full Cost Accounting is an important tool for change and offers an alternative to our current, predominantly profit-centric model."

Many other organizations and institutions such as WWF are making most interesting reports and work on the theme of TCA:

1. Introduction: Sustainable agriculture and food culture

Beras International is a foundation whose purpose is to promote education, information, research and development on holistic thinking on regenerative organic agriculture, sustainable food systems and sustainable food societies/ Bio districts.

Beras has received funding from the Axel and Margaret Ax: son Johnson Foundation for Science for the dissemination of research findings on agriculture and food culture.

The objective of our work is as follows:

- Make a review of scientific research related to the concept of True Cost Accounting for the hidden costs of food and the potential positive contributions from organic on health, climate and biodiversity
- Disseminate these research results through publications, seminars, conferences, exhibitions etc.

The aim is to reach out with a clear message to a broad audience that includes all actors in the food chain from farm to table, authorities, education, research and NGOs.

The work focuses on a number of issues:

- True Cost Accounting for the hidden costs of food (TCA) as an eye-opener and motivator for concrete action.
- Is there relevant research describing the benefits of sustainable agriculture and food culture opening the pathway for the next phase of organic.
- Are there relevant examples on how to apply the concept of TCA in practice and how can such practice be implemented in Sweden – initiate pilot projects?
- Which messages are marketable to which target groups?
- What initiatives and channels should be used to disseminate and invite concrete action and within this a particular focus on the role of Bio districts (Organic districts)

2. Studies

We have reviewed around 50 scientific papers, 13 of which were on True Cost Accounting for the hidden cost of food (TCA) and the rest on impacts and

opportunities in health, climate and biodiversity and with a focus on the need to change dietary patterns and the potential role of organics.

The outcome of selected studies within the TCA estimates hidden costs of food at USD 12 - 19 trillion in addition to global food expenditure.

- Broken down by country, the bulk, 75%, of the costs originate from high and upper middle-income countries. Low-income countries account for only 3% and lower-middle-income countries for the remaining 22% according to the FAO.
- Hidden costs of food are growing strongly, mainly driven by increased health related problems from unhealthy diets.
- The environmental (climate and biodiversity) hidden costs of food are ultimately even greater given the transformation of nature and the costs of managing and mitigating impacts such as wildfires, floods, storms, extreme heat, etc.

Opportunities related to positive health and environmental impacts have been studied by several researchers:

- Tillman & Clark demonstrates the environmental and health benefits of Mediterranean, pescetarian and vegetarian diets.
- The BioNutrinetSanté study shows a correlation between organic diets and health benefits, with significant positive effects on overweight and obesity, coronary heart decease, diabetes type 2 and some type of cancers.
- Two meta-studies by Rahman and Jiang show positive health effects of organic food.
- Biodynamic systems in the FiBL - DOK study produced 63% lower greenhouse gas emissions than conventional ones, and all fertility and diversity indicators were better in the biodynamic/organic systems.
- The Swedish researcher Arthur Granstedt et al. shows that net-zero greenhouse gas emissions can be achieved with ecological recycling agriculture, where greenhouse gas emissions are offset by, among other things, carbon sequestration in the soil.
- The EAT Lancet Commission presents a global framework for creating a sustainable food system, “The Planetary Health Diet”.

A. The concept of True Cost Accounting for hidden costs of food

1. Introduction to True Cost Accounting for hidden cost of food.

True cost accounting for hidden costs of food (TCA) is a holistic and systemic way of measuring and valuing the environmental, social, health and economic costs and benefits generated by food systems to facilitate better decisions by policy makers, businesses, farmers, investors and consumers.

It is a methodology that, in addition to market transactions, measures and values all flows into and out of agricultural systems, including those not captured by market transactions, so-called hidden costs or externalities. Valuation can be either qualitative or quantitative, and in possible cases monetary.

2. Global hidden costs of food - an overview from all scientific papers studied.

The cost is estimated at 12 - 19 thousand billion USD on top of global food expenditure- the columns in grey are in comparison global food spend and GDP of EU and China!

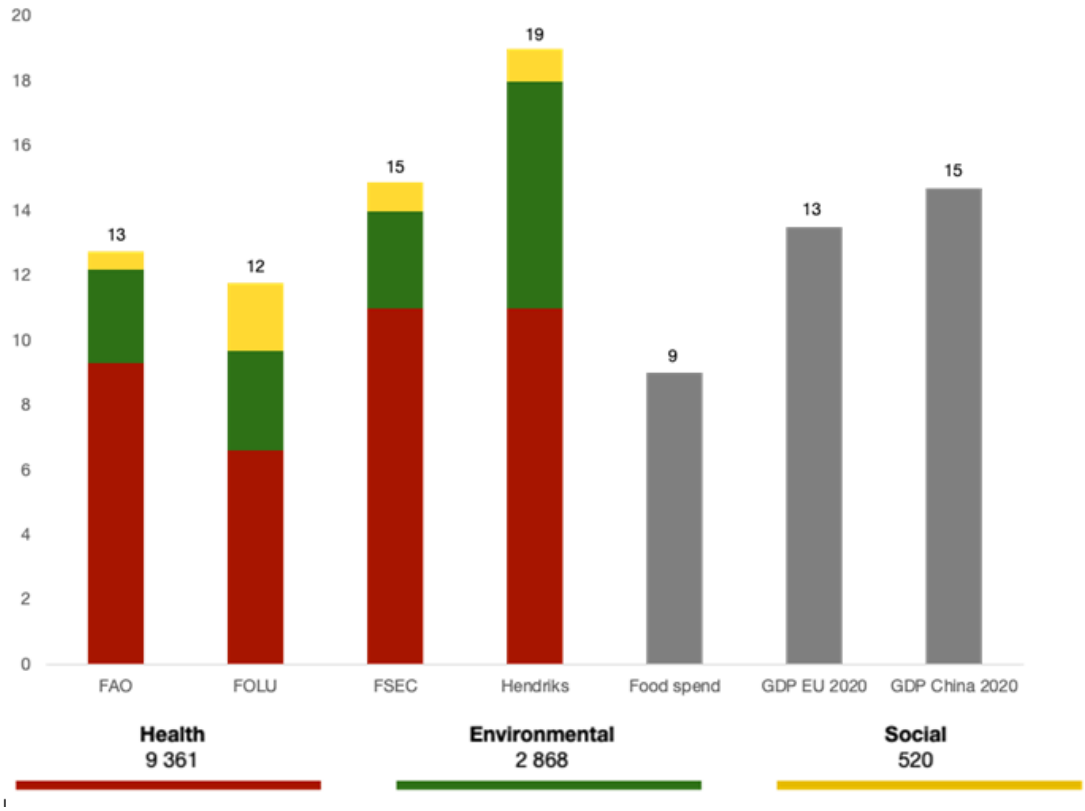

Figure 034-1: Hidden costs globally (USD thousand billion)

The graph shows the average and range of four studies; FAO, FOLU, FSEC and Hendriks. The variation between these is driven by differences in what is included, what year is referred to, how cost impacts are calculated and what models are used. However, the ambition in all cases is to assess total global hidden costs of the food system.

Broken down by country, the bulk, 75%, of the costs originate from high and upper middle-income countries. Low-income countries account for only 3% and lower-middle-income countries for the remaining 22% according to the FAO. Hidden costs are growing strongly, mainly driven by increased health-related problems from unhealthy diets which increased by 14% between 2016-2023 according to

the FAO. Global hidden costs in 2050 are estimated to exceed USD 16 trillion according to FOLU.

The environmental hidden costs can be much higher if the tipping point is approached, given the transformation of nature and the costs of managing and mitigating impacts such as floods, storms, temperature, etc.

Health effects are valued on the basis of GDP lost due to illness and death, so medical costs and a valuation of lives are not included in the studies, except for Hendrik's, which is based on a global average for the loss of human life.

B. Need for a shift in dietary patterns and the potential positive contributions from organic on health, climate and biodiversity

1. Health and environmental effects – Nature 2014, Tilmann & Clark

Tillmann and Clark, Global diets link environmental sustainability and human health, Nature (2014)

Diets link the environment and human health. Rising incomes and urbanisation are driving a global dietary shift in which traditional diets are being replaced by diets higher in refined sugar, refined fats, oils and meat.

This study summarises results from ten million man-years of observations across eight cohort studies. For each study, reported health effect after statistical control is used to compare disease incidence in individuals who consumed typical omnivorous diets with those who had diets classified as Mediterranean, pescetarian or vegetarian.

These alternative diets offer significant health benefits and, if widely adopted, could reduce global agriculture's greenhouse gas emissions, reduce deforestation and associated species extinction, and help prevent diet-related chronic non-communicable diseases.

2. Health and environmental effects - EAT Lancet

8 EAT-Lancet Commission, Summary report: Food Planet Health (2019)

Introduction: Food is the single most powerful lever to optimise human health and environmental sustainability on Earth. But food is currently threatening both people and the planet. A huge challenge facing humanity is to provide a growing world population with healthy diets from a sustainable food system.

While global food production of calories has generally kept pace with population growth, more than 820 million people still lack enough food, and many more eat either low-quality diets or too much food. Global food production threatens the climate and ecosystem and is the single biggest driver of environmental degradation and overshooting planetary boundaries.

There is considerable scientific evidence linking diets with human health and environmental sustainability. But the absence of globally agreed scientific targets for healthy diets and sustainable food production has hindered largescale and coordinated efforts to transform the global food system.

To address this critical need, the EAT-Lancet Commission has convened 37 leading scientists from 16 countries across disciplines including human health, agriculture, political science and environmental sustainability to develop global scientific goals for healthy diets and sustainable food production.

EAT Lancet presents a global framework for creating a sustainable food system: How food is produced, what is consumed, and how much is lost or wasted has a major impact on the health of both people and the planet.

The EAT-Lancet Commission presents an integrated global framework, providing for the first time quantitative scientific targets for healthy eating and sustainable food production.

The Commission shows that it is both possible and necessary to provide 10 billion people with a healthy diet within safe planetary boundaries of food production by 2050. It also shows that the universal adoption of a planetary health diet would help avoid serious environmental degradation and prevent around 11 million human deaths annually.

But to protect the natural systems and processes on which humanity depends and which ultimately determine the stability of the Earth system will require a major food transformation.

The Commission calls for comprehensive action at multiple levels across several sectors, including a significant global shift towards healthy dietary patterns, major reductions in food waste and spoilage, and major improvements in food production methods. The research and data available are both sufficient and strong enough to justify immediate action.

3. Health effects - BioNutrinetSanté

These studies show associations between organic diets and positive benefits with all reported health areas such as overweight and obesity, metabolic syndrome, type2 diabetes and cancers.

The NutriNet Sante Cohort Study is a web-based prospective study since 2009 of adults with the aim of studying the relationship between nutrition and health outcomes and examining the relationship with various dietary and nutritional determinants. From 2013 organic food was studied “BioNutrinetSanté”. Up to 2020, the base has amounted to 170.000 persons.

A questionnaire surveyed people's habits across 16 food groups and identified organic frequency such as never, sometimes or mostly to make an organic profile which was matched with the prevalence of organic options for 264 food items to

estimate the proportion of organic diet in a group. The model was adjusted for sociodemographic characteristics, lifestyle such as smoking and exercise, dietary patterns, BMI, etc.

Regular consumers of organic products show specific socio-demographic characteristics (women, higher level of education, more physical activity, less smoking, fewer low-income earners) healthier dietary patterns (more plant-based), more customised food based on nutritional recommendations.

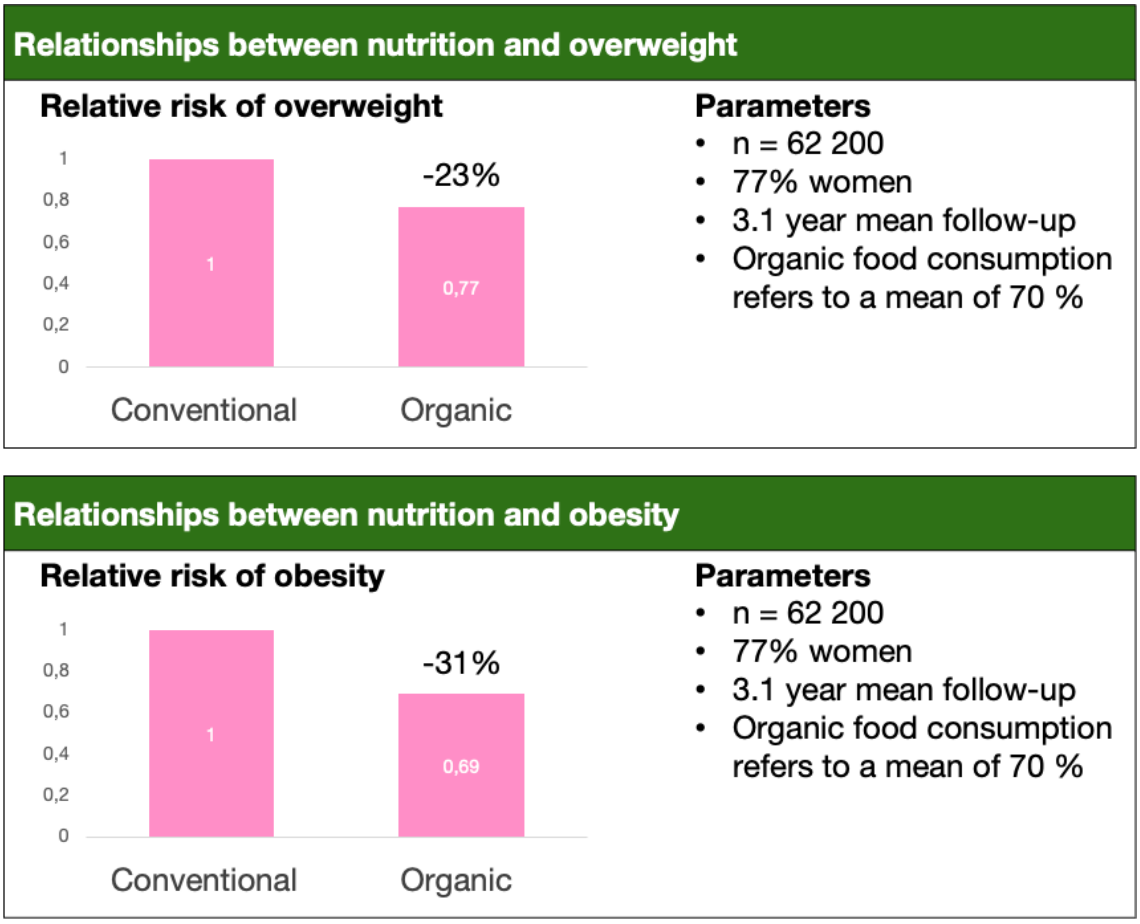

Figure 034-02: Relationships between nutrition and overweight (top figure) and obesity (bottom figure). (Figures by: A. Bergkvist)

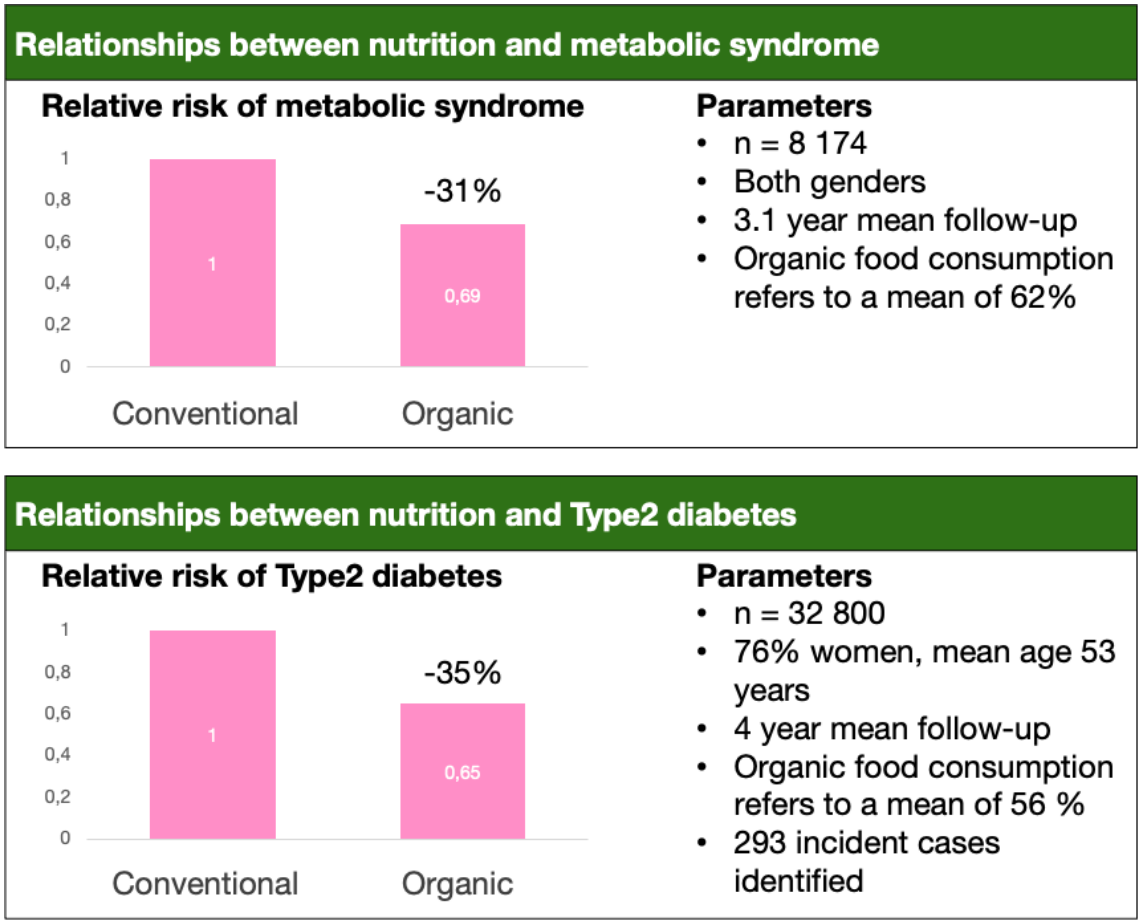

Figure 034-03: Relationships between nutrition and metabolic syndrome (top figure) and Type 2 diabetes (bottom figure) (Figures by: A. Bergkvist)

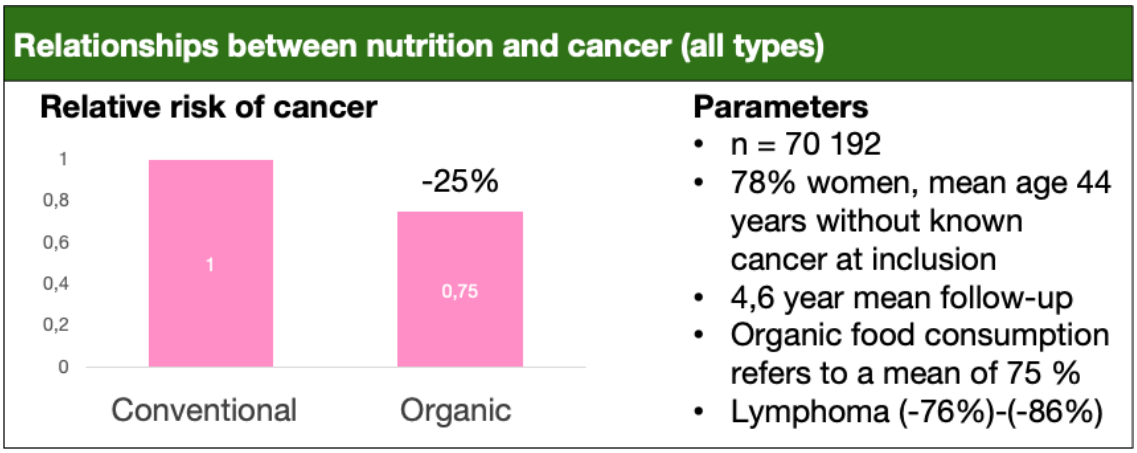

Figure 034-04: Relationships between nutrition and all cancer types (Figure by: A. Bergkvist)

A sub-study shows a link between pesticides and breast cancer

Some pesticides, used in large quantities in current agricultural practices across Europe are suspected to have adverse effects on human reproductive health (breast and prostate cancer), as observed in agricultural settings.

In 2014, participants completed a self-administered semi-quantitative food frequency questionnaire that distinguished conventional and organic foods. Exposures to 25 active substances used in EU plant protection products were estimated using a database of pesticide residues related to agricultural practices.

The lowest exposure to synthetic pesticide mixtures was associated with 43% reduced risk of breast cancer. Highest exposure to synthetic pesticide mixtures was associated with 73% increased risk of breast cancer, especially in obese women (+413%).

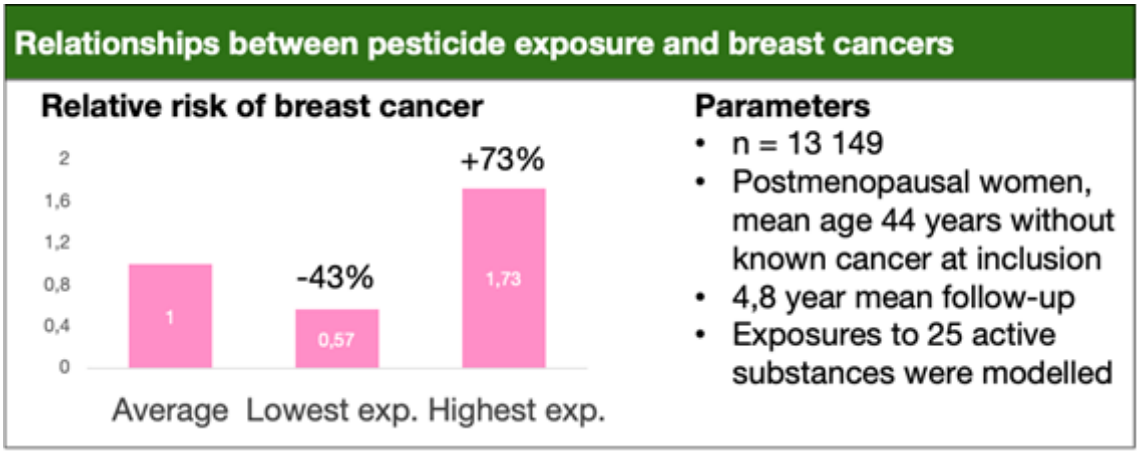

Figure 034-05: Relationships between pesticide exposure and breast cancers (Figure by: A. Bergkvist)

4. Health effects of organic – Meta studies by Rahman et al.

Meta-study by Rahman et al. "A Comprehensive Analysis of Organic Food" shows positive health effects of organic food for obesity, blood nutrients composition and some forms of cancers.

Various health benefits have been associated with higher consumption of organic foods. This review identified some of these health benefits, including a reduction in obesity and body mass, BMI, improvements in blood nutrient composition, as well as reductions in maternal obesity and pregnancy-related risks of pre-eclampsia. Furthermore, consumption of organic food can reduce the development of non-Hodgkin lymphoma (NHL) and colon cancer.

After reviewing the existing literature regarding the nutritional value of organic foods, it was found that organic food contained higher levels of iron, magnesium and vitamin C.

5. Health effects of organic – Meta studies by Jiang

Meta-study by Jiang et al "The effects of organic food on human health" shows positive health effects of organic food for obesity and other effects related to less pesticide exposure in organic food.

This study shows that consumption of organic food was found to reduce pesticide exposure, and the overall effect on diseases and functional changes (BMI and male sperm quality) was noticeable. More long-term studies are needed, especially for single diseases.

6. Environmental impacts - FiBL

The DOK trial - FiBL compares biodynamic, organic and conventional systems since 1978

The Research Institutes of Organic Agriculture (FiBL) are governmental independent social institutions or non-profit organisations operating as foundations or associations in different European countries. In Switzerland alone there are 80 researchers on organic.

The DOK trial by FiBL compares biodynamic, organic and conventional (integrated) farming systems since 1978, mimicking real farming practices divided into crop plots.

Below some of the results from the DOK trial:

- Overall, greenhouse gas emissions per unit area were 63% lower in BIODYN and 44% lower in BIOORG than in the conventional system (CONFYM).

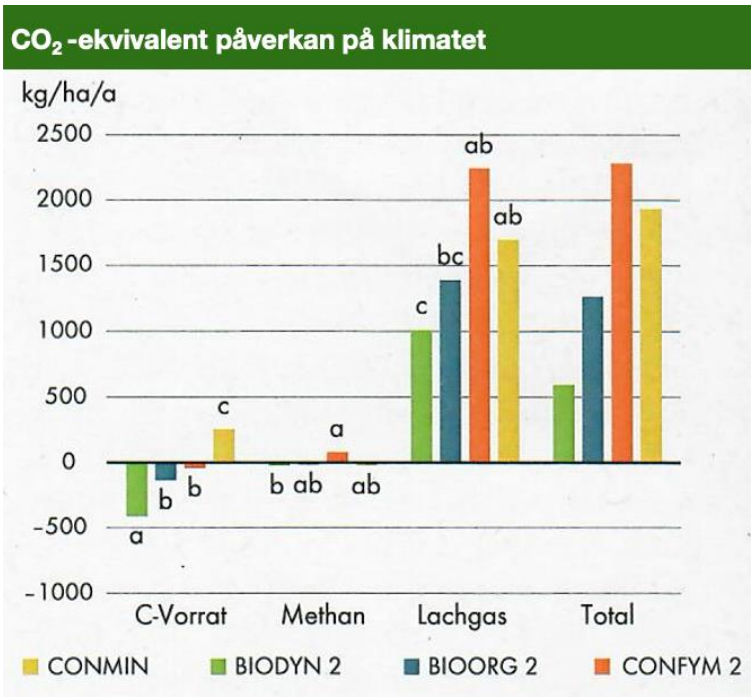

Figure 034-06: Of the different farming systems, it was mainly the biodynamic system (BIODYN 2) with normal fertilisation intensity (Swiss standards) that stored organic carbon in the soil (Source: Gabel et al. 2024)

- The lowest nitrogen emissions were also measured in the BIODYN system. The high emission rates in CONFYM 2 and CONMIN are due to high levels of nitrogen fertiliser.
- After 20 years of cultivation, all soil fertility indicators showed better values in the organic systems than in the conventional ones, and especially in the BIODYN systems.

7. Environmental impacts - Artur Granstedt et al.

At farm level, net-zero greenhouse gases can be achieved with ecological recycling Agriculture

The study is based on 30 Swedish organic recycling farms distributed across the country with different climates, soil conditions, sizes and production orientations. The farms have:

- Crop rotations with high proportion (≥ 50%) of legume-grass swards (2-4 years); fixing nitrogen for subsequent crops and sequestering carbon in the soil, at least 400 kg C/ha and year (~1500 kg CO2e)
- Integration with livestock (mostly ruminants) and manure recirculation.
- Low purchases of inputs, most are largely self-sufficient in feed and fertilizer (some exceptions exist that purchase more than 20% fertilizer or feed)

The results should be interpreted with caution, but the scenarios with adapted diets that can be produced by the example farms show that it would be possible to achieve a 90% reduction in the greenhouse impact of staple food consumption (calculated at the production stage of cereal products, meat, dairy products, potatoes, horticultural products and eggs) in Sweden - and this without importing either staple foods or agricultural inputs. However, the recirculation of plant nutrients within the country would need to be improved. The food chain up to the consumer is not studied in the report, but was done in the BERAS study.

A food supply based on ecological recycling agriculture with current policy regulations would cost a little more to produce, but with the proposed changes in policy instruments and a reorganised diet, the shift could take place without increased costs for the consumer. The cost increases that arise for individual products are offset by the fact that plant products are cheaper than animal products when the diet is changed.

C. The role of Bio districts (Organic districts) in facilitating the inclusive process advocating for and implementing the transformation needed for farming, food and lifestyle.

The EU Commission has defined a Bio district as follows:

”A ‘Bio district’ is a geographical area where farmers, the public, tourist operators, associations and public authorities enter into an agreement for the sustainable management of local resources, based on organic principles and practices. The aim is to maximise the economic and sociocultural potential of the territory. Each Bio district’ includes lifestyle, nutrition, human relations and nature considerations. This results in local agricultural production that is appreciated by consumers and hence has a higher market value.”

Ref “Action Plan for the Development of Organic Production” https://eur-lex.europa.eu/legal-content/EN/TXT/DOC/?uri=CELEX:52021DC0141

Presently there are 60 Bio districts in Europe and a growing number globally https://gaod.online/ The first Bio districts was established in Cilento, Italy in 2004. The network incudes organisations such as IFOAM Organics International, IFOAM EU, IFOAM Asia, Asian Local Governments for Organic Farming “ALGOA”, IN.N.E.R., Regeneration International, the UN Core initiative Organic Food System Programme “OFSP”, LOAMC – PH from the Philippines and Baltic Foundation.

Network of Ecoregions “IN.N.E.R.” provides support to the start-up and management of Bio districts, examples on work groups, guiding documents and a Monitoring Tool for the performance of the districts https://gaod.online/wp-content/uploads/2023/05/Organic_Districts_Introduction_Tool_Kit.pdf

A number of research articles has been published related to Bio districts.

There are yearly conferences and every 5 year a World Congress.

Below an extract from the Declaration from the 2nd Organic Districts World Congress in July 2024 in Idanha- a- Nova, Portugal

RECLAIMING HUMAN DIGNITY - FOCUS AREAS OF ORGANIC DISTRICTS Sustainable food production and consumption are key to increasing both human and ecological capacities to cope with major challenges such as for our health, food and nutrition security, climate change and loss of biodiversity. Our network can offer significant positive contributions for all of these challenges.

Guided by the principles of Health, Ecology, Fairness and Care organic invites us to take steps even beyond being a production method, consumption and diets and a food system perspective. Together with likeminded initiatives organic should also take the lead for a lifestyle respecting human rights, social inclusiveness, reducing inequality, the health and right of nature on its own on a pathway reclaiming human dignity. Within this realm of bringing all the pieces together lays the unique capacity and future potential of Organic Districts.

- to encourage the development of new Organic Districts and with the Guidelines, Tool Kit and Monitoring Tools of IN.N.E.R., assisting in the start -up and management of the districts.
- strengthening the knowledge sharing and cooperation in our partnership related to organic production and consumption/healthy diets with common programs for education/academies for farmers and people engaged in the food value chain.
- communication directed to consumers and advocacy initiatives for governments and policy makers. An example is True Cost Accounting for the hidden costs of food and the positive contributions from organic.
- facilitate the dialogue between the local actors in the food value chain in order to strengthen business models on the principles of ecological economy for fair and equal sharing of revenues, enhancing all aspects of sustainability from farm to table.
- engage in the work for a healthy lifestyle respectful of ecological, social and economic long-term sustainability “Reclaiming Human Dignity”.
- Develop common approaches, tools and guidelines for organic school meal programs “Leave no child behind”.
- building relations between rural and urban areas in order to strengthen the recognition and respect of our farmers for the important and necessary work they are doing producing our food in caring for animals and nature. To this end also promote the active engagement women in the food system transition.
- attract youth in agriculture and in the food value chain. To this end acknowledging that the new generation may have different expectations, needs and desires connected to the work environment and social relations compared to the present structures and that they are given the space necessary to elaborate on this.
- Promote the development of sustainable tourism.

In view of available resources flowing from strategies from the EU Commission, the global network, R&D and proof of concepts, we assume that Bio districts have a vital role in facilitating the inclusive process advocating for and implementing the transformation needed for farming, food, equal rights and lifestyle.

034.05 The positive externalities of organic food

French Research Institute for organic food and farming (ITAB)

Authors: N. Sautereau, E. Lacarce, B. Dallaporta, C. Gentil-Sergent, F. Cisowski, R. Vidal

Alongside the work done in partnership with EREN (epidemiological team leader of the BioNutrinet project), ITAB also engaged strategic work on organic food and

farming. For the last 2 years, the Transition and Sustainability team led by Natacha Sautereau and the Qualities and Food processing team have written together an update of organic farming and food externalities report. This work has been delivered to the French Ministry of Transition and Environment by June 10th, 2024.

Background

In western countries, organic food sector is currently in crisis. The consumer is overwhelmed by labels, scores, and claims and is more attentive to expenses, notably regarding food. The organic sector needs to reaffirm its specification and their benefits at different level of the food chain.

Aim

The goal of this study was to serve as an overview of current scientific knowledge, based on published works and not on expert opinion. The analysis of the source material aims to give a summary of established knowledge and to identify the points where gaps need to be filled or which are controversial.

Methods

The methodology used for this evaluation was to analyze the externalities generated by organic farming as compared to those generated by 'non-organic' farming, or 'conventional farming'. A bibliographic state of the art was performed and divided in 4 themes: climate, biodiversity, soil, and human health.

Results

Organic farming lays down restrictive rules on the intrants used. In agriculture, these restrictions have an impact on farmers by authorizing them to use a limited list of substances for plant protection (in particular by banning synthetic substances), but also on consumers by limiting their exposure to residues of plant protection products in food. Some of these substances or mixture are linked to pathologies. In the food industry, organic products are subject to a reduced list of additives, which may also have an impact on consumer health. On the other hand, the nutritional qualities of organic products, in certain categories, offer health benefits for consumers. In addition, organic eaters (who include a high proportion of organic products in their diet) have healthier diet profiles (more in line with national recommendations) and are more sustainable (with more plant-based diets).

Discussion and conclusion

This work is going to be delivered in 2024 and is an update of the first report of positive externalities of organic farming dated from 2016 (Sautereau and Benoit, 2016). It should give a picture of organic farming assets from biodiversity preservation to sustainable healthy diets. This report should serve as a reference for policy making at national level and above.

ITAB Study - Externalities of organic farming: soil, biodiversity, climate, health - June 2024

The study analyzed nearly 800 scientific articles to establish an up-to-date state of scientific knowledge and produce a synthesis resulting from the comparison of the results. Only a selection of bibliographic references is mentioned here. Collective of co-authors led by Natacha Sautereau (agronomist, expert in assessing the sustainability of agri-food systems): Fanny Cisowski, food engineer, food product quality expert Bastien Dallaporta , agronomist, biodiversity and climate expert Céline Gentil-Sergent , Dr, agronomist, ACV expert, and environmental health Eva Lacarce , Dr, agronomist, soil expert Rodolphe Vidal, expert in the quality and processing of food products ITAB experts were able to benefit from the support of INRAE, ISARA and INSERM researchers.

The executive summary of the report was provided by Natacha Sautereau, Head of the Sustainability and Transitions Department, on behalf of the Externalities Team, ITAB. Contact: natacha.sautereau@itab.asso.fr

EXECUTIVE SUMMARY

General settings

Agricultural activities, along with the production of agricultural goods, generate negative (costs) or positive (benefits) externalities, i.e. services not taken into account by the market. Decreasing negative externalities and increasing positive externalities are major challenges for agriculture in general and even more acutely for society as a whole. Such momentum could justify financial support policies.

This partial update of the 2016 study entitled "Externalities of Organic Agriculture (OA)" focused on i) identifying how practices implemented in the organic sector rather promote or downgrade different environmental and health dimensions compared to conventional agriculture (CA) through soils, biodiversity, climate and human health issues, and ii) estimating the differentials of externalities of OA compared to CA.

In organic farming prohibiting synthetic inputs and curtailing a certain number of other inputs implies de facto increasing autonomy and therefore a greater reliance on biological processes. Beyond the organic regulation a certain number of practices are, on average, more implemented in organic farming, e.g. longer and more diversified crop rotations with more legumes, cover and catch crops, and leys, lower nitrogen inputs, etc. All these practices, whether enforced or induced by the regulation, were considered.

Organic farming enhances soil multi-services

The INRAE IFREMER Collective Scientific Expertise “Impacts of plant protection products (PPP) on biodiversity and ecosystem services” (ESCo PPP, 2022) shows that all environmental matrices are contaminated by PPP (water, soil, air).

In Europe, soils are widely (80 % to 98 %) contaminated by pesticide residues and metabolites (Silva et al., 2019; Froger et al., 2023; Leenhardt et al., 2023) due to present agricultural practices, transfers or persistence. By considerably limiting PPP, OA significantly lowers the contamination of cultivated soils compared to CA: albeit present, pesticide residues are fewer in number (-30 % to -55 %) and less concentrated (total content reduced by 70 % to 90 %) in soils (Geissen et al., 2021; Pelosi et al., 2021; Riedo et al., 2021). Therefore, thanks to its practices, organic farming restrains soil contamination by toxics for today and for the future, not only on organic land but also on uncultivated areas.

The quality of groundwater with respect to PPP has significantly deteriorated between 2010 and 2018, despite water protection areas implementation (SDES, 2020). Noteworthy, 13 % of surface water bodies are degraded by copper to which organic farming, especially in vineyards, contributes along with CA because cupric PPP are allowed. Generally speaking, organic farming makes little use of PPP thence contributes to a much lesser extent to PPP water pollution.

Furthermore, banning i) synthetic nitrogen fertilizers, and ii) acid extraction of mine phosphates, and linking animal feed to the territory, organic farming cuts down on plant nutrient inputs. Because it reduces nitrogen inputs, organic farming is a model for recovering satisfactory water quality by reducing nitrate losses by 30 to 60 % compared to CA in arable crops (Benoit et al., 2015; Billen et al., 2024; Sanders and Heß, 2019). Despite generally lower nitrogen inputs, organic farming occasionally leads to increased nitrate leaching, particularly after alfalfa ploughing.

Not very mobile and not very bioavailable in soils, phosphorus is largely inherited from past fertilizing practices. Current inputs in CA are rather low except in intensive livestock farming areas due to effluents. They are even lower in organic farming with P input-output balances divided by 2 in arable crops (Véricel and Demay, 2023) .

More systematic spreading of livestock effluents does not increase the risk for contamination with pathogens or antibiotic-resistant strains of organic food and feed (Rodriguez et al., 2023). Spreading can cause heavy metals and organic contaminants pollution . Banning sewage sludge, organic farming mitigates this pollution, however other organic fertilizers may constitute significant sources of contamination. Fertilizers from biowaste allowed in organic farming must respect lower heavy metals contents compared to general requirements. With regard to cadmium in particular, that is at high concentration in French soils, the balance of cadmium inputs and exports to soils in organic farming is at the same level as in CA with good fertilization practices (Sterckeman et al., 2018) . Note that studies indicate a 30 % reduction in cadmium content in organic cereals (Baranski et al., 2014).

In organic farming, soil biology indicators are improved in 70 % of cases compared to CA whether they concern abundance or diversity or the activity of living organisms despite tilling practices and in a clear manner for microorganisms. Note that compared to deep ploughing (i.e. deeper than 20 cm), reduced soil work has a positive effect on the density of earthworms, in particular species living on the surface (anecic and epigeic). If the positive effects of organic farming are clear for arable crops or orchards, they do not show a clear trend for grassland where management differs little from CA (Christel et al., 2021) .

The implementation of more diversified rotations in OA, e.g. with 2.4 times more cover and catch crops (Barbieri et al., 2017), is the main lever for improving the porosity and root exploration of the soil. The enrichment of soils with organic matter, in a variable manner depending on the nature of inputs and the action of soil biomass are also beneficial. Organic farming thus shows a general positive effect on the physical quality of soils and consequently more favorable properties with regard to water dynamics in the agrosystem (Blanco-Canqui et al., 2024) . Structural stability is often improved in organic farming, and a positive effect is observed on infiltration in 55 % of studies for which the effect varies from +50 % to +256 %, the remaining studies showing no significant effect. OA improves drought resistance potential compared to CA with generally improved water availability for plants (a positive effect of +4 % to +45 % in 56 % of studies, and never negative in the remaining 44 % of studies) (Lori et al., 2020; Mäder et al., 2020). These elements are also likely to reduce the risk of soil erosion.

To sum up, organic farming practices are favorable to soil quality and strengthen environmental services. Long-term trials as well farm monitoring systems multifunctional indicators generally point out improved soil “health” in organic farming (Bai et al., 2018; Wittwer et al., 2021; Walder et al., 2023).

Biodiversity

Based on monitoring between 1970 and 2018, on a global scale, nearly 69 % of the relative abundance of wild species populations (mammals, fish, birds, reptiles and amphibians) would have been lost (Almond et al., 2022). The loss of biodiversity in terrestrial ecosystems has been strongly influenced by i) the degradation and ii) the loss of terrestrial habitats. Thus, two levers for protecting biodiversity must be mobilized and combined in agricultural areas: i) reducing the intensity of agricultural practices, and ii) developing the heterogeneity of agricultural landscapes (semi-natural elements and configuration of the cultivated mosaic).

The PPP scientific expertise (ESCo PPP, 2022) highlights PPP are majorly involved in the decline of many populations (Leenhardt et al., 2023). Concerning natural substances allowed by the organic regulation, the few existing results indicate that a great majority presents a low ecotoxicity, but some few (notably spinosad) have a toxicity equivalent or superior to that of their synthetic counterparts.

OA is a production method that has lower impacts on the associated biodiversity of agricultural plots. OA plots host more biodiversity than plots managed in CA (Tuck et al., 2014; Smith et al., 2019) . Most biodiversity measurements provide information on the number of individuals (abundance) and/or the number of species (specific richness) and mainly come from temperate zones. All crops and taxonomic groups combined, plots managed in organic farming have on average an abundance and specific richness respectively 32 % and 23 % higher (Smith et al., 2019) . The effects are predominant on plants and are noticeable for a wide diversity of taxonomic and functional groups.

Compared to mineral fertilization, organic fertilization has a positive effect on soil biodiversity. The most documented effects are on the abundance and specific richness of nematodes.

According to the collective expertise "Protecting crops by increasing plant diversity in agricultural areas", all plant diversification practices at the plot scale are beneficial to associated biodiversity (Tibi et al., 2022). In Europe, longer, more diversified rotations in organic farming (Barbieri et al., 2017) therefore contribute to improving associated biodiversity, the effect on soil organisms being the most documented.

These beneficial effects of OA can be explained altogether by the restrictions on PPP and by the contributions of organic matter and by the plant diversification strategies. These effects are perceptible in annual crops and in perennial crops.

At scales wider than the agricultural plot, parameters other than practices contribute significantly to the biodiversity of agricultural areas. Semi-natural elements contribute to compositional heterogeneity. They host species that depend solely on these environments (50 % of species richness) and species that depend on both natural environments and agricultural areas to carry out all or part of their cycle (Jeanneret et al., 2021). The presence of semi-natural elements in the landscape thus favors species whose mobility exceeds the perimeter of the agricultural plot (e.g. flying insects) or depend on these elements to carry out all or part of their cycle (e.g. birds). Consequently, the quantification of the effect of OA depends on the complexity of the landscape around the plots, which can mask the effect of more intensive management practices at the plot scale. A study on 200 farms at the European scale showed an surface of semi-natural elements equivalent between OA and CA (Schneider et al., 2014). Consequently, at the farm scale, the effect of organic farming on species richness is less significant (+4.6 %) than that observed at the plot scale (+10.5 %) (Schneider et al., 2014) . However, since these semi-natural habitats are influenced by agricultural practices of adjacent plots (drift and runoff), studies support the hypothesis that these habitats are of better quality in organic farming (Andrade et al., 2021; Schöpke et al., 2023; Stein-Bachinger et al., 2021) .

Longer and more diverse rotations associated with smaller farm sizes likely contribute to the heterogeneity of composition and configuration of the landscape

mosaic. The influence of these elements on biodiversity is also probably variable depending on the species. For so-called low-mobile species (plants, soil fauna and microorganisms), the impact of agricultural practices seems to be predominant. For more mobile organisms (insects, pollinators, birds), agricultural practices and the landscape context have a combined effect.

Biodiversity plays a key role in the functioning of ecosystems. For pollination and natural regulation, it is established that the diversity of communities is associated with enhanced levels of services (Dainese et al., 2019). The levels of insect pest and pathogen infestations in OA plots are on average respectively equivalent or lower, which shows that OA makes it possible to achieve levels of regulation equivalent to the levels enabled by crop protection practices in CA; with the exception of weeds where the levels of infestations are higher in OA (Muneret et al., 2018).

Given its lower yields, the provisioning service (agricultural production) is a degraded service in OA. According to (Gong et al., 2022) and global data available on both yields and biodiversity measurements, biodiversity gains in OA plots are, on average, comparable in magnitude to yield losses compared to CA plots (approx. -20 %).

At food product level, only 3 out of 100 studies dealing with OA assessments and/or OA vs CA comparisons in life cycle analysis (LCA) integrate biodiversity (Hashemi et al., 2024) . It implies i) the delicate exercise of reducing a quantity of biodiversity to a quantity produced, in the form of flows, ii) the choice of a biodiversity measurement unit, and iii) the complexity of the assessment scales and interactions in trophic chains. Thus, despite a significant development of methods in recent years, existing LCA methods struggle to reflect the complexity of biodiversity issues : ecosystem functioning and conservation, and this at different scales (genetic, species, communities) over a broad taxonomic coverage (Crenna et al., 2020; Marques et al., 2021; Damiani et al., 2023) .

Increasing the share of organically cultivated land in agricultural areas has a positive effect on the diversity of plant species and pollinators. Further work is needed to quantify the importance of this parameter and the combination with other components of landscape heterogeneity.

Role of organics in climate change mitigation

Organic farming can contribute to the reduction of GHG emissions, mainly in relation to fertilization practices. The absence of synthetic fertilizers and the low availability of organic fertilizers are the cause of lower emissions of N2O and CO2 per plot. Consequently, organic plant production emissions, mainly composed of these two GHGs, are lower per area unit (around -50 %).

CH4 emissions which mainly concern ruminant raising, may be higher in organic farming. However, several hypotheses support the lower contribution of organic farming systems to emissions induced by the land deforestation abroad (due to

greater autonomy) and by grassland ploughing in France (due to livestock generally being more pasture-based).

Finally, fertilization practices (organic fertilizers and legumes) in OA are also the cause of an accumulation of organic carbon in the soil, greater than in CA.

The performance of OA to mitigate climate change depend on the functional unit used. While for almost all productions, emissions per hectare are systematically lower in OA, the literature shows that, per unit produced, the conclusions vary according to the product categories, due to the lower yields in OA. Recent work shows that plant productions present, with a few exceptions, better GHG performances regardless of the functional unit used. For animal products, the effects are heterogeneous: organic footprint relative to conventional is slightly better for beef cattle, equivalent in the case of milk cattle, worse for monogastrics.

Although organic farming occupies a tiny part of cultivated areas worldwide and areas converted in France remain below the national and european objectives, work focusing on the assessment of full conversion of areas points to biophysical limits on a global scale if demand remains constant and identical, and to a risk of increasing delocalized emissions through greater use of imports at the national scale. The development of alternative production methods – towards desintensification – not specifically or exclusively organic, must be accompanied by a food transition to act jointly on reducing territorial emissions and reducing the carbon footprint of food.

It should be noted that the latest HCC report (2024) explicitly mentions that scenarios for reducing agricultural emissions by 50 % by 2050 imply 1) a reduction in animal protein consumption of at least 30 %, a reduction in the share of mineral nitrogen supplied to crops of 40 to 100 % and 3) development of agroecology and organic farming to reach 50 % of the utilized agricultural area.

Human health

Due to input differentials, and in particular PPP, many human health benefits of OA over CA have been identified especially for the most exposed professional populations, as well as for specific populations such as dwellers near agricultural plots, pregnant women and children (INSERM, 2021).

The general population is also exposed to PPP residues found in food with not only a frequency of contamination reduced by 30 % in organic food compared to conventional but also an average residue concentration observed a 100 times lower in organic fruits and vegetables.

The benefits of eating organic over conventional foods are also linked to lower cadmium levels and nitrates. However, no significant difference in plasma cadmium concentration is observed in individuals with a high consumption of organic or conventional plant products.

Furthermore, due to its lower use of antibiotics, OA contributes less to the phenomenon of antibiotic resistance, which is a growing public health issue.

The formulation of organic processed products could also have a positive impact through i) better formulation (less added sugar and salt), ii) the limitation of permitted additives – and thus the avoidance of certain problematic additives – and iii) via the lower share of ultra-processed foods. However, the absence of specific data on the frequency of use of additives in organic products or their doses of use does not allow conclusions at the diet level concerning the impact on health of these restrictions on the number of additives in organic food.

Moreover, if organic products have potentially higher levels of phytochemicals and a healthier fatty acid composition, Vigar et al. (2020) point out that what is likely to be more important than the composition differences between organic and conventional is what organic foods do not contain.

Thus, since plants are by far the foods most contaminated by PPP, favoring organic plant foods can significantly reduce exposure to synthetic PPP.

Regular consumption of organic foods is associated with a reduced risk of obesity, type 2 diabetes, post-menopause breast cancer, and non-Hodgkin lymphoma (Kesse Guyot et al., 2020 ; Baudry et al., 2018 ; Rebouillat et al., 2021) in some studies, although these results are not always convergent across cohorts (Bradbury et al. 2014 ; Andersen et al., 2023). Indeed, some associations require i) to be studied in other contexts, ii) over longer periods, iii) or even to be coupled with experimental studies, to be confirmed.

Finally (Kesse-Guyot et al., 2022) point out that the adoption of the French dietary recommendations PNNS4 (adopting a healthy diet and favoring organic consumption) by a large part of the population could contribute to preventing chronic diseases while reducing environmental pressures linked to the agri-food system. Adherence to the recommendations could lead to a better nutritional quality diet, a clear reduction in exposure to pesticides through food leading to improved health and fewer negative externalities on natural resources and the climate, for a slightly higher food purchase price (+ €0.9/day/person) (Seconda et al., 2018).

Literature cited see Annex 034

034.06 SHEAF – Sustainability, Health and Acceptability of plant-based Foods – dairy alternatives as a case study

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SHEAF seeks to understand the cultural and personal drivers of accepting sustainable foods and the role of nutritional and sensory quality in such acceptance. Dairy alternatives will be used as a case to provide concrete knowledge on the nutritional value and acceptance of such products and to serve as a model to elucidate drivers and barriers toward accepting more sustainable foods. Additionally, SHEAF will investigate the role of plant-based alternatives to animal protein in the Great Food Transformation towards more sustainable diets, using dairy as a case study.

SHEAF looks into and cross-compares dietary patterns and consumer behaviour in Denmark, China and Brazil. The three countries have very different eating habits, including traditional and current use of dairy products. The project is divided into four studies run in parallel.

SHEAF 1: Quality of current dietary patterns in Denmark, China and Brazil: In SHEAF 1, we establish a framework by analysing how healthy and sustainable current dietary patterns are in the countries part of the project against their national dietary guidelines and the Planetary Health Diet.

SHEAF 2: Nutritional and environmental impacts of dairy analogues: SHEAF 2 seeks clarification on the nutritional and environmental impacts of the substitution of animal milk and dairy products for plant-based alternatives in the context of current diets. Moreover, it should consider different types of production (e.g., organic vs conventional), most commonly consumed products and current laws on the enrichment of vitamins and minerals that could improve the plant-based products' nutritional profile (when compared to dairy). Specifically, current EU regulations do not allow the enrichment of organic products unless required by other legislation. Therefore, organic alternatives to dairy products might impose a higher risk of nutritional deficiencies if used to substitute their animal counterparts.

SHEAF 3: Social and personal drivers and barriers towards sustainable foods and dairy analogues explicitly: SHEAF 3 investigates how people’s social and cultural backgrounds influence their attitudes and perception towards sustainable foods and dairy analogues explicitly, in a cross-country comparison between regular and non-regular plant-based consumers in Copenhagen (DK), Beijing (CN) and Brasília (BR).

SHEAF 4: Pilot intervention study: SHEAF 4 proposes a dietary intervention with healthy Danish adults. The intervention consists of the participants substituting their habitual intake of milk, yoghurt and cheese for plant-based analogues for four weeks. The products are a mix of raw materials (oats, peas, soy and organic cashew nuts) and the alternatives to milk and yoghurt are enriched with micronutrients in amounts similar to dairy. Changes in diets and motivation to eat plant-based foods are investigated.

Research questions:

- What are the nutritional impacts of substituting animal dairy for plant-based analogues? How do they fit into individuals' global diets?
- Are plant-based dairy analogues sustainable? What is their role in the Great Food Transformation?
- What are consumers' drivers and barriers to consuming more sustainable alternatives to dairy products? Are there cultural and social differences in attitudes towards these products?

Researchers

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7. Renata Puppin Zandonadi Associate professor Department of Nutrition, University of Brasília (UnB)

In relation to organic food the researchers explain that SHEAF investigates the nutritional impacts of substituting milk and dairy with plant-based analogues. In the context of Europe, where organic food products cannot be fortified, an increased consumption of organic plant-based alternatives to dairy might be of concern due to this lack of fortification, particularly for vitamins B12 and B2 and calcium.

News about SHEAF can be found here:

https://nexs.ku.dk/english/research/nutrition-health/sustainable-nutrition-and-health/sheaf/

Nº 5

Chapter 035 >> Deliverable 5

To build the data collection, sharing, and reporting capabilities to demonstrate and advocate for increased support of the OFS

This Deliverable involved two main activities – the establishment of Task Force on Key Performance Indicators and the launch of a Special Issue of journal "Frontiers in Sustainable Food Systems" called "Biodistricts: a Concrete Example of Sustainable Food Systems". While the first activity was initiated by two OFSP Steering Committee members, David Gould and Prof. Dr. Denis Lairon, the second one was called for by the OFSP partner, Prof. Dr. Cesare Zanasi from University of Bologna (Italy) and supported by two Steering Committee members, Prof. Dr. Carola Strassner and Dr. Lilliana Stefanovic. Both activities are described in detail in the below sections.

035.01 Key Performance Indicators (KPIs) Task Force

As part of OFSP's work on Deliverable 5, and as an outcome of our successful side event at the United Nations' 4th Global Conference of the Sustainable Food Systems Programme in April 2023, the Organic Food System Program (OFSP) has convened a special KPI Task Force. Our intention is to draft a set of Key Performance Indicators (KPIs) that can be globally adopted toward food system transformation and serve for defining and evaluating sustainable organic agri-food system developments. These KPIs can be used as a focus for information sharing and learning amongst existing and developing OFS, and to measure and report progress, benefits, and challenges in order to bring more support, adoption, and improvement toward the development of and advocacy truly sustainable food systems worldwide, UN level down to local governments. It is the sense of the Task Force that food system transformation is a socially-based decision coming from the evidence and experience of the benefits of agroecological approaches that are based on organic principles. As such, a combination of social science and physical sciences approaches is needed.

The human and associated expertise of this specific task force is worldwide and combines academics from universities and research centres together with institutions and actors involved in local development projects, especially those acting within the international network (Global Alliance for Organic Districts (GAOD), a partner of OFSP.

The output of the Task Force is a draft framework intended to be useful toward the establishment of new organic food systems; the implementation, monitoring, and further enhancement of existing systems; and to eventually aggregate

performance data both within a given system and across systems to show the benefits and the challenges of organic approaches. The Task Force conducted its work through emails, online virtual meetings (October 20, 2023 and April 10, 2024) and cloud-based document sharing.

Task Force present members were selected so as to bring a broad spectrum of expertise and perspectives. Current members are:

- Eve Fouilleux (France) – CNRS Research Director, Interdisciplinary Laboratory for Sciences, Innovations Societies, at University Gustave Eiffel; Research Associate at Agronomic Research International Cooperation Centre for Development (CIRAD).
- David Gould (USA) – Senior Sustainability Advisor; OFSP Steering Committee; IFOAM Seeds Platform General Secretary
- Denis Lairon (France) – Professor Emeritus, Marseilles University; Emeritus Researcher, Bionutrinet cohort study on organic food consumers and sustainability; OFSP Steering Committee
- André Leu (Australia) – Executive Director, Regeneration International
- Samia Maamer (Tunisia) – Director General of Organic Agriculture, Tunisian Ministry of Agriculture, Water Resources, and Fisheries
- Adrian Müller (Switzerland) – Department of Food System Sciences, Research Institute for Organic Agriculture (FiBL)
- Gerold Rahmann (Germany) – Director, Thünen Institute of Organic Farming; Professor, University of Kassel, Faculty of Organic Farming
- Nacianceno (Jun) Pacalioga (Philippines) – former Mayor, Dumingag City, Winner of One-World Award; Asian Institute of Management (AIM), Makati, Philippines; Development Academy of the Philippines (DAP)
- Patrizia Pugliese (Italy) – International Officer, Senior Researcher, CIHEAM Bari
- Juan Pablo Sciurano (Argentina) – Organic Food Systems Development Expert; Sustainable Development Consultant and Researcher
- Victoriano I. Tagupa (Philippines) – Professor Emeritus, Xavier University; Founder, League of Organic Agriculture Municipalities and Cities of the Philippines; President, SAFEGCC INC.
- Cesare Zanasi (Italy) – Professor, Bologna University; Founding member, Global Alliance for Organic Districts

The distilled results of the framework are:

Farmer / Primary Producer	**Post-harvest enterprise**	**Consumer**	**Government**
income and wages	wages	cost of goods	health problems incidence, costs
biodiversity Stewardship	economic resilience (income, stability of relationships)	diet quality (including diversity, cultural relevance, quantity, safety)	environmental clean-up costs (from production, from consumption)
resilience (Economic, Environmental)	pollution (water, GHG, soil)	health	job creation
health of family and workers	waste	waste (organic, packaging)	poverty level
education / Generational Succession	distribution of supplier performance (sourcing)		political stability, crime rate
pollution			cultural vibrancy
			Immigration (rural exodus/international)
			participation % at each level of value chain

035.02 Special edition of *Frontiers in Sustainable Food Systems* on "Biodistricts: a Concrete Example of Sustainable Food Systems"

The research topic "Biodistricts: a Concrete Example of Sustainable Food Sytems" was proposed by Prof. Dr. Cesare Zanasi (University of Bologna, Italy), who has launched it and invited two additional topic editors – Prof. Dr. Carola Strassner (FH Münster University of Applied Sciences, Germany) and Dr. Lilliana Stefanovic (University of Kassel, Germany). The research topic aims at tackling the challenge of defining a manageable holistic approach to develop Sustainable Food Systems, and support the Ecological Transition, through the Biodistricts. To this end, new or updated knowledge should be produced on the analysis of the Biodistricts' structure and dynamics. On top of the organic agriculture, which represents the core of the Biodistricts values and practices, recent advances in managerial, organizational and technical solutions should also be considered; this include innovative agronomic practices like regenerative agriculture, as well as tools supporting the creation and monitoring of the Biodistricts; the interaction among the different dimensions characterizing the Biodistricts, and contributions to effective strategies and policies definition should also be involved. This includes also institutional aspects like the role of Biodistricts networks in supporting their development.

The scope of the research topic is broad, mirroring the systemic nature of Biodistricts, where different themes are intertwined, such as:

- Integrated sustainable rural development/Land Planning (Biodistrict definition, creation and management tools and guidelines, strategic planning)
- Sustainable tourism/gastronomy
- Sustainable farming (organic, agroecological, regenerative agriculture)
- Sustainable organic food chains (from farm to fork, including Green Public Procurement)
- Social sustainability (inclusiveness, gender gap, social agriculture, urban/rural relations)

The manuscripts should refer to state of the art contributions (research, literature reviews) on Biodistricts. The abovementioned topics should be considered in terms of their role within a Biodistricts' analysis perspective. Analytical frameworks and methods design, empirical analyses, strategic planning and policies addressing the Biodistricts are welcomed.

Keywords: Biodistrict, Food system, Organic agriculture, Integrated rural development, Agroecology, Regenerative agriculture, Social agriculture, Sustainable tourism.

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Petra Votsalo
Restaurant
Welcome

Our outlook

Some final words and our outlook

Towards the end of our second active and reporting period we embrace a number of opportunities for meeting, co-learning and co-creating our way ahead. One of these is FQH's third international conference Organic Food for a Sustainable Future from 11th to 13th November 2024 in Copenhagen, Denmark.

Organic food for a sustainable future – in Copenhagen

Organic food for a sustainable future is a 3-day conference in Copenhagen with the purpose to promote dialogue, collaboration, and action towards building a more global sustainable and resilient food system centred around organic principles. The conference will feature a variety of activities designed to: 1. facilitate the exchange of knowledge among scientists, stakeholders and policymakers regarding organic food quality, food culture, dietary patterns, health and well-being; 2. identify scientific knowledge gaps related to organic food systems and explore avenues for filing these gaps through research and innovation and; 3. highlight the role of organic food systems to the green transition and mitigating challenges such as climate change, biodiversity loss and soil degradation.

Renowned experts from industry and academia will deliver keynote speeches to provide insights into the latest developments and future directions in organic food quality, sustainability, and its role in promoting health and well-being. Participation from 100-150 people is expected with early career researchers encouraged by fee reduction.

Participants will have the opportunity to present their research findings, innovative ideas, and case studies through short free and open oral presentations. Panels with a broad diversity comprising experts from academia, industry, government, and non-governmental organizations will engage in discussions on key issues and challenges facing the organic food sector. Participants will show their research and projects through physical posters to encourage interact and exchange ideas. Additionally, participants are invited to deliver a 3-minute oral presentation to highlight key points and findings. The conference will provide ample networking activities for participants to connect with fellow researchers, practitioners, policymakers, and stakeholders to facilitate collaboration, knowledge exchange, and the formation of partnerships to advance the organic food agenda.

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BIOFACH – World Trade Fair for Organic Food

A further opportunity is provided by the BIOFACH trade fair for organic food, held annually in February, in Nuremberg, Germany. This is where the community meets. BIOFACH World takes these trade fairs into America, Brazil, China, India, Japan, Saudi Arabia and South East Asia.

IFOAM Organic World Congress (OWC and further regional activities

Our partner IFOAM-OI hosts the international OWC every few years. In December 2024 this takes place in Taiwan, where the winning bid to host the OWC 2027 will be revealed. Besides this major activity, there are many regional activities providing opportunities, especially with various foci, such as the School Meals and Public Procurement Conference of IFIAM Asia together with the Asian Local Governments for Organic Agriculture (ALGOA) and the Global Alliance of Organic Districts (GAOD).

Organic Districts World Congress (ODWC)

GAOD together with its partners and alliances convenes both local and global activities to exchange growth and learning. The last summit in 2024 was held in July – August in Portugal, Idanha-a-Nova with the focus One Health, One Planet.

Our way forward

In going forward into the next years we continue to work with and expand on organic food systems, especially biodistricts. We work towards making organic learning and training more available, especially through tertiary education and pursue science and practice of organic food systems for transformation in the service of humans and non-humans alike.

OFSP continues to be open and inclusive with ample room for all stakeholders to take an active role in contributing to the growth and spread of organic food systems. Our strong global network of researchers, governments, market players and communities; our significant scientific studies; and our informational and educational resources are achievements that provide a sound base on which we can continue building well into the future.

Come and join us at https://organicfoodsystem.net/

Annex

Annex to >> Chapter 032 >> Deliverable 2

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