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Lilliana Stefanovic

Basis for monitoring the performance of Sustainable Development Goals in Organic Food Systems

A first approximation

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I Table of Contents

II List of Tables

III List of Figures

IV Dedication

This dissertation is dedicated to its first supervisor of the earlier phases, an initiator of the overarching project which the present study is contributing to and the inspirator of the topic of this dissertation, late Prof. Dr. Johannes Kahl. May you rest in peace, your spirit will be kept alive and aspirations for transforming the food system also aiming at a broader societal transformation shall be continued through the projects and initiatives you have brought to life and contributed to, such as this one.

With endless gratitude, Lilliana

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VI List of abbreviations

AFN	Alternative food network
AIAB	the Italian Association for Organic Agriculture
ALGOA	Asian Local Governments for Organic Agriculture
AMAP	Association pour le Maintien d'une Agriculture Paysanne / Association for the Maintenance of Peasant Agriculture
ASD	Actor-systems dynamics
BERAS	Baltic Ecological Recycling Agriculture and Society
CC	Climate change
CH_4	Methane
CO_2	Carbon dioxide
CRFS	City Region Food System
CSA	Community supported agriculture
DOC	Controlled designation of origin
DPSIR	Driver-Pressure-State-Impact-Response framework
EC	European Commission
EEA	European Environment Agency
ERA	Ecological regenerative agriculture
EU	European Union
EVs	Essential variables

FAO	Food and Agriculture Organisation of the United Nations
FiBL	Research Institute of Organic Agriculture
FNS	Food and nutrition security
FS	Food system
FSS	Food system sustainability
GEC	Global environmental change
GHG	Greenhouse gas
HORECA	Hotels, restaurants and canteens
IFOAM	International Federation of Organic Agriculture Movement
IN.N.E.R.	International Network of Eco-Regions
JVS	Jardins de la Vallée de la Siagne / the Gardens of the Siagne Valley
LCA	Life cycle assessment
MCE	La Maison du Commerce Equitable / The Fair Trade Centre
MDGs	Millennium Development Goals
MEAD	Maison d'Education à l'Alimentation Durable / Centre for Sustainable Food Education
MoU	Memorandum of understanding
N_2O	Nitrous oxide
OA	Organic agriculture
OECD	Organisation for Economic Co-operation and Development

OFS(s)	Organic food system(s)
OFSP	the Organic Food Systems Programme
PGS	Participatory Guarantee System
QOL	Quality of life
RUAF	Global Partnership on Sustainable Urban Agriculture and Food Systems
SAFA	Sustainability Assessment of Food and Agriculture Systems
SCP	Sustainable consumption and production
SCPSs	Sustainable consumption and production systems
SD	Sustainable development
SDG(s)	Sustainable Development Goal(s)
SFPS(s)	Sustainable food production systems
SFS(s)	Sustainable food system(s)
SFSP	Sustainable Food System Programme
SMART	Sustainability Monitoring and Assessment RouTine
UFSs	Urban food systems
UN	United Nations
UN 10 YFP on SCP	the United Nations Ten Year Framework of Programmes on Sustainable Consumption and Production (Patterns)

UN 10 YFP SFSP	The United Nations Ten Year Framework of Programmes Sustainable Food Systems Programme
UNEP	the United Nations Environmental Programme
U.S.	the United States
USA	the United States of America

VII Abstract

The many challenges in pursuing a sustainable future within the planetary boundaries are attributed to negative externalities of the contemporary food system (FS), which is why the FSs transformation discourse has gained in importance. Whatever the exact transformation approach is, it would require the optimisation of FS outcomes – the consequences of FS activities. The study at hand approached the FS outcomes as a gate to FSs transformation, taking an example of one of the alternative FSs – the organic food system (OFS). The aim was to disclose its potential contribution to the transformation towards sustainable food systems (SFSs) through the identification of specific outcomes as well as the United Nations (UN) Sustainable Development Goals (SDGs) addressed through organic systems. The identification was accomplished using an actor-oriented approach.

In pursuing its research objectives, the study employed mixed methods research design combining qualitative and quantitative data collection methods including a systematic literature review on FS outcomes, an expert round, a web-based survey as well as the multiple-case study of three selected OFSs. A variety of OFS outcomes has been identified, spanning from ecosystem-related outcomes through individual to community-related outcomes. Apart from the outcomes previously reported in the literature, the multitude of social aspects as well as higher perception of wellbeing and quality of life (QOL) have been revealed. The investigation of the UN SDGs addressed in the analysed OFS case studies revealed a variety of goals being addressed at their target-level. Likewise, the UN SDGs addressed by the highest number of targets in all three analysed case studies were the SDG 12 (Responsible consumption and production); SDG 2 (Zero hunger); SDG 15 (Life on land) and

SDG 17 (Partnerships for the goals), whereby the SDG 12 appeared to be the central goal acting as a leverage in the studied OFSs.

Data integration compiling the findings of each research phase of the study enabled to formulate a conceptual framework for potential monitoring of the SDG-performance in OFSs, while disclosing their transformative potential towards SFSs. The conceptual framework includes five parts, each linked to specific UN SDG targets: sustainable consumption and production systems; viability and sustainability of ecosystems; renaissance of rural territories and enhanced rural-urban links; human resources with relevant knowledge, competences and skills; governance. The latter two parts can also be viewed as enabling mechanisms for driving the FSs transformation. Further research is needed to validate the conceptual framework and identify the OFS-specific UN SDG targets in other contexts and settings.

VII Abstract in German

Eine Vielzahl der Herausforderungen für eine nachhaltige Zukunft innerhalb der planetarischen Grenzen sind auf das gegenwärtige Lebensmittel- und Ernährungssystem (LES) zurückzuführen, weshalb der LES Transformationsdiskurs an Bedeutung gewonnen hat. Wie immer der genaue Transformationsansatz sein mag, er wird eine Optimierung der LES Auswirkungen – Konsequenzen der LES Aktivitäten – voraussetzen. Die vorliegende Studie ging die LES Auswirkungen als Transformationstor an und nahm eins der transformativen LESe, nämlich ein ökologisches LES, als Beispiel. Das Ziel war, dessen Potenzial zur Transformation in Richtung nachhaltige LESe offen zu legen, durch Identifizierung spezifischer Auswirkungen nebst der UN-Nachhaltigkeitsziele, die in den ökologischen LESen adressiert sind. Die Identifizierung stützte sich auf einen akteursorientierten Ansatz.

Um die Forschungsziele zu verfolgen, wurde ein Mixed Methods Design eingesetzt der sowohl qualitative als auch quantitative Erhebungsmethoden beinhaltete, einschließlich eines systematischen Literaturreviews über die LES Auswirkungen, einer Expertenrunde, einer onlinegestützten Umfrage sowie einer multiplen Fallstudie der drei ausgewählten ökologischen LESen. Eine Vielzahl der ökologischen LES Auswirkungen wurde identifiziert, die sowohl die ökosystembezogenen als auch die individuellen und Gemeinde-bezogenen Auswirkungen umfassen. Neben den Auswirkungen, die in der Literatur bereits beschrieben sind, wurde eine Vielzahl der sozialen Aspekte sowie eine höhere Wahrnehmung vom Wohlbefinden sowie der Lebensmittelqualität offenbart. Die Ermittlung der UN-Nachhaltigkeitsziele, die in den drei analysierten ökologischen LES-Fallstudien adressiert sind, resultierte in einer breiten Palette der UN-Nachhaltigkeitsziele, die an deren Vorgabenebene adressiert sind. Die UN-

Nachhaltigkeitsziele, die durch die höchste Anzahl an Zielvorgaben in allen drei Fallstudien vorkamen, waren das Ziel 12 (Verantwortliche/r Konsum- und Produktion), Ziel 2 (Kein Hunger), Ziel 15 (Leben an Land) und Ziel 17 (Partnerschaften zur Erreichung der Ziele), wobei das Ziel 12 sich als zentrales Ziel erwiesen hat, das eine Hebelwirkung in den erforschten ökologischen LES-en besitzt.

Die Datenintegration von Ergebnissen aller Forschungsphasen ermöglichte die Formulierung eines Rahmenkonzeptes für das potenzielle Monitoring der Erfüllung von UN-Nachhaltigkeitszielen in ökologischen LESen, während sie gleichzeitig das transformative Potential dieser Systeme in Richtung nachhaltige LESe offenbarte. Das Rahmenkonzept beinhaltet fünf Teilen, jeder davon ist mit spezifischen Zielvorgaben verbunden: nachhaltige Konsum- und Produktionssysteme, Renaissance der ländlichen Räume und verstärkte Verbindungen zwischen ländlichen und städtischen Räumen, Lebensfähigkeit und Nachhaltigkeit der Ökosysteme, Personal mit relevanten Kenntnissen, Kompetenzen und Fähigkeiten und Regierung. Die letzteren zwei Teile sind auch als ermöglichende Mechanismen anzusehen, die die Transformation der LESe vorantreiben. Weitere Forschung ist nötig, um das Rahmenkonzept zu validieren und die ökologischen LES-spezifischen Vorgaben hinsichtlich der UN-Nachhaltigkeitsziele in anderen Kontexten und Umfeldern zu identifizieren.

1 Introduction

1.1 Background

In times when the world is confronted with natural disasters, climate change (CC), pandemics and food insecurity, it is more important than ever to ensure humanity's activities remain within the safe operating space without transgressing the planetary boundaries (Rockström et al., 2009; Steffen et al., 2015). The role of the FS in countering multiple challenges related to negative environmental and social impacts has been increasingly recognised since FS activities have their significant share in them, largely unintended (UNEP, 2016, p. 36f; EEA, 2017, p. 6; HLPE, 2017). Indeed, soil, water and air pollution, loss and degradation of habitats, loss of terrestrial and marine biodiversity, deforestation, CC are all examples of negative externalities largely attributed to the FS (UNEP, 2016; Whitmee et al., 2015; IPBES, 2019; FAO, 2019). Moreover, the FS is one of the major contributors to anthropogenic greenhouse gas (GHG) emissions, accounting for a global share of up to 29% (FAO, 2019; Vermeulen et al., 2012). Finally, food waste of about 1,3 billion tonnes per year poses an additional pressure, which results in waste of resources used to produce this amount of food (Noleppa and Cartsburg, 2015, p. 7; FAO, 2015). All this led to a situation when humanity's demand on natural resources surpasses the planet's ability to regenerate so that the current human activities are equivalent to 1,5 Earths (WWF, 2020). A variety of social equity and justice issues are impacted by FSs, particularly with regard to resource distribution, right to food and decent livelihoods, especially critical for the rural communities in the Global South (Tirado von der Pahlen et al., 2018). Against this background it has been acknowledged that the FS has a potential to reverse some of these negative externalities offering a solution for feeding the world within "safe operating space" (Gerten et al.,

2020; Rockström et al., 2009). However, for this to happen, the current FS would need to undergo the process of transformation to create a SFS, with optimised outcomes across the sustainability dimensions (Caron et al., 2018; Bortoletti and Lomax, 2019; Rockström et al., 2020; etc.). A SFS should be capable of maintaining or even enhancing its essential functions (or outcomes) over time in all dimensions of sustainability (Allen and Prosperi, 2016). Ideally, a SFS should deliver "desired" outcomes, while moving away from unsustainable ones (Whitfield et al., 2015; Béné et al., 2019). Hence, improving FS sustainability performance should incorporate interventions targeted towards optimising FS outcomes. In this context it becomes apparent, that to enable the FSs transformation it would be beneficial to consider outcomes as an entry point (Bortoletti and Lomax, 2019, p. 13; Béné et al., 2019).

To enable the FSs transformation, it is first necessary to understand where the FS underperforms. For diagnosing and verifying the FSs performance, various FS assessment methods and tools have been suggested varying in their scope and complexity (Aubin et al., 2013; Blay-Palmer et al., 2020a). Hence, "measuring" change has become a priority, and the assessments capable of capturing all dimensions of sustainability along with nutritional characteristics of FSs are in spotlight (ibid.). One of the assessment tools qualified for this task is seen in the SDGs – the heart of the UN Agenda 2030 for Sustainable Development (SD) adopted in 2015 (UN, 2015; FAO, 2018b; Blay-Palmer et al., 2020a). The goals are conceived of as guidelines for the transition towards sustainability, offering a framework for coordinated actions (Le Blanc, 2015). Food has been recognised as one of the central issues in the UN Agenda 2030, and the FSs sustainability (FSS) is now increasingly associated with the FS's performance vis-à-vis the SDGs aiming at "greatest possible contribution" to achieving them (EEA, 2017; FAO, 2018; Caron et al., 2018, p. 41). However, in assessing the contribution, the

preference is often given to technocratic approaches. The importance of participatory approaches and working in communities in order to potentially replicate a process and identify relevant indicators has been emphasised by Blay-Palmer et al. (2020b). The authors further stressed the lack of such participatory approach in the development of the SDGs, with little public consultation involved in the process (ibid.). Same applies to the SDG-based assessments of the FSs, which, to the best of researcher's knowledge, are non-existent at the moment.

The role of alternative or transformative FSs in the process of transition towards SFSs is being negotiated, and a variety of systems are being considered in terms of their potential to support the FSs transformation (King, 2008; Johns et al., 2013; Lamine, 2015; Play-Palmer et al., 2018). This could ultimately result in the achievement of a multitude of SDGs (Caron et al., 2018). One of such alternative FSs is organic, and the attempts have been made to demonstrate its ability to trigger the transition towards SFSs (Müller et al., 2017; Eyhorn et al., 2019). For instance, it has been shown that a transition to 100% organic agriculture (OA) would make it possible to feed the growing population sustainably, if this transition is accompanied by other changes such as food waste reduction and reduction in land used by food-competing feed coupled with the adoption of diets with lower share of animal products (Müller et al., 2017). Looking beyond agriculture
embracing the whole organic system thereby linking production to consumption could unlock additional potential – that of an OFS (Kahl, 2015; Strassner et al., 2015; Strassner and Kahl, 2020). With its sustainable farming processes, processing methods and overall healthier consumption patterns, the OFS offers itself as a "living laboratory" for studying it as a model of SFSs (Strassner et al., 2015, p. 4; Kahl et al., 2016; Strassner and Kahl, 2020). The present

dissertation seeks to pave the way towards this endeavour through the prism of OFS outcomes.

1.2 Research gap

To date, the sustainability assessments of the OFS have been mostly limited to those of OA. The closest attempt to embrace the complexity of the organic system in the assessments thus far has been the approach called Sustainability Monitoring and Assessment RouTine (SMART) developed by the Research Institute for OA (FiBL) and based on the Sustainability Assessment of Food and Agriculture Systems (SAFA) Guidelines from Food and Agriculture Organisation (FAO) of the UN (Schader et al., 2014; Schader, 2016; FAO, 2013). However, since the assessment technique facilitates evaluations at an operator level, the assessment of the organic as a system remains beyond the scope of this method. Yet, investigating organic as a system, the OFS, looks beyond organic farming, so as to bridge organic production and consumption patterns within one system, which could provide deeper insights into its performance as compared to looking at single parts (Strassner and Kahl, 2020).

So far, the OFS's performance in terms of its outcomes has been analysed in terms of the effects of OA (Bengtsson et al., 2005; Niggli, 2015; Simon, 2010; Reganold and Wachter, 2016; Seufert and Ramankutty, 2017; etc.) or, else, health implications of organic food (Brandt et al., 2011; Smith-Sprangler et al., 2012; Baranski et al., 2014; etc.) or organic consumption patterns (Baudry et al., 2016; 2018; Eisinger-Watzl et al., 2015; Kesse-Guyot et al., 2017). The outcomes of the organic system from field to table have not been addressed thus far.

Moreover, contributing to the FSs transformation discourse where pathways towards SFSs are being sought for, assessing the

performance of the OFS vis-à-vis the SDGs could demonstrate the transformative potential of organic systems. However, so far, the contribution of the OFS to the SDGs has been scarcely addressed, mainly hypothesised and accomplished at goal-level (Eyhorn et al., 2019; de Schaetzen, 2019). And, again, the discussion is limited to OA addressing its potential contributions based on the benefits of organic farming reported in the literature. To date, the contribution of organic as a system has not been studied. Moreover, the assessments of real-life OFSs in terms of their SDG-performance are lacking, too. The dissertation at hand seeks to fill in this research gap by analysing the OFS and its outcomes using actor-oriented participatory approach as opposed to indicator-based technocratic assessments.

1.3 Aim, objectives and scope

This dissertation aims at identifying the outcomes of the OFS, with a special focus on the sustainability performance assessed through the SDGs for uncovering the OFS's potential to contribute to the FSs transformation. That said, the study seeks to lay down a basis for potential monitoring of the SDGs in OFSs. Mixed methods research design comprised of quantitative method using web-based survey and qualitative methods containing multiple-case study, with focus group discussions as well as semi-structured interviews (latter performed by three master students at the department and analysed by the researcher) is used to fulfil the aim. The identification of outcomes is accomplished through actor-oriented participatory approach, focusing on the perspectives of people involved in real-life OFSs. The analysis is carried out using a stepwise approach to first disclose the general outcomes as well as the potential contribution to the SDGs at goal-level and afterwards zooming in on the SDGs at target-level using multiple-case study and analysing three European OFSs.

The study poses the following research questions:

- What pattern of outcomes can be identified in OFSs?
- What are the SDGs addressed in OFSs?
- Is there a specific SDG pattern that would allow for potential monitoring of the SDG-performance in OFSs?
- Based on the OFS-specific SDG pattern, how could the OFS contribute to FSs transformation towards SFSs?

The research project further seeks to contribute to the work of the OFS Programme (OFSP) – one of the international core initiatives of the UN Ten Year Framework Programme on SFS Programme (UN-10 YFP on SFSP) bringing together experts from various scientific disciplines (OFSP, n. d.; Kahl et al., 2016). Moreover, the present study is part of the project "What contribution to the global societal sustainability transformation can OFSs and biodynamic FSs make?" carried out at the Department of Organic Food Quality and Food Culture and financially supported by the Software Foundation AG. Hence, the case study work of the dissertation has been financially enabled by the Foundation and is, in turn, contributing to the afore mentioned project. Since the project incorporates further perspectives apart from the outcomes, namely OFS actors and their relations as well as OFS drivers, these perspectives represent separate PhD research projects pursued by the researcher's colleagues at the Department of Organic Food Quality and Food Culture of the University of Kassel. Therefore, some steps in the research design of the study at hand incorporate phases jointly performed as a team on each of the three perspectives (actors and relations, drivers and outcomes), with each researcher being responsible for his/her part and performing it (see chapter 3.1).

The present project focusses on OFS outcomes taking an example of real-life OFSs with clear boundaries. The boundaries defined for the study are municipalities and districts, the presence of quality

assurance of organic production, namely organic certification, and production diversity. Furthermore, for the purpose of the study, it was important that the OFSs have been well established in that they have undergone certain developmental stages (ten years and more). The OFSs have been investigated between March 2019 and March 2020. The process of data collection has been completed before the outbreak of the Coronavirus pandemic, therefore any possible pandemic-induced changes in the systems under study are not reflected in this dissertation.

The dissertation aims at contributing to the strand of research dedicated to FSs transformation and the role of alternative FSs in supporting it. That said, the study at hand might be helpful to policymakers attempting to shape the transformation pathways, research and academia studying alternative FSs and their contribution to transforming the FS as well as OFS actors and organisations working closely together with them. Finally, for the organisations and authorities dealing with the SDGs implementation, the study might be helpful for shedding light on the potential that a participatory approach to assessing the SDGs holds.

1.4 Structure of the dissertation

This dissertation is built as follows: the theoretical background is provided in chapter 2, where all relevant concepts used throughout this dissertation are presented. This chapter is followed by research methodology, chapter 3, presenting the research design, elaborating on the mixed methods approach used in collecting primary data and introducing the individual methods used in the study for collecting and analysing the data. Chapter 4 presents the findings in the same sequence the data were collected beginning with the findings from a systematic literature review of FS outcomes, proceeding to the results of expert round followed by the findings from web-based survey. The final subchapter of chapter 4 presents

the three case studies of the study at hand, again in the same sequence these have been carried out beginning with the OFS in Italy (Cilento bio-district), proceeding to the OFS case in Sweden (Södertälje municipality) and finalising with the OFS in France (Mouans-Sartoux municipality). Afterwards, chapter 5 integrates the data from all research phases in a meaningful way for enabling the author to answer the research questions posed in the dissertation. Next, chapter 6 reflects on the results and methodology, outlining the conceptual framework for potential monitoring of the SDGs in OFSs and reflects on the study's limitations. Finally, chapter 7 concludes and offers an outlook. The references are found in chapter 8 and supplementary materials are provided in chapter 9, Annex, with some being attached directly to the dissertation and others provided in a repository.

2 Theoretical background

2.1 Concepts and definitions

This chapter starts with presenting the important within the context concepts of the present research, which will be consistently used throughout the dissertation. This aids better understanding of the approach framing of the present study.

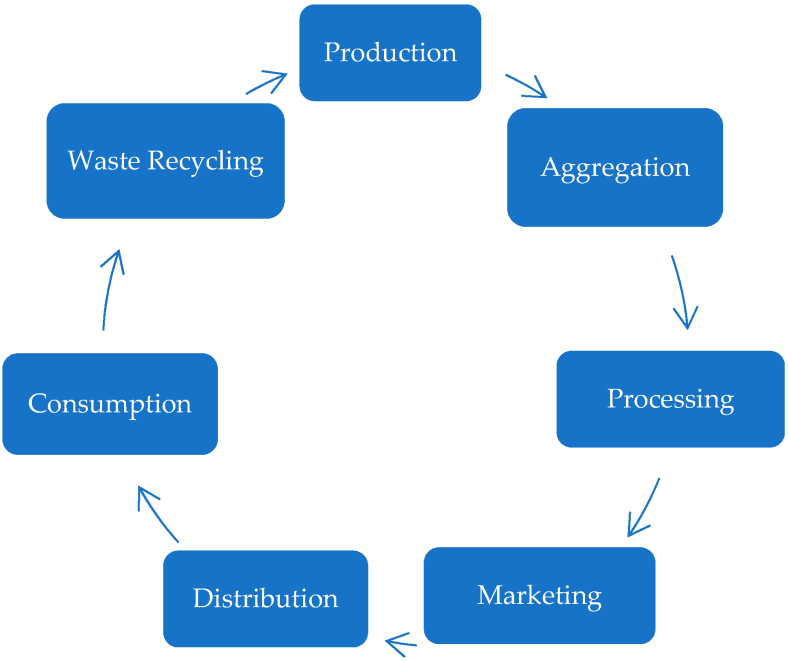
2.1.1 The food system

The FS concept is not new, it has been evolving over time, bridging the multitude of disciplines – e.g. ecology, biology, geography, sociology, anthropology, political sciences, sociology, political economy and others (van Berkum et al., 2018; Okpala, 2020; etc.). The understanding of the term, however, varies. For instance, a traditional view of the FS has defined it as a set of activities linking supply and demand, from production to consumption (Chase and Grubinger, 2014, p. 1; Ericksen, 2008). The description of operations, actions and flows involved in delivering food "from farm to fork" equals the concept to that of a supply chain, or value chain (linear model, see *Figure 1, a*) (ibid.; Ruben et al., 2019; Colonna et al., 2013). While such conceptualisation did contribute to an overall better understanding of horizontal interdependencies within the FS, it did not allow for taking account of the existing interactions and feedbacks (Ruben et al., 2019; Ericksen, 2008). Adding waste management, recycling and composting to the far end of the linear model transferred the representation to a circular FSs model (see *Figure 1, b*) (Chase and Grubinger, 2014, p. 1; Ruben et al., 2019). The recognition of the existing complexities and interactions within the system as well as with other (sub)-systems led to the emergence of web- or network-based conceptualisations (Ruben et al., 2019) (see *Figure 1, c*). Such representation views the FS as "(…) an interconnected web of activities, resources and people that extends

across all domains involved in providing human nourishment and sustaining health (…)" (Grubinger et al. 2010, p. 2; see *Figure 1, c*). As a complex network or web, the FS encompasses a wide range of actors involved in value-adding activities from production to consumption and disposal of foods (from agriculture, fisheries and forestry) along with the activities such as inputs provision and farmer training as well as broader natural, societal, political and economic realms embedding them (FAO, 2018a; iPES 2015; MacDonald and Reitmeier, 2017, p. 2).

a)

b)



c)

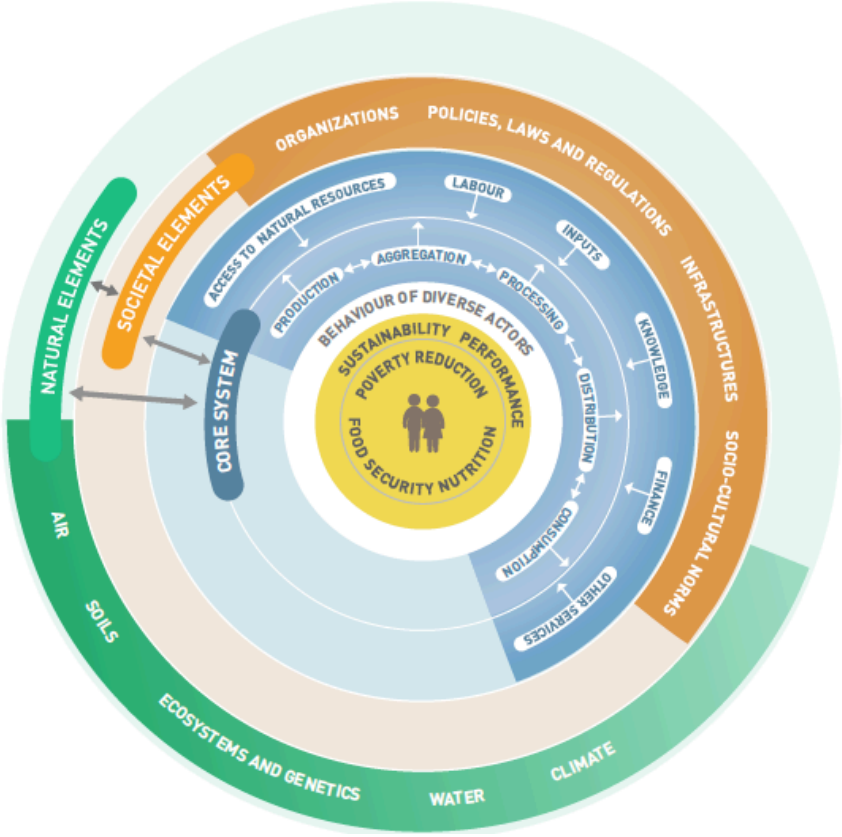


Figure 1: Visualisation of FSs representing different FS models
(a – linear FSs model; b – circular FSs model; c – network/web-based model)
Sources: a – Ruben et al., 2019, p. 4; b – Ruben et al., 2019, p. 4; c – FAO, 2018a.

The representation presented in *Figure 1, c* corresponds to the broader definition of the FS, which is known as the FSs approach. The concept bridges the multitude of elements, or integral parts of the FS and considers the relationships and interactions between them (van Berkum et al., 2018, p. 6; Bortoletti and Lomax, 2019; Ericksen, 2008; Ingram, 2011, etc.). The approach has its origin in systems thinking, when a system's behaviour is viewed as interplay of subsystems interacting with one another, and arising thereby feedbacks play a key role (van Berkum et al., 2018, p. 6; Combs et al., 1996). As has been stressed by Combs et al. (1996), the subsystems can be viewed vectorially, beginning with the physical points (e.g. plant growing and animal breeding) towards the physiological utilisation of the food nutrients. Likewise, similar to other systems, FSs have hierarchies, meaning that an overall FS contains a multitude of other, smaller, subsystems, like farming system, agroecosystem, etc. (Chase and Grubinger, 2014, p. 5; Neff and Lawrence, 2015). At a global scale, the FS contains a multitude of FSs of smaller scale, namely regional, national and local FSs (EEA 2017, p. 6; Chase and Grubinger, 2014, p. 9ff). Furthermore, Zhang et al. (2018) consider three layers involved in FSs:

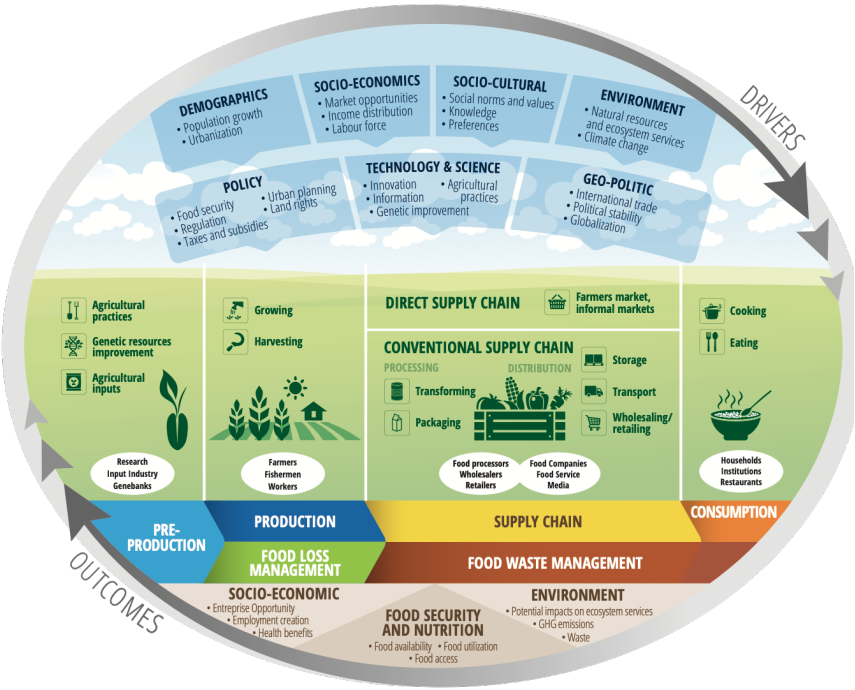
a) climatic and biological systems at local, regional and global levels underpinning agricultural production systems;
b) social systems incorporating people involved in agricultural production activities and the transformation of crops into food, fibre and fuels overlaying production systems;
c) economic systems, where products are delivered to people in accordance with market forces, infrastructure in place coupled with corporate strategies and government policies.

In this context, a set of boundaries can be determined in terms of environmental, economic, political and social conditions (Grant, 2015). All of them contribute to shaping FSs at the same time affecting their functioning (ibid.). Being non-static, these boundary

conditions have the tendency to interact affecting drivers across geographic and national borders (ibid.).

Other important components of the FSs approach include FS outcomes, drivers as well as the interconnectedness of the FS's elements along with the arising feedbacks and potential trade-offs between them (Bortoletti and Lomax, 2019; UNEP, 2016; iPES, 2015; Ericksen, 2008; Ingram, 2011, etc.) (see *Figure 2, a*). Likewise, through the emphasis on multi-layered, multi-scale and cyclical interactions, the FS's lens sheds light on the potential reinforcing as well as balancing feedback loops (iPES, 2015). This has two reasons. First, the feedbacks and dynamics in the FS stem from a mix of factors, such as relations between the actors, markets and regulations in place (UNEP, 2016; iPES, 2015). Second, the non-linear character of feedbacks in the FS results in unpredictable effects across different elements of the system, including its ultimate outcomes (Ericksen, 2008; UNEP, 2016; Nesheim et al., 2015; van Berkum et al., 2018, pp.7; 24, etc.). These complexities are reflected in *Figure 2, b*.

a)


DRIVERS
DEMOGRAPHICS
• Population growth
• Urbanization
SOCIO-ECONOMICS
• Market opportunities
• Income distribution
• Labour force
SOCIO-CULTURAL
• Social norms and values
• Knowledge
• Preferences
ENVIRONMENT
• Natural resources and ecosystem services
• Climate change
POLICY
• Food security
• Regulation
• Taxes and subsidies
• Urban planning
• Land rights
TECHNOLOGY & SCIENCE
• Innovation
• Information
• Genetic improvement
• Agricultural practices
GEO-POLITIC
• International trade
• Political stability
• Globalization
Agricultural practices
Genetic resources improvement
Agricultural inputs
Research
Input Industry
Genebanks
Growing
Harvesting
Farmers
Fishermen
Workers
DIRECT SUPPLY CHAIN
Farmers market, informal markets
CONVENTIONAL SUPPLY CHAIN
PROCESSING
DISTRIBUTION
Transforming
Packaging
Storage
Transport
Wholesaling/ retailing
Food processors
Wholesalers
Retailers
Food Companies
Food Service
Media
Cooking
Eating
Households
Institutions
Restaurants
PRE-PRODUCTION
PRODUCTION
SUPPLY CHAIN
CONSUMPTION
FOOD LOSS MANAGEMENT
FOOD WASTE MANAGEMENT
OUTCOMES
SOCIO-ECONOMIC
• Entreprise Opportunity
• Employment creation
• Health benefits
FOOD SECURITY AND NUTRITION
• Food availability
• Food utilization
• Food access
ENVIRONMENT
• Potential impacts on ecosystem services
• GHG emissions
• Waste

b)

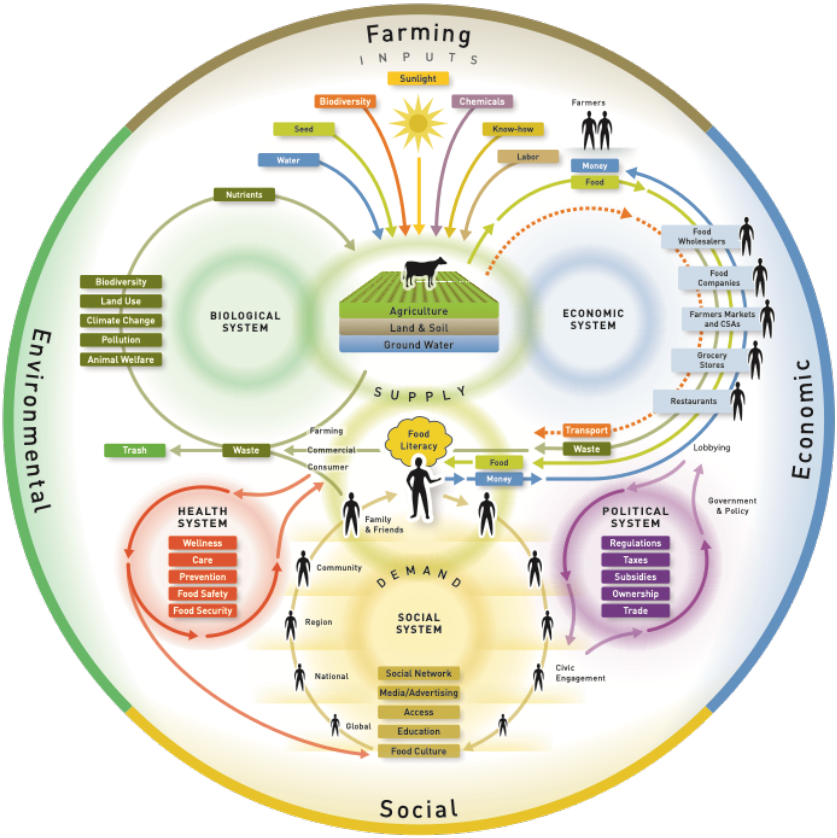


Figure 2: Conceptual models of the FS
(a – concept incorporating activities and actors, resources, drivers and outcomes; b – model presenting the FS as a complex dynamic system incorporating subsystems, actors, activities, interactions, drivers and outcomes)
Sources: a – CIAT, 2019; b – Nourish initiative (n. d.), Copyright 2014 WorldLink.

The unique position of the FS – if compared to other systems – is that it bridges three various aspects of life – biological, economic and political, as well as social and cultural (Tansey and Worsley, 1995, p. 1f). While biological aspects incorporate all the living processes involved in the food production along with their ecological sustainability, economic and political aspects relate to the distribution of control and power over the system parts (ibid.). Social and cultural aspects involve cultural traditions and community values coupled with personal relations, which all influence the way the food is used (ibid.).

Due to the essential links between food production and nutritional health, the latter is often highlighted as an important component, or, else, outcome of the FS ultimately contributing to wellbeing (HLPE, 2017, Neff et al., 2015a; b; Sobal et al., 1998; Combs et al., 1996; etc.). This led Sobal et al. (1998, p. 853) to conceptualise the FS as a food and nutrition system – „(...) the set of operations and processes involved in transforming raw materials into foods and transforming nutrients into health outcomes, all of which functions as a system within biophysical and sociocultural contexts". Hence, health and nutrition can be conceived of as important FS outcomes, which will be further elaborated on in *chapter 2.1.3* (HLPE, 2017; Nugent et al., 2015; Neff et al., 2015b). The next subchapter outlines the attributes and characteristics of SFSs.

2.1.2 Sustainable food systems

A SFS would be a FS that ensures "food security and nutrition for all in such a way that economic, social and environmental bases to generate food security and nutrition for future generations are not compromised" (HLPE, 2014, p. 31). The FS needs to have positive contributions in social, environmental, and economic dimensions of sustainability in order to be considered sustainable (FAO, 2018a) (see *Figure 3*). While within the environmental dimension, the FS

activities would be expected to have neutral or positive impacts on the surrounding natural ambiance, the positive contribution within the social sustainability pillar is concerned with the equity issues in terms of distribution of economic value within the value-added activities while taking into consideration vulnerable groups (ibid.).

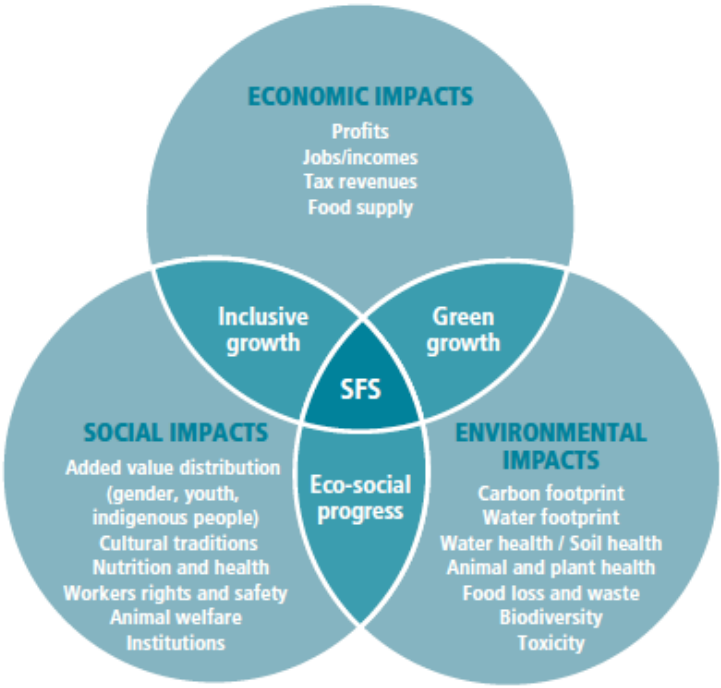


Figure 3: Food system sustainability
Source: FAO, 2018a.

Blay-Palmer et al. (2020a) has articulated concrete attributes of sustainability in FSs, assigning them to the three dimensions of sustainability. For instance, issues within the social pillar include aspects like right to food, food democracy, food and nutrition security (FNS), gender equity, fair labour practices, social connectivity, rights to natural resources, cultural self-determination (ibid.). Environmental dimension incorporates ecological methods of food production, while acknowledging the vital role of biodiversity,

agroecology, renewable energy, protection of natural resources, including efforts on establishing regenerative closed loop FSs (ibid.). Within the economic pillar, Blay-Palmer et al. (2020a) stress the vital role of maintaining equitable economic activity at local levels (to the highest possible extent) and then moving outward. This would encourage mutual trust and equal sharing of risk, along with value across agro-food webs (ibid.).

Carlsson et al. (2017, p. 7) emphasise that SFSs should "(…) nourish communities in culturally appropriate ways". The authors further specify that for achieving this, nutrient, water and energy cycles should be supportive of the ecosystem as well as people and communities, while simultaneously enhancing them (ibid.).
Moreover, the productive capacity of ecosystems should be taken into account as FSs depend upon it (ibid.; UNEP, 2016; FAO, 2019). Some emerging approaches point to a holistic character of sustainability of FSs, which should find corresponding reflections in conceptualising and assessing SFSs (Peano et al., 2015; Moragues-Faus, 2016; etc.). For instance, Viola and Marinelli (2016) put forward the concept of wellbeing sustainability as the widest meaning of sustainability emphasising an ethical principle in terms of generational vision. Peano et al. (2014) bridge the sustainability of agri-FSs with Slow Food criteria suggesting two additional sustainability dimensions for agri-food systems, namely quality (with regard to food) and cultural dimension. Similarly, Moragues-Faus (2016) reflects on the role of urban food strategies and advocates for a holistic approach to FSS, with the inclusion of aspects of quality, pleasure and culture. Bricas (2017; in: Valette et al., 2020) suggests that FSS dimensions should embrace five main realms, with an additional governance pillar and a social pillar replaced with the socio-cultural, as shown in *Figure 4*. Likewise, in SFSs, the governance pillar would incorporate transparency, participation and accountability (see *Figure 4*). The offered

conceptualisation takes on a more holistic approach to FSS and incorporates such essential issues as inequality, identity and culture, equity and decent jobs as well as participation, among other aspects (ibid.). Also, it emphasises the role of FNS, environment and economic dimension, just like the other concepts do (ibid.).

Figure 4: Five dimensions of SFSs
Source: Valette et al., 2020, p. 28.

The dissertation at hand applies a broader understanding of SFSs as suggested by Valette et al. (2020) considering aspects of governance and socio-cultural dimension, apart from FNS, environmental and economic pillars.

2.1.3 The organic food system

Following the FSs approach, it is possible to describe the OFS as a sub-system of a larger global FS. The main difference as compared to other sub-systems would be the values-driven principles and practices of the organic sector formulated in the organic principles and laid down in standards and regulations. As has been stressed by Luttikholt (2007), the organic movement has been based on values right from the beginning. Gradually developing beginning with philosophy and teachings that were based on observations of the natural world with its existing laws and cycles, the organic movement ultimately resulted in the formulation of principles-driven farming practices that have spread all over the world (Strassner et al., 2015; Kahl, 2015). Having a history with 100 years to look back on, the OFS has become a system capable of increasing the food security and safety of both producers and consumers, while raising incomes and safeguarding fair access to the means of food production for farmers and workers (Strassner et al., 2015). From its onset, the organic movement has aimed at creating a "(…) sustainable and healthy FS with a focus on primary production (agriculture), but one that also includes processing and the entire value chain as well as distribution and organic consumption issues and ethics" (Kahl et al., 2016, p. 296). Value orientation clearly differentiates OA, and organic values are institutionalised into comprehensive production standards, certification systems and organisations performing specification of OA's distinctiveness (Michelsen, 2003). This makes it possible to describe the OFS from the organic vision all the way down to metrics (Strassner et al., 2015). Indeed, while the organic system is described in Codex Alimentarius and the vision laid down in international standards (e.g. International Federation of OA Movement (IFOAM)), the regulations (in the European Union (EU), Switzerland, Japan, the United States of America (USA), etc.) and private standards define

the organic metrics (Kahl, 2015; Strassner et al., 2015). The Guidelines of Codex Alimentarius specifically dedicated to organically produced foods define OA as “a holistic production management system which promotes and enhances agroecosystem health, including biodiversity, biological cycles, and soil biological activity. It emphasises the use of management practices in preference to the use of off-farm inputs, taking into account that regional conditions require locally adapted systems” (FAO/WHO, 1999, p. 2). The Guidelines further stress the importance of organic certification and inspection as integral elements of organic management system for quality control and assurance (Morgera et al., 2012, p. 26). Organic legislation exists in more than 86 countries worldwide, and evaluation is performed through organic-specific criteria, parameters and indicators (Strassner et al., 2015). Organic standards define relevant technologies and practices helping “to translate principles into practice” (Lampkin, 2015, p. 51). The OFS aims at “feeding people organically”, while contributing to health and wellbeing (Strassner and Kahl, 2020, p. 56; Kahl et al., 2012). The organic food quality is defined based on process- and product-related aspects as well as wholesomeness (Kahl et al., 2012; Strassner et al., 2015; FiBL and ORC, 2015). The latter calls for a system approach to organic food quality embracing the entire chain “from field to fork” while focusing on the whole food approach, with the holistic view on food (Kahl et al., 2012; FiBL and ORC, 2015). Some of the product-related criteria specific to organic food are, for instance, vital qualities, organic integrity and true nature, with the first one articulating resilience, second referring to inner structure and order and last one representing the species-typical (for unprocessed foods) or typical (for processed foods) characteristics of the raw material (Kahl et al., 2012). Furthermore, naturalness has a moral value in organic system, therefore the concept of naturalness can be used to

characterise organic farming, with three meanings of natural – as embracing realm of life and life processes, as ecological and as referring to nature as an entity (Verhoog et al., 2003).

The organic consumption provides further insights into values-driven orientation of the OFS. Likewise, regular organic consumers, on the average, tend to have a healthier lifestyle with dietary patterns more in line with the nutritional recommendations (Eisinger-Watzl et al., 2015; Baudry et al., 2016; etc.). Moreover, organic consumers appear to show more involvement with food in terms of the role that food plays in their lives (Vega-Zamora et al., 2020). Not only do the quality and healthfulness of organic food play an important role for organic consumers, but so do the environmental and social aspects of food production, with a strong role of "common good" motivations (Monier-Dilhan and Bergès, 2016). Furthermore, Brunner (2007) differentiates between two value orientations among the organic buyers – conservative approach linked to tradition, homeland and region and post-material approach, with a significant orientation towards equality, cultural diversity, ecology and social criticism.

The afore described characteristics and values of organic food production and consumption suggest that the OFS brings together sustainable food production practices and sustainable consumption patterns thereby linking organic production and consumption (Strassner et al. 2015; Kahl et al., 2016). In doing so, the concept of an organic food chain or organic food product is expanded to that of an OFS operating at a territorial level and connecting organic food to its origin, with interdependence and mutual support between producers and consumers (Kahl et al., 2016).

2.1.4 Food system outcomes

FS outcomes have been addressed previously as one of the important components, or elements, of the FS and a vital part of the FSs approach (see chapter 2.1.1). When it comes to defining the term, however, it becomes apparent that the exact definition in the context of FSs is under-developed. This might be explained by the straightforward character of the term, implying its meaning without a need to define it.

The FSs literature addresses the outcomes referring to the consequences, effects or results of the FS activities in environmental, social and economic realms of life, which is why it was deemed feasible to adapt the definition of FS effects provided by Nesheim et al. (2015). FS outcomes, or effects, can hence be defined as positive and negative consequences of FS activities in many realms of physical, economic and social systems, which can manifest themselves in a direct or indirect manner (ibid., p. 83). FS outcomes can be defined as "what we get" (outcomes) from "what we do" (FS activities) (Ingram, 2011, p. 419; UNEP, 2016, p. 31). Furthermore, FS outcomes can be seen as products of the FS's evolution taking into account the resources, the directions in which the FS has been pushed by the FS drivers and the way the FS activities unfold, while at the same time being shaped by the FS outputs (Neff, 2015). Simultaneously, FS outcomes can be considered products of a broader system incorporating biophysical and social environments (ibid.).

Such conceptualisation of FS outcomes would be in line with the major categorisations of the outcomes found in the FSs literature. For instance, Ericksen (2008), Ericksen et al. (2010) and Ingram (2011) presented three main groups of FS outcomes as contributions to social welfare, food security, and environmental security (see *Figure 5*). Within this conceptualisation, food security

is seen as a principal outcome of any FS comprised of food availability, food access and food utilisation (ibid.). The concept provided insights into complex interactions and feedbacks between FS outcomes and drivers of change (ibid.).

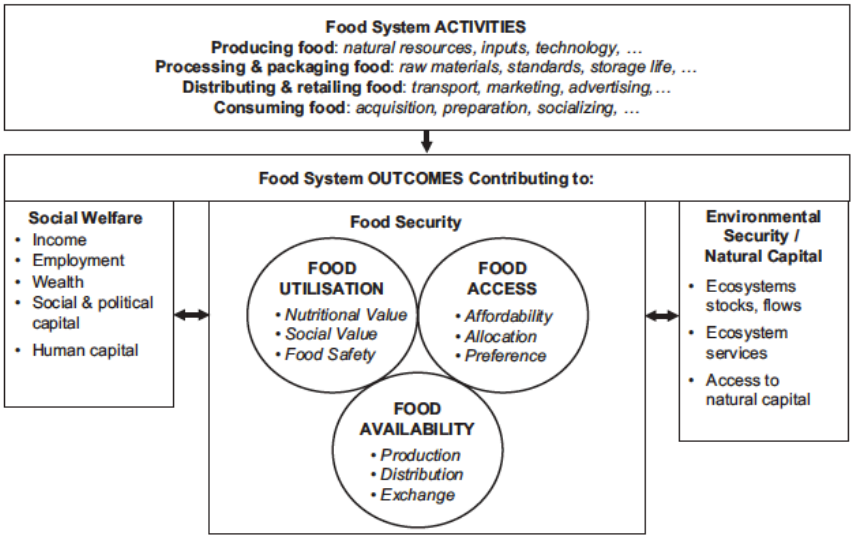


Figure 5: FS components with the three FS outcome groups
Source: Ericksen, 2008, p. 239.

Nesheim et al. (2015) differentiate between health effects, social and economic effects and environmental effects, which corresponds to Ericksen's categorisation. Health implications in Ericksen's concept were incorporated into food security and social welfare outcomes, while economic aspects were part of the social welfare. Both Nesheim et al. (2015) and Ericksen (2008) stress the existence of interactions and feedback mechanisms between FS outcomes and other components of the FS.

European Environment Agency (EEA) presents three groups of FS outcomes that correspond to Ericksen's and Ingram's conceptualisation – FNS, ecosystem health and social wellbeing (EEA, 2017; see *Figure 6*). However, there are certain differences

in every outcome category in the EEA conceptualisation. First of all, the incorporation of a broader term FNS as opposed to food security. This is explained by the fact that the scope of the term has broadened with time due to acknowledgement of the role of nutrition in sustainable food security in order to better differentiate between the quantity in terms of energy and quality in terms of dietary diversity (Charlton, 2016). Two concepts have been later merged to account for the role of nutrition in achieving food security, yet maintaining the emphasis on availability, stability and access (El Bilali et al., 2019). Second, the EEA (2017) conceptualisation incorporates resilience as part of ecosystem health outcomes.
Finally, the third important difference is the incorporation of equity, culture and ethics within the social wellbeing outcomes.

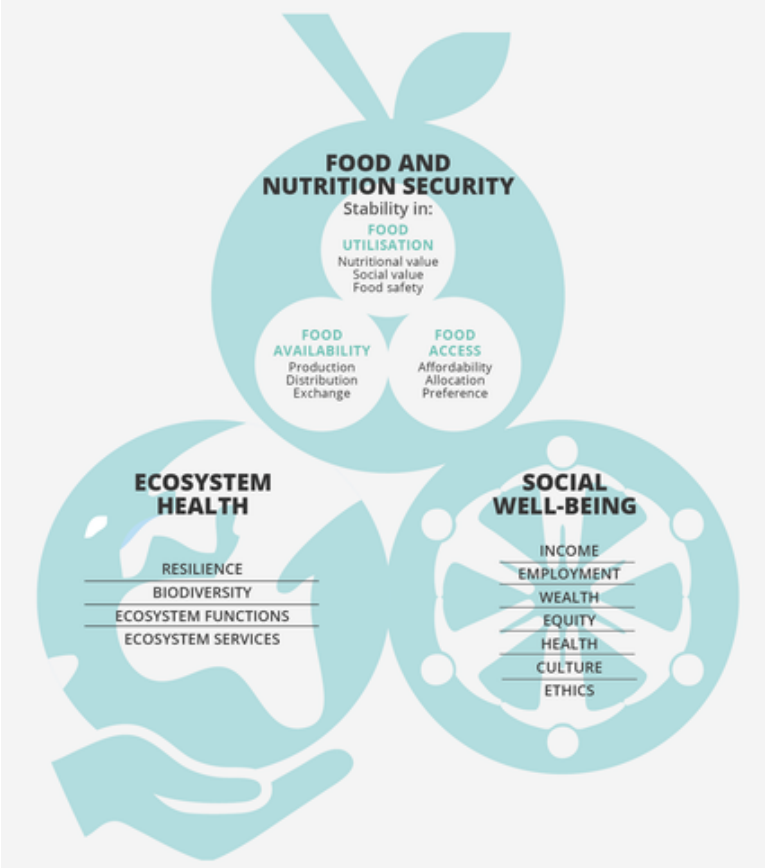


Figure 6: FS outcomes with contributions to FNS, social wellbeing and ecosystem health
Source: EEA, 2017, p. 8.

Another conceptualisation by Neff (2015) presents the outcomes of the United States (U.S.) FS, which is yet applicable to any other FS across the globe, differentiating between five main groups of FS outcomes – health, environment, equity, food security and community food security (Neff, 2015). The author emphasises that these outcomes might be viewed as "(…) the ultimate end goals of a functional food system" (ibid., p. 24). While health outcomes are primarily concerned with the aspects of dietary health and food

safety, equity outcomes incorporate FS-related health and social inequities in the community as well as in occupational settings within the FS (Kim and Wilkins, 2015; Neff et al., 2015b). Furthermore, within the food security outcomes the differentiation between household and community levels of food security as different units of analysis is put forward (Chilton et al., 2015; Palmer et al., 2015).

Synthesising various conceptualisations of FS outcomes, the dissertation at hand approaches the outcomes using four pillars, differentiating between ecosystem health (or stability) outcomes, social welfare, FNS and economic viability, while also considering governmental pillar as was explained in subchapter 2.1.2.

2.2 Food systems sustainability performance

Assessing the performance is a common activity of modern societies acting as a benchmark in facilitating and shaping the economic and political decisions and choices, justifying and backing them (Aubin et al., 2013). This chapter will elaborate on FSs performance, with a specific emphasis placed on FSS performance, while shedding light on the role of FS outputs, outcomes and impacts. Finally, the essential links between the UN Agenda 2030 for SD and FSS performance assessments will be established, and the role of indicators in the assessments will be outlined.

2.2.1 Food system outputs, outcomes and impacts

FSs performance assessments build upon the key performance functions, or purposes, of the FS, which can be expressed through FS outputs, FS outcomes or, else, FS impacts (Ericksen, 2008; Ingram, 2011; Nesheim et al., 2015; EEA 2015; Chase and Grubinger 2014, p. 3; Nugent et al., 2015; HLPE, 2017). For avoiding any potential confusion, it is essential to differentiate between these terms.

While the term FS outputs corresponds to the flows (material or energy), it is generally used to express crop yields, produced foods, by-products of production processes as well as wastes and emissions, FS impacts are particularly common in the literature dealing with environmental consequences of FSs and/or specific products as well as diets (ISO 14040: 1997, p. 2; Notarnicola et al., 2017; UNEP, 2016; Pelletier, 2015; etc.). FS outcomes have been defined previously (see chapter 2.1.4).

In order to better differentiate between all the three terms, it was considered feasible to turn to the terms used in evaluations and results-based management laid down by the Organisation for Economic Co-operation and Development (OECD) (OECD, 2002). Results-based management is a performance-focused strategy aimed at achieving outputs, outcomes and impacts (OECD, 2002, p. 34). Such management aims at achieving the intended results, while systematically incorporating "(…) lessons learned on past performance into decision-making" (UN, 2017, p. 7). The results-based management lend itself to the evaluation-focused contexts with an emphasis on development interventions, which defines the outputs as products, services or capital goods resulting from an intervention or changes resulting from this intervention, with a specific relevance for achieving the outcomes (ibid., OECD, 2002, p. 28). Outcomes, on the other hand, are defined as short- to medium-term effects (achieved or likely) of an intervention, while impacts are related to long-term effects (OECD, 2002, pp. 24; 28). Impacts are viewed as long-term cumulative effects (UNAIDS and MERG, n. d.). Such differentiation falls in line with the conceptualisation by the United Nations Environmental Programme (UNEP) (UNEP, 2016, p. 40), which is based on Driver-Pressure-State-Impact-Response (DPSIR) framework (see *Figure 7*). With its primary focus on natural resources, the concept presents both outcomes and impacts (ibid.). While the former ones are linked to

FS activities and socio-economic drivers, the latter represent more long-term effects on the environment, with feedbacks to and from biophysical drivers (ibid.) (see *Figure 7*).

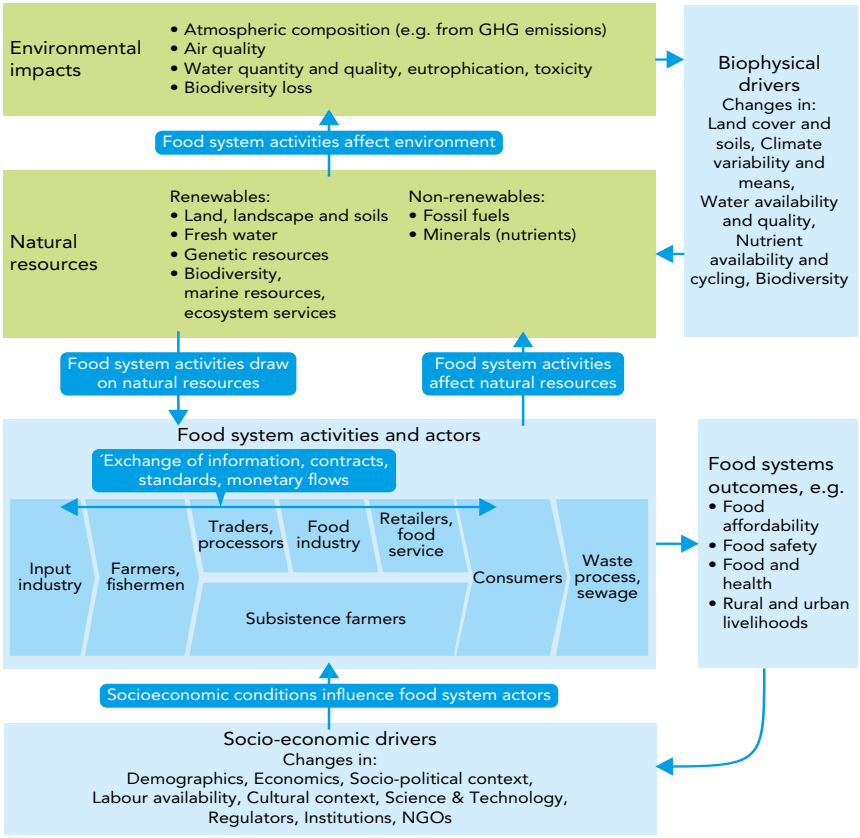


Figure 7: UNEP conceptual framework of FS activities and natural resources
Source: UNEP, 2016, p. 40.

The approach is known as the results chain that establishes "the causal sequence from cause to effect" (Ferretti, 2013). It aims at developing an objectives-targeted intervention through laying down the sequence of processes starting with inputs, through activities, outputs towards outcomes and ultimately impacts (OECD, 2002, p.

33). Hence, the results chain contributes to an important differentiation between the terms initially applied in the area of evaluation and results-based management (OECD, 2002; Simister, 2015; UN 2017; OECD, 2018, etc.). Simister (2015) explained this approach in a manner that can be well applied to FSs. Likewise, inputs are required to perform the activities, with the latter ones resulting in products and services (outputs) that start bringing about changes (outcomes) ultimately contributing to the impact (ibid.) (see *Figure 8*). This conceptualisation fits well into the FSs concept, with FS activities relying on inputs and leading to outcomes, with the latter resulting in the ultimate long-term impacts (i.e. CC).

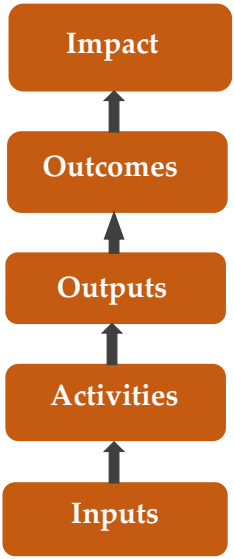


Figure 8: The results chain
Adapted from Simister, 2015, p. 1.

The intended results of the results-based management, therefore, include outputs, outcomes as well as impacts (UN, 2017, p. 7). Finally, results framework builds upon the results chain, explaining strategies and mechanisms leading to the achievement of the development objective, which involves causal relationships and

basic assumptions (OECD, 2002, p. 33; Ferretti, 2013). The framework can be applied to any target-oriented developments and the achievement of intended results, such as the sustainability goals laid down in the UN Agenda 2030 (see chapter 2, subchapter *2.2.3*) (OECD, 2018). The afore described results-centred approach suggests that in order to achieve the desired impacts, it would be advisable to target the outcomes since impacts given their long-term character might prove irreversible or hardly reversible.

2.2.2. Food systems performance and sustainability assessments

For transitioning to sustainability, goals need to be assessed through efficient and reliable tools, which is why sustainability assessment has quickly become a promptly developing area (Ness et al., 2007; Aubin et al., 2013; Blay-Palmer, 2020a, etc.).
Assessment of the FSs performance might serve various purposes. As explained by Aubin et al. (2013), it could accomplish FS's "diagnosis" seeking to characterise or qualify FS's states, dynamics and functions. Assessments may also serve normative goals aiming at verifying whether the FS (or nutrition) performs in accordance with certain standards and norms (ibid.). Sometimes, the assessments act as forecasting tools anticipating consequences of changes or for the purpose of testing contrasting scenarios, with a potential use for modelling (ibid.; Devuyst, 2001, p. 421). With the recognition of the FSs' interconnectedness (see chapter 2.1.1 The food system, "measuring" change in FSs became a priority in order to get more insights into SFSs (Blay-Palmer et al., 2020a). To facilitate the transition to sustainability, it is vital that the goals are assessable (Ness et al., 2007). This is why sustainability assessments have gained in importance becoming a rapidly developing area (ibid.). According to Devuyst (2001, p. 419), the aim of sustainability assessment is to direct societies towards "(…) a

more sustainable direction by providing tools that can be used either to predict impacts of various initiatives on the sustainable development of society or to measure progress toward a more sustainable state". The author stressed a vital role of sustainability assessments in policymaking for distinguishing between the actions that should and should not be taken in order to make societies more sustainable (ibid.). This renders sustainability assessments to a vital instrument in policymaking for SD (Devuyst, 2001, p. 421; Bortoletti and Lomax, 2019, etc.). Based on the ultimate purpose, sustainability assessments can be broken down into two types – tools used in the decision-making process and tools for setting standards and measuring progress (Devuyst, 2001). Furthermore, Ness et al. (2007) differentiate between three assessment categories, with the first category being based on indicators and indices of an integrative or non-integrative character and the second category including product-related assessments (ibid.). The latter puts emphasis on the flows (material and/or energy) of a specific product or service using a life cycle perspective. Finally, the third category includes integrated assessments comprised of various tools, often for the purposes of policy change or projects' implementation (ibid.).

Perhaps the most known and widely applied assessment technique is the umbrella of Life Cycle Assessment (LCA) techniques belonging to the second assessment type, which is used to evaluate the environmental (less commonly also social or economic) impacts of a products or services, or, more recently, consumption patterns (Ness et al., 2007; Aubin et al., 2013; Pelletier, 2015, etc.). Assessment of the entire FS is, however, more complex. Therefore, integrated multicriteria approaches have been called upon owing to the increased recognition of the FSs complexity and systemic nature of FS interactions, coupled with the multitude of spatial scales that

have significantly broadened with time (Aubin et al. 2013; Allen and Prosperi, 2016; Bortoletti and Lomax, 2018).

As has been put forward by Aubin et al. (2013), one method alone would hardly be able to fulfil the task of responding to the challenge imposed by FSs complexity. Therefore, a combination of methods and indicators would seem more feasible (ibid.). Another challenge FSs sustainability performance assessment is confronted with is taking a full account of the FS's systemic complexity, namely assessing the FS as a whole as opposed to using siloed approaches (ibid.). That is why it was suggested that for assessing FSS the assessment tools would need to integrate three important elements – nature-society systems, a variety of spatial levels as well as temporal aspects in terms of both short- and long-term perspectives (Ness et al., 2007). With regard to the first mentioned element, it is argued that the vast majority of FSS assessment techniques are still one- or two-dimensional, for instance environmentally oriented tools such as LCAs and environmental footprints or, else, nutrition-focused evaluations such as consumption surveys and food security assessments (ibid.; Aubin et al., 2013; Valette et al., 2020, etc.). Yet, in order to assess the FSS performance in its entirety, it would be vital that an assessment framework incorporates all the dimensions of sustainability (Ness et al., 2007; Aubin et al., 2013; Blay-Palmer, 2020a, etc.). In terms of temporal aspects, monitoring and forecasting tools seem to be more appropriate compared to retrospective assessments since they allow the revealing and/or forecasting impacts as well as benefits and risks resulting from a certain system change (Ness et al., 2007). Finally, spatial scale of assessments ranges from local FSs through urban-regional to sub-national and national to global contexts, with correspondingly varying assessment frameworks (ibid.; Blay-Palmer et al., 2020a, etc.).

There exists a variety of assessment frameworks for evaluating local, national as well as global FSs (Ness et al., 2007; Aubin et al., 2013; Blay-Palmer, 2020a; etc.). For instance, SAFA Guidelines developed by FAO (2013) offer a broad range of indicators attributed to the four dimensions – environmental integrity, social wellbeing, economic resilience and good governance. This allows to holistically assess the sustainability performance of all the supply chain members (ibid.). The SAFA-Framework differentiates between themes (21 refined core sustainability goals, universal in scope), sub-themes (58 built upon themes sustainability objectives relevant for various actors of the supply chains) and indicators (116 in number default indicators laying down measurable sustainable performance criteria within sub-themes) (FAO, 2013, p. 3f). Individual indicators are rated through a 0-100 percentage scale, with colour rating ranging from best (deep green colour) to unacceptable (red colour) (FAO, 2013, p. 59). SAFA-Guidelines lend themselves to the multitude of FSS assessments and monitoring approaches in local, national as well as global contexts (Jawtusch et al., 2013; Schader et al., 2016; Landert et al., 2017; etc.). For local and urban contexts, there exist separate assessment frameworks, with their own indicators for monitoring the performance of such systems. One good example of such frameworks is the City Region FS (CRFS) Indicator Framework developed by the Global Partnership on Sustainable Urban Agriculture and FSs (RUAF) Foundation in collaboration with FAO and Wilfrid Laurier University as part of the toolkit for assessing and planning sustainable CRFSs (Carey and Dubbeling, 2017). The framework offers a set of 210 indicators for measuring baseline data as well as progress towards the desired FSS outcomes (ibid.).

2.2.3 The role of the UN Agenda 2030 in assessing food systems performance

In recent years, sustainability performance at all levels and in different sectors has become increasingly associated with the UN Agenda 2030. The progress in improving the sustainability is often measured against the core part of the Agenda, namely the 17 SDGs that have arguably become the most high-profile assessment tool at global scale (Reyers et al., 2017; FAO, 2018b; Caron et al., 2018; Blay-Palmer et al., 2020a; etc.). The UN Agenda 2030 has been adopted by 193 UN member states in September 2015 at the UN SD Summit (UN, 2015; Weigelt et al., 2018). The document builds upon the four Ps approach incorporating people, planet, prosperity and peace and aims at stimulating action towards SD over the 15 year-timespan, namely between 2015 and 2030 (UN, 2015). The 17 SDGs displayed in *Figure 9* serve as "(…) an urgent call for action by all countries – developed and developing – in a global partnership" (UN, n. d. b). These goals have replaced the ancestor – Millennium Development Goals (MDGs), which had been set through 2015 (European Commission (EC), n. d.). Building on the MDGs, the 17 SDGs seek to complement them and achieve what the ancestor had not – through integration, indivisibility and balancing the three sustainability dimensions, namely environmental, social and economic (UN, 2015).

Figure 9: The 17 Sustainable Development Goals of the United Nations 2030 Agenda
Source: UN, n. d. a.

It has been recognised that food appears to be a cross-cutting issue of the Agenda 2030 directly or indirectly connecting the 17 goals as the SD cannot be achieved without eliminating hunger, achieving FNS and improving health and well-being of the world population (Rockström and Sukhdev, 2016; EEA, 2017; Weigelt et al., 2018; etc.). As stated by EEA (2017), the way in which food production and consumption take place affects also other objectives including CC mitigation, biodiversity and nature protection, the circular economy, just to mention a few. Stockholm Resilience Centre pointed out that there is a need for paradigm change with regard to SD, which implies moving away from the sectorial approach of treating ecological, social and economic aspects "(…) toward a world logic where the economy serves society so that it evolves within the safe operating space of the planet" (Rockström and

Sukhdev, 2016). The illustration of this approach links the SDGs within the three sustainability dimensions, while owing to the fundamental reliance of society and economy on the biosphere became known as the “SDG-wedding cake” (ibid.). Building upon this approach, Weigelt et al. (2018) showed the interlinkage between eco-agri-FSs and all the SDGs in a three-tiered structure corresponding to the three dimensions of sustainability (see *Figure 10*). This conceptualisation brings forward the fundamental role of the SDG 17 (Partnerships for the goals) as well as the target 15.9 of the SDG 15 (Integration of ecosystem and biodiversity values in decision-making) in the implementation of other goals of the Agenda 2030 (ibid.). As presented in *Figure 10*, this would ultimately lead to food security and nutritional diversity, ecological long-term stability, sustainable agricultural systems and cultural diversity.

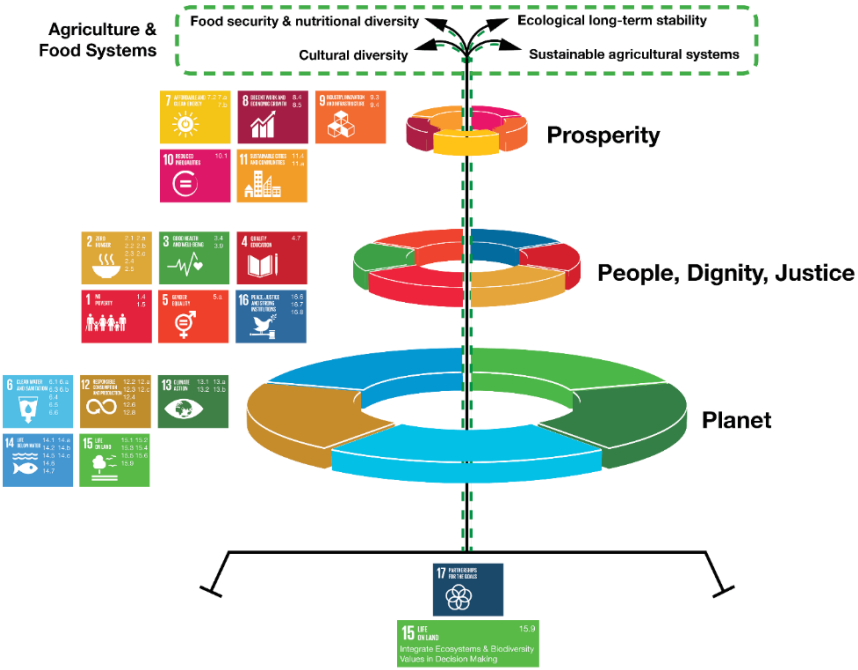


Figure 10: The SDG-Food Cake showing three-tiered SDG structure and links to FSs
Source: Weigelt et al., 2018, p. 380.

2.2.4 The role of indicators in assessing the food systems performance

For the complex systems such as the FS, assessing sustainability performance implies the consideration of a broad range of dimensions and related indicators, which has led to a significant rise of indicators that became increasingly important at all scales (Prosperi et al., 2020; Blay-Palmer et al., 2020a). An indicator is a simple measure, often of quantitative nature, representing "(…) a state of economic, social and/or environmental development in a defined region – often the national level" (Ness et al., 2007, p. 499). According to Reyers et al. (2013, p. 269) an indicator delivers information "(…) about more than itself and serves as an indication

of a feature of interest". Furthermore, indicators are appropriate tools for showing the state of an analysed system capable of operationally representing specific attributes such as system's property or system's characteristic (Feenstra et al., 2005; Gallopin, 1997). Indicators provide evidence of an existing condition or the achievement of certain results (FAO, 2013, p. 225). Indicators can be aggregated in a certain manner to form an index, or an aggregate indicator, or, else, integrated indicator (Reyers et al., 2013; Ness et al., 2007; etc.). Prosperi et al. (2020) presented three principal objectives of aggregate indicators, or metrics, if they aim at providing a perspective:

- to inform (all stakeholders, including public officials, industry and civil society);
- to measure (an impact or progress towards certain goals);
- to aid the decision-making process.

With regard to indicators intended for global monitoring, ten principles specifically targeting SDGs-based monitoring have been laid down (UN SDSN, 2015) (see *Table 1*). Global indicators should be consensus based and universally applicable, while having a straightforward disaggregated character allowing for frequent monitoring backed by well-established data sources as well as scientific and forward-looking approach (ibid.).

Table 1: Ten Principles for Global Monitoring Indicators for the SDGs

No.	Principle	Details
1	Limited in number and globally harmonised	It is recommendable to set two sets of SDG-indicators – up to 100 global monitoring indicators and nationally appropriate number of complementary national indicators.
2	Simple, single-variable indicators, with straightforward policy implications	Indicators should be simple in compilation and easy to interpret and communicate, with clear policy implications. Composite indicators are to be avoided due to complexity of corresponding data collection methods as well as imputation and arbitrary weighing for missing indicators. One variable based metrics are to be preferred.
3	Allow for high frequency monitoring	Indicators should allow for annual monitoring cycles.
4	Consensus based, in line with international standards and system-based information	Broad international consensus has to be reached on indicators' measurement. International standards, recommendations and best practices should form the basis for indicators to facilitate international comparison.
5	Constructed from well-established data sources	Well-established sources of public and private data should back the indicators. In case of new indicators with unavailable data sources, a baseline should be established.
6	Disaggregated	For tracking inequalities in SDG achievement, indicators should be preferably of disaggregated nature. Key dimensions for disaggregation: - characteristics of individual/household (i.e. gender, age, income, etc.); - economic activity; - spatial dimensions

		(metropolitan, urban or rural areas, districts).
7	Universal	SDG-indicators should allow for tracking a universal agenda while being at the same time applicable at local, national and regional levels. Indicators should bear capability for localisation.
8	Mainly outcome-focused	Indicators should preferably track the outcomes (the ends) as opposed to the means.
9	Science-based and forward-looking	Design of indicators should account for changing global dynamics and anticipate future changes over time. Hence, the framework needs to be flexible in allowing for replacing the outdated indicators with the new ones.
10	A proxy to broader issues and conditions	Well-chosen indicators should allow for tracking broader concepts, hence, the indicator framework should track a number of cross-cutting issues that the title of individual goals might not necessarily imply.

Adapted from: UN SDSN, 2015, p. 12ff.

The global indicator framework within the UN Agenda 2030 has been agreed upon in March 2017 laying down 231 global indicators linked to 169 targets under the 17 SDGs (UN, 2021). In the FSs context, it seems like SDG targets and indicators can be well suited for monitoring the FS outcomes, which could be anchored in the OECD results framework (OECD, 2018) (see chapter 2.2.1), with the primary focus on outcomes. Based on the performance results, interventions can be planned, ultimately facilitating the FSs transformation.

2.3 Potential outcomes of the organic food system

The first insights into potential outcomes of the OFS are provided it the definition given in the EU Regulation on organic production and labelling: „Organic production is an overall system of farm management and food production that combines best environmental and climate action practices, a high level of biodiversity, the preservation of natural resources and the application of high animal welfare standards and high production standards in line with the demand of a growing number of consumers for products produced using natural substances and processes“ (EU, 2018). Outcomes such as ecosystem stability, climate action, preservation of biodiversity and natural resources, health promotion and ethically driven practices can be deduced directly from this definition, and they can also be found throughout the entire Regulation. Another important clue is provided through the organic principles laid down by the IFOAM as a result of a worldwide participatory process that involved various stakeholders (Luttikholt, 2007). The four organic principles, as explained by the IFOAM, “(…) express the contribution that OA can make to the world (…)” (IFOAM, 2020). These principles form the basis for how organic practices should be performed at the same time pointing towards the developmental direction that OA should pursue (Luttikholt, 2007). The first principle is the principle of health, implying that OA should be sustaining and enhancing health of humans and the planet, whereby the term health means “(…) the wholeness and integrity of the living systems”, with characteristics of resilience, immunity and regeneration (IFOAM, 2020). The second IFOAM principle is the principle of ecology that suggests that organic agricultural practices should be carried out in ways that fit the natural cycles so as to maintain ecological balance and achieve wellbeing and nourishment (ibid.). The third is the principle of fairness prescribing equitable and respectful relationships among

all the involved parties, from farmers to consumers, as well as animal welfare, open and equitable production-distribution-trade systems capable of accounting for true environmental and social costs (ibid.). This principle outlines the desired outcomes of OA for all involved actors, namely food sovereignty, reduction of poverty and good QOL (ibid.). Finally, the principle of care, the fourth IFOAM principle, articulates precautionary and responsibility approaches to enhancing efficiency and increasing the productivity of OA stressing that safe and ecologically sound practices should be ensured in order to prevent risks related to the adoption of unpredictable technologies (ibid.).

2.3.1 Organic food system outcome categories discussed in the literature

The outcome categories discussed here represent mainly the outcomes of OA that are well described in the literature, with some of them having been studied in long-term field trials in different countries. First of all, due to diversification practices commonly used on organic farms along with alternative practices for controlling weeds and pests (e.g. mechanical weeding, flower strips and hedge-rows), an increase in biodiversity on organically managed plots is reported, manifested through higher richness of plants as well as associated fauna (Simon, 2010; Niggli, 2015). A meta-study by Bengtsson et al. (2005) reported an increased species richness of up to 30% with organic farming, while organisms' abundance was found to be about 50% higher. The authors concluded that the OA systems generally had a higher abundance of soil organisms, particularly earthworms as well as microarthropods and fungi (ibid.). Seufert and Ramankutty (2017) reviewed meta-analyses and quantitative reviews and concluded that organic practices result in higher carbon content in the soils, improved fertility and soil structure, with the latter contributing to reduced soil erosion. Niggli

(2015) linked improved soil fertility on organic farms to system-oriented practices applied in OA such as incorporation of compost and legumes as well as recycling of organic matter and local nutrients. Schader et al. (2015) discussed the contribution of the OFS to sustainability advocating for differentiation between different assessment levels – operator, product and spatial / policy levels. Better performance has been revealed in terms of overall environmental assessment, in specifics with regard to ground and surface water pollution, air quality, soil fertility, biodiversity and landscape (faunal and habitat diversity particularly), resource depletion and CC (Schader et al., 2012; Schader et al., 2015). Organic production systems might positively contribute to CC mitigation, which can be explained by the fact that organic practices such as cultivation of perennial clover grass in organic crop rotations and application of manure and compost lead to humus accumulation in soil, which, in turn, benefits carbon dioxide (CO_2) sequestration in soil (Gattinger, 2010).

Furthermore, a comprehensive review by Reganold and Wachter (2016) compared the performance level of organic versus conventional farming with regard to several sustainability metrics. The authors came to a conclusion that apart from improved environmental sustainability performance certain parameters of social wellbeing as well as economic sustainability are enhanced as well. Likewise, increased employment of farm workers as well as reduced worker exposure to pesticides, income diversification and improved food access are some of the reported positive outcomes in the realm of social sustainability (Reganold and Wachter, 2016). Reduced farmers' and farm workers' exposure to chemicals attributed to ban and/or restricted use of pesticides and synthetic fertilisers translates into reduced occupational exposure and accidents, particularly relevant in less-developed countries,

ultimately resulting in safer working conditions and better health (ibid.; Seufert and Ramankutty, 2017; etc.).

Based on existing literature Seufert and Ramankutty (2017) examined the influence of OA on farmer livelihoods and concluded that apart from improved profitability (mainly due to premium prices) and socio-ecological resilience (with mixed farming systems reducing economic dependence on single crops), farmer's autonomy can be also increased in the systems where organic farmers are part of alternative food networks (AFNs) (ibid.). Moreover, economic resilience might also be enhanced in OFSs, which could be mainly explained by the cradle-to-grave principle (Schader et al., 2015). Curran et al. (2020) conducted sustainability performance assessment of 185 organic farms in Switzerland based on the themes of the SAFA-Guidelines and found out that the average theme scores appeared to be the highest for the social wellbeing dimension, with the best ranking among all the themes corresponding to median value of 87%. Assessed organic farms showed the highest scores in the themes of participation, water, animal welfare, fair trading practices, labour rights, equity, human safety and health as well as cultural diversity (ibid.). MacRae et al. (2007) reviewed studies with a focus on social and economic implications of organic production systems and concluded that not only are these systems more profitable as a cumulative result of input cost reductions, yield changes, and price premiums, but they can also contribute positively to economic development of communities, while improving participation and social interaction. Based on that the authors argue that the organic systems have a potential for revitalising the rural communities (ibid.). In the same vein, positive contributions to social and human capital have been revealed in the qualitative descriptive study exploring psychosocial and contextual factors affecting mental health of organic farmers and farm workers in New Mexico, the USA (Brigance et al., 2018).

The results revealed that this positive contribution was mainly attributed to increased degree of community participation through farmers markets, gardens and educational workshops – the channels that create spaces for community interaction, while simultaneously enhancing trust and contributing to the promotion of employment opportunities (ibid.). The study has also found a higher perception of wellbeing reported by the organic farmers and farm workers, which was mainly attributed to knowledge sharing, bonding with co-workers as well as participation in community events related to farming (ibid.).

Due to the fact that a higher variety of crops is grown by organic farmers, the dependence on a few crops only in the market is reduced, and farmers and their families can also benefit from the variety of harvested crops (Kilcher, 2007). This ultimately contributes to improving FNS for organic farmers and their families (Reganold and Wachter, 2016).

Quality and safety aspects of organic food can also be highlighted as outcomes of the OFS, owing to absence of pesticides, synthetic fertilisers and genetically modified organisms (GMOs) in organic production as well as ban on colouring agents, irradiation, flavourings, synthetic additives and sweeteners, and trans fatty acids in organic processing (Hansen et al., 2002). Since synthetic pesticides are not used in OA, organic food contains significantly lower pesticide residues compared to its conventional counterpart, with only trace levels occasionally found in organic produce and attributed to carryovers from neighbouring conventional fields or during processing and storage (FiBL and ORC, 2015). Furthermore, since the organic system aims at maintaining authenticity of organic produce, only essential additives are permitted in processing, which significantly reduces the number of additives – from over 320 approved in the EU food additives to only 48 permitted for organic processing in the EU (ibid.).

Regarding nutritional properties of organic food, several studies indicate certain benefits in terms of nutritional composition of organically grown foods. For instance, Brandt et al. (2011) reported 12% higher concentration of secondary metabolites in organic fruits and vegetables. A meta-analysis by Baranski et al. (2014) revealed higher content of antioxidants in organic crops, while pesticide residues were found to be four times lower compared to conventional crops. Smith-Sprangler et al. (2012) revealed higher concentration of total phenols in organic foods as well as higher levels of omega-3 fatty acids in organic chicken and milk.

The afore describes effects of OA and organic food described in the literature provide the first insights into potential outcomes of OFSs if organic production is linked to organic consumption, and the FSs approach is applied. These outcomes embrace various FS outcome categories suggesting a contribution to SFSs as well as the SDGs, which allows for building upon them to empirically investigate such contribution.

2.3.2 Organic food systems and their contribution to the SDGs

Potential contribution of the OFS to the SDGs is scarcely addressed in the literature. Only a few publications disclose the (potential) contribution to the SDGs, with a focus on organic production systems as opposed to OFSs. For instance, Eyhorn et al. (2019) discussed policy interventions required for the transformation to more SFSs and emphasised the potential contribution that up-scaling of transformative systems such as OA can have to the achievement of the SDGs. In particular, the authors highlighted the contribution to the following SDGs: SDG 1 (No poverty), SDG 2 (Zero hunger), SDG 3 (Good health and wellbeing), SDG 6 (Clean water and sanitation), SDG 12 Responsible consumption and production), SDG 13 (Climate action) and SDG 15 (Life on land)

(ibid.). There are no details or specifications on contributions provided by the authors. Next, de Schaetzen (2019) explored the potential of OA to address the Sustainability Agenda through the focus on contributions to its eight SDGs – SDG 2 (Zero hunger), SDG 3 (Health and wellbeing), SDG 6 (Clean water and sanitation), SDG 8 (Decent work and economic growth), SDG 12 (Responsible consumption and production), SDG 13 (Climate action), SDG 14 (Life below water) and SDG 15 (Life on land). The justifications for these contributions are largely in line with the outcomes of the OFS described in the previous subchapter. The report addressed some systemic aspects and intertwined nature of the goals in that it presents reoccurring benefits of OA as justifications of positive contribution to multiple SDGs. Likewise, elimination of synthetic pesticides in OA is linked to increased biodiversity (SDG 15), while simultaneously improving water quality (SDG 6) due to reduced pollution, with the latter having positive impact on marine biodiversity (SDG 14) (ibid.). At the same time, absence of mineral fertilisers and pesticides in OA reduces CO_2 emissions related to production and application of these inputs. Another systemic issue is improved soil quality, which seems to act as a leverage point for triggering the achievement of multiple SDGs. For instance, de Schaetzen (2019) argues that key to the explanation of OA's contribution to the SDG 2 lies in healthy soils capable of safeguarding food security in the long term. Furthermore, the importance of soil quality has been put forward for addressing further issues, namely CC mitigation (SDG 13) due to enhanced carbon sequestration of organically managed soils and water holding capacity (SDG 6) due to the increased soil organic matter (ibid.). Nutritional properties of organic food and absence of pesticide residues have been explained to contribute to the SDG 3, while no exposure to pesticides on organic farms has positive effects on farmers' and farm workers' health contributing to decent

working conditions (SDG 8) (ibid.). Finally, SDG 12 has been highlighted by de Schaetzen (2019, p. 42) referred to as a "summary" of all other SDGs addressed in the report.

Finally, the OFS could potentially contribute to the SDG 4 (Quality education), since some organic initiatives have succeeded in providing access to education and training for their farmers (FAO, 2002; Henke and Bromberg, 2021). Additionally, organic farmers' organisations can act as catalysts of education bringing producers together (Kilcher, 2007).

2.4 Food systems transformation

This chapter will begin with outlining the current challenges and unsustainable traits of a contemporary FS laying down the arguments for a transition to SFSs referred to as FSs transformation. The chapter then proceeds to presenting an actor-oriented approach as one of the potential transformation pathways.

2.4.1 The need for food systems transformation

To achieve the sustainability goals by 2030, not only does the society as a whole needs to undergo a process of transformation, but so does the FS (Niles et al., 2017; Caron et al., 2018; FAO, 2018b; Bortoletti and Lomax, 2019; etc.). A multitude of negative externalities related to the dimensions of sustainability as well as human health can be attributed to the FS (Pelletier, 2015; UNEP, 2016; HLPE, 2017; FAO, 2018 a, b; etc.). The ecological implications are the results of the intricate two-way relationships between the FS and natural resources (UNEP, 2016). Indeed, the interrelations between the FS and natural resources are inextricable (ibid.). On the one hand FSs are fundamentally reliant on natural capital to produce foods, on the other they are largely responsible for negative ecological externalities in terms of their impacts on natural resources (ibid.). Since FSs depend on land, water

resources and biodiversity for producing food, agricultural production is sensitive to the soil and water quality as well as to the presence of diseases and pests, climate fluctuations and weather extremes (ibid.; Liverman and Kapadia, 2010). These are food production and consumption that can be named among the main drivers of environmental degradation (Meybeck and Gitz, 2017). As FSs have undergone the process of structural transformation from predominantly local systems of exchange into complex global webs with long supply chains and multiple nodes, the role of 'value-added' activities has significantly increased shifting downstream, away from the farm-based activities towards processing and packaging as major economic activities (EEA, 2017; Nugent et al., 2015; Ericksen, 2008; Sage, 2012, p. 15). As a result of this, the diversity of cultivated crops and farmed animals has dramatically decreased (FAO, 2018d). Industrialised food production has replaced or is replacing biodiverse agricultural landscapes with large monocultures requiring extensive amounts of inputs including mineral fertilisers and pesticides as well as fossil fuels (FAO, 2019). The consequence is not only the drastic reduction in (agro)biodiversity, but also impoverished soils with increased soil erosion, chemical runoffs, polluted aquafers as well as groundwater, antimicrobial resistance, as well as impaired air quality (Miller and Spoolman, 2009, p. 286ff; Tegtmeier and Duffy, 2004; Sundkvist et al., 2005; FAO, 2021). Furthermore, the FS is considered the major cause of deforestation while at the same time being the principal user of becoming increasingly scarce water resources (van Berkum et al., 2018; FAO, 2020a; etc.). Around 20% of the world's freshwater aquifers have become overexploited (UNEP, 2016). Another problem is overfishing, with approximately 91% of commercial fish populations fully or partially overexploited (ibid.; FAO, 2020b). This has resulted in the drop in global fish stocks within biologically sustainable thresholds from 90% in 1974 to

65,8% in 2017 (FAO, 2020b). Even though aquaculture does offer a potential solution in terms of diversified fish production for meeting the increasing demand for fish products, yet even fish farming is becoming intensified (FAO, 2019; FAO, 2020b). Finally, the FS is one of the major contributors to CC, with a total contribution of up to 29% of anthropogenic GHG emissions, mainly as CO_2, methane (CH_4) as well as nitrous oxide (N_2O) (Vermeulen et al., 2012; Anderson, 2015). Approximately two-thirds of the total FS's contribution can be attributed to livestock-related emissions through enteric fermentation coupled with manure management (FAO, 2016a).

Environmental impacts are further exacerbated by the implications of food losses and waste along the food chain since this adds pressure on natural resources (FAO, 2015). Indeed, for producing foods that ultimately go lost or discarded lands had been occupied and freshwater withdrawn (ibid.). Furthermore, food losses and waste contribute to CC making up 6-10% of anthropogenic GHG emissions, corresponding to the estimated carbon footprint of about 3,3 Gtonnes of CO_2 equivalent (Vermeulen et al., 2012). Finally, significant social implications and ethical concerns are linked to food being lost or wasted in that it exacerbates the situation with poverty and food insecurity in Global South (FAO, 2015; HLPE, 2014).

These are, however, not exclusively negative environmental impacts that the contemporary FS can be held accountable for. Health implications and social externalities should not be underestimated either. And first to mention here is the situation with food security. Food security is defined as a situation "when all people, at all times, have physical and economic access to sufficient, safe and nutritious food that meets their dietary and food preferences for an active and healthy life" (FAO, 1996). Even though the modern FS does produce enough food for meeting nutritional requirements of the world population, with the overall average

dietary energy supply of 2,904 kcal/cap/day reported for the period between 2015 and 2017, yet the normative purpose of feeding the world is not fulfilled (FAO, 2018c; FAO et al., 2020). Likewise, 690 million people around the world, or 8,9% of the global population are hungry, and 11% of the world population are undernourished (IPBES, 2019; FAO et al., 2020). About one in ten people are affected by severe food insecurity (FAO et al., 2020). Undernutrition in early life is particularly critical since it has severe health implications leading to immediate as well as long-term health problems including abdominal obesity, stunted physical growth, diabetes, coronary heart disease, etc. (FAO et al., 2019). The situation is exacerbated by the two-sided problem of global malnutrition crisis, namely the presence of the so-called double burden of malnutrition, when undernutrition and overweight or/and obesity coexist (Global Nutrition Report, 2020). Likewise, two billion of adult population are overweight, with additional 40.1 million children under five years of age affected by overweight in 2018 (FAO et al., 2019). The health implications are diet-related non-communicable diseases including cardiovascular diseases, certain types of cancer as well as chronic respiratory diseases (WHO, 2021).

Social externalities add the icing on the cake, topping the negative impacts attributed to the contemporary FS. Social equity can be considered a key aspect of the FS since equitable FSs are vital for safeguarding sustainable livelihoods of vulnerable communities and ensuring food security (Tirado von der Pahlen et al., 2018). Within the FS, agriculture alone provides the livelihood for 2.5 billion people worldwide, with small-scale farmers, fishers, herders and forest-dependent communities producing more than half of the global agricultural goods, being yet particularly vulnerable to shocks and natural disasters (FAO, 2016b). In the light of overexploitation of natural resources caused by the contemporary FS and particularly

dangerous for vulnerable rural communities, an equitable and SFS would be pivotal for securing sustainable livelihoods and safeguarding food security, especially for vulnerable communities (ibid.). Furthermore, global industrialised agriculture and related FSs affect actors, both urban and rural, regarding land use change and land ownership (Vaarst et al., 2018). Smallholders particularly are extremely vulnerable to market supply fluctuations imposed by the dominant FS's specialisation with the resulting surpluses of crops (Johns et al., 2013). This ultimately threatens the livelihoods of small-scale farmers (ibid.). In rural communities of the Global South countries, decent livelihoods are particularly threatened due to inadequate standards of living exacerbated by environmental crises (Tirado von der Pahlen et al., 2018). Decent work deficiencies, particularly in agriculture and processing sector, along with discrepancies in gender equality, especially with regard to decision-making, ownership and access to land and financial services are all found in the contemporary FS, in parts to an extremely high extent (Scherrer and Verma, 2018; Tirado von der Pahlen et al., 2018; Nesheim et al., 2015).

Based on all the afore-described challenges, it becomes apparent that the contemporary FS clearly needs to optimise its outcomes (Caron et al., 2018; Bortoletti and Lomax, 2019; Ruben et al., 2019; etc.). It needs to undergo a process of transformation, to align its outcomes with the SDGs and minimise negative externalities (FAO, 2018b; Caron et al., 2018; Bortoletti and Lomax, 2019, etc.). Next section will disclose the approach that might prove helpful for facilitating the FSs transformation.

2.4.2 An actor-oriented approach to transformation

Transformation of a complex dynamic social-ecological system such as the FS would inevitably imply "bringing human agent into the picture" to allow for linking the human interaction to

developments and outcomes stemming from it (Burns et al., 2002, p. 212). At the same time, it is important to acknowledge that external interventions are mediated by the same actors whose lives they affect (Long, 2001, p. 13). This is why it would be vital to consider an actor-oriented approach when attempting to transform the FS. To facilitate the transformation, it might be helpful to view human actors as co-constructors of their environment (as opposed to interacting agents solely) since through their daily activities, individuals create and co-create the society and its institutions, which they are part of (Kondrat, 2002). As has been put forward by Long (2001, p. 13), a dynamic approach that would emphasise the interplay and feedbacks between the multitude of "internal" and "external" factors and relationships while recognising the central role of consciousness and human action is pivotal to the understanding of social change. Therefore, the focus on human beings is justified through viewing humans as active and conscious agents, creative and moral, with intentionality and the ability to self-transform (Kondrat, 2002; Burns et al., 2002).

An actor-system dynamics theory (ASD) considers social systems as open to and interacting with their social and physical environments, with this interaction and the internal system's processes resulting in the acquisition of new properties and, ultimately, system's transformation (Burns, 2006). Actors are conceptualised as active "creative participants in social systems as well as agents of much of the dynamics of the structuring and transformations of these systems" (Burns and DeVillé, 2017, p. 12f). As social beings, actor agents are capable of self-reflection, intentionality and self-transformation (ibid.; Burns et al., 2002). Apart from their creative potential, human beings also possess destructive transforming forces that translate into agents' capability to act in innovative or perverse ways regarding the values, norms and social structures of a social system they are part of (Burns, 2006). Here,

two aspects are of particular relevance. On the one hand, human consciousness with the ability of self-reflectivity and self-representation on individual and collective levels are essential (Burns and DeVillé, 2017). Likewise, individual actors are capable of processing social experience and constructing their ways of coping with life, oftentimes under conditions of uncertainty, information limits and other pressures (e.g. normative, physical, politico-economic) (Long, 2001, p. 16). Here, knowledgeability of human actors comes into play, with three types of knowledge – mutual (common knowledge of individuals from the same socialising community), discursive (readily available for conversation knowledge) and practical (articulated in acts knowledge) (Kondrat, 2002). On the other hand, the environment of human behaviour in terms of institutional and cultural formations becomes partly internalised in humans as social agents (Burns and DeVillé, 2017). Likewise, rule complexes (including social rules) shape and constraint human agents, while at the same time providing the basis for organising and regulating human interactions, predicting and interpreting their activities, and expressing the implications of their affairs (Burns et al., 2002). The outcomes stemming from these interactions, however, might have intended as well as unintended consequences, with latter ones often arising through performance failures and mistakes (ibid.; Burns, 2006). The ASD approach is hence concerned with the organisation of social systems' complexity through a closer examination of how socio-economic systems evolve, function and interact with and affect each other as well as their environments, with unexpected developments and outcomes arising from such interactions (Burns and DeVillé, 2017). Within the ASD conceptualisation, interactions and actions of human agents are facilitated and constrained by social structures (cultural formations and institutions in accordance with socially shared rule systems) and physical systems (ecological and physical

factors incorporating a variety of resources) (Burns, 2006) (see IA and IB in *Figure 11*). The former ones regulate and structure agents along with their interactions, acting as constraints or facilitators of initiative as well as transformation (ibid.). Physical, or ecological systems provide resource base for life and material development at the same time acting as major constraints based on the availability (ibid.; Burns et al., 2002). Socio-technical systems incorporate combinations of social and material structural elements (Burns, 2006) (see IA, IB in *Figure 11*). Social and natural structuring and selection mechanisms (IA-S and IB-S, respectively in *Figure 11*) operate to facilitate and constrain actors' activities as well as their consequences, while at the same time allocating resources (ibid.). Interacting social actors (II in *Figure 11*) in the context of material, socio-structural and socio-technical systems are on the one hand constituted and regulated through these structures (i.e. institutions), on the other hand social interaction and actions of human agents (see III in *Figure* 11) result in multiple consequences, both intended as well as unintended such as production, wastes, etc. (ibid.; Burns et al., 2002). Actions of social actors operate on the structures provided by socio-structural and natural systems, and through interactions, social agents elaborate, reproduce and transform material and ecological conditions and social structures (Burns, 2006) (see IV-A and IV-B in *Figure 11*).

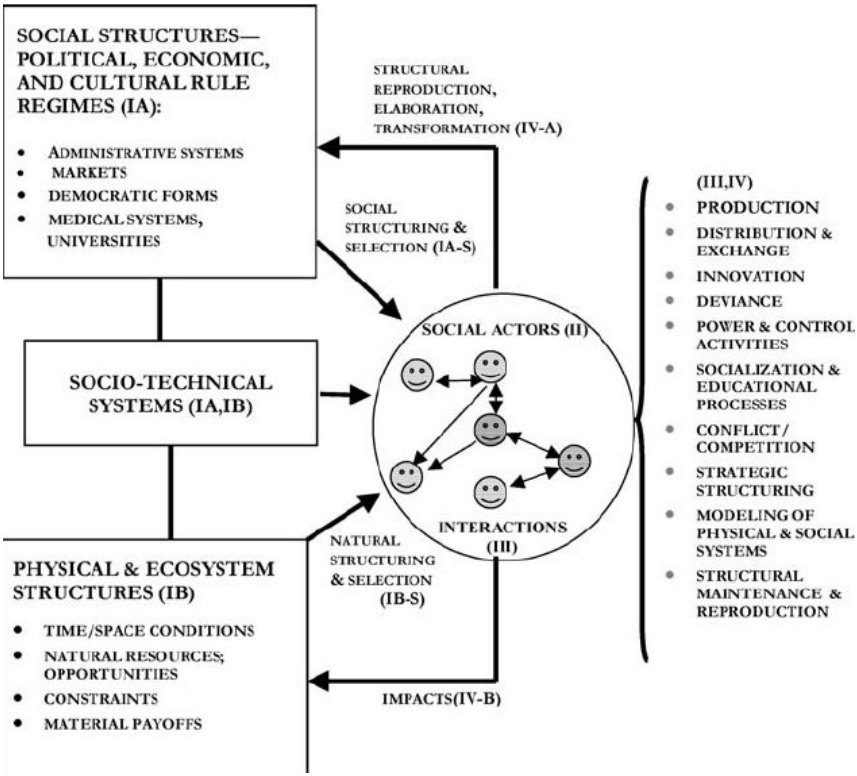


Figure 11: ASD model showing structuring powers, socio-cultural and materials embeddedness of interacting human agents
Source: Burns, 2006, p. 414.

Social actors encompass not only individuals, but also social groups, alliances and organisations as well as nations – all capable of making reflective judgements and collective decisions resulting in collective action (Burns and DeVillé, 2017). Human agency and the power attributed to it depend upon networks of actors since humans are embodied in social relations becoming effective through them (Long, 2001, p. 17).

As regards physical systems and ecosystems, social systems interact with them, with the feedbacks taking the form of material responses in terms of availability of resources as well as selective

factors (Burns, 2006). Physical conditions, distribution of natural resources and climate offer both opportunities and limitations to the way social action and interaction will be carried out (Burns et al., 2002). On the other hand, human groups also affect physical conditions, climate and ecosystem generating intended and unintended impacts (Burns, 2006).

Owing to the freedom of decision and transformative opportunities that human actors possess enables treating system sustainability as a problematic realm being subject to social struggle (Burns and DeVillé, 2017). Consequently, transformation seems promising as opposed to views on transformation as “natural” condition taken for granted (ibid.). The present research project seeks to build upon this approach placing emphasis on human actors as a (co)-constructor of transformation, with their perspectives, knowledge and experience making up the core of transformation efforts towards SFSs.

The dissertation at hand applies FSs approach to analyse the outcomes of the OFS. The outcomes have been chosen due to their short- to medium-term character leaving possibility to reverse the potentially negative ones. The outcomes of OA and organic consumption reported in the literature as well as the SDGs and their targets provide the basis for analysing the OFS outcomes. The analysis employs actor-oriented approach focusing on the perspectives of the key actors involved in real-life OFSs.

3 Research Methodology

3.1 Research Design

The present study is part of an umbrella research project on OFSs around the globe carried out in collaboration with the OFSP – one of the eight "core initiatives" within the UN 10 YFP on SFSP (OFSP, n. d.). Therefore, some data collection phases were performed jointly by the research project team at the Department.

The research aim of the present study is to identify the outcomes addressed in OFSs, with a special focus on assessing the OFS's sustainability performance through its contribution to the SDGs. The research questions aimed at disclosing the OFS-specific pattern of outcomes and SDGs so as to uncover the OFS's potential to contribute to the FSs transformation towards SFSs. The OFS-specific SDG pattern could act as a first approximation to monitoring of transformation processes towards SFSs. To answer the research questions and analyse the outcomes of OFSs, mixed methods approach was applied. This approach allows the researcher to combine and integrate both quantitative and qualitative data collection methods within one project, which contributes to a better understanding of complex phenomena and investigated problems (Kuckartz, 2014, p. 33; Creswell and Plano Clark, 2007). The present research employed multiphase design that combines connected qualitative and quantitative studies, both sequentially and concurrently, with approaches building upon each other to address a central research objective (Creswell and Plano-Clark, 2011, p. 100) (see *Figure 12*). As *Figure 12* illustrates, most research phases were carried out sequentially, with only systematic literature review having been performed concurrently.

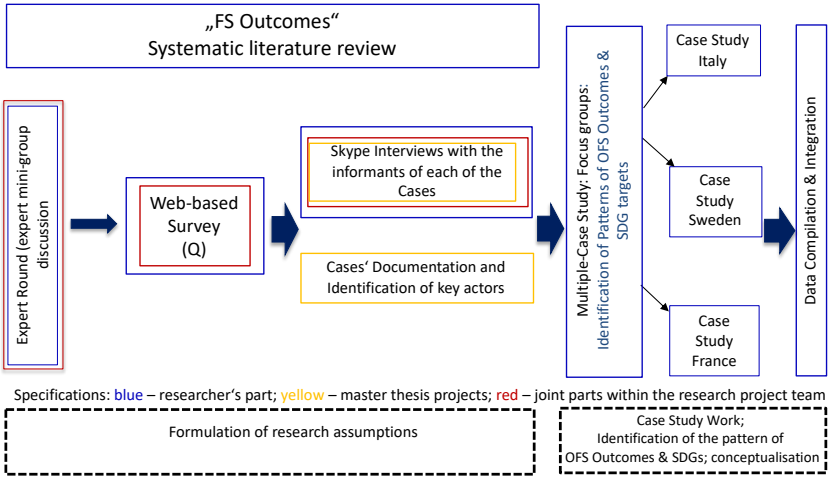


Figure 12: Research design of the research project on the Outcomes of the OFSs (own elaboration)
Source: own elaboration.

The systematic literature review on FS outcomes aimed at synthesising the general understanding and classification of FS outcomes in recent literature and disclosing the role of FS outcomes in the FSs transformation towards sustainability. It therefore provided a theoretical framing for the present research project, especially with regard to transformation towards SFSs. This research phase was parallel to expert round, online-survey and cases' documentation stretching till multiple-case study (see *Figure 12*). The first primary data collection method employed in the present study was the expert round. Prior to performing the expert round potential outcomes of OFSs were identified based on the existing literature related to OA and organic consumption. In this step, findings from the literature provided the basis for formulating the research assumptions guiding the first research phase. The research assumptions were then discussed with the experts during the expert round, where certain adjustments have been made (see subchapter 3.2.2.1). Afterwards, web-based survey has been

conducted with the aim of identifying the outcome patterns as well as the SDGs addressed by the OFSs at goal-level. After the survey, cases' documentation phase followed, which was carried out by three master students receiving the respective topics for their completion projects (master theses) from the Head of the Department of Organic Food Quality and Food Culture of the University of Kassel in Witzenhausen (and project leader at that time), late Prof. Dr. Johannes Kahl. Within this phase, the informants of the respective cases have been interviewed via Skype (with the presence of at least one of the project members, namely PhD candidates at the Department), which was followed by in-situ semi-structured interviews with key actors of the respective cases and observations. After the process of cases' documentation was completed by the master students, the researcher of the present study performed a multiple-case study in three selected cases – Italy, Sweden and France (details on the cases' selection process see subchapter 3.2.2.3). First, the case documentation for each of the cases along with the additional supporting literature were analysed and reported by the researcher, who afterwards conducted focus groups in each of the three cases under study. The multiple-case study design as the last primary data collection phase allowed for strengthening the analytical generalisations because the cases were designed using literal replication, with three cases having been selected predicting similar results, "replicating" each other (Yin, 1998, p. 239f; Yin, 2003, p. 47). Sometimes this case study design is referred to as a collective case study (Creswell, 2007, p. 74). Additionally, the researcher analysed the data from semi-structured interviews with the key actors previously collected by the master students in each of the three case studies (further information is provided in corresponding sections of subchapter 3.2.2.3). Details on each of the data collection phases will be provided in the following subchapters.

3.2 Data collection

3.2.1 Secondary data collection: systematic literature review

The aim of the systematic literature review was to disclose the understanding and classification of FS outcomes as well as their role in the FSs transformation towards sustainability. Furthermore, this systematic review also attempted to shed light on various overarching themes, within which the outcomes are framed in the literature. The review process has been performed following the standards laid down by PRISMA method (Moher et al., 2009).

The literature search has been conducted between November 2018 and April 2019. The databases used were Web of Science (core collection) and Springerlink. The final search string included the following terms: „food system* outcome* OR food system* impact* OR food system* consequence* as a topic (for Web of Science) or as a searched words combination (for Springerlink) paired with "food system*" in titles of searched articles. For Web of Science, due to build-up of the search engine and the broad disciplinary orientation of the database, it has been possible to additionally incorporate "socio-ecological system* OR agri-food system*" in titles. For both databases, the search included all articles published between January 2008 and April 2019 (this timespan has been chosen due to the fact that the literature review has begun in 2018 and ended on April 24, 2019, hence it has been decided to add the first four months of the year 2019 to the review). The initial search output yielded 1069 articles for Web of Science and 132 articles for Springerlink (1201 papers in total). Next, irrelevant scientific fields for Web of Science have been filtered out. The following scientific fields have been selected as relevant: environmental sciences, environmental studies, agriculture multidisciplinary, economics, agricultural economics policy, ecology, multidisciplinary sciences, agronomy, behavioural sciences, management, sociology,

development studies, social sciences interdisciplinary, regional urban planning, public administration, urban studies, area studies, political science and social work. After checking full texts' availability for both databases, the sample contained 354 articles in total with full texts available, four of which have been duplicated and hence removed (for details on step-by-step selection process see *Figure 13*).

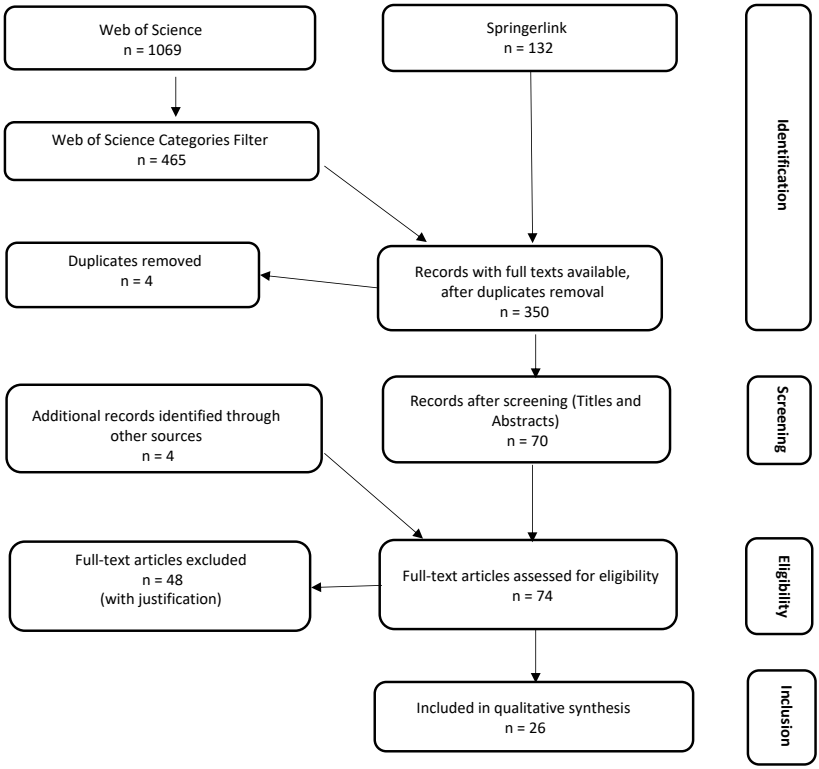


Figure 13: Flow diagram of the selection procedure for articles to be reviewed
Source: own elaboration.

The articles with available full texts have undergone the screening process where titles and abstracts have been assessed for relevance. This step was followed by eligibility assessment of full

texts (eligibility criteria are presented in *Table 2*). At this step 48 articles in total have been filtered out. The remaining 26 papers have been considered relevant and hence included in the qualitative synthesis of the following systematic review (synthesis matrix can be found in Annex I).

Table 2: Eligibility criteria applied to screening and eligibility assessment

Exclusion criteria	Inclusion criteria
Article's interpretation of FSs is equivalent to food chain, food production / agriculture, no broader context is addressed.	Article does adopt broader understanding of FSs incorporating other elements and/or subsystems and/or interrelations and/or drivers etc.
Outcomes of FSs are not discussed – instead focus is on outcomes of projects on FSs-related topics.	Article does discuss FS outcomes.
Article does not specifically address FS outcomes, even though the term is mentioned.	Article does address FS outcomes, directly or indirectly (sustainability metrics and FS performance have been considered relevant).
Article makes no own contribution to the topic, FS outcomes mentioned in the article are adopted from the existing concepts and frameworks.	Article does make own contribution to the topic / article elaborates on existing framework, but does add new findings regarding FS outcomes.
Article discusses only one set of outcomes (i.e. environmental LCAs).	Article discusses more than one set of FS outcomes (justified exceptions have been made, where particular relevance has been identified).

Source: own elaboration.

Most of the reviewed articles have been published between years 2015 and 2019, with a general upward trend in the number of publications per year observed between 2011 and 2019 (considering the year 2019 has included only papers published till end of April 2019, when the literature search for the present review has been ended) (see *Figure 14*).

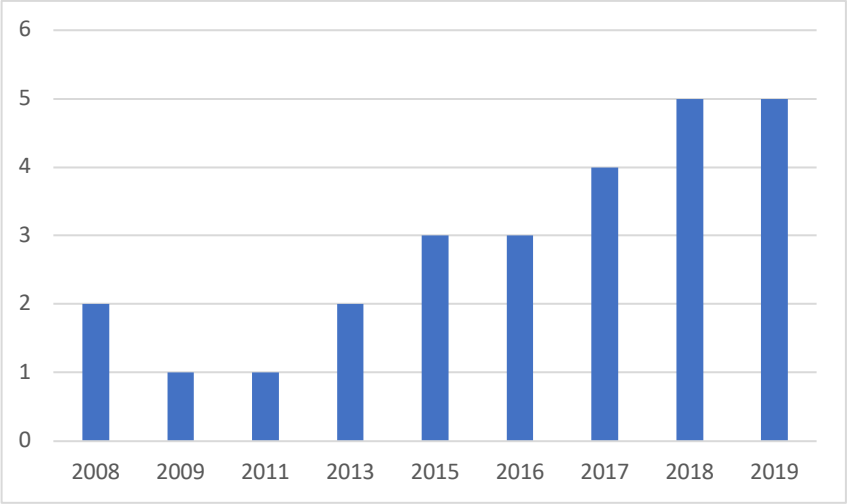


Figure 14: Number of publications included in qualitative synthesis by year of publication
(*n=26, search period: 2008 till April 24, 2019)*
Source: own elaboration.

Eight of the reviewed articles have been conceptual framework / concept papers, seven – review articles, while research articles and metrics papers represented three papers, each, and two reviewed articles were reports, with other types making up one article, each (see *Figure 15*).

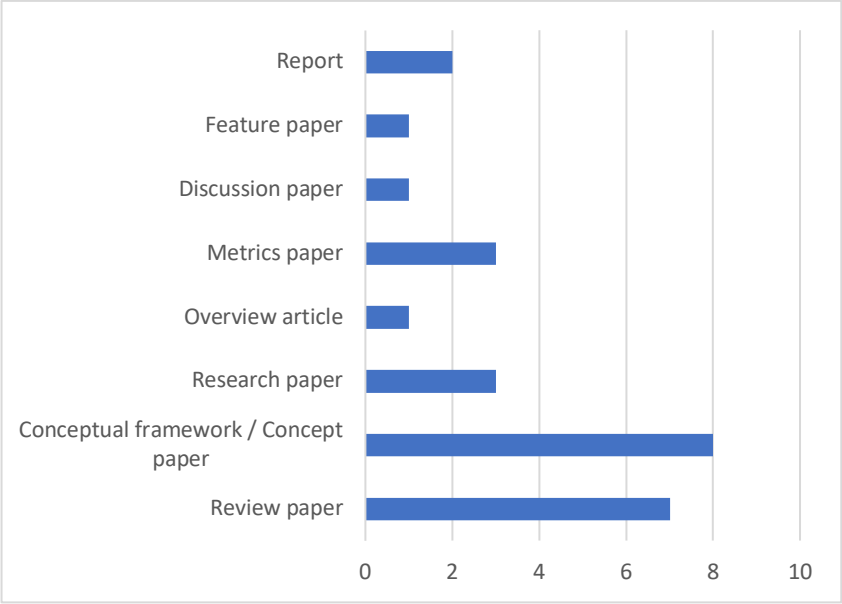


Figure 15: Number of publications included in qualitative synthesis by article type
(n=26, search period: 2019 till April 24, 2019)
Source: own elaboration.

3.2.2 Primary data collection

3.2.2.1 Expert round (mini-group expert discussion)

The expert round was the first primary data collection method employed in the research project at hand. The main aim was to identify the pattern of outcomes and the related SDGs addressed in OFSs at goal-level. For this purpose, four research assumptions on the potential outcomes of OFSs have been formulated based on the analysed literature, which provided a basis for the expert discussion. The expert round represented a mini-group expert discussion. This form is quite commonly used for expert discussions (Kepper, 1994, p. 71). In a mini-group expert discussion, several experts in the studied field gather together for a focused and substantial

discussion (Kühn and Koschel, 2011, p. 277). The given format was considered particularly appropriate due to the fact that it offers enough talking time available per participant to ensure that each expert would have enough time for sharing one's own experiences and opinion on the topic (ibid.). The presence of lower number of participants can facilitate "better and extensive probing into the subject matter", which was an important consideration given the expert round was the first primary data collection method in the present study (Sreejesh et al., 2014, p. 53). Furthermore, mini-group discussions create an atmosphere facilitating a better engagement of experts into discussed topic, with a more open and confident manner of handling the topic on the part of experts (Kepper, 1994, p. 71; Kühn and Koschel, 2011, p. 277).

For the purpose of expert round, the scope of the term "expert" was defined to refer to experts in a given field familiar with the studied subject (Cooke, 1992; McBride and Burgman, 2012). Six experts with a long-term experience in the organic sector from around the world have been invited to participate in the expert round. All of them were OFSP partners from the following countries: South Korea, China, the Philippines, India, USA and Norway. The expert round was carried out as part of the workshop "Organic Food Systems with focus on Asia", taking place on October 4, 2018 at the Department of Organic Food Quality and Food Culture of the University of Kassel in Witzenhausen. The workshop took place in the discussion room equipped with the oval shaped discussion table, a blackboard, beamer, pinboard and flipchart. Apart from the discussion on the OFS outcomes, the workshop incorporated other topics and presentations, including those by the experts (see workshop programme in Annex II-1).

First, the brief ten-minute presentation on FS outcomes was given by the researcher in order to familiarise the experts with the research topic to be discussed (see Annex II-3). Afterwards, the four

research assumptions (see *Table 3*) have been presented, which formed a basis for the discussion. The group discussion on the OFS outcomes took place three hours after the presentation on FS outcomes, after a lunch break and two other discussion rounds of the project team members (on actors and relations and on drivers of OFSs; see Annex II-1).

The duration of the expert discussion on outcomes was 45 minutes. At the beginning of the workshop, all participants signed the consent form for audio recording (see Annex II-4). Hence it was possible to make audio recording of the discussion round to avoid any potential loss of important information. The expert round has been moderated by the researcher, with the assistance of the first supervisor at that time, Prof. Dr. Johannes Kahl. Four research assumptions have been discussed with the experts (see *Table 3*).

Table 3: Research assumptions on outcomes of OFSs discussed during the expert round

Research assumptions
1. Analysis of literature, expert consultations, expert survey and interviews of FS key actors allow for identification of an OFS specific pattern of outcomes – protection of natural resources and enhanced resilience of ecosystems, improved livelihoods, revitalised community and improved health and nutrition security.
2. The SDGs can be identified as intended outcomes of OFSs through the analysis of literature, expert consultations, expert survey and interviews of FS key actors.
3. Based on the literature, expert consultations, expert survey and interviews of FS key actors the following SDGs find greater representation in OFS outcomes: SDG 2, SDG 3, SDG 4, SDG 6, SDG 8, SDG 12, SDG 13, SDG 14 and SDG 15.
4. The 20 interconnected actions proposed by FAO (2018) for FSs transformation are addressed in the OFSs outcomes to a high degree and can therefore lay down a basis for monitoring OFSs' transformation process.

Source: own elaboration.

During the round the pinboard was used for pinning down the additional themes (outcomes) suggested by the experts.
Furthermore, notes were taken by the moderator. For the third research assumption regarding the SDGs addressed in OFSs, supplementary material in a form of the UN poster with the 17 SDGs has been used. Here, the experts were asked to place red sticky dots (five per participant) at the poster on those five out of 17 SDGs that they perceived to be addressed in OFSs as intended outcomes. The dots have been then counted for each of the SDGs, with the total count per goal being written on a flipchart. During the discussion it turned out to be that the wording "intended outcomes" appeared to be misleading resulting in certain confusion among the experts. They thought they were asked about the outcomes that should ideally be addressed by OFSs ("desired" outcomes). Therefore, there was a need for a second voting on the SDGs that are currently addressed in OFSs, according to experts' opinion. The second voting was carried out straight after the first voting using blue sticky dots, again with five dots per expert. Therefore, the first voting represented the outcomes that should ideally be addressed in OFSs (or "desired" outcomes), while the second voting represented the outcomes that are perceived to be readily addressed in OFSs to date (for more details see results in chapter 4.2).

3.2.2.2 Web-based survey

The second primary data collection phase was a web-based survey conducted after literature review on the outcomes of OFSs and the expert round. The aim of the survey was to explore the perceived outcomes of OFSs as well as the OFS's contributions to the SDGs. The web-based format of administration has been chosen for a number of reasons. First of all, it is easier and less expensive to administer allowing for gathering answers from large numbers of

respondents relatively fast using dynamic elements and advanced visual features (TRB, 2006, p. 3; Couper and Bosnjak, 2010; Dillman et al., 2014, p. 303). Furthermore, the web-based design offers more flexibility to a respondent since survey can be completed at respondents' convenience (Shine and Dulisse, 2012; TRB, 2006, p. 3). Besides, the web-based format has become increasingly popular not least due to the fact that nowadays people are more accustomed to performing various daily activities online and are therefore more receptive to completing web-based surveys (Dillman et al., 2014, p. 301f). Some of the limitations of this format are coverage and non-response biases as well as non-deliverability of surveys due to email change (Shine and Dulisse, 2012; Couper and Bosnjak, 2010).

The survey used non-probability sampling since the aim was to explore the topic from the sample of population with specific characteristics, which can contribute to better understanding of the topic under study, namely the outcomes of OFSs (Lau, 2016). The chosen sampling approach combined judgement sampling with snowball sampling techniques (Kothari, 2004, p. 15). Regarding the former technique, the considered representative selection is based on the researcher's judgement (ibid). The selected target group were experts in the organic sector representing the value chain, research and academia, organic certification agencies and organic policymakers. For the purpose of present survey, the term "expert" was applied in its meaning of "expert of a given subject", or domain, or substantive expert (Cooke, 1992, p. 196). Such an expert can be defined as "(…) an individual familiar with the subject at hand and responsible for the analysis of the issues and providing judgements" (McBride and Burgman, 2012, p. 14). The identification of experts in this case aims at identifying persons whose work area encompasses the studied subject (Cooke, 1992, p. 196). For the purpose of present survey individuals professionally involved in the

organic sector have been considered experts in the organic food (systems).

The survey was based on a semi-structured questionnaire containing a combination of structured and open-ended questions for exploring the opinions and perceptions of the respondents (Simon, 2006). This type of questionnaire enables a combination of quantitative and qualitative information to be collected (Hague et al., 2004, p. 100). In closed-ended questions, respondents are offered to select from a list of predetermined answers, whereby multiple response questions allow for choosing more than one answer option at a time (Cargan, 2007, p. 93; Hague et al., 2004, p. 101). Open-ended questions are considered particularly suitable for exploratory research questions given the respondents are knowledgeable about the topic (Folz, 1996, p. 82). The open-ended form is generally used to get insights into what the respondents believe (Cargan, 2007, p. 94). In the present survey, open-ended questions mainly aimed at gathering specific examples of the OFS outcomes as well as the selected SDGs.

The web-based survey was a joint part of the research project on OFSs, and therefore it was jointly conducted by the project research team. The survey questionnaire consisted of several parts – an introduction, with general information and important definitions, a socio-demographic part and the three thematic parts based on three perspectives used by the project team to approach the OFS, namely actors and their relations, drivers and outcomes (see survey screenshots in Annex III-1). The common questionnaire consisted of 24 questions in total, four of which were socio-demographic questions (see Annex III-1). Initially, the outcomes part (present research project) included in the pre-test contained seven questions, two of which were conditional follow-up questions that were based on the previous answer given (questions 3 and 4, see Annex III-2). The last, seventh, question contained an option for not

answering, which was counted as a separate question later in the survey. Four questions were closed-ended, with two out of four containing open-ended parts for specifications on each of the answer options (see Annex III-2). One question was exclusively open-ended. Multiple response option was offered for all closed-ended questions. For the question regarding the perceived degree of OFS contributions to the 17 SDGs (see question 5, Annex III-2), the balanced rating scale was used. Such a scale uses an equal amount of positive and negative categories, with a neutral point at the centre of the scale (Babin and Zikmund, 2016, p. 295).

A pre-test of the first draft of the questionnaire has been performed between February 11 and 19, 2019. Eight persons took part in the pre-test, mainly academic employees of the Faculty of Organic Agricultural Sciences of the University of Kassel as well as three experts in the fields of FSs, nutrition and sustainability assessments. A few adjustments of the questionnaire have been undertaken based on the pre-test's results (see Annex III-2 and Annex III-3). First of all, all survey questions have been numbered and the definition of a FS as well as the OFS has been added to the introduction part of the survey (see screenshots part 2 in Annex III-1). Furthermore, in the first question from the outcomes section, the open-ended part was added straight after the chosen option to enable gathering the concrete examples of the selected outcomes (see screenshots part 5, question 8 in Annex III-1). Moreover, a graphic interval scale has been used for the third question about universality of the outcomes, which included universal applicability to 100% on the left end, regional applicability to 100% on the right end, and the 50/50 ratio – in the middle of the scale (see screenshots part 5, question 10 in Annex III-1). Finally, the fifth and sixth questions of the initial questionnaire have been merged so that the respondents would be able to provide concrete examples directly under the chosen SDGs (see screenshots part 5, questions

11 and 12 in Annex III-1). The questions on the outcomes received the question numbers 8 to 13 in the survey; one longer question was split into two pages and numbered separately (see screenshots part 5 in Annex III-1). Additionally, the open-ended question of the joint survey part on the personal understanding of an OFS (question 22 of the survey, see screenshots part 7 in Annex III-1) has been considered relevant for the present research project and hence analysed with regard to OFS outcomes (see chapter 4, subchapter 4.3.3).

After the final adjustments and editing, the survey was launched on February 26, 2019. The academic online survey platform EFS Survey (from UNIPARK and Questback) was used to design a web-based questionnaire and administer the survey. The software generated a personalised link to the given survey, which was included into the survey invitations. The survey invitation template was created, which has been slightly adjusted afterwards based on the target group, i.e. personalised message or general text (see Annex III-10, a). For circulating the survey invitation, the continental database of organic food sector has been created. This database was filled out based on online research about the organic sector in different continents of the world. This database was complemented by the multipliers (OFSP, IFOAM and Faculty of Organic Agricultural Sciences of the University of Kassel) as well as the researchers' personal organic network. Furthermore, on February 14, 2019 the research project team visited the international organic fair "Biofach" in Nuremberg, Germany, where some representatives of organic companies and associations, mainly European, have been personally invited, with the personalised email invitation being sent 12 days later once the survey was launched. All in all, 613 organisations and private persons and 18 multipliers have been invited to take part in web-based survey. It was assumed that the multipliers would be circulating the invitation in their organisations

(snowball method). Additionally, all survey participants were asked to circulate the invitation in their personal "organic" network.

Initially, it was planned to carry out the survey over the period of one month, which has proven insufficient due to the low response rate. Therefore, the survey deadline has been extended twice, with the reminders being sent to multipliers (see Annex III-10, b).
Furthermore, over this additional period of time the database has been gradually expanded through further online research. The final deadline was set for April 23rd, 2019, so that the survey has been conducted over the two months' period.

3.2.2.3 Multiple-case study

The last phase of the present research represented a multiple-case study. The focus was on exploring the particularity of the cases under study whereby multiple perspectives of participants (key actors of the cases) were of high value (Simons, 2009, p. 3f). Hence, the case study approach has been chosen in order to undertake an in-depth investigation of a contemporary phenomenon – the cases under study – "(…) within its real-world context (…)" relying on multiple data sources (Yin, 2014, p. 16f). Here, the documentation of the selected cases (master thesis projects, see research design in *Figure 12*) as well as other supporting literature were studied first. Three European cases have been selected for the multiple-case study – the bio-district Cilento in Italy, the Södertälje municipality in Sweden and Mouans-Sartoux municipality in France. The selection process was based on the specific criteria laid down at the beginning of the project. First and foremost, the cases should have been well established so that their transformation over time could be studied. Further selection criteria included the presence of clear geographical and jurisdictional boundaries (municipalities and districts), organic quality assurance (third-party certification and/or participatory guarantee system (PGS)), presence of internal

funding, and production diversity. Based on the preceding case documentation, it became apparent that the three European cases share certain similarities in that they all have started with sustainable public procurement engaging school canteens. This aspect qualified them for a multiple-case study with a literal replication, when the cases are selected predicting similar results (Yin, 2014, p. 57). Hence, each of the three selected cases represented a holistic case comprising part of the multiple-case study (ibid., p. 62).

The multiple-case study employed focus groups as a primary data collection method in order to reveal what the OFSs' key actors think about the complex subject under study (outcomes of OFSs) – the topic they might not have been attempting to articulate previously and could hence benefit from a group conversation (Wayne, 2013). Hence, self-contained focus groups have been conducted in this study with the aim to uncover the participants' opinions, attitudes, experiences and perspectives (Morgan, 1997, p. 20). Self-contained, or "stand-alone", focus groups are particularly appropriate if the purpose is to gather the respondents' perspectives on the research topic (Morgan, 2019, p. 20). This method allows for determining not only "(…) what participants think about an issue but also how they think about it and why they think the way they do" (Morgan, 1997, p. 20).

In addition to the self-contained focus groups making up the core part of the multiple-case study in the present research project, interview data from three analysed case studies collected by the master students have been analysed in the context of OFS outcomes. The data collection process will be briefly described in the subchapter below.

Semi-structured interviews with key actors

Semi-structure interviews with the key actors in three selected OFS case studies have been carried out by master students as part of their thesis projects between March 2019 and July 2019. Personal face-to-face as well as Skype-interviews were conducted. The initial nomination of key actors to be interviewed in each of the studied cases has been performed by the informant(s) of the respective case, which was later complemented by further nominations through snowball sampling. This sampling technique is generally applied to increase the sample size to that required for the study, which is done through asking interviewees to nominate further possible candidates to be interviewed (Handcock and Gile, 2011; Bartlett and Vavrus, 2017, p. 55; Wan, 2019).

Semi-structured interviews were employed to gather the perspectives of the key actors regarding their motivations to engage in the OFS, their relations with other actors of the system under study as well as the perceived OFS outcomes. Semi-structured interviews are overall consistent with the case study approach, allowing for in-depth structured conversations with diverse actors through a combination of prepared in advance questions and a certain degree of flexibility in ordering and asking them (Bartlett and Vavrus, 2017, p. 54f). For this purpose, an interview guide was used (see Annex IV-1). The guide contained questions assigned to three overarching themes – actors' motivations, relations and perceived OFS outcomes (referred to in the interviews as effects). In the bio-district Cilento the total amount of 15 key actors have been interviewed, in the Södertälje OFS – 27 and in the Mouans-Sartoux OFS – 28. Since the present study is focused on OFS outcomes, each of the interviews has been screened for eligibility with regard to the outcomes-related answers, which resulted in the reduced number of interviews that could be used for data analysis in terms of OFS outcomes (see chapter 3.3.4.1).

Focus groups

Focus groups are a qualitative data collection method representing a focused on specific issues interactive discussion involving a predetermined group of people (Hennink, 2014, p. 1). Focus groups aim at generating "(…) conversations that uncover individual opinions regarding a particular issue" (Cyr, 2016, p. 233f). This method is useful for collecting data about people's attitudes, perceptions, thoughts, experiences, knowledge and beliefs related to the topic of research (Watkins and Gioia, 2015, p. 59; Wayne, 2013). According to Bryman (2012, p. 501f), there are three distinct characteristics of a focus group discussion: first, it involves several participants and a moderator, second, an emphasis of the discussion is placed on in-depth exploration of a specific theme or topic and, third, the interaction within the group is in spotlight, with a group jointly constructing the meaning. Furthermore, the participants of a focus group bear certain characteristics that make them similar to one another in a way that is meaningful for the researcher, with this "homogeneity" being determined by the research purpose (Krueger and Casey, 2015, p. 6). One clear advantage of this method is the natural environment enabled by the focus group, where the ideas are generated through interaction, with participants influencing and being influenced by others and with an atmosphere facilitating a safer self-disclosure feeling (Krueger and Casey, 2015, p. 7; Watkins and Gioia, 2015, p. 59). This might be particularly helpful for discussing complex phenomena, when participants can tackle complicated concepts through working together (Cyr, 2016). The participatory aspect is the basic element of focus groups, with a dynamic discussion taking place and engaging all participants (Kumer and Urbanc, 2020). Not only do participants reveal their views and experience, they also listen to those of others having the chance to reflect on what has been said, which makes it possible to further consider an own standpoint (Finch

and Lewis, 2003). This facilitates generation of additional material triggered as a response to what has been heard (ibid.). Another distinctive advantage of focus groups is that they facilitate tapping into the multitude of various forms of communications used by people in their daily life communication, such as teasing, arguing, jokes, etc. (Kitzinger, 2006). These forms of communication help uncover people's knowledge and experience "(…) revealing dimensions of understanding that often remain untapped by other forms of data collection" (ibid., p. 22). The particular value of focus groups as a data collection method is in that they enable illuminating patterns of thinking, categories used for organising ideas as well as connections and images through which issues are conceptualised (Kitzinger, 1994). The number of participants in focus groups ranges from five to twelve, with reported real-life modifications of up to fourteen focus group members (Krueger and Casey, 2015, p. 6; Kumer and Urbanc, 2020).

Sampling and group composition for the focus groups

The focus groups within the present study employed purposive sampling when the participants are "(…) selected to reflect the range within the total study population (…)" (Kitzinger, 2006, p. 24). Here, the respondents with certain characteristics are purposely selected (Stewart and Shamdasani, 2014, p. 60). Purposive sampling is reported as a commonly used sampling technique in focus group research (ibid.). The group composition is determined by the research objectives and the purpose of the study (ibid.; Krueger and Casey, 2015, p. 79ff).

The selection procedure in the present study aimed at gathering together the key actors representing the main stakeholder groups of the case studies, with a particular attention being paid to the homogeneity between the groups, with the same/similar stakeholder groups being present in each of the focus groups. At

times, however, the individual key actors deemed important for a specific case represented a stakeholder group not found in other cases (e.g. tour operators in the bio-district Cilento). Homogeneity within the group was determined by the common characteristic all the participants shared – their role as key actors in the OFS system under study. Furthermore, the vast majority of respondents in each of the focus groups also knew each other well due to their daily work and close collaboration within the respective OFS. The focus groups can be hence considered "naturally occurring", enabling "(…) to observe the fragments of interactions that approximate to naturally occurring data (…)" (Kitzinger, 2006, p. 25). The groups were, however, heterogeneous in terms of range of professions and the roles of individual key actors. Such diversity within a group is beneficial so as to magnify exploration of various perspectives in a group setting and allow for contrasting answers (Kitzinger, 2006; Krueger and Casey, p. 81).

All three focus group discussions conducted within the present research project have been audio and video recorded, with the consent from each of the participants (see Annex V-4). Recording primarily aimed at enabling the researcher to assign statements to the participants during the transcription process while keeping track on the group dynamics (Bryman, 2012, p. 504; Morgan, 1997, p. 32).

Questioning route for the focus groups

For structuring the focus group sessions, a questioning route has been designed. A questioning route incorporates "(…) a list of sequenced questions in complete, conversational sentences" (Krueger and Casey, 2015, p. 43). The categories of questions that a questioning route should generally include are the following: opening question, introductory questions, transition questions, key questions, and ending questions (ibid, p. 44ff). For the purpose of

present research, the individual introduction of the participants has been used as an opening question (with the exception of the focus group session in Sweden, see section describing focus group session in Södertälje). The questioning route comprised eight broad question categories, with the first one representing the introduction, a second one serving as a transition, question categories three to seven representing the key categories and the eighth question category being the ending (see questioning route in Annex V-1). As the basis for the key part of the focus group discussions and as an additional aid for the participants, the Power Point slides have been designed, which incorporated possible outcomes of OFSs (addressed as “effects” in the focus groups to avoid potential confusion) within each of the outcome categories under question (see Annex V-2). There have been all in all five outcome categories, representing the broader clusters of outcomes. The specific outcomes have been put together and assigned to categories by the researcher in the preparatory phase for the focus group sessions. These outcomes represent the shortened version of the SDG targets of the UN 2030 Agenda. The researcher has been selecting the targets that have direct and/or indirect relevance in the FS context. The majority of implementation targets from SDGs 16 and 17 have been purposely omitted following the approach used by Le Blanc (2015). The total number of outcomes selected and assigned to the outcomes categories was 72 (see Annex V-5). These outcomes along with the question categories have been translated into Italian for the focus group in Italy (by the Italian translation bureau) and to French for the respective focus group (by the researcher with the help of DeepL translation software).

As alternative to the slides, large cards with the same outcomes as displayed on the slides have been prepared, printed and assigned to the five predetermined question categories. The use of series of statements printed on large cards has been suggested by Kitzinger

(2006) as a form of prompts helping the group to focus and initiate the discussion. This format has proven particularly helpful in the Italian focus group session (for more details see subchapter describing focus group in Cilento). Furthermore, the use of slides and cards aimed at streamlining the discussion towards SDG target-level, in accordance with the research objective. The estimated duration for each of the focus group sessions was two hours.

Focus groups' procedure

The focus group sessions within the multiple-case study of the present project consisted of five stages as described by Finch and Lewis (2003): scene setting and ground rules, individual introductions, the opening topic, discussion and, finally, ending the discussion. Within the first phase, the researcher introduced herself and briefly described the research project, its aims and affiliation as well as the topic of the focus group session. The participants were also thanked for their willingness to contribute to the discussion and encouraged to share their opinions and perceptions regarding the topic. In was also in the scene setting phase that the researcher distributed the consent forms for audio and video recording of the focus group session (see Annex V-4). Afterwards the opening part consisting of individual participants' introduction took place followed by the introduction question that incorporated the retrospective view of the OFS under study (see Annex V-1). Here, the participants who have been engaged in the system over a longer time period were asked to share their experience on how the system was established, with what primary objective and initial outcomes observed.

Afterwards, the transition category was introduced where the group was asked to focus on the first apparent outcome of the OFS under study (in each of the cases) – sustainable public procurement. Broadly speaking, the transition category was dedicated to the SDG 12 (Responsible consumption and production), with specific

focus on sustainable public procurement as the first observed outcome (target 12.7). The participants were encouraged to name any other effects they might have observed at the beginning phase of the OFS. Afterwards, the session embarked on the key question category of the focus group discussion – the five outcome categories along with their specific outcomes (SDG targets). The participants were asked to choose the effects they have observed or perceived in the OFS under study from the ones displayed on the screen and/or cards and briefly explain their choice. Furthermore, the group was encouraged to think of some other potential effects that might have been observed, but were missing on the slides and/or cards. Finally, in the ending phase of the session the participants were asked if they had any remarks, amendments or questions. Their contribution to the project has been acknowledges once again, and the participants have been thanked for their time and engagement. Whenever the time allowed, the participants have been asked about the OFS's goals and objectives for the near future.

The details and specifications on each of the three focus groups are provided in the separate sections below.

Focus group session in Italy: the bio-district Cilento

The focus group session with the key actors of the bio-district Cilento has been carried out on Friday, January 24, 2020, scheduled for the late afternoon / early evening time, between 4:00 p.m. and 6:00 p.m. The session has been scheduled through the case informant, who has also assisted with the nomination of stakeholder groups according to the researcher's selection (important stakeholders that were found missing in the initial case's documentation). The informant also translated into Italian language and circulated among the participants the invitation to take part in the focus group discussion (see Annex V-6, a). Thirteen persons

have been invited to the session taking into consideration the possibility of last-minute dropouts. It turned out to be that all thirteen participants were able to attend the session, however some of them needed to leave the session earlier while others joined the focus group with a significant delay.

The focus group discussion has been carried out in the meeting room of the seat of the bio-district Cilento in Ceraso, Italy. This was a medium-size room capable of accommodating fifteen people maximum. The room was equipped with a beamer with a projection screen and a flipchart. An elongated group discussion table has been placed in the centre of the room around which the participants have been seated facing the projection screen. Refreshments (mineral water) have been provided for the participants.

Due to the fact that the vast majority of participants were not able to speak English, there was a need for simultaneous translation of the focus group session. For this purpose, the researcher hired a professional interpreter from the local translation bureau in Ceraso, following the referral from the informant. Naturally, the simultaneous translation influenced the group dynamics and the conversation flow since the participants were asked to pause after each individual answer to facilitate the translation process. Consequently, the participants could not fully engage in an immediate dialogue waiting for the translation to be completed, which had an impact on the natural flow of discussion. Furthermore, the translation also slowed down the session significantly extending its duration (in the end the session lasted longer than planned, namely two hours and 45 minutes).

The focus group session began with a 20-minute delay since more than half of the participants have not arrived by 4:00 p.m. The introduction to the focus group was started when the majority of the participants were present. Since the session was delayed and took

longer than planned due to simultaneous translation, there has not been enough time allocation for the last two question categories, so that the participants were in a hurry to complete the session and hence did not pay due attention to these questions. The focus group session ended at 7:05 p.m.

Focus group session in Sweden: the Södertälje OFS

The focus group session with the key actors from the Södertälja OFS has been performed on Friday, January 31, 2020, scheduled for afternoon, between 1:00 p.m. and 3:00 p.m. The date has been offered by the case informant due to the fact that an annual event, MatLust conference, has been taking place in Södertälje on the previous days, so the key actors of interest were physically in Södertälje at that time and hence available for participation. The time slot has been chosen by the participants via virtual poll. Twelve key actors have been selected and invited to participate in the focus group (see Annex V-3). These persons have been invited via email with the attached invitation (see Annex V-6, b). Nine participants confirmed their attendance, and there was no possibility of extending the participants list. There were two dropouts. Due to an emergency on the farm, one participant – a biodynamic farmer – was not able to attend the session. He was interviewed by one of the project partners later (see section “

Face-to-face interview with a biodynamic farmer”). One further participant (a biodynamic farmer) who had previously confirmed his participation did not show up for the session. Therefore, seven participants attended the focus group discussion (see Annex V-3).

The focus group session was carried out in one of the conference rooms of Skillebyholm centre in Järna (locality belonging to Södertälje municipality, approximately 15 km away from Södertälje centre). Skillebyholm is a centre for biodynamic cultivation, education and SD (Skillebyholm, n. d.). The centre features an own

biodynamic restaurant. Based on this and due to the fact that the session was carried out straight after lunch time, the researcher decided to invite the participants for a joint lunch prior to the focus group session. The lunch was scheduled for 12.00 p.m. and provided the researcher an opportunity to get to know the participants and introduce herself and the project prior to the focus group discussion. Therefore, there was no need for the opening part and the introduction to the focus group discussion.

The conference room was bright and spacious with a total capacity of up to 35 persons. The room was equipped with a beamer, a projection screen and a flipchart. An elongated discussion table has been placed close to the screen, and the participants were seated around it facing the projection screen. Refreshments (spring water) and coffee have been provided for the participants.

All the participants were fluent in English, which made it possible to carry out the focus group discussion in English language. The session began on time, namely at 1:00 p.m. and lasted exactly two hours as scheduled, until 3:00 p.m.

Face-to-face interview with a biodynamic farmer (complementation to focus group session in Sweden)

Due to an on-farm emergency, the biodynamic farmer who had been confirming his participation in the focus group, was not able to attend the session. He has agreed, however, to be interviewed on his premises later. This interview has been conducted by the OFSP project partner who regularly visits Järna and knows this farmer. The interview was carried out on Saturday, March 14, 2020, between 10:30 and 11:15 a.m. The Power Point slides with five question categories, which have been shown during the focus group sessions, served as an interview guide for this follow-up interview. The interview has been audio recorded (with an oral consent at the

beginning of the interview), and the recording was then provided to the researcher for further transcription and data analysis.

Focus group session in France: the Mouans-Sartoux OFS

The focus group discussion with the key actors of the Mouans-Sartoux OFS took place on Thursday, February 13, 2020, in the afternoon between 2:00 p.m. and 4:00 p.m. Ten key actors have been selected and invited to participate in the focus group discussion. For this purpose, the invitation has been sent to the participants via email (see Annex V-6, c). The French translation has been prepared by the researcher with the aid of DeepL translation software. The invitation provided a link to a virtual poll in order to schedule the session based on the participants' availability. The best fitting option was then chosen based on the majority of votes in the poll. Nine participants confirmed their attendance, all of them did manage to attend the session. However, three participants confirmed their participation with a significant delay (last minute confirmation), which had implications for the translation process (see below).

The focus group session was carried out in the meeting room of the Mouans-Sartoux town hall. This was a bright medium-size room capable of accommodating approximately twenty people. The room was equipped with a beamer and a projection screen. An elongated discussion table was placed in the middle of the room, and the participants have been seated around it facing the projection screen. Refreshments (mineral water and organic juice) and snacks (nuts) have been provided for the participants.

The vast majority of participants were not fluent in English. Therefore, similar to the focus group in Italy, there was a need for a simultaneous translation. However, there appeared to be no possibility of hiring a professional interpreter in this case due to two reasons. First, the informant could not recommend any local

translation office. Second, since some participants made last minute confirmations, the focus group session was prepared one week before it was conducted, which made a search for a professional translator impossible. One of the focus group participants fluent in English and involved in international projects expressed his willingness to translate the session. This was, however, an unprofessional translation summarising the answers rather than translating them 1:1. The transcript of this focus group session was therefore handed over to a translation office in Kassel, Germany, for a professional French-English translation.

The focus group session began on time and lasted two hours and five minutes, with last five minutes taken up by the ending part, where the OFS's objectives for the future have been discussed.

3.3 Data analysis

3.3.1 Systematic literature review on food system outcomes

For the 26 articles selected for qualitative synthesis, the data extraction process has been performed, where the following information has been recorded in an Excel matrix: author(s), article's title and year of publication, article type, aim of the study, methodology, key findings and the outcomes covered as well as potential contribution of the article (see Annex I).

All in all, two approaches in addressing the FS outcomes in the reviewed literature have been identified – direct through describing the outcomes and/or classifying them and/or naming concrete examples, and indirect. In the latter the outcomes have been addressed indirectly through FSs performance metrics or, else, concrete examples without explicitly referring to them as "outcomes". Due to the fact that the present review also aimed at disclosing the role of FS outcomes in the FSs transformation, it has been considered feasible to identify the main thematic framings

underpinning the FS outcomes. For this purpose, the narrative synthesis in three steps has been performed as described by Petticrew and Roberts (2006, p. 170ff). In the first step, the description of the reviewed studies was organised into logical categories. The findings were then analysed within each of the categories (step two) and synthesised across all included studies (step three) (ibid.).

3.3.2 Expert round (expert mini-discussion)

Based on the aim of the mini-discussion, namely to adjust the research assumptions prior to conducting an online-survey, it has been considered feasible to create a detailed protocol of the expert round session, as suggested by Kühn and Koschel (2011, p. 203). The detailed notes taken throughout the discussion session as well as the audio recording of the entire session have been analysed, and the detailed protocol was considered sufficient. Furthermore, the flipchart sheets and the results of the voting procedure for the third research assumption photographed after the session have been used for analysing the data.

3.3.3 Web-based survey (Q)

After the online survey's launch period has expired, the raw data set has been saved as an Excel spread sheet and imported into SPSS, version 27.0 (IBM©). Afterwards, the steps recommended by Sue and Ritter (2007, p. 106ff) have been performed. Likewise, data cleaning has been performed, which included the deletion of the other parts of the online survey which were related to the research topics other than outcomes (namely, actors and relations as well as drivers of the OFS). This step was followed by data transformation (specification of missing values). Finally, the data from eight questions were analysed using descriptive statistics. Since the online survey aimed at collecting the answers on the OFS-specific

outcome groups as well as the SDG patterns, the descriptive statistics were used in order to categorise and summarise data in a meaningful manner (Holcomb 1998; Anthony 2011, p. 48). The results of the descriptive statistics from SPSS have been transferred to MS Excel spread sheet for building charts.

With regard to individual questions analysed, the question about the contributions of OFSs (see screenshots, part 5, question 8 in Annex III-1), which aimed at determining the patterns of outcomes addressed in OFSs, represented a multiple response question since the respondents were able to choose more than one outcome category through selecting “yes” within each of the offered answer options. Therefore, all provided answer options have been combined into a separated category named “Outcome_patterns”. Furthermore, the additionally offered category “others” as well as “prefer not to answer” have been added to the composite multiple response category. For the question about the concrete SDGs being addressed in OFSs, the mean values have been analysed since this was a rating question representing the scale from 1 (no contribution at all) to 5 (a very strong contribution), with an additional score of 6 for the option to not answer (see screenshots, part 5, questions 11 and 12 in Annex III-1).

The qualitative part (five questions in total including the last survey question about the meaning of the OFS) with open-ended questions has been analysed separately using computer assisted software package MaxQDA, versions 2018.2 (portable version) and 2020, release 20.3.0 (test version) (whenever feasible, i.e. in case the amount of responses qualified for computer assisted data analysis). Whenever the amount of collected answers allowed for it, content analysis has been performed using both concept- and data-driven coding approaches, as described by Gibbs (2009, p. 44f). Afterwards, the individual themes within each of the analysed questions have been presented graphically as code frequencies. In

most instances, however, the amount of answers collected was too low to perform coding using MaxQDA – in these cases the manual coding has been performed.

3.3.4 Multiple-case study

The multiple-case study included analysis of literature on the three European cases as well as analysis of primary data. Primary data included semi-structured interviews performed by the master students as part of the cases' documentation as well as data generated through focus groups conducted by the researcher. Data analysis for each of the data sources will be described below.

3.3.4.1 Semi-structured interviews with key actors

The transcripts from the master students who performed the initial case study documentation of each of the three cases, have thereby been used to perform own analysis focused on the OFS outcomes. Since the transcripts incorporated also other parts of the interviews not dedicated to the outcomes, editing took place so as to eliminate all the segments related to the topics other than outcomes. Where it has been detected that the answers provided for different perspectives (actor and relations as well as drivers, see Annex IV-1) contained OFS outcomes, these segments have been kept and transferred to the corresponding question.

Qualitative content analysis has been performed following steps recommended by Schreier (2014), namely selecting material, building a coding frame, segmentation, trial coding, evaluating and modifying the coding frame and, finally, presenting and interpreting the findings. It was during the selection phase that some interview transcripts have been filtered out due to poor interview quality or insufficient information provided on the OFS outcomes. The selected transcripts have been imported into computer-assisted qualitative analysis software MaxQDA 2020 (release 20.3.0) (test

version), where the coding has been performed. Coding involved both deductive and inductive approaches, with the former subsuming from the already existing concepts and the latter generating codes based on the data (Reichertz, 2014).

3.3.4.2 Focus groups

Data analysis process started with a 1:1 transcription. For transcribing, both audio- and video-recordings were used. The transcripts have been imported into computer-assisted qualitative analysis software MaxQDA 2020 (release 20.3.0), trial version. Computed analysis has been employed due to complexity of the data in order to ensure that the analysis strategy remains systematic and consistent (Krueger, 1998a, p. 25). Additionally, the notes taken during the focus group discussions have been also analysed. Video-recorded data have been later revisited to account for the flow of conversation, the tone of comments and the larger environment (i.e. comments from other participants), which ensured the corresponding limitations of the transcript-based analysis would be eliminated (Krueger, 1998a, p. 33f).

For analysing the data generated through the focus groups, a reconstructive-hermeneutic approach was employed, in which the material is not analysed based on the existing hypotheses or previously formed categories thus allowing to avoid approaching the data "(…) with preconceived classification systems and variables" (Rosenthal, 2018, p. 50f). Instead, the data from each focus group session was interpreted afresh, and the significance of any specific segment was reconstructed in the context of the process "interactive constitution" of this segment in the discussion as a whole (ibid., p. 50f). Reconstructive approach allows for the reconstruction of the implicit subject of research along with the implicit rules of social behaviour (Meuser, 2018).

The composition of the focus groups, which aimed at putting together a group of key actors who work together as part of the OFS under study and are hence in their familiar social context, allowed for creating the communicative context in which single participants refer to each other's statements and generate the meaning (Bohnsack, 2000, p. 22). Expressions of the participants build the basis for the reconstruction of an implicit guiding knowledge base (Meuser, 2018).

The use of thematic coding has been performed beginning with the first question and the first response and proceeding in a stepwise manner, response by response to then move to the next question until the data are exhausted, as recommended by Krueger and Casey (2015, p. 147). SDG targets represented the basis for coding. Apart from the SDG targets selected by the researcher prior to conducting the focus groups and displayed to the participants during the session (see chapter 3, subchapter 3.2.2.3, part focus groups), the complete list of 169 targets from the final list of proposed SDG targets (UN, 2016) has been consulted during coding process to ensure that targets that had not been included by the researcher, but appeared to be addressed by the participants would be incorporated.

To visualise the results, single-case models with code hierarchy (concept maps) were used. Furthermore, for analysing the frequencies of comments per focus group session, code-matrix-browser was used. The analysis remained purpose-driven and was guided by the focus groups' questions, as recommended by Krueger (1998a, p. 23) and Krueger and Casey (2015, p. 138f). The reconstructed meaning attributed by the participants was assigned to the themes of the respective outcome categories (as presented to the participants during the session, see Annex V-2). Sometimes this was a direct assignment as specified by the participants themselves, while in other instances the meaning of statements was

reconstructed by the researcher based on the theme, in accordance with Meuser (2018).

4 Results

4.1 Systematic literature review on food system outcomes[1]

4.1.1 Food system outcomes: classification

The FSs literature addresses the outcomes linking them to the FS activities referring to “what we get” (the outcomes) from “what we do” (FS activities) (Ingram, 2011, p. 419; UNEP, 2016, p. 31). Although the classification of FS outcomes varies from author to author, yet, regardless of the differences the outcome categories can generally be assigned to four broad groups: FNS (or health pillar) and the three pillars of sustainability, namely environmental, social and economic, which is the representation used by Niles et al. (2017). The earlier classification by P. Ericksen (2008) presented FS outcomes as contributions to food security, social welfare, and environmental security, with social welfare incorporating both social and economic aspects or determinants of food security (Ericksen, 2008). More recent publications differentiate between FNS, socio-economic and environmental outcomes (Bortoletti and Lomax, 2019). As the FSs literature was acquiring more sustainability-oriented and transformative character, new classifications emerged, for instance, the “desired” (Whitfield et al., 2015; Béné et al., 2019; Ruben et al., 2019) or “emergent” outcomes (Eakin et al., 2017), or, else, “intended” (Johns et al., 2013) or “expected” sustainable FS outcomes (Bortoletti and Lomax, 2019).

4.1.2 Main discourses framings the food system outcomes

To disclose the role of FS outcomes in the FSs transformation, the main thematic framings underpinning the outcomes have been

1 Stefanovic, L., Freytag-Leyer, B., and Kahl, J. (2020): Food System Outcomes: An Overview and the Contribution to Food Systems Transformation. In: Frontiers in Sustainable Food Systems, Vol. 4, doi: 10.3389/fsufs.2020.546167

identified using narrative synthesis as described by Petticrew and Roberts (2006, p. 170ff). Six broader discourses were identified spanning from food (and nutrition) security and global environmental change to resilience, sustainability, the overall FSs performance and, finally, transformation (see *Table 4*). The following sections provide a brief description of these discourses highlighting the corresponding outcomes.

Table 4: Classification of food system outcomes and their discourse framings

Discourse framing	Food system outcomes / performance criteria addressed	Concrete outcomes / Performance characteristics	References
FNS	FNS, social welfare, environmental security; indirect and/or unintentional outcomes; nutritional, environmental, social and economic outcomes	Food access, availability and utilisation, nutrient and diet, socio-cultural wellbeing (gender equity, respect for community rights, etc.), income and employment, wealth, equity, ecosystem services, ecosystem stability, waste and loss reduction, food safety, etc.	Ericksen, 2008; Ingram, 2011; Ingram et al., 2013; Gustafson et al., 2016; Zurek et al., 2018; Allen et al., 2019.
FSs and global environmental change (GEC)		Potential outcomes of CC mitigation: small-scale livelihoods, nutritional outcomes, food safety, improved pasture quality and animal health, etc.	Ericksen, 2008; Ingram, 2011; Niles et al., 2017, 2018.
Sustainability	Sustainable FS outcomes and attributes; social and ecological performance measures; desired outcomes of a SFS versus outcomes with unintended negative consequences / unsustainable outcomes emergent outcomes of a SFS; "sustainability space"	FNS, equity, accountability, CC resilience, biodiversity, stability, health and wellbeing, community empowerment, secure livelihoods, agroecological integrity, food sovereignty, food democracy, etc.	Ostrom, 2009; Whitfield et al., 2015; Allen and Prosperi, 2016; Gordon et al. 2017; Eakin et al., 2017; Niles et al., 2017; Niles et al., 2018; Béné et al., 2019.
FS performance / metrics for FS(S) assessment	Sustainability outcomes; FS effects: direct and indirect, intended and unintended; sustainable nutrition security performance; holistic SFS performance	Ecosystem stability (including (agro)biodiversity, GHG emissions), resilience, socio-economic benefits and costs / socio-cultural wellbeing (fair and just conditions for FS actors, wealth distribution and equity, animal welfare), diets and consumption patterns (including dietary diversity), etc.	Pelletier, 2015; Nesheim et al., 2015; Allen and Prosperi, 2016; Gustafson et al., 2016; Prosperi et al., 2016; Landert et al., 2017; Zurek et al., 2018
Resilience	Ecological resilience and community resilience; resilience-based FSS; agroecological principles and resilience	Enhanced biodiversity and adaptive capacity, human / community health and wellbeing, self-sufficiency and deliberate learning, food security, human and ecosystem health	King, 2008; Allen and Prosperi, 2016; Prosperi et al., 2016; Schipanski et al., 2016.
Transformation	Transformational "wedges" for leveraging FS resilience; FS outcomes contributing to sustainability, resilience and equity; intended outcomes; expected outcomes; short-term and long-term outcomes	FNS, healthy and nutritious diets, nutritional health and wellbeing, reduced waste, increased equity and justice, promoted community-based socio-economic development, increased (agro)biodiversity, ecosystems regeneration, CC mitigation, social justice, etc.	Johns et al. 2013; Schipanski et al., 2016; Caron et al., 2018; Lindgren et al., 2018; Vaarst et al., 2018; Ruben et al., 2019; Bortoletti and Lomax, 2019.

Source: Stefanovic et al., 2020.

4.1.2.1 Food and nutrition security and global environmental change

Although FNS and GEC are two separate narratives, often they are handled concurrently due to the increased recognition of their interrelations. The vast majority of literature within these discourses considers FNS as a primary FS outcome (Ericksen, 2008; Ingram, 2011; Ingram et al., 2013; Allen et al., 2019). Food security is defined as a situation „when all people, at all times, have physical and economic access to sufficient, safe and nutritious food that meets their dietary and food preferences for an active and healthy life" (FAO, 1996). The definition addresses four pillars of food security – physical availability of food, access to food (physical and economic), food utilisation and stability of the food supply (FAO, 2008). However, since stability is interlinked with availability and access, sometimes the stability pillar is left out (FAO, 2006; Charlton, 2016). Concurrent GEC discourse examines the complex interactions between FSs and GEC. GEC is defined as changes in the environment (both biogeophysical and physical) due to natural causes or human activities (urbanisation, deforestation, etc.) (GECAFS, 2008). Not only does this discourse address the two-way interactions between FSs and GEC – the interactions between other components of FSs and GEC as well as the arising feedbacks are also considered (Ericksen, 2008; Ingram, 2011). Particular attention is drawn to the interactions between GEC and food security, with the intent of enhancing food security without compromising the ecosystem services (Ericksen et al., 2010; Ingram, 2011). With weather extremes and increasing temperatures over the past decade the topic of CC and its interrelations with the FS gained in importance, both within and outside the GEC discourse. Likewise, Niles et al. (2017; 2018) present the FS-CC interplay and show the potential for CC mitigation and adaptation with possible contributions of each of the FS's components as well as system-

level implications. Furthermore, some potential outcomes of mitigation opportunities are outlined (see).

4.1.2.2 Sustainability and food system (sustainability) performance

Although sustainability and FSs performance have been identified as separate discourses, they will be discussed jointly due to the fact that the performance assessments attempt to evaluate the FSS. FS outcomes hence represent a vital part of both discourses. Likewise, Allen and Prosperi (2016, p. 960) link the notion of sustainability to the outcomes arguing that sustainability "is about maintaining and/or enhancing essential functions or outcomes over time, taking into account environmental, social, and economic constraints and assets". Similarly, Eakin et al. (2017, p. 759) stress that it seems appealing to define FS sustainability "in terms of maintaining critical system functions". The sustainability discourse is laying down the desired attributes of a sustainable FS through setting prerequisites, boundaries or, else, making concrete suggestions, which can be ultimately used for performance assessments. Building upon the concept of planetary boundaries, Whitfield et al. (2015, p. 1293) introduce the concept of multidimensional sustainability space incorporating the myriad of ecological and social boundaries acting as "limits of acceptable compromises for a system". The concept is closely related to the concept of resilience – the system's ability to absorb shocks and maintain integrity regenerating after a disturbance, which is why resilience is often listed among the desired outcomes of a SFS (Allen and Prosperi, 2016; Béné et al., 2019, etc.). This renders resilience to a vital part of FSs performance discourse, where it is viewed as an intrinsic characteristic of the system (Prosperi et al., 2016). It can be also viewed as an important dimension of FSs performance, thereby carrying potential for the identification of variables conducive to

ensuring the sustainability of FS outcomes that can be applied in the assessments (ibid.; Nesheim et al., 2015).

Building on the social-ecological systems research, the efforts are made to articulate sustainability performance using concrete attributes and principles. Likewise, Gordon et al. (2017) suggest reinforcing sustainability and health outcomes through improvements in food production and consumption while enhancing the biosphere outcomes could be accomplished through FSs "rewiring". Essentially this conceptualisation links biosphere and health outcomes through the FS differentiating between multiple levels within food environment – individual, community, national and global. This differentiation is also found in conceptualisation by Eakin et al. (2017), however here it is taken to the next level bridging natural capital, social welfare and economic viability, with the evident prominence of the social dimension. The authors identified five FS sustainability attributes for streamlining FS activities towards the "emergent" outcomes: modularity, diversity, innovation, congruence and transparency. Furthermore, the socio-cultural aspect has been stressed within the congruence (ibid.).

Another strand of literature offers concrete metrics for assessing the FSS performance. For instance, metrics for assessing sustainable FNS are proposed, with the holistic character of the offered approach qualifying it for the assessment of the entire FS (Gustafson et al., 2016; Zurek et al., 2018). While the proposed assessment metrics from Gustafson et al. (2016) seem to build upon social, ecological and food security dimensions, the integrated approach offered by Zurek et al. (2018) adds the economic pillar. The latter assessment approach proposes a sustainable FNS visualiser based on people, planet and profit approach incorporating equitable conditions, balanced and sufficient diets, reduced environmental impacts and competitiveness of the agri-food business (ibid.). Both assessment approaches explicitly incorporate

social wellbeing and equity as part of the assessment and have the potential of revealing synergies and trade-offs among potential interventions. Furthermore, Gustafson et al. (2016) included animal welfare as an indicator in this category – the issue otherwise insufficiently addressed in the discourses. Finally, combining the variety of existing assessment approaches Landert et al. (2017) propose a holistic method for evaluating the sustainability performance of FS governance. The assessment results display the potential areas of action in four subthemes: good governance, economic resilience, environmental integrity and social wellbeing (ibid.).

4.1.2.3 Resilience

The resilience discourse is closely intertwined with the sustainability narrative and at the same time seems to be deeply entrenched in the performance discourse as was previously described. However, if the previous discourses viewed resilience rather as a vital system's characteristic, the present discourse incorporates it as a central component and, often, an outcome, which translates into the notion of a resilient FS. Resilience stands for "the ability of a system and its component parts to anticipate, absorb, accommodate, or recover from the effects of a hazardous event in a timely and efficient manner by ensuring the preservation, restoration, or improvement of its essential basic structures and functions" (Allen and Prosperi, 2016, p. 959). These properties are vital for ensuring the sustainability of FS outcomes. Often resilience is linked to agroecology with a distinct community-based approach (King, 2008; Schipanski et al., 2016). Furthermore, King (2008) differentiates between ecological and community resilience and provides an overview of three models of resilience – engineering resilience, ecological resilience and resilience as adaptive capacity. The latter along with the enhanced socio-ecological links are stressed as

crucial FSs attributes for enduring short-term volatility and withstanding pressures (Schipanski et al., 2016).

4.1.2.4 Transformation

This discourse looks at possible transition pathways to SFSs. Although the vision of a transformed FS as well as the concrete suggestions vary, certain commonalities clearly stand out. For instance, community-based approaches underpinned by agroecological and city-region concepts are offered as a transformation strategy capable of facilitating the transition to a regenerative and resilient, agrobiodiverse, food secure, equitable and healthy FS with higher wellbeing of rural communities (Schipanski et al., 2016; King 2008; Vaarst et al., 2018). Moreover, a stronger focus on the interplay of resilience and institutions through agroecological approach is also put forward, which should better address issues like the right and access to natural resources and ecosystems services (Vaarst et al., 2018; Niles et al., 2017). Closely related to the latter is the next commonality: similar to the majority of previously discussed narratives, resilience is distinctly incorporated as one of the transformational principles or attributes (Niles et al., 2017; Vaarst et al., 2018; Ruben et al., 2019). Here, an important differentiation has been made by Vaarst et al. (2018) who stressed various levels of resilience in ecological, institutional and social realms as well as at individual and populations level suggesting to treat health as resilience. Moreover, multiple publications emphasise an important contribution to various levels of resilience including equity, inclusiveness, health, but also agrobiodiversity and economic growth through a stronger focus on smallholders and traditional communities (Johns et al., 2013; Niles et al., 2017; Schipanski et al., 2016). The latter is intertwined with addressing the rural-urban links through the renaissance of rural territories (Caron et al., 2018). This not only aims to enhance the

inclusiveness aspect, but also seeks to improve FNS along with environmental protection, social welfare and economic growth (ibid.; Vaarst et al., 2018; Johns et al., 2013). The contribution to at least seven goals of the 2030 Agenda is simultaneously achieved (Caron et al., 2018). Another important leverage point for the transformation is seen through the adoption of sustainable consumption patterns, which could bring in far-reaching effects benefiting health and all the sustainability dimensions (Caron et al., 2018; Lindgren et al., 2018; Gordon et al., 2017). Finally, collaborative policymaking and governance for SFSs is vital, which should be based on a systems approach, a long-term outlook and the emphasis on outcomes as a starting point of transformation (Bortoletti and Lomax, 2019).

4.1.3 Food system outcomes and their potential role in transforming the food system

All discourses emphasise a vital role of systems approach, stressing the importance of existing interactions, feedback mechanisms and potential trade-offs. This should necessarily find reflection in transformation strategies. The FNS and GEC discourses bring forward the FNS as a principal FS outcome while addressing the interactions with GEC and the related environmental security outcomes. Sustainability and FSs performance discourses lay down specific properties and attributes making up a set of “desired” outcomes of SFSs. Moreover, quite promising multidimensional indicators and holistic assessment tools are suggested. However, the focus is placed on measuring sustainability using quantifiable parameters. The eponymous discourse addresses resilience as a property or an outcome of SFSs often linking it to agroecology. Resilience, however, is present in other discourses as well suggesting that it should deserve a closer consideration for the transformation. As an intrinsic system’s characteristic and a transformative principle, resilience bears potential for leveraging the

"intended" outcomes. Here, agroecological and city-region approaches could unlock potential of a truly systemic approach to FS outcomes. A focus on smallholders and rural communities allows these approaches to activate synergetic outcomes. Coupled with dietary changes, this could bring in a multitude of "desired" outcomes simultaneously achieving several SDGs.

4.2 Expert round

The expert round on outcomes of the OFSs aimed at discussing four research assumptions. The emphasis was placed on determining whether or not the SDGs can be perceived as intended outcomes of the OFSs, while seeking to uncover the common pattern of outcomes that can be addressed in OFSs, regardless of geographic and economic conditions.

The first research assumption (see *Table 3* in Chapter 3.2.2.1) was agreed upon, with a few adjustments made to it. First, experts advocated for adding the word "food" to "nutrition security" so that the largely accepted in the academic community and used in the United Nations reports term "FNS" would emerge. Second, the participants chose to add "inclusive governance and leadership" as an additional group of outcomes in the first research assumption. However, there appeared to be a doubt whether or not it is a good idea to name these concrete outcomes at the beginning or to rather stay more open in terms of collecting the opinions and perceptions so that the pattern would emerge.

Regarding the second research assumption, it has been agreed upon that this would rather be a "SDG-trajectory" that is intended in OFSs, which can be explained by the fact that the sustainability goals are inherent in the organic principles. However, since the organic principles had been formulated before the SDGs were laid down, it was found somewhat misleading to use the exact phrasing

of the second research assumption. Hence, it has been agreed upon that the wording “SDG-trajectory” would be more suitable to avoid any potential confusion in this regard (for details see protocol of the expert round in Annex II-2).

In order to discuss the third research assumption, a voting procedure has been carried out. The experts were asked to vote for the five SDGs, each, that, in their opinion, find a greater representation in OFSs as a central pattern of outcomes. The exact voting procedure has been described in chapter 3 (see subchapter 3.2.2.1). Since the results of the first voting appeared to represent rather desired than the current outcomes addressed in OFSs, a second voting has been initiated. Therefore, it has been decided that a differentiation has to be made between those outcomes that should ideally be addressed to a greater extent in the OFSs (“desired” outcomes) and the ones that are currently addressed to a high degree, according to the experts. The results of both voting rounds are displayed in *Table 5*. While responsible consumption and production, elimination of poverty and hunger as well as the promotion of health and wellbeing appeared to be linked to the “desired” outcomes of OFSs, the current outcomes were perceived to be quite different (see highlighted in green bold numbers in *Table 5*). Among the SDGs that currently find a greater representation in the organic sector, the majority of experts chose climate action, responsible consumption and production along with life on land, good health and wellbeing coupled with partnerships for the goals (see highlighted in red colour bold numbers in *Table 5*) (see also Annex II-2).

Table 5: Voting results on the top five SDGs highly represented in the OFSs

SDG and its title	Number of votes in voting round 1 ("desired" outcomes in OFSs)	Number of votes in voting round 2 (outcomes currently addressed in OFSs)
SDG 1: No poverty	**5**	2
SDG 2: No hunger	**5**	3
SDG 3: Good health and wellbeing	**4**	**4**
SDG 4: Quality education	2	1
SDG 5: Gender equality	0	0
SDG 6: Clean water and sanitation	0	0
SDG 7: Affordable and clean energy	3	0
SDG 8: Decent work and economic growth	0	2
SDG 9: Industry, innovation and infrastructure	0	0
SDG 10: Reduced inequalities	3	0
SDG 11: Sustainable cities and communities	0	2
SDG 12: Responsible consumption and production	**6**	**5**
SDG 13: Climate action	2	**6**
SDG 14: Life below water	0,5	1
SDG 15: Life on land	2,5	**5**
SDG 16: Peace, justice and strong institutions	2	0
SDG 17: Partnerships for the goals	2	**4**

Source: own data generated during the expert round with six experts of the OFSs.

The voting process revealed certain discrepancies in the way the experts perceived the SDGs in relation to the outcomes of OFSs. Likewise, the voting uncovered a great degree of variation in the

general perception of the SDGs among the experts. The differences were partly explained by the fact that the voting has been carried out on the level of goals as opposed to targets under the SDGs. Here, for instance, the example of a broad representation of the food waste theme under the SDG 12 (Responsible consumption and production) has been named. The goal level of the SDG 12, however, does not necessarily imply this high prominence of the food waste topic. Therefore, for instance, if one would vote on the target-level, the results would differ, as was explained by one of the experts:

> *When looking at the actual targets for goal number 12… like half of them are about minimising waste (...) In my brain, I did not unpack all of that... I would not have voted for that. I just wonder, how well other people who are going to be questioned are going to understand what all the goals are all about?* (Expert 5).

There was a certain criticism of the siloed approach within the goals, with the example of the environmental dimension being separated from other goals. The voting procedure uncovered a certain degree of "prioritisation" with regard to addressing the SDGs in OFSs. For instance, it has been emphasised that responsible consumption and production along with quality education should be first reached before one can proceed to targeting sustainable cities and communities. This has been explained by two experts as a justification for the low rating of the SDG 11.

Finally, the fourth research assumption has been discussed. Since the experts appeared to be unfamiliar with the 20 interconnected actions laid down by FAO (2018), they recommended not to use these actions as part of the last research assumption. Instead, it has been suggested that the emphasis would be placed on the independent character of the central pattern of the OFS-specific outcomes. Here, the experts agreed that there would be a common pattern of SDGs, which would be addressed in any OFS across the

globe, regardless of cultural, geographic or socio-political conditions. The experts named such OFS-specific pattern a "nucleus" (see Annex II-2). Some additional SDGs, on the other hand, would add to the pattern and vary across continents as well as cultural and political conditions, according to the experts. Based on this, the fourth research assumption has been reformulated accordingly (see *Table 6*).

The results of the expert discussion represented suggestions on the potential adjustments of the research assumptions (*Table 6*). These suggestions have been considered not only in the process of research assumptions' reformulation, but they also laid down the basis for a questionnaire design for conducting a web-based survey (Q) (see subchapter 4.3).

Table 6: Suggested adjustments to the research assumptions as recommended by participants of the expert round

N	Adjusted research assumptions as resulting from expert round
1	Analysis of literature, expert consultations, expert survey and interviews of FS key actors allow for identification of an OFS specific pattern of outcomes: protection of natural resources and enhanced resilience of ecosystems, improved livelihoods, revitalised community, inclusive governance, improved health and FNS.
2	The SDG-trajectory can be identified in OFSs as intended outcomes.
3	The following SDGs find greater representation in OFS outcomes: SDG 13, SDG 12 and SDG 15, SDG 3 and SDG 17
4	The pattern of outcomes is largely independent of geographical and cultural conditions.

Source: own data generated during the expert round with six experts of the OFSs.

Considering all the comments made by the experts throughout the discussion round as well as certain discrepancies with regard to the perceived degree of the SDGs' representation in OFSs, it was

decided to adjust the research assumptions in a way that would allow for staying more open in terms of potential pattern of outcomes as well as the SDGs. Therefore, the research assumptions were reformulated so as to give more room for the selection of outcomes and SDGs differing from those revealed through the literature and expert round. The reformulated research assumptions are presented in *Table 7*.

Table 7: Final research assumptions for the study

N	Final research assumption
1	Analysis of literature confirmed by expert consultations, expert survey and focus groups with the key actors allow for identification of OFS-specific groups of outcomes.
2	The pattern of outcomes is largely independent of geographical and cultural conditions[1].
3	Outcome patterns found in the OFSs allow for the identification of the Essential Variables (EVs)[2].
4	The outcomes of OFS are related to specific SDGs (analysed on the level of targets).
5	The identified EVs and their relation to the SDGs lay down the basis for monitoring the FS transformation[2].

Source: own data generated based on analysis of existing literature and the results of expert round.

Remarks: 1 – since only European case studies have been selected for the multiple-case study, this research assumption has not been followed up on; 2 – since the research design did not foresee any validation of the conceptualisation, the EVs have not been pursued, and the respective research assumptions have focused on patterns' identification.

4.3 Web-based survey (Q)

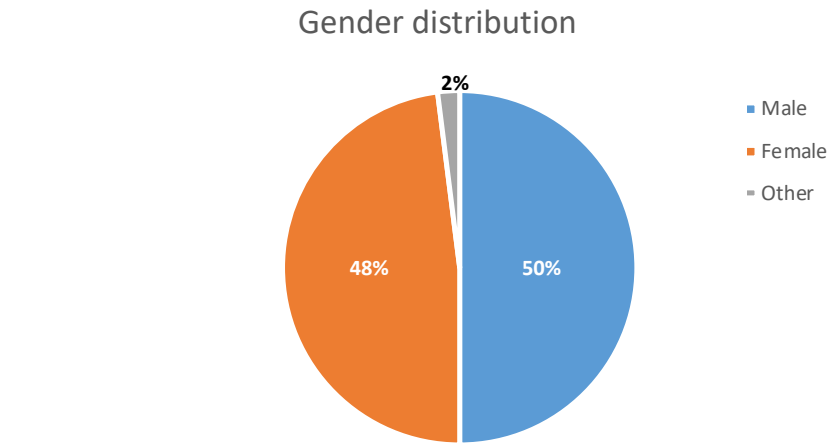
Web-based survey has been jointly performed by the research project team, as was previously mentioned. The survey questionnaire incorporated three perspectives in total, with two more perspectives, apart from the outcomes. The questions for the outcomes part were incorporated in the middle of the joint

questionnaire following the drivers and preceding the actors and relations. It appeared to be that a significant part of the respondents, who have begun the survey did not reach the outcomes part (see the dropout rate in Annex III-4). The general overview of the respondents who completed the online survey is provided in the next section followed by the overview of the results of the quantitative part on the outcomes of OFSs and finalising with the summary of the findings from the qualitative part.

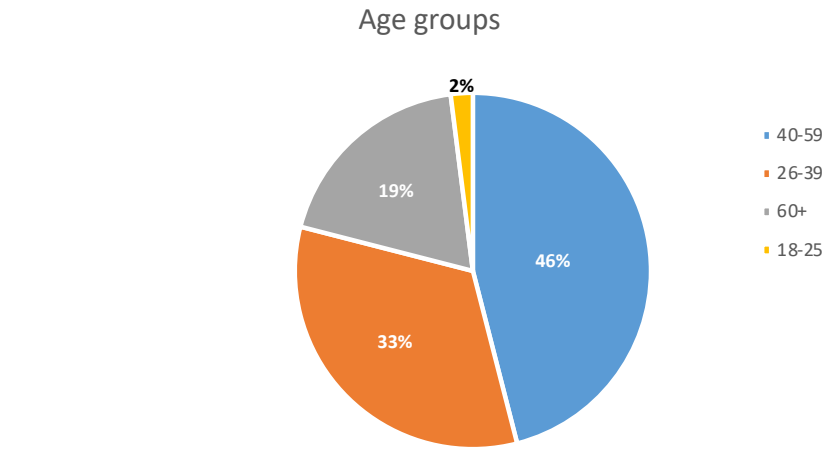
4.3.1 General overview

The total amount of 124 respondents completed the survey, including the outcomes part. In spite of the overall higher number of respondents who have started the survey, the dropout quota turned out to be quite high (see Annex III-4). This might be explained by the complexity of the survey and the resulting lengthy time required for completing it. There might have been some technical issues hindering the completion. The researcher, who has been indicated as a contact person for the matters related to the survey, has received an email from one respondent who stated that he could not complete the survey due to a technical glitch.

Gender distribution of the respondents indicates a balanced participation from both genders (see *Figure 16, a*) (table of frequencies is shown in Annex III-5). The vast majority of survey participants comprised the group of 40-59 year olds (46%) followed by the group of 26-39 year olds (33%), which suggests that the respondents do qualify to be considered experts in the organic sector as it was intended, judging from the fact that almost all survey participants were in the age range between 26 and 60+ (see *Figure 16, b*) (table of frequencies is shown in Annex III-5).



a) n=124

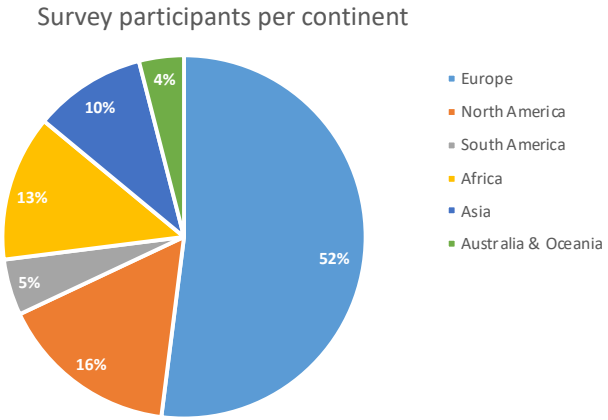


b) n=124

Figure 16: Gender and age distribution of the survey respondents
Source: own calculations.

The continental distribution of the survey participants was not balanced. Slightly more than half of the total amount of respondents were Europeans followed by North Americans and Africans (see *Figure 17*) (table of frequencies is shown in Annex III-5). This might be explained by the higher approachability of the Global North

(partly explained by the personal network) as well as better internet coverage coupled with the absence of connectivity interruptions. Furthermore, a high percentage of contact information found through the desk research appeared to be invalid, and a lot of email invitations were bouncing back (particularly in Asian, African and some of the Oceanic countries).



n=124

Figure 17: Continental distribution of the survey participants
Source: own calculations.

The respondents were also asked which OFS actor group they represent (see screenshots, part 3, question 1 in Annex III-1). This question allowed for choosing multiple answers. The majority corresponding to 50% of the respondents (62 answers) appeared to be consumers of organic food, while 48% (59 answers) indicated their affiliation to OFS production activities (see *Figure 18*).
Category "other" chosen by 36% of respondents (45 answers) was mainly comprised of representatives of research and academia, education, administrative positions as well as advocacy groups and NGOs (see *Figure 18*). 27% of respondents (34 answers) represented distribution, marketing and retail sector, while 24% of respondents (30 answers) worked in organic processing. Lastly,

11% of respondents (14 answers) were involved in organic waste management or input supplies (see *Figure 18*) (table of frequencies is shown in Annex III-5).

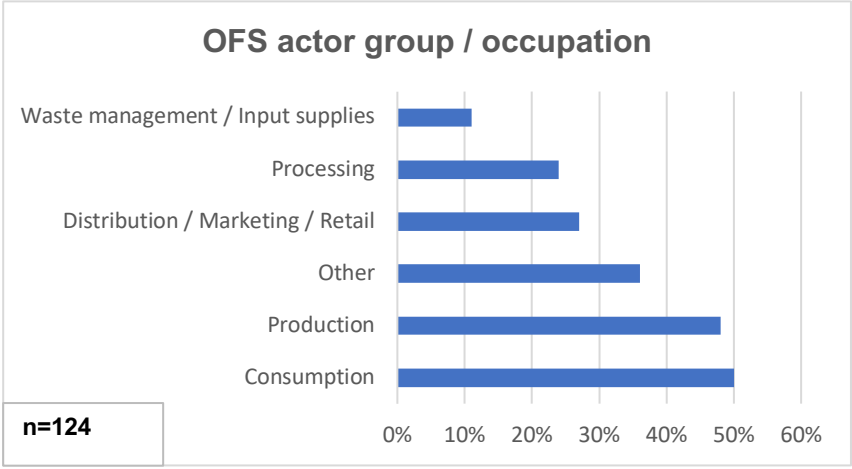


Figure 18: Overview of respondents' role in / affiliation to the OFS
Source: own calculations.

4.3.2 Quantitative part of the survey

The quantitative part of the survey dedicated to the OFSs outcomes consisted of four questions (considering the longer question about the SDG contributions numbered as two questions in the survey as one single question), with three out of four questions containing also an open-ended part (described in subchapter 4.3.3). Results of the closed-ended question parts will be discussed in the same sequence the survey questions were posed.

Contributions of OFSs

The first question in the outcomes part of the survey (see screenshots, part 5, question 8 in Annex III-1) aimed at determining the outcome categories (or patterns) resulting from OFSs. The question allowed for multiple responses and offered an option for a

negative answer as well as an option for not answering. The results are presented in *Figure 19* as combined frequencies under consideration of multiple responses. Since there were two missing answers for this question, the total amount of valid answers is 122. The majority of survey participants considered ecosystem stability as a primary outcome category addressed by OFSs, with the corresponding frequency of 75% (91 respondents) (table of frequencies is shown in Annex III-6, a). Health and nutritional status have been named by 71,3% (87 respondents), FNS – by 70,5% (86 respondents). These three outcome categories can be hence viewed as the top-three since they have been stated by more than 70% of the respondents. Furthermore, more than half of the survey participants have named dietary diversity, improved livelihoods, food sovereignty and revitalised community (see *Figure 19*).

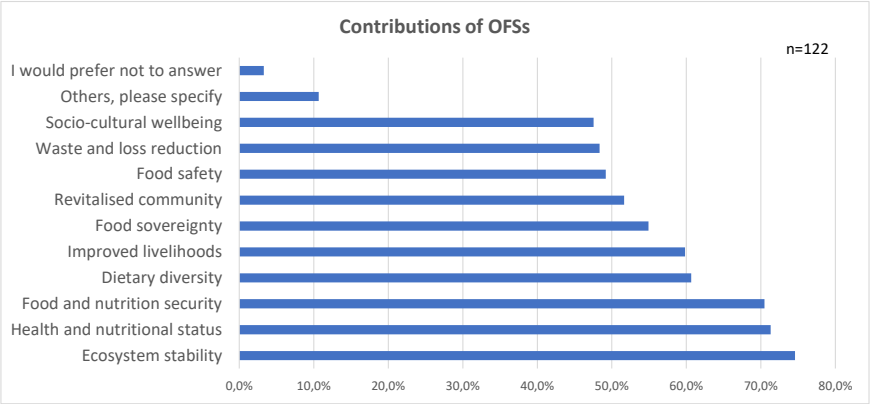


Figure 19: Outcome groups representing patterns of outcomes perceived as resulting from OFSs (multiple responses)
Source: own calculations.

Universality / region-specificity of outcome groups

The next question (ninth survey question, see Annex III-1) aimed at determining whether or not the chosen outcome groups could be viewed as universally applicable (true for any OFS around the world) or not (implying regional specificity of the chosen outcome groups). All 124 respondents answered this question, with 65% (81 respondents) stating the universal applicability of the chosen outcome patterns and 35% (43 respondents) indicating the region-specific character of the outcome patterns (see *Figure 20*) (table of frequencies is shown in Annex III-6, b).

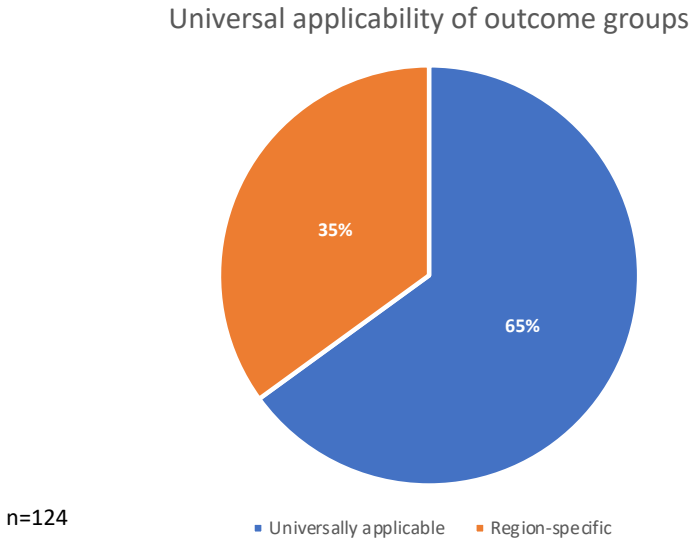


Figure 20: Universal applicability of the selected outcome groups resulting from OFSs as perceived by survey participants
Source: own calculations.

Regional character of the selected outcome groups

Respondents who indicated that the selected outcome patterns would not be universally applicable to any OFS around the globe were asked a follow-up question, which aimed at determining the

extent to which the outcomes, in respondents' opinion, would bear a universal character (tenth survey question, see Annex III-1; the numbering differed if the respondents chose 100% universal applicability). 43 survey participants who have previously negatively answered the question regarding the universal applicability of the selected outcome patterns have been answering this question. The majority corresponding to 22 respondents (65%) indicated that the universal and regional character of the chosen outcome categories would be expressed to an equal extent, while 12 survey participants (28%) believed that the outcomes would bear a region-specific character to 75% and universal to 25% (see *Figure 21*) (table of frequencies is shown in Annex III-6, c). Only 5% of respondents thought the opposite would be the case, while one respondent indicated the 100% region-specific character of outcome categories (see *Figure 21*).

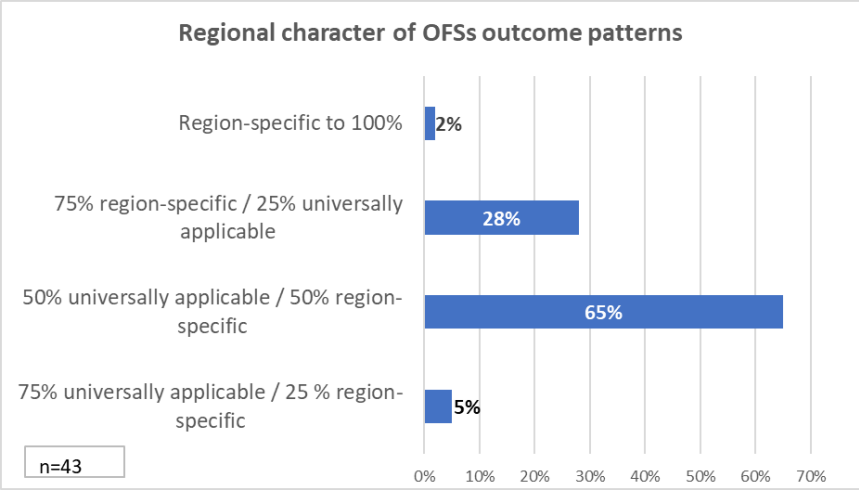


Figure 21: Degree of regional specificity of outcome patterns as perceived by survey participants
Source: own calculations.

SDGs with higher representation in OFSs

Survey questions 11 and 12 dedicated to the contributions of OFSs to the SDGs (see Annex III-1) have been offered as a multiple response question, with a separate answer option for each SDG ranging from 1 (not at all) to 5 (totally). An option for preference of not answering was given as well (coded as 6). In spite of the fact that the respondents were provided with the option of not answering about the contribution to the individual SDGs, the results nevertheless revealed the presence of missing values (ranging from two to five missing values depending on the SDG) (see *Table 8*). Based on the calculated mean values, the highest contributions have been identified for the SDG 12 (Responsible consumption and production), SDG 3 (Good health and wellbeing), SDG 15 (Life on land) and SDG 13 (Climate action) (the respective mean values are highlighted in red colour and shown in bold numbers, see *Table 8*).

Table 8: Mean values for contributions of OFSs to SDGs as perceived by survey participants

SDG No. and Title	N		Mean	Std. deviation	Min	Max
	Valid	Missing				
SDG 1: No poverty	120	4	3,29	1,198	1	6
SDG 2: Zero hunger	120	4	3,38	1,203	1	6
SDG 3: Good health and wellbeing	120	4	**4,12**	0,954	1	6
SDG 4: Quality education	120	4	3,12	1,217	1	6
SDG 5: Gender equality	120	4	2,88	1,379	1	6
SDG 6: Clean water and sanitation	119	5	3,73	1,184	1	6

SDG 7: Affordable and clean energy	119	5	2,86	1,317	1	6
SDG 8: Decent work and economic growth	120	4	3,56	1,158	1	6
SDG 9: Industry, innovation and infrastructure	119	5	3,22	1,360	1	6
SDG 10: Reduced inequalities	121	3	3,02	1,304	1	6
SDG 11: Sustainable cities and communities	122	2	3,54	1,114	1	6
SDG 12: Responsible consumption and production	122	2	**4,16**	0,979	1	6
SDG 13: Climate action	122	2	**3,93**	1,134	1	6
SDG 14: Life below water	121	3	3,44	1,341	1	6
SDG 15: Life on land	121	3	**4,01**	1,084	1	6
SDG 16: Peace, justice and strong institutions	121	3	3,28	1,439	1	6
SDG 17: Partnerships for the goals	122	2	3,51	1,344	1	6

(n= 124; multiple response option; see also Annex III-11)
Source: own calculations.

4.3.3 Qualitative part of the survey

The qualitative part of the survey dedicated to OFS outcomes included one exclusively open-ended question regarding a potential benchmark to be used for monitoring the contributions of OFSs (question 13, see Annex III-1). Additionally, there have been open-ended parts of three questions, namely the question on the outcome categories (question 8, see Annex III-1), the question about the

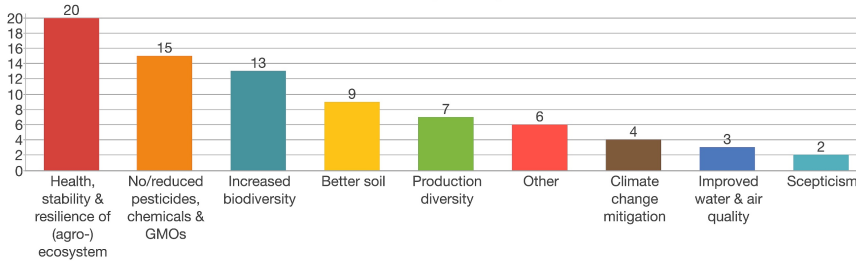
OFS's contributions to the SDGs (questions 11 and 12, see Annex III-1) and the question regarding the regional specificity of the selected outcome patterns (an open-ended part of question 10, see Annex III-1). The latter one has been offered as a follow-up question to the respondents who considered the outcome categories they had selected in question 8 to be region-specific. Furthermore, as has been mentioned in chapter 3 (see subchapter 3.2.2.2), in another open-ended question of the general survey part the respondents were asked to define an OFS (question 22, see Annex III-1). This answer has been analysed for the presence of outcomes in the provided definitions of an OFS. Results for each of the open-ended questions will be presented as code frequencies and discussed in more detail in the following sections.

Contributions of OFSs – elaborations on the selected outcome patterns

In the eighth survey question about the OFSs contributions (see Annex III-1) the respondents were offered an option to elaborate on the concrete examples of the outcomes within the selected outcome categories. An alternative option of skipping this step was also offered. The total amount of answers within each of the outcome categories varied, with the lowest amounting to 28 answers (for the outcome category "waste and loss reduction") and the highest totalling 54 responses (for the outcome category "ecosystem stability"). Furthermore, the offered answer option for the category "others" provided additional 12 answers. Based on the results of descriptive statistics (see subchapter 4.3.2 and *Figure 19*), only the outcome categories selected by more than half of survey participants will be discussed here. The overview of the responses provided for other outcome categories can be found in Annex III-12.

Ecosystem stability has been named by the majority of survey participants as the outcome category addressed by OFSs (see

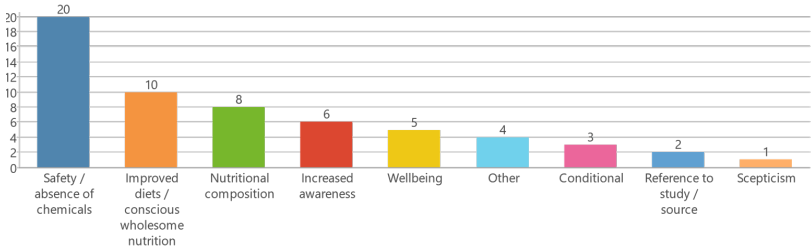
Figure 22). The open-ended part of this question yielded the highest amount of 54 answers in total. The majority of answers pointed to the overall health, stability and resilience of (agro-) ecosystem as well as increased biodiversity, absence of pesticides, chemicals and GMOs in OFSs (see *Figure 22*). Here, mostly the positive contributions of OA have been emphasised. For instance, it has been mentioned that organic farms "*that incorporate agroforestry systems encourage biodiversity and the protection of native species*" (respondent 307, see Annex III-13, a). Improved soils along with improved water and air quality along and the overall production diversity have also been mentioned. CC mitigation effects of the organic practices have been stated by four respondents, which, according to one survey participant, can be attributed to increased carbon sequestration (respondent 171, see Annex III-13, a). Some respondents referred to the intended character of FNS in the OFS or, else, pointed to the organic principles (category "other", see *Figure 22*; respondents 340, 137, see Annex III-13, a). Finally, two respondents were sceptical concerning the OFS's contribution to ecosystem stability (see *Figure 22*).



(n=54)

Figure 22: Frequencies of coded answers collected within the outcome category "ecosystem stability"
(open-ended part of survey question 8)
Source: own data (analysed using MaxQDA 2018.2).

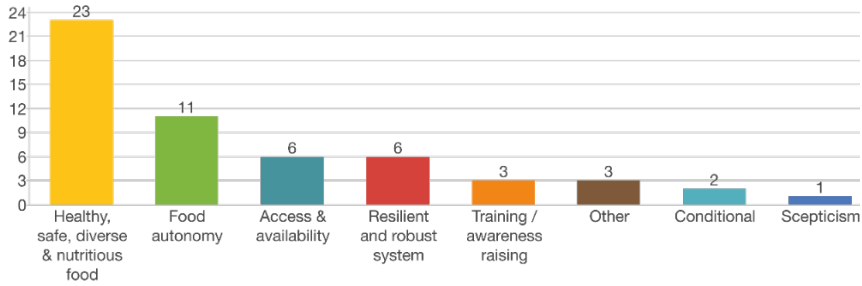
Moving on to the second of the top-three mentioned outcome categories, namely health and nutritional status, 46 answers to the open-ended part have been provided. The majority corresponding to 20 respondents (44% of all the collected answers) pointed to the safety of organic food in terms of absence of pesticide residues and chemicals (see *Figure 23*). Other responses linked OFSs to the overall healthier diets and more wholesome nutrition of organic consumers (ten respondents corresponding to 22% of the provided answers) as well as better nutritional composition of organic foods (eight responses corresponding to 17% of the answers) (see *Figure 23*). Here, for instance, "*wholesome food access*" as well as higher ratio of raw and whole products in a diet have been mentioned (respondents 156 and 179, see Annex III-13, b). Elaborating on the overall healthier diets enabled through OFSs, respondents stated that such diets are usually characterised by "*less meat, more fruits and vegetables*", while "*regular consumers of organic food have food consumption patterns in line with dietary recommendations*" (respondents 313, 171, see Annex III-13, b). Respondents who mentioned more favourable nutritional profile of organic foods have pointed to a higher content of fibre, bioactive compounds, vitamins and minerals in organic food (respondents 251 and 243, see Annex III-13, b) (see *Figure 23*). Interestingly, wellbeing has also been mentioned as a contribution of OFSs to an overall health status, with examples such as "*positive impacts on mental and physical health*", or, else, that "*reduction in the use of chemicals is good for the wellbeing of farmers*" (respondents 188 and 307, see Annex III-13, b). There have been three conditional answers provided, while one respondent was sceptical (see *Figure 23*).



(n=46)

Figure 23: Frequencies of coded answers collected within the outcome category "health and nutritional status"
(open-ended part of survey question 8)
Source: own data (analysed using MaxQDA 2018.2).

With regard to the third among the top-three selected outcome categories, FNS, the total amount of 45 responses have been provided to the open-ended part of this question. As *Figure 24* indicates, the vast majority of responses corresponding to the total amount of 23 (47% of all the provided answers) pointed to diversity, health and nutritious attributes as well as safety of organic food, with statements such as "*no pesticide residues in organic food / higher content in nutrients*" and "*safe food without chemicals*" (respondents 185 and 238, see Annex III-13, c). Eleven respondents referred to locality and food autonomy leading to FNS pointing to community supported agriculture (CSA), community garners and growing own food as a factor ultimately increasing food security and resulting in food autonomy (respondents 146, 150, 152, 179, see Annex III-13, c). Access and availability aspects as well as resilience and robustness of the OFS resulting in FNS were mentioned by six respondents, each (see *Figure 24*). Three respondents mentioned other aspects such as relations between the organic actors or increased land under organic production (respondents 366 and 137, see Annex III-13, c). Finally, there have been two conditional answers and one sceptical respondent (see *Figure 24*).



(n=45)

Figure 24: Frequencies of coded answers collected within the outcome pattern "food and nutrition security"
(open-ended part of survey question 8)
Source: own data (analysed using MaxQDA 2018.2).

Dietary diversity as an outcome pattern selected by the respondents revealed answers pointing to higher diversity of cultivars, crop varieties and species of farmed animals, preservation of old and local varieties underpinned by diversified cultivation practices (see Annex III-13, d). 36 respondents provided specifications on this outcome category. The outcome category of improved livelihoods mentioned by 38 respondents uncovered profitability of OFSs providing better incomes as well as increased biodiversity and better overall health status, the latter attributed to the absence of pesticide applications as well as better nutrition resulting from organic foods (see Annex III-13, e). Specifications on food sovereignty as an OFS outcome category were provided by 37 respondents. The answers incorporated issues of locality and regionalism, farmers' autonomy and the right to define own food and markets, while revealing the importance of small-scale production and CSAs (see Annex III-13, f). Finally, for the outcome category revitalised community, 37 answers in total have been provided. The responses cover a variety of contributions spanning from cooperation, networking and community building due to OFSs to solidarity, job creation, improved food access (see Annex III-13, g). Overall increased wellbeing as

well as gathering together like-minded people have been also acknowledged. A detailed overview of the answers provided for this question is presented in Annex III-13, g.

Region-specificity of the selected OFS-specific outcome patterns

The respondents who indicated that the outcome patterns they had previously selected would bear a region-specific character were asked to elaborate on the potential variations (open-ended part of question 10, see Annex III-1). Nine answers in total have been provided for this question. The answers pointed to the differences in climatic conditions as well as varying local problems, differences in food culture and site-specific dietary variations, discrepancies in availability of and awareness about the organic food, organic certification hindrances along with variations in food security and, finally, social implications (see Annex III-7).

Examples of contributions of OFSs to the SDGs

Similar to the elaboration on the concrete outcome categories within the eighth survey question, the question about the OFSs' contributions to the SDGs (questions 11-12, see Annex III-1) equally left a space for specifications on the examples of concrete contributions under each of the chosen SDGs. The total numbers of answers per SDG were lower as compared to the answers within the outcome categories, ranging from 11 (SDG 17) to maximum of 23 (SDG 1). Based on the mean ranks of each of the SDGs selected as OFSs' contributions (see *Table 8* in subchapter 4.3.2,), only the elaborations of the top-four selected SDG-based contributions will be discussed here (an overview of elaborations on other SDGs is presented in Annex III-14). The SDG 12, responsible consumption and production, which has received the first rank among the total mean values of various SDGs, yielded 15 responses solely in the open-ended part (see Annex III-15, a). The answers were attributed

mostly to increased awareness, less fossil inputs, direct distribution channels as well as decreased food waste coupled with food valence. As the respondent 139 put it, OFSs contribute to the SDG 12 through "*saving resources and lower input, awareness raising of consumers, direct purchase from farmers*" (see Annex III-15, a). Within the contributions to SDG 3, good health and wellbeing, 20 responses in total have been provided, pointing mainly to the health aspects of organic food and overall healthier diets as well as the ecosystem health. Here, for instance, safety attributes of organic food in terms of absence of pesticides, chemicals and GMOs have been emphasised coupled with higher nutritional value of organic foods (respondents 138, 185, 211, 251, 271, 338, 341, see Annex III-15, b). Better air and water quality have been also pointed out (respondent 211, see Annex III-15, b). Within the responses about the contributions of OFSs to the SDG 15, life on land, 12 responses in total have been provided. The majority of answers pointed to enhanced biodiversity and improved soil quality. Here, the answers such as "*better soil quality, less soil erosion, less impact on pollinators*" or "*higher biodiversity, less soil degradation, species conservation*" were given (respondents 138, 139, respectively, see Annex III-15, c). A "*rich biosphere*" enabled by organic farming has been also mentioned (respondent 146, see Annex III-15, c). For SDG 13, climate action, the total amount of 17 responses were provided, with the majority referring to the lower GHG emissions from organic production systems as well as better soil management practices and reduced use of fossil fuel on organic farms. With regard to the lower GHG emissions, respondents justified it through localised food with reduced carbon emissions and transportation as well as higher energy efficiency in organic production systems coupled with saved emissions due to absence of pesticides' and synthetic fertilisers' production (respondents 129, 139, respectively, see Annex III-15, d).

Benchmark for potential monitoring of the OFS contributions

In this question the respondents were asked to suggest an indicator or an index that could have potential applicability as a benchmark for monitoring the OFSs' outcomes (question 13, see Annex III-1). The total amount of 72 responses has been provided for this question. Out of this amount two answers were not useful for the analysis since two respondents have stated in their answers that they did not know such an indicator or index. Therefore, the total amount of 70 answers has been analysed. The responses represent a wide variety of concepts spanning from indicators of environmental, social and economic performance, over production-consumption oriented indicators, QOL index, health- and nutrition-based indices, holistic assessment frameworks to miscellaneous benchmarks and indices used by various institutions and/or organisations (see *Figure 25*). The various concepts and frameworks offered by 14 respondents included for instance the FAO indicators, agroecological principles, Earth Charter, regenerative organic index, good governance index and some more (see *Figure 25*) (a detailed overview of the answers is presented in Annex III-8). Environmental performance indicators clearly dominated the suggested benchmarks for OFSs, with soil health- and biodiversity-based indicators having been mentioned the most. For instance, one respondent stated that the OFS "(…) should always be judged based on soil improvements", while another suggested that:

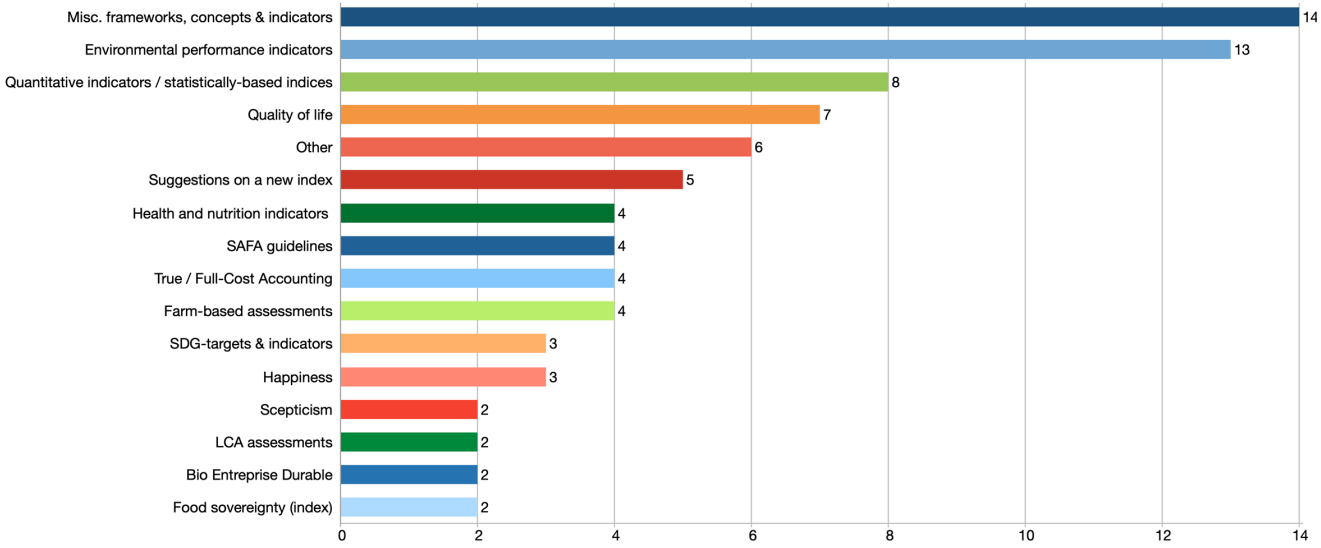
> *(…) it comes down to soil health – no matter where on the planet we are – healthy soil gives healthy plant, animals and also is a HUGE carbon sink, promoting and monitoring soil microbial diversity is a great indicator for impact of OFSs" (respondents 192, 248, respectively, see Annex III-8)* (see *Figure 25*).

Various quantitative indicators have been offered by eight respondents, QOL was offered by seven respondents, while health

and nutrition indicators, SAFA Guidelines, true / full cost accounting, farm-based assessments were recommended by four respondents, each (see *Figure 25*). The targets and indicators under the 17 SDGs offered within the Global Monitoring Framework have been suggested by three respondents. Five survey participants pointed to the certain existing gaps in current assessment frameworks and/or offered suggestions on how to establish an indicator that would be appropriate for assessing OFSs (see *Figure 25*). Likewise, one respondent emphasised the need to "(…) *formulate a new index that takes the vitality of the food system into consideration in relation to the GDP goals*" (respondent 324, see Annex III-8). Two survey participants suggested multidisciplinary and multi-stakeholder approach for developing *"(…) a tailored monitoring tool focusing on OFS* (…)" pointing out that evaluation of its applicability in different contexts would be vital due to potential local variations (respondents 206, 270, respectively, see Annex III-8). Moreover, another respondent stressed that

> *The alternative is to devise an own set in line with an own understanding or interpretation of the SDGs or their spirit. (...) At the same time it may be a chance to add more values to the internationally agreed upon ones, in the same way as 'environmental services' show just how much more 'value' there is in things around us, even if it's not yet the widely used basis (respondent 305,* see *Annex III-8).*

Lastly, the category "other" included some elaborations without concrete suggestions or with lack of specification such as "*healthy food for people*" or "*sustainability measuring instruments*" (respondents 238, 223, respectively, see Annex III-8).



(n=70)

Figure 25: Overview of the suggestions on benchmark / index to be used for potential OFS monitoring

Source: own data (analysed using MaxQDA 2018.2).

Outcome patterns identified in the respondents' definition of an OFS

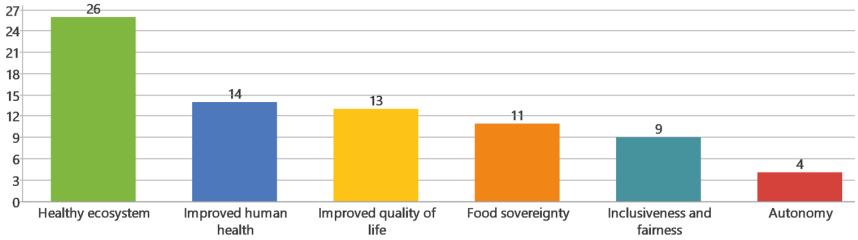
In the concluding question of the general part of the survey, the respondents were asked to state what an OFS means to them (question 22, see Annex III-1). The question yielded the total amount of 99 answers. The analysis of the answers in the light of the outcomes sought to identify the OFS-specific outcomes as defined by the survey participants and resulted in the total amount of 44 answers containing statements related to OFS outcomes (see *Figure 26*). The frequency distribution of thematically coded answers with the emphasis on outcomes is presented in *Figure* 26. The results suggest that healthy ecosystem is perceived as the major outcome associated with OFSs addressed in 26 responses. For instance, one of the survey participants defined an OFS as a "(…) *system for the living beings on earth, and for a healthy ecosystem*" or, else, as a FS "(…) *that is environmentally and socially sustainable*" (respondents 278, 249, see Annex III-9). Other outcomes perceived as resulting from the OFS include improved human health (14 answers) as well as QOL (13 statements), food sovereignty (eleven responses) and inclusiveness and fairness (nine answers). Four survey participants associated OFSs with the issues of autonomy (see *Figure 26*).

The answer category of improved human health incorporated answers mainly linked to safety and nutritional quality of organic food:

> *(…) the food system where we are able to have safe food with trust, transparency, and give us a nutritional healthy environment for the human, ecological and animal welfare* (respondent 238, see Annex III-9).

Regarding the QOL, the survey participants referred to a better environment including ecosystem health and social capital, healthy and sustainable living as well as issues of equity and human

welfare. As one of the respondents specified: "*It is a way to improve the environment and life quality, to allow our planet to develop sustainably*" (respondent 171, see Annex III-9). The details on other answer categories can be found in Annex III-9.



(n = 44; multiple answers possible)

Figure 26: Results of the OFS-specific outcome patterns identified in the respondents' definition of an OFS
(survey question 22)
Source: own data (analysed using MaxQDA 2018.2).

4.4 Case studies

4.4.1 Bio-district Cilento

4.4.1.1 Background information of the bio-district Cilento

Inception and development

The bio-district Cilento located in the area inside the National Park of Cilento was founded in 2009 as the first “organic district” in Italy, following the public process of its constitution initiated in 2004 (Cuoco and Basile, 2014; Stotten et al., 2017). According to the definition that has emerged in 2012, a bio-district is “a geographical area where farmers, citizens, tourist operators, associations and public authorities enter into an agreement for the sustainable management of local resources, based on organic production and consumption (short food chain, purchasing groups, organic canteens in public offices and schools)” (Basile and Cuoco, 2012, p. 2). The idea behind the creation of the bio-district was to create and reinforce links between all the involved parties, with the resulting benefits to all: a better market and exposure for organic producers; local fresh organically grown products with transparency in terms of origins for the consumers; new destinations and sights (eco-trails and agritourism farms) for tourist operators; ensuring food security and defining the ways to meet the needs of local communities for public authorities (AgriSpin, 2017).

An official memorandum of understanding (MoU) has been signed to create “Bio-distretto of Cilento and Valle di Diano National Park”, aiming to promote organic territorial actors and enterprises as well as initiate “(…) collective decision-making and joint strategic action for the sustainable management of Cilento’s resources and potential” (Stotten et al., 2017, p. 145). The official establishment of the bio-district Cilento as the first multi-vocational European bio-

district followed in 2009, when the Campania region passed the corresponding act (Bio-distretto Cilento Association, n. d.). At that time, the exact definition of a bio-district has not existed. The bio-district's development represents a bottom-up approach involving a multitude of actors operating in the territory including farmers, local communities as well as economic operators and public authorities (Favilli et al., 2018). The inception of the organic district was a response to the organic farmers' struggle to reach the consumers and market their produce, at the same time promoting OA (AgriSpin, 2017). According to Basile and Cuoco (2012), within a bio-district, the promotion of organic produce is closely intertwined with the promotion of the land so as to unfold its economic, cultural and social potential. The Italian Association for OA (AIAB) saw a potential in responding to the farmers' aspirations through a new district model-based initiative, where a variety of local actors are brought together (AgriSpin, 2017). Series of workshops and meetings organised by ten regional municipalities, with the participation of AIAB and other organisations, have shaped the bio-district concept (Pugliese et al., 2015, p. 7). Through a participatory approach, public administration, canteens and restaurants, tour operators and other actors elaborated the joint strategy for the promotion of organic food and farming in Cilento as well as the entire area itself, underpinned by the organic principles (AgriSpin, 2017). Later, in 2011, in order to ensure coordinated and structured governance of the bio-district, a non-profit organisation the "Bio-distretto Cilento Association" was established (Stotten et al., 2017).

In 2014 the AIAB developed and launched the label "Bio-Distretto®" (see *Figure 27*) aiming to establish guidelines for the inception and management of other similar territorial initiatives through codifying Cilento's experiences into a stepwise approach (Pugliese et al., 2015, p. 11). The following major procedures have been laid down: creation of an organising committee responsible for setting up the

initial meetings with stakeholders as well as analysing territorial needs and resources; analysis of the support level from and interest of the local community including private and public actors; joint definition of the boundaries of a bio-district; formalisation of the municipalities' and other public actors' involvement; drafting of an action plan based on preliminary context analysis; formulation of an operational programme of activities for the implementation by the initiative's promoters; development of a communication strategy, with local actors as well as external stakeholders as a target group (ibid., p. 11). The same year has witnessed the establishment of the International Network of Eco-Regions (IN.N.E.R.), an international network dedicated to fostering cooperation between the bio-districts in Italy and similar initiatives elsewhere in the world (Pugliese et al., 2015, p. 1).

Figure 27: Bio-Distretto® label by AIAB
Source: AIAB, 2017.

Geography, jurisdiction and organisational aspects

Situated in the south of Italy, in the province of Salerno of the Campania region, the bio-district Cilento (bio-distretto in Italian language) has a heterogeneous and rich landscape (Pugliese et al., 2015, p. 5; Stotten et al., 2017). It incorporates a long coastland beside the Tyrrhenian Sea, the Alburni mountains consisting of sloping hills and high peaks, and, finally, narrow plains of Valle di Diano, with scattered human settlements, often small in size and

dating back to ancient times (Stotten et al., 2017; Pugliese et al., 2015, p. 5; see *Figure 28*). The Cilento's coastland stretches for hundreds of kilometres along the sea, with clear seawaters, beaches varying from fine sands to rocks and entrenched into the rocks grottos (Pugliese et al., 2015, p. 5). The National Park of Cilento, Valle di Diano e Alburni, within which the bio-district is partly contained, is the second largest Italian nature park included in the list of UNESCO World Heritage Sites (Stotten et al., 2017). The total area of the bio-distretto is 3,196 km^2 (Favilli et al., 2018; Bio-distretto Cilento Association, n. d.). According to the statistics from 2015, the Cilento bio-district in inhabited by 220,000 permanent residents (UNESCO, 2019).

a) b)

Figure 28: Map of the bio-district Cilento
(a – location of the bio-district Cilento on the map of Italy; b – map of the bio-district showing three district areas: the mountainous part of Alburni area, narrow plains of Valle di Diano and the National Park)
Sources: a – Tageo, n. d.; b – Cilento-Travel, n. d.

Not only is the bio-district Cilento heterogeneous in terms of its morphology, but it is also highly complex with regard to social, cultural and economic relations (Pugliese et al., 2015, p. 5). In the area characterised by morphological disparities, there exists a dense network of economic and socio-cultural relations, where families aggregate in small to very small communities (ibid.). It is due to this geographical proximity that the synergies among economic activities and the self-organisation have been promoted (ibid.).

Cilento bio-district currently includes 38 municipalities gathered into three associations corresponding to geographical areas – Cilento coastland, Alburni mountains and Valle di Diano plains (Bio-distretto Cilento Association, n. d.; Pugliese et al., 2015, p. 14). Cilento bio-distretto includes about 450 organic farms making up 23% of all organic producers of the Campania region (AgriSpin, 2017; Favilli et al., 2018). Decision-making in the bio-district represents multi-level governance with a bottom-up approach (Pugliese et al., 2015, p. 15). The non-profit Association Bio-distretto Cilento is made up by various stakeholder groups bringing in individual topics of interest based on specific needs of the group (ibid., p. 15; Stotten et al., 2017). Each member directly contributes to the management costs of the Association since no specific budget is allocated for the bio-district from national and regional authorities (ibid.). The financing of the bio-district's activities has been derived from various projects (Pugliese et al., 2015, p. 15).

Supply chains and production diversity

Short supply chains linking local organic producers to the consumer have been the central aspect behind the establishment of the bio-distretto Cilento (Basile and Cuoco, 2012; Pugliese et al., 2015, p. 17; Stotten et al., 2017; Favilli et al., 2018). The backbone of the eco-region Cilento are the family farms and small- to medium-scale

enterprises (Pugliese et al., 2015). Not all the farmers practicing OA are certified through third-party certification. The PGS has been tested and increasingly applied in the area offering group certification schemes (Stotten et al., 2017). This makes it a more affordable option for the small producers (ibid.). Almost all of Cilento's organic products are processed, sold and consumed locally (Stotten et al., 2017). Cilento is well-known for its food heritage and agricultural products that are predominantly processed using old methods based on traditional and ancient family recipes (Favilli et al., 2018). It was in Cilento that the American scientist Ancel Keys was investigating the benefits of the healthy Mediterranean diet of the Cilento inhabitants back in 1960s, which he described in a book called "Eat Well and Stay Well: the Mediterranean Way (Pugliese et al., 2015, p. 6). Due to the fact that the scientist's studies were conducted in a small Cilentan village Pioppi this place has become the world capital of the Mediterranean diet (ibid., p. 6).

The range of organic products produced in the Cilento OFS represents almost exclusively the Mediterranean diet basket: pulses (including Cicerale chickpeas and Controne beans), vegetables and fruits, anchovies, the Cilento white fig, chestnuts, black pork and black goat products, various types of cheese (including mozzarella and goat cheese), extra virgin olive oil, Cilento DOC (controlled designation of origin) wine and honey (Basile and Cuoco, 2012, p. 9; Pugliese et al., 2015, pp. 4; 18). Organic food processing in the bio-district includes mainly small-scale on-farm processing (predominantly jams) as well as wine processing plants, olive oil mills, chestnut processing and dairy plants (Pugliese et al., 2015, p. 18; Zanasi et al., 2016 in: Stotten et al., 2017). Distribution channels are represented by direct marketing initiatives comprised of farmers markets, on-farm sales, purchase groups and e-commerce; the hotels, restaurants, canteens (HORECA) sector; traditional retail

(organic specialised stores and supermarkets); innovative promotional initiatives such as bio-beaches and eco-trails (Pugliese et al., 2015, p. 17ff; Stotten et al., 2017). Additionally, there is a small percentage of distribution intended for export, which is comprised of wine and olive oil (ibid.). While direct marketing makes up the largest share of the distribution channels (75%), HORECA corresponds to 15%, and traditional retail channels and export correspond make up 5%, each (Pugliese et al., 2015, p. 17). According to Pugliese et al. (2015, p. 18), about one third of organic farmers are grouped in cooperatives and associations for collective marketing of their produce. The proportion of organically managed land has increased, since many state-owned lands have joined the bio-district and hence were converted to organic (ibid., p. 12; Cuoco and Basile, 2014). The Cilento OFS recognises two organic quality assurance schemes – third-part certification and PGS (Pugliese et al., 2015, p. 22f; Agbolosoo-Mensah, 2020). The latter has been successfully tested in the region and was promoted as a more affordable alternative for the small-scale farmers who cannot bear the costs of organic certification and could hence benefit from a group certification scheme (ibid.).

Activities and main actors

While the initial goal of the bio-distretto concept in Cilento was to create a market for local organic produce, with time the scope of the bio-district's activities widened aiming at supporting rural development and preserving local traditions (Favilli et al., 2018). For instance, the eco-region created tourist facilities representing a network of restaurants and bathing establishments committed to promoting local organic producers and associations and introduced eco-trails, or bio-routes, taking tourists to organic state-owned land, bio-villages, (holiday) farms and sites of importance in terms of local traditions and biodiversity (Basile and Cuoco, 2012, p. 9; Pugliese

et al., 2015, p. 19). The eco-trails are part of region's eco-tourism, linking inland rural areas to coastal tourist sites, with all sites along the routes classified by AIAB Campania's charter of principles of sustainable tourism in rural areas as sustainable in long-term tourism activities (Basile and Cuoco, 2012, p. 9). Bio-beaches of Cilento represent another range of tourist attractions, offering promotional activities for rural areas as well as locally produced organic food (ibid., Pugliese et al., 2015, p. 19). Due to collaboration between bathing establishment and coastal municipalities, territorial marketing activities are performed to promote organic products, eco-trails and other bio-beaches, latter through specially organised boat trips (Basile and Cuoco, 2012, p. 10). Organic operators of the bio-district have been increasingly turning their business to multifunctional farms, offering tourist services as well as educational activities, which adds value and helps to generate additional job opportunities (Pugliese et al., 2015, p. 20). Social agriculture is practiced in the bio-district, with the support for farms and cooperatives performing social activities for the disadvantaged and marginalised groups through employment creation and therapeutic services on the farms (Basile and Cuoco, 2012; Cuoco and Basile, 2014). Furthermore, teaching farms, agri-schools for children, leisure activities in gardening, cooking courses in the countryside as well as educational activities with schools are also practiced in the bio-district (Basile et al., 2016; Pugliese et al., 2015, p. 20).

The key actors of the bio-district Cilento include the value chain actors from producers over distributors and HORECA to consumers; public authorities and local institutions (including participating municipalities; authorities of the National Park); tour operators (agritourism businesses; Pro Loco office in Ceraso); research and training centres (University of Salerno); associations (Mediterranean Diet Association, Bio Logica Association, Campanian branch of the AIAB (see *Table 9*).

Table 9: Overview of the main actors of Cilento OFS, their function in the system and performed activities

Actor of the Cilento OFS	Function	Performed activities
Municipality Associations	Management of public services	Creation of a joint management system for public services (transportation, waste management, green public procurement)
AIAB Campania	Coordination of members' activities and promotion of agreements with organic food control bodies	Coordination of activities and provision of know-how for the members; facilitation of agreements with organic control bodies and launching the PGS
Individual organic farmers	Major stakeholder group; organic producers adhering to principles of organic farming	Organic farming; direct marketing; multifunctional tourism activities (agritourism)
Individual tour operators	Involvement in the activities of the bio-district and promotion of the local organic produce	Promotion of organic farms and farming associations through organic menus and bio-trails
Tourist associations	Promotion of eco-tourism activities in the area	Promotion of eco-tourism in the bio-district through bio-routes for walkers, horse riders and cyclists, rural tourism, study visits, self-catering holidays, summer camps.
Local training and research centres	Carrying out trials and trainings	Trials and training initiatives for the improvement and consolidation of single local stakeholders' initiatives
The Cilento National Park	Important role in the initiation of the bio-district initiative; participation in	Active participation in some short supply chain activities and testing of

	short supply chain activities; participation in testing of the PGS; support for projects	the PGS; support for projects (i. e. “Seed savers”, when a group of farmers located in the park area gathered local ancient varieties of cereals; now pasta is made of these varieties); support in the mill’s and local pasta-making plant’s establishment
Pro Loco Ceraso	Civic membership association of volunteers working together with local institutions, businesses and schools to enhance the area	Promotion of tourism and cultural activities, assistance to visitors
Campus Mediterraneo” centre	Centre comprised of a group of partners supporting the process of innovative territorial development in the area	Research, training and technical assistance services

Source: own compilation based on Pugliese et al., 2015, p.15f; Bio-distretto Cilento Association, n. d.; Basile and Cuoco, 2012, p. 8ff; Paree and Wielinga, 2016, p. 58; ICH NGO Forum, 2020.

Vision and core principles

A bio-district concept represents an innovative solution and integrated approach to SD, which is in line with the Action Plan of the Agenda 21 of the UN World Conference in Rio de Janeiro held in 1992 as well as the Declaration of Nyéléni, Sélingué on food sovereignty adopted in 2007 in Mali (Basile and Cuoco, 2012; Cuoco and Basile, 2014; Basile et al., 2016). Different local actors sharing common values have been brought together under an umbrella of a non-profit association with a territorial approach and self-governance, and all together they commit to fulfilling the joint purposes, which have expanded over time to embrace environmental and social aspects (Basile and Cuoco, 2012; Pugliese et al., 2015, p. 15; Favilli et al., 2018). Important work has

been initiated in the area of social agriculture (Basile and Cuoco, 2012; Cuoco and Basile, 2014; Pugliese et al., 2015, p. 23). Farms and cooperatives have been encouraged to create employment and offer therapeutic services for the disadvantaged and marginalised groups, including former prison inmates, immigrants and disabled people (ibid.). With the goals of serving as a promotion tool for territorial actors and organic enterprises and strategizing the sustainable management of the resources of Cilento, the bio-district aims at simultaneously meeting the needs for environmental quality, counter rural exodus and annual financial crises, and respond to climate emergencies (Cuoco and Basile, 2014).

4.4.1.2 Findings from the interviews with key actors (Cilento)

During the initial case documentation process 15 interviews with key actors have been conducted as a master thesis project of Agbolosoo-Mensah (2020). The data from 14 interviews build the data basis for the below described findings on the OFS outcomes. One interview did not generate sufficient data on the outcomes and was therefore filtered out (see chapter 3.3.4.1). Out of 14 key actors, two interviewees were mayors, two represented catering restaurant and beach club), one was a farmer and agritourism operator, one was an agronomist and president of an association, one was a tour operator, one was an employee of the museum of Mediterranean diet, one represented an environmental association, one represented the administration of the bio-district, one was an employee of the local tourism office, one represented European Landscape Observatory, one was an administrative employee of the National Park and one represented the Italian Alpian club (the overview of the interviewees can be found in Annex IV-2, a). Within the outcomes part, the interviewees were asked to name the effects perceived from the OFS in Cilento considering individual effects, effects on the community as well as the ecosystem.

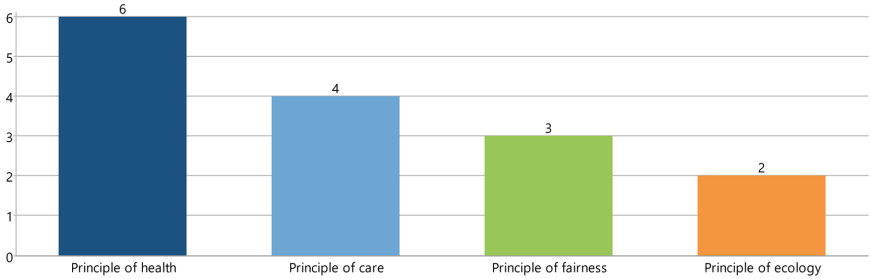
Throughout the part of the interviews dedicated to the outcomes of the Cilento OFS, the interviewees often referred to the specific effects corresponding to the principles of organic farming, regardless of the question's focus (i.e. outcomes on individual and community level or ecosystem outcomes). Likewise, six interviewees provided answers reflecting the principle of health (see *Figure 29*). Here, the health of the OFS has been emphasized, resulting in healthy food without chemical inputs, ultimately leading to human health: "*Organic farming without pesticides, chemical inputs has a benefit for the environment and, finally, for our lifestyle*" (key actor 14). As *Figure 29* shows, answers pointing to the principle of care have been provided by four key actors, explained by key actor 2 as follows:

> *(…) we need to protect our plants. You don't need to put some stuff into it, some chemicals as we need to have a continuity and respect the nature because if you put some chemical stuff in it, then you make people eat the chemicals, basically. If you want your plants to have long life, then you have to respect them and animals as well.*

Closely linked to the last statement of the quotation, principle of fairness has been found in the answers of three interviewees (see *Figure 29*). As one key actor summarised:

> *Solidarity through the people in general, one of the principal activities of my work is to create collaboration… between the persons, through the generations, and with other living animals. For example, vegetables, with all the people who are alive to have solidarity* (key actor 8).

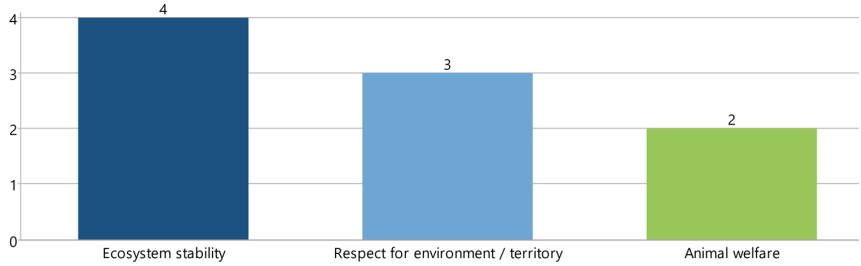
Finally, as shown in *Figure 29*, two key actors spoke of aspects corresponding to the principle of ecology, best summarised in the answer of the key actor 3: "*I believe in a coherent relationship between man and nature, between society and nature, and the cycle of nature. And the bio-distretto respects these values and this relationship*".



(n=14)

Figure 29: Outcomes of the Cilento OFS corresponding to the IFOAM-principles, as perceived by the key actors
Source: own data analysis (using MaxQDA 2020; based on raw data from Agbolosoo-Mensah, 2020).

As for the ecosystem-related outcomes (see *Figure 30*), four key actors spoke of ecosystem stability referring to genetic diversity of plants and seeds, for instance using the ancient seeds and local cultivars (key actors 10 and 6, respectively). Another answer pointed to the improved soil fertility (key actor 9). Three interviewees pointed to respect towards the environment and / or the territory as an important effect of the OFS: "*It is important that there is a project of development based on the environment. The value of sustainability is very important. Respect of ecosystems – it's the only possibility that humanity has to survive*" (key actor 7) (see *Figure 30*). Two interviewees referred to animal welfare pointing to free-range keeping systems for organic animals, migration to another territory over wintertime and good feeding and respectful treatment of animals (key actors 5 and 2, respectively; see *Figure 30*).



(n=14)

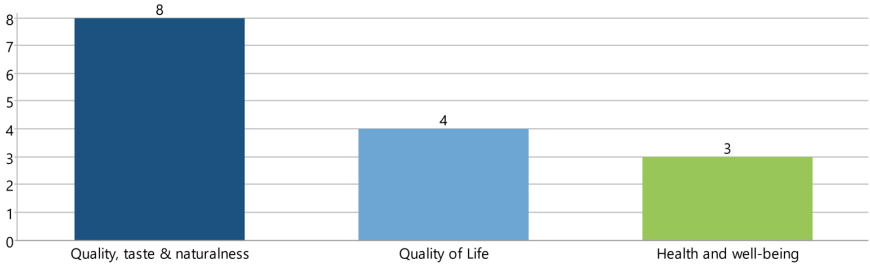
Figure 30: Ecosystem-related outcomes of the Cilento OFS, as perceived by the key actors
Source: own data analysis (using MaxQDA 2020; based on raw data from Agbolosoo-Mensah, 2020).

The outcomes on individual level have been dominated by the answers pointing to the high quality, good taste and naturalness of the organic food. Eight key actors referred to these aspects when asked about the perceived effects of the Cilento OFS (see *Figure 31*). Within this answer category, the interviewees stressed absence of pesticides and industrial additives, locally processed traditional and local ingredients and genuine Mediterranean diet (key actors 10, 9, 11, 15, 6 and 14). Four key actors spoke of QOL (see *Figure 31*). As the key actor 15 explained:

> *To have a full life, not only for myself, but also other people. Finally, you have one life and I try to have the maximum from this life working together with other people. And in the interest of other people. So, food is the main topic, but, you have the different way for interpretation. The first value for me is the quality of the life. I think that in this place you can have higher quality of the life. Because here you are not near the big city, the big metropolis. The principle of the quality for a very quiet lifestyle, very slow, and I think that it is also possible to export this quality because the tourists from Naples, from Salerno can come here and find this kind of lifestyle.*

Health and wellbeing have been stated by three key actors (see *Figure 31*). The answers revealed the perceived link between consumption of organic food without pesticide residues and health,

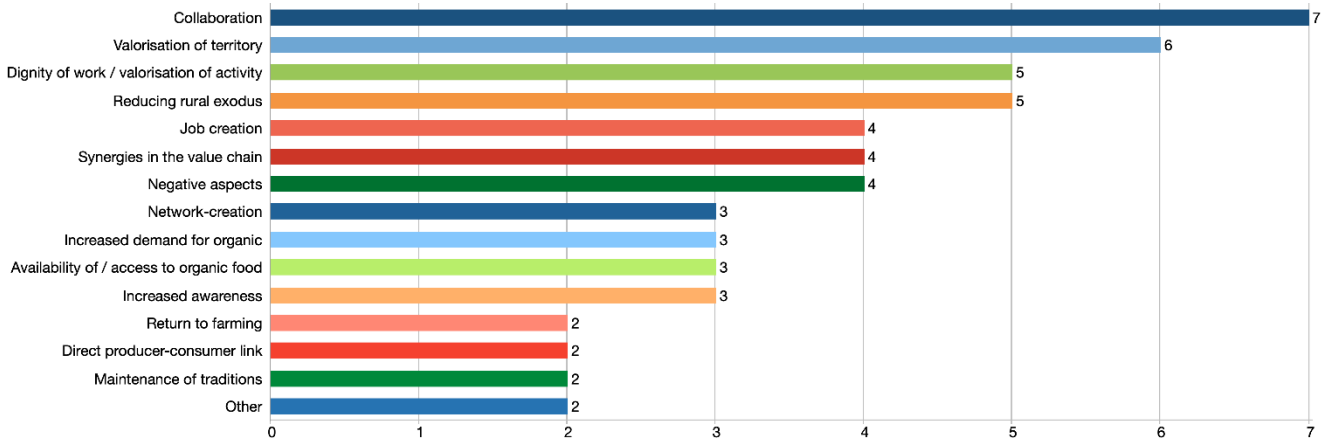
the importance of health aspects to people asking for organic food as well as individual health and wellbeing linked to the activities of organic farming (key actors 14, 11 and 15, respectively).



(n=14)

Figure 31: Outcomes of the Cilento OFS on individual level, as perceived by the key actors
Source: own data analysis (using MaxQDA 2020; based on raw data from Agbolosoo-Mensah, 2020).

The outcomes on the community level represent the outcome category with the widest range of answers indicating the importance of these topics for the key actors (see *Figure 32*).



(n=14)

Figure 32: Community-related outcomes of the Cilento OFS, as perceived by the key actors

Source: own data analysis (using MaxQDA 2020; based on raw data from Agbolosoo-Mensah, 2020).

The majority of the interviewees spoke of collaboration (seven key actors), valorisation of the territory (six interviewees), reduction of rural exodus (five key actors) and increased dignity of work and / or valorisation of activity (five interviewees) (see *Figure 32*). Regarding collaboration, the key actors believe that the OFS, namely the bio-district, has created appropriate conditions for the stakeholders to work together towards the joint objectives. This has been put together by the key actor 5:

> *Normally, not all the people work together, together with the other people for the same objective. This is the process that you have to learn with the time. This process needs more time and slowly you can create the connection through all the stakeholders (…) the positive effect, of course, is the alliance we have inside the bio-district for all the stakeholders. From producers to consumers and public administrators who work at the same level. So, this is a bottom-up initiative for in particular the needs of people of the community who live in a bio-district, but with the collaboration of all the stakeholders that sit around the same table for the first time.*

Regarding valorisation of the territory, the key actors referred to the protection and promotion of the territory through the bio-district (key actors 7, 8, 10, 13, 11 and 15). Countering rural exodus has been perceived as another important outcome of the Cilento OFS, closely linked to the valorisation of the territory. As has been explained by the interviewees, a significant rural exodus has been observed over the years prior to the establishment of the bio-district, with a lot of people, especially youth, migrating to metropolises in search for jobs. According to the key actors, the bio-district has changed this trend:

> *There is a project community trade for the involvement of all the community. Now, for example, in this place that you are now, we have 40 workers. 100s and 100s of people that work in all the fields. From the desert to the place where people can find work, for the export and not only for the internal market* (key actor 9).

Another outcome that seems to be closely intertwined with the reduction of rural exodus is the dignity of work and / or valorisation of the activity performed by the stakeholders in the OFS. The majority of interviewees explained that due to the bio-district the perception of farming as a job has changed, and the organic farmers' image has become dignified in the society (key actors 2, 5 and 15).

Not limited to the afore described outcomes, the interviewed key actors perceived other effects of the bio-district. They named synergies in the value chain and job creation (four interviewees, each), network creation, increased awareness, availability of and access to organic food and the increased demand for organic produce (three interviewees, each), return to farming, maintenance of traditions and direct producer-consumer link (two key actors, each) (see *Figure 32*). The answer category "other" incorporated the statements about the improved cultivation and reduced production costs (key actors 11 and 9) (see *Figure 32*).

Apart from all the positive effects perceived as resulting from the Cilento OFS, certain negative aspects and challenges have been also mentioned by four key actors (see *Figure 32*). Limited support or lack of support from the politicians and local administration have been stated by two interviewees (key actors 6, 8). Apart from that, intensive external communication required for the activities of the bio-district coupled with limited financial support of activities have been addressed (key actor 5). One key actor considered a further challenge in the time-consuming extensive amount of work required for the innovation that is needed in the activities of the OFS (key actor 13).

4.4.1.3 Findings from the focus group in Cilento

The focus group session has been carried out with thirteen participants. The group was not balanced in terms of gender distribution since the group composition has been determined by the representation of various stakeholder groups rather than gender groups. The group consisted of three females and ten males representing a broad range of stakeholders making up the key actors of the Cilento OFS: value chain actors, tour operators, associations, research and academia, education, administration, entrepreneurship, etc. (see *Table 10*).

Table 10: Overview of the focus group participants in Cilento

	Stakeholder group / role in the Cilento OFS	Gender	Estimated age group
Participant 1	Network association	Male	Senior
Participant 2	Administration of the Bio-district Cilento	Male	Upper middle age
Participant 3	Research and academia; association	Female	Middle age
Participant 4	School administration; teacher; tour operator	Male	Upper middle age
Participant 5	Organic farmer; agri-business and agritourism	Female	Upper middle age
Participant 6	Organic cooperative and tour operator	Female	Middle age
Participant 7	Administration of the National Park	Male	Senior
Participant 8	Administration of organic cooperative; mayor	Male	Senior
Participant 9	Tourism information office Ceraso	Male	Senior
Participant 10	Business and entrepreneurship in energy sector	Male	Middle age
Participant 11	Organic producer and processor; administration of the agritourism association and association promoting local products from Cilento;	Male	Upper middle age
Participant 12	Sustainable eco-tourism business	Male	Upper middle age
Participant 13	Beach club	Male	Upper middle age

Source: own data based on focus group session performed in Ceraso on January 24, 2019.

The Cilento OFS: Retrospective view and the first outcomes achieved

The focus group session consisted of five thematic rounds: retrospective view on the first outcomes achieved (with sustainable public procurement as a starting outcome), ecosystem stability outcomes, improved livelihoods, inclusive economic growth and governance and partnerships. The discussion began with the retrospective look at the inception of the Cilento OFS and its first achieved outcomes. The key actors were recalling how the bio-district was initiated, with a small group of stakeholders comprised of ten administrators and mayors who had been meeting to work out the solutions for the small-scale local organic producers to market their produce. This was when one organic agribusiness operator has been contacted and offered collaboration towards a new idea in order to "*externalise the concepts*" of organic agricultural business practiced on the farm, which were tradition, solidarity, naturalness and zero-kilometre food (participant 5). From that point on, the OFS has been established and stated to develop. One participant stressed that people who have been involved in the project back then, now tend to come to the area on holidays. Many of them being abroad inquire about the possibilities of ordering Cilento products. As the participant concluded: "(…) *for my business, it was an excellent experience – both in terms of business and in terms of the human factor*" (participant 12). Another participant put forward the definition that addresses the outcomes of the bio-district:

> *The bio-district is a model that through the good practice of organic agriculture preserves… protects the environment, it preserves health and gives to future generations fertile and productive land, which they can enjoy. We had out chance, and we had to give it… the chance to our posterity – you. It's our responsibility* (participant 5).

Two more participants spoke of soil fertility emphasising positive effects observed due to the bio-district. Regarding the collaboration

with the Cilento National Park it has been stressed that the objectives of the bio-distretto matched the objectives of the Park, namely safeguarding the nature and culture. In terms of sustainable public procurement outcomes, it has been mentioned that more would need to be done since the demand is high and at the moment is not fully matched.

Ecosystem stability

The category of environmental outcomes referred to in the session as ecosystem stability was discussed after the retrospective view. The category incorporated the variety of outcomes at the SDGs' target-level (see Annex V-2). Although the participants started touching upon the environmental dimension of the achieved outcomes when looking at the Cilento OFS retrospectively, when they have been asked to focus on the ecological outcomes contributing to ecosystem stability specifically, they disclosed both direct and indirect outcomes of this realm. Knowledge dissemination, awareness building, development of relevant skills for SD as well as some economic outcomes have been mentioned. With regard to the latter ones, economic viability has been linked to organic production methods:

> *In fact, this particular process has actually made organic products more economically viable and profitable than traditional farming methods. So, in fact, (…) the quality and the life of the soil itself that has increased production and, consequently, profit, compared to traditional methods* (participant 8).

Furthermore, the outcomes that are closely linked to the environmental performance were mentioned by the participants as well. For instance, health impairment as a driver towards the consumption of organically produced food ultimately resulting in positive ecological outcomes has been addressed. Furthermore, food waste reduction as an outcome has been addressed, with an

example of schools educating their children, who, in turn, pass this knowledge on to their parents. As participant 4 explained:

> *So, we've also avoided not only waste, but we've also avoided an economic loss on the part of the family that did not buy too much food. For the second part of the question (…) obviously, less food is wasted because if we teach families to only buy what they need, they understand how much pasta, for example, they need to eat per day – not only will they waste less food, but they won't gain weight, because they won't be overeating.*

The statement also points to the positive health effects of raising awareness on food waste reduction.

Next, increase in the use of renewable energy was mentioned as an accompanying outcome of organic beaches and part of the implementation of the 10 Year Framework of Programmes on Sustainable Consumption and Production (10 YFP on SCP) Patterns:

> *(…) a beach club or any sort of establishment that sat up on a beach for bathing, and it was done with respect for the eco-sustainable model. And not only that – the products that were ordered for the consumption of the users themselves were also organic. So, in specifics, the examples of the structure itself was made out of wood instead of cement, there also were solar panels on the roof of the building for energy production, and all of the products for the consumption of the patrons to this place was strictly controlled as organic products* (participant 13).

Coming to the direct outcomes representing specific effects within the ecological dimension of sustainability, the participants named improved soil quality and restoration of degraded soil, protection of natural resources and halting biodiversity loss, protection of marine resources and conservation of coastal and marine areas, protection of genetic diversity of seeds and cultivate plants. The improved soil quality appeared to be one of the central outcomes the participants focused on, addressing this topic already in the retrospective round:

"*Our primary concern at this moment if the fertility of the soil in foothills and in the mountains through biological farming methods*" (participant 8). It has been further explained that before the inception of the bio-district the soil was trampled as a result of intensive farming practices. The Cilento OFS has changed that through the approach combining traditional farming methods including terrestrial farming and innovative technology such as radio-controlled equipment (e.g. roller-crimper). Furthermore, maintenance of biodiversity has been addressed as one of the outcomes of the bio-district:

> *(…) biodiversity is what guarantees the stability of the ecosystems. And bio-district is important because it's an instrument of knowledge. Because of until now these concepts such as biodiversity were concepts that were very little known. And so now, these systems including things as simple as water, the air… are becoming a platform for economic profit. And so, in the National Parks we work to know about these… spread the knowledge of these services… and thanks to the culture of organic farming… we push for these concepts to become economy. The Italian Minister of the Environment, from this year, has decided to hijack all of the funds for biodiversity to the bees, the pollinators, because, obviously, they are the foundation to maintaining biodiversity* (participant 7).

This statement also indicates the significant increase of financial resources for biodiversity conservation as another outcome. It also suggests that maintenance of biodiversity is closely intertwined with the knowledge dissemination and awareness-raising about the ecosystem services and the role of biodiversity for safeguarding them.

Furthermore, sustainable management and conservation of marine and coastal areas have been mentioned:

> *To protect coast from erosion, we're deciding very different from what normally has been done… So, we didn't make any coastal barriers or other structures in the sea – our philosophy instead is that there is a*

natural balance between the sea and the rivers and streams that flow into it… so it's our responsibility to protect this balance, so the sea water level goes down, and then it's filled by the run-off from the rivers. So, the problem is that today, a lot of rivers have been blocked by dams with a consequence of blocking the run-off into the sea. So, it's my observation that where this balance was respected, there was… the beach would not had eroded at all (participant 8).

Restoration of fish stock and prevention of overfishing has been also pointed out as the outcome of the bio-district:

(…) the small-scale fisherman that traditionally… that does not use any overfishing methods – net, something like that – even though that that was a sustainable model, did not have the possibility to support himself because there was no market for his product) (participant 13).

Finally, genetic diversity of seeds and cultivated plants has been named, too:

"(…) thanks to the bio-district, they recuperated the farming of a lot of antique products that would have been lost otherwise: wheat, legumes, soft wheat "Carosella" (participant 1).

Looking at the concrete outcomes identified by the participants within the "ecosystem stability" category, it becomes apparent that there is a multitude of SDGs addressed in this dimension at target-level: SDG 2; SDG 4; SDG 7; SDG 8; SDG 12; SDG 14 and SDG 15 (see *Figure* 33). Likewise, it was observed that the direct outcomes of this category (those that are directly linked to the ecological dimension of sustainability) represent the SDGs 2, 12, 14 and 15, while the other SDG targets and the related outcomes can be viewed as the supporting outcomes for the former ones.

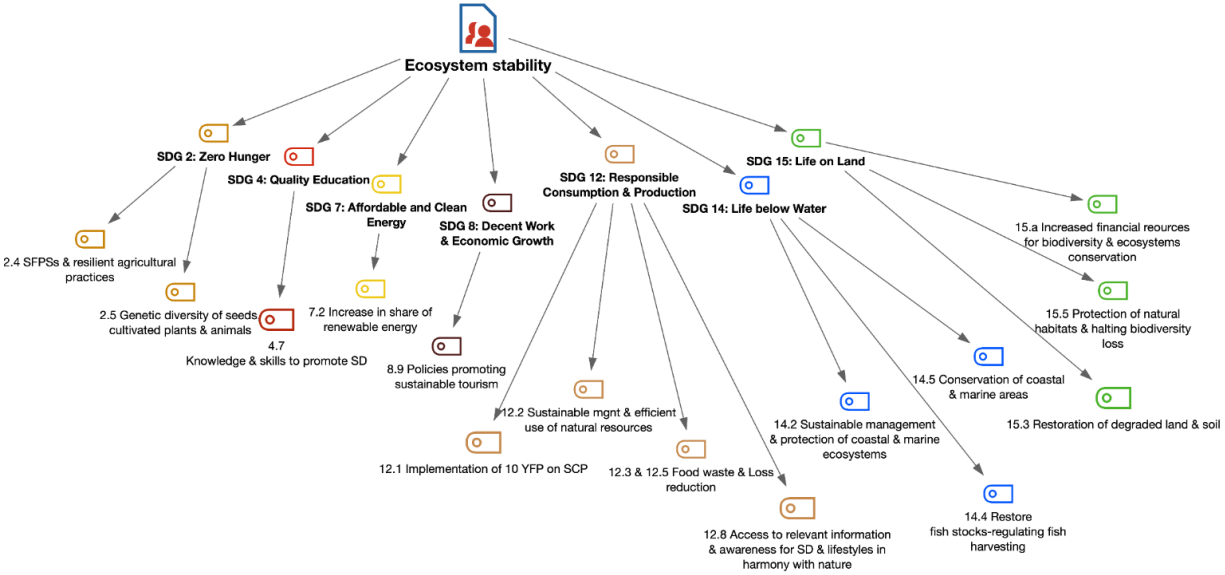


Figure 33: Overview of the specific outcomes and corresponding SDG targets of the Cilento OFS within the category of "Ecosystem stability" on the basis of the focus group discussion
(SDG targets are displayed in a shortened form as presented during the focus group session).
Source: own data (data analysis using MaxQDA 2020).

Improved livelihoods

The multitude of various outcomes has been addressed by the participants when discussing the category of "improved livelihoods". This group of outcomes represented the social dimension of sustainability, with specific effects corresponding to implications for individual wellbeing and community welfare. FNS outcomes will be also discussed in this category.

> *Within FNS, access to relevant information and awareness for SD as well as implementation of 10 YFP on SCP have been named: (…) spreading information in families, but also in organised meetings that people can attend for free, that might be put on by the local government, things like that… with the objective of divulging information about that… Even on how to harvest olives to farmers that, maybe, were already experts, but they were able to do workshop to educate them on how to do it in a sustainable way* (participant 9).

Furthermore, sustainable food production systems (SFPSs) and resilient agricultural practices have been mentioned, too, as relevant outcomes contributing to FNS. In this regard, the increase in the number of organic farms has been named as a direct outcome of the bio-district's existence.

The topic of gender equality and equal representation in the decision-making and leadership position has been brought up as the effect of the bio-district. Likewise, it has been noted that "*A lot of young businesses are being run and managed by young women and young men as well, but there's definitely a higher presence of women*" (participant 6). This statement has been reinforced by participant 1:

> *Not only has it been fundamental in implementing the equality between men and women – we can even say that women themselves are becoming leaders in this sector, thanks to the intervention of the bio-district.*

Another set out social outcomes were identified, which can be linked to resilience-building for vulnerable groups as well as social integration of marginalised groups prone to social exclusion. In this context, social reintegration of prisoners: "(…) *the prisons that had a work programme contacted the bio-district in order to individuate agribusinesses that would assume inmates, so that they could work*" (participant 2). Another example provided was the social integration of immigrants:

> *(…) in Ceraso, there is an association that's responsible for the integration of immigrants, and they work in collaboration with the bio-district in order to integrate them into the community and … and they are training them to do work* (participant 2).

This latter example can be also viewed as contributing to the increase in the number of adults and youth with relevant skills for employment.

Not limited to that, access to information and awareness-raising for SD and sustainable lifestyle were named multiple times, with various instruments for raising the awareness. For the year 2020, a calendar representing twelve women-entrepreneurs has been printed. As was explained by the participant:

> *(…) out of the twelve women that are present in this calendar, only three of them are operating at an organic farming level. So, an instrument like this is also fundamental for spreading the knowledge of the organic method"* (participant 5).

Another participant has pointed out that other channels would be employed such as books, social media and Internet.

All the afore described outcomes represent the target-levels of the following SDGs: SDG 1; SDG 2; SDG 3; SDG 4; SDG 5; SDG 8; SDG 12 (see *Figure 34*).

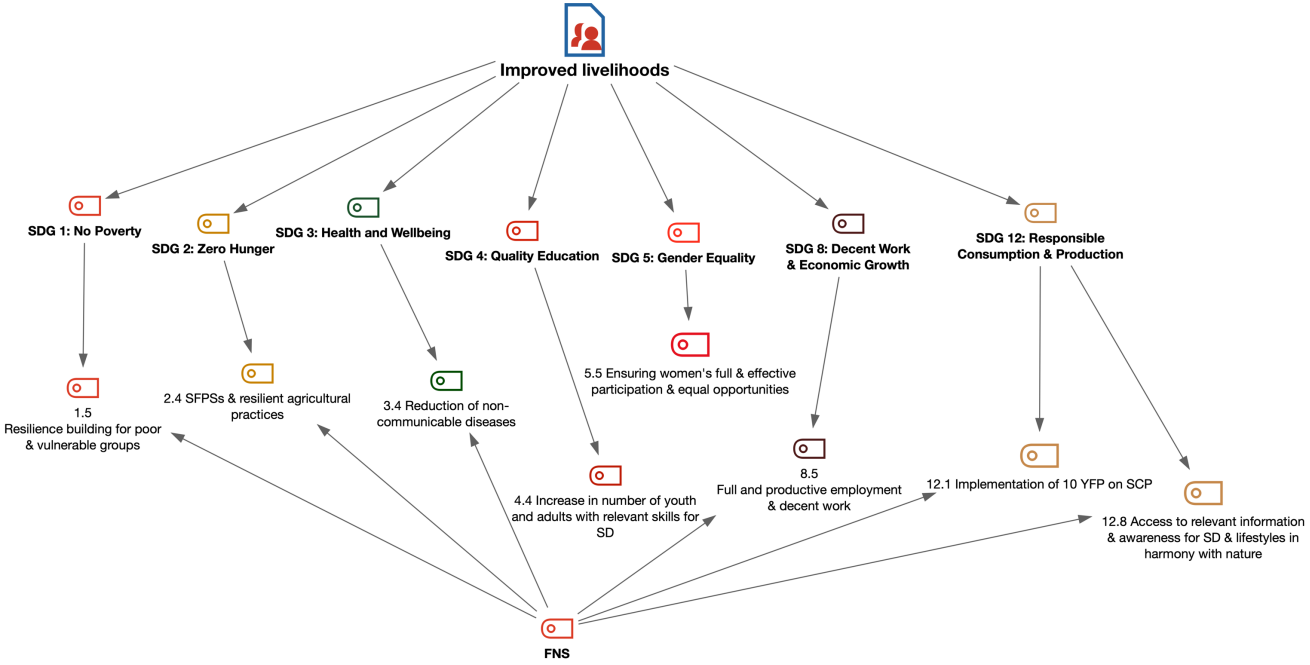


Figure 34: Overview of the specific outcomes and corresponding SDG targets of the Cilento OFS within the category "Improved livelihoods" on the basis of the focus group discussion
(SDG targets are displayed in a shortened form as presented during the focus group session; target 3.4 represents a modified version of the original formulation applied to the FSs context).
Source: own data (data analysis using MaxQDA 2020

Inclusive economic growth

Reflecting on the economic outcomes of the bio-district referred to in the session as "inclusive economic growth" the focus group participants identified a broad range of specific outcomes representing various dimensions of sustainability (see Figure 35). Similar to previous outcome categories, the acquisition of knowledge and skills for the promotion of SD and sustainable lifestyles was mentioned and explained to lead to "secondary" effects:

> *(…) the secondary effect of that is that we are also safeguarding the territory and… most importantly, not only that, but we are safeguarding it for future generations. And that is possible because of key elements in the bio-district* (participant 2).

These "secondary" outcomes can be viewed as corresponding to the protection of natural habitats and, more broadly speaking, natural heritage. Other outcomes emphasised by multiple participants are the aspects of representativeness and participation in the decision-making as well as inclusiveness – social, economic and political. As has been put forward by one of the participants:

> *Not only were these forms of farming known – they were also managed at the governmental level, and so the effect that the Cilento bio-district had was especially on the concept of participation because through their actions they were able to involve the number of businesses, and, from what I understand, a growing number of businesses… So that there is a participation, and it's not just governmental level* (participant 7).

And since the inclusive and participatory approach to decision-making and governance is central to the bio-district's functioning, the corresponding outcome naturally stands out in this category:

> *(…) within the bio-district all of the roles are representative – from public administrators to tour operators, to agribusinesses… to, you know, all of the people that introduced themselves today. So, they collaborate together in making decisions* (participant 1).

Next, increased integration of small-scale businesses into value chains and markets was named:

> *(…) thanks to, for example, some of the food fairs that were organised by the bio-district, the small producers were able to get themselves known, and they had access to markets that maybe they would not have had if the bio-district had not been in existence* (participant 5).

Various examples of the specific outcomes under the category of "inclusive economic growth" provided by the participants allow for identifying the following SDGs addressed through the corresponding targets: SDG 4; SDG 5; SDG 7; SDG 8; SDG 9; SDG 10; SDG 11; SDG 15 and SDG 16 (see *Figure 35*).

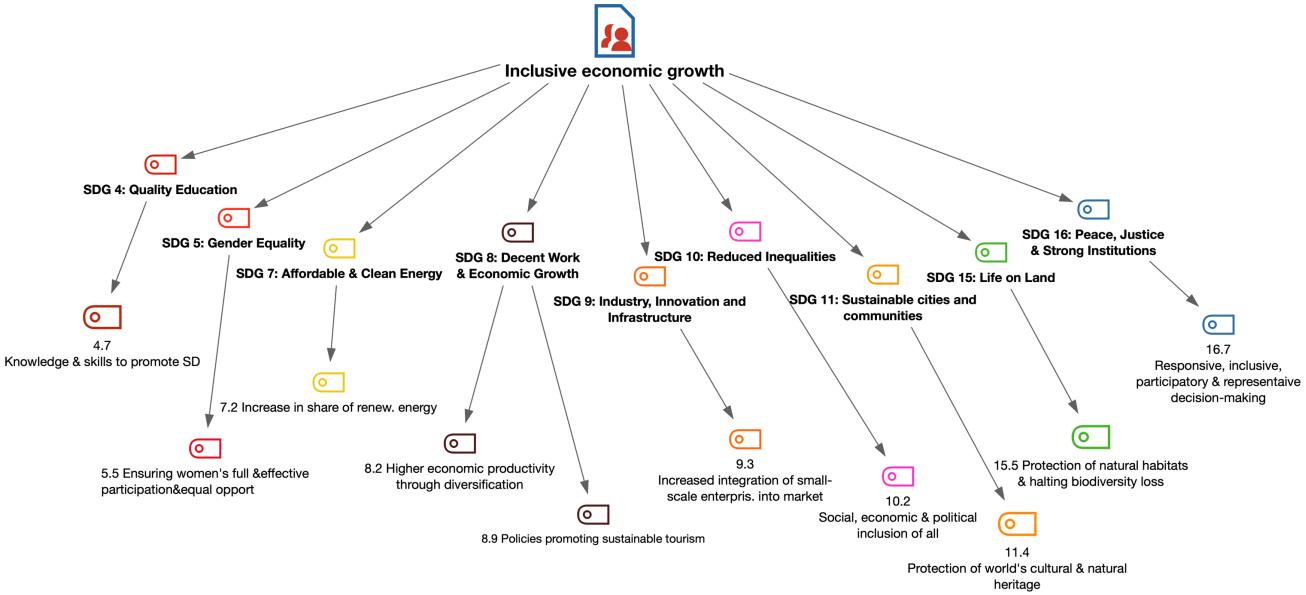


Figure 35: Overview of the specific outcomes and corresponding SDG targets of the Cilento OFS within the category "Inclusive economic growth" on the basis of the focus group discussion
(SDG targets are displayed in a shortened form as presented during the focus group session).
Source: own data (data analysis using MaxQDA 2020)

Governance and partnerships

The final category of outcomes dedicated to the political and governmental implications of the bio-district revealed some additional outcomes compared to the ones that had been previously named when looking at other outcome categories (see the retrospective view as well as "inclusive economic growth"). Likewise, integration of CC measures into planning and strategies was addressed. The concrete measures were explained to be linked to the sustainable agricultural practices employed in the organic farming, which ultimately contributes to the reduction of GHG emissions and carbon sequestration in the soil. Moreover, this was further linked to lower energy requirements and the use of renewable energy. The integration of CC measures into planning and strategies was ultimately linked to another outcome – integration of sustainable practices and sustainability information into reporting. Finally, protection of the world's cultural and natural heritage has been highlighted by several participants and linked to the UNESCO's recognitions for the bio-district with regard to the National Park Cilento and the Mediterranean Diet:

> *For the UNESCO, there are four categories, and we have four recognitions under these four categories – the material heritage of humanity, as a cultural landscape, the immaterial heritage, as a Mediterranean lifestyle, the UNESCO Geopark is the geodiversity, and the conservation of the biosphere* (participant 7).

The examples named by the participants in the context of "governance and partnerships" outcomes (including those mentioned when discussing the previous outcome dimensions) reveal the following pattern of SDGs addressed at the target-level: SDG 4; SDG 5; SDG 7; SDG 8; SDG 10; SDG 11; SDG 12; SDG 13; SDG 15; SDG 16 and SDG 17 (see *Figure 36*).

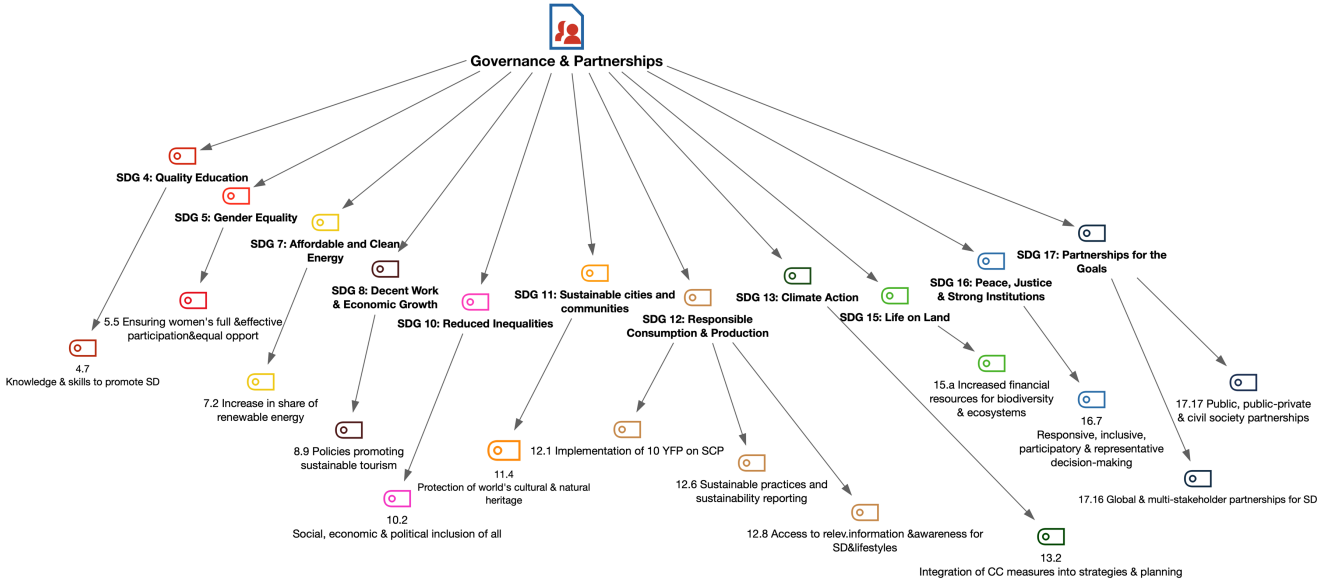


Figure 36: Overview of the specific outcomes and corresponding SDG targets of the Cilento OFS within the category "Governance and partnerships" on the basis of the focus group discussion
(SDG targets are displayed in a shortened form as presented during the focus group session; target 13.2 represents a modified to the local context version of the original formulation applied to national context).
Source: own data (data analysis using MaxQDA 2020).

Overview of outcomes most frequently addressed by the participants

The distribution of various topics and the related SDGs in the course of the entire focus group session is represented in the code-matrix browser, displaying the relative proportion of the discussed topics throughout the discussion round through the relative size of the coloured squares as well as the corresponding frequencies of mention (see *Figure 37*). The SDGs that were most frequently addressed by the participants throughout the focus group session (regardless of the outcome category discussed) were the SDG 12, SDG 15, SDG 4, SDG 5, SDG 11, SDG 8 and SDG 2 (see *Figure 37*).

Figure 37: Code-matrix-browser of the focus group session on the Cilento OFS outcomes, SDG goal-level
Source: own data (data analysis using MaxQDA 2020).

Since the outcomes discussed in the session represented the specific SDG targets rather than the broader 17 goals, it makes sense to have a closer look at the distribution of the specific targets throughout the discussion (see *Figure 38*). As can be seen from *Figure 38*, throughout the entire focus group session the participants mentioned the following topics most frequently:

- access to relevant information and awareness for SD and lifestyles in harmony with nature;
- restoration of degraded land and soil;
- protection of the world's cultural and natural heritage;
- ensuring women's full and effective participation and equal opportunities;
- implementation of the 10 YFP on SCP and knowledge and skills to promote SD.

Figure 38: Code-matrix-browser of the focus group session on the outcomes of the Cilento OFS, SDG target-level

(SDG targets are displayed in a shortened form as presented during the focus group session;
formulation of targets 3.4 and 13.2 has been modified to FSs and local as opposed to national level).

Source: own data (data analysis using MaxQDA 2020).

4.4.2 Södertälje municipality, Sweden

4.4.2.1 Background information of the Södertälje Organic Food System

Inception and developmental stages

The organic and biodynamic farming systems have a long history in Södertälje dating back to 1930s, however the year 2001 that can be considered as the inception of the OFS in Södertälje, when the consumption of organically produced food in public food programmes has become a tool for linking production and consumption to a system. There has been a corresponding political decision aiming at promoting healthy and enhancing environmental performance (Södertälje kommun, 2014; URBACT and Södertälje kommun, 2018). The concerted action towards using the purchase of food for municipal public meals as a tool for enhancing SD has been initiated by the Södertälje City Council in 2001 (URBACT and Södertälje kommun, 2018). By Swedish law, local authorities are responsible for childcare and adult education, schools, elderly care and disability care establishments, and the school lunches are free by law (Nordlund, 2015; Södertälje kommun, 2016). This area has been considered an important opportunity in advocacy work (ibid.). The municipality seized the opportunity to tackle environmental issues through the emphasis on the important role of food choices using municipal policy on public procurement of organic food in Södertälje as an instrument (Larsson, 2017). For the purpose of present research project, the year 2001 was hence considered as the inception of the OFS in Södertälje, when consumption of organically produced food in public food programmes has become a tool (linking production and consumption to a system) in that there has been a corresponding political decision aiming at promoting heath and enhancing environmental performance (Södertälje

kommun, 2014; URBACT and Södertälje kommun, 2018). In the same year a new position within the Södertälje municipality was created – the Head of the Södertälje Diet Unit (URBACT and Södertälje kommun, 2018). The Södertälje Diet Unit is responsible for all municipal public meals served in Södertälje including kindergartens, school and elderly care homes, with the total number of kitchens within the Unit equalling approximately 90 (Södertälje kommun, 2014). Between 2006 and 2010 the Diet Unit has been elaborating the Diet Policy – a political document aiming at providing guidelines towards the overall direction of work in the area of public catering including kindergartens, schools and elderly care facilities (URBACT and Södertälje kommun, 2018; Södertälje kommun, 2014). The Diet Policy has been adopted by the City Council in 2010 (ibid.). Between 2011 and 2013 Södertälje municipality has joined the BERAS (Baltic Ecological Recycling Agriculture and Society) Implementation project, with the Diet Unit having been made responsible for the development and implementation of the concept called Diet for a clean Baltic (ibid.). BERAS Implementation aimed to establish organic and sustainable agriculture (ecological recycling agriculture (ERA) farms) in the Baltic Sea region countries (Food Society, n. d.). The aim was to embrace the entire food chain, develop sustainable food societies ultimately resulting in the increased engagement on the side of the consumer (Food Society, n. d.). Part of the BERAS Implementation, with time, Diet for a clean Baltic has transformed to Diet for a green Planet aiming at providing healthy public meals and making a positive contribution in terms of environmental impacts including climate, soil fertility and biodiversity (Södertälje kommun, 2014). The concept laid down several criteria for a healthy and environmentally-friendly diet such as seasonally and sustainably produced organically grown food, preferably local, with a maximal distance of 50-250 km between

producers and consumers, minimised waste throughout the entire FS, less meat and more whole grains and vegetables in a diet (ibid.).

General information and jurisdiction

Södertälje municipality is located in east-central part of Sweden, 35 km south away from the capital city, Stockholm, and belongs to the Stockholm län province of the Stockholm region (UrbiStat, 2020; Britannica, 2020). The municipality incorporates 23 nature reserves, 86 lakes and 707 islands (URBACT and Södertälje kommun, 2018). The climate of Södertälje is mild over the fall and spring seasons, with dark and cold winters, while summers are warm characterised by long daylight hours (Haden and Helmfrid, 2004).

As *Figure 39, b* shows the municipality consists of the Södertälje city and four municipal districts: Järna (area A, *Figure 39, b*), Enhörna (area B, *Figure 39, b*), Vårdinge-Mölnbo (area C, *Figure 39, b*) and Hölö-Mörkö (area D, *Figure 39, b*) (Södertälje kommun, 2016).

a)

b)

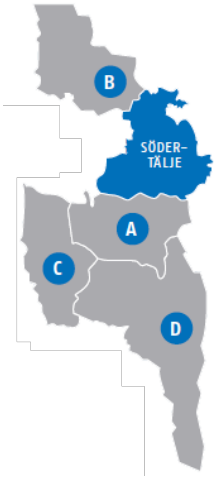


Figure 39: The Södertälje municipality
(a – location within the Stockholm region; b – composition of the municipality)

Sources: a – Södertälje kommun and URBACT, n. d., p. 9.; b – Södertälje kommun, 2016, p. 11.

The Södertälje city is an industrial town at the intersection of metropolitan and rural areas located between the Baltic Sea and the bay of Lake Mälar, with a 5 km-long Södertälje Canal connecting lake to the sea (Nordlund, 2015; Britannica, 2020). The city houses large international industries and dominant employers – the bus and truck constructing company Scania and the pharmaceutical company AstraZeneca, the latter having its research centres and manufacturing in Södertälje (Haden and Helmfrid, 2004; URBACT, 2011). Being the 20th largest city of Sweden, Södertälje bears the status of Fairtrade City (URBACT and Södertälje kommun, 2018). The municipal district Järna plays an important role within the Södertälje OFS due to its anthroposophists community located in Ytterjärna (Outer Järna) and the concentration of organic and biodynamic farms as well as the seat of the Swedish Demeter branch (Södertälje kommun, 2016; Haden and Helmfrid, 2004). One of the largest anthroposophy centres in the world in Ytterjärna houses establishments such as hospitals, culture centre, schools of various education levels, food and agricultural production (URBACT, 2011). All of these facilities are built in accordance with the humanistic and ecological ideas of the anthroposophical movement (ibid.). The Södertälje municipality and Järna district particularly have the highest percentage of land under certified organic cultivation compared to the Swedish average (Haden and Helmfrid, 2004).

The municipality encompasses the total area of 694 km^2, with the population amounting to 99,213 (state: July 21, 2020) (County Administrative Board of Västra Götaland, 2018). In 2019, 18% of the Södertälje population was made up by the foreigners, another highest number in Sweden (UrbiStat, 2020). Additional 53% of the Södertälje residents (as of 31.12.2017) have a foreign background,

with the largest groups having Finnish, Turkish, Iraqi, Syrian, Lebanese, German, Norwegian and Chilean backgrounds (URBACT and Södertälje kommun, 2018; Haden and Helmfrid, 2004).

Supply chains and production diversity

The range of local food production in organic and biodynamic quality spans from cereals, open land and greenhouse grown vegetables, root vegetables, legumes, herbs, fruits and berries to eggs, milk and meat (Haden and Helmfrid, 2004; Granstedt, 2012, p. 102f). 14,6% of agricultural land of Södertälje municipality is in organic production (URBACT and Södertälje kommun, 2018). There is a variety of processors within the Södertälje OFS, some of them having a dual role in the system acting as distributors as well. The processing activities performed within the OFS include first of all milling and baking (Haden and Helmfrid, 2004). Mill and bakery corporation Saltå Kvarn performs baking and flour-milling of grain in biodynamic and organic quality acting as a distributor as well (ibid.). Vegetable processing (Järna Syrat processing facility) and slaughtering (slaughterhouse Stigtomta Slakteri located 50 km away and used by Järna farmers) are further processing activities performed in the OFS (ibid.). Distribution channels of the Södertälje OFS are represented through direct distribution including farm shops, farmers market, CSAs and indirect distribution through wholesalers, retail shops, health stores, national food chain shops, cooperatives as well as HORECA (ibid.; URBACT and Södertälje kommun, 2018). The Södertälje municipality purchases food from a CSA called Under Tallarna (URBACT and Södertälje kommun, 2018). The organic food makes up 60% of the food used in municipal activities (ibid.). All the municipal kitchens are certified organic (ibid.; Nordlund, 2015). Therefore, municipal public meals provided in kindergartens, schools and old care homes represent an important

distribution channel, with the daily average of 24,000 meals being served (Södertälje kommun, 2014; URBACT and Södertälje kommun, 2018). There are efforts underway to significantly increase the share of local organic produce in public procurement (ibid.). Organic quality assurance within the Södertälje OFS is guaranteed through a third-party certification – National certification scheme KRAV and Demeter biodynamic certification (Haden and Helmfrid, 2004; Khaliq, 2020).

Activities and main actors

Apart from the mainstream value chain activities within the Södertälje OFS, the concept of complementary farming has anchored itself in the area having a long history, with the wide variety of activities that are gaining popularity (URBACT and Södertälje kommun, 2018). The activities within complementary farming can take various shapes and forms stretching from educational gardens at pre-school level and school kitchen gardens growing their own produce for lunches and simultaneously providing learning opportunities for children to CSA offering courses and events, youth beekeeping centre for stimulating interest in the environment and ecosystem services and own hatchery at primary school for familiarising schoolchildren with life cycles (Södertälje kommun & URBACT, n. d.). The heart of complementary farming in the Södertälje OFS, however, lies in the social therapy and rehabilitation centre in Norrbyvälle providing green-rehabilitation through therapeutic gardens as well as activities with animals (ibid.). Aiming at reaching as much self-sufficiency as possible the centre contains own gardens and orchards using biodynamic techniques as well as a greenhouse, solar-powered barn, packing and storage house, kitchen, restaurant and a café, (ibid.). The core goals of the establishment are to maintain the wellbeing and QOL for its

participants and residents, safeguard ecosystem health and the overall sustainability (ibid.).

The range of key actors involved in the Södertälje OFS spans from the value chain actors (organic and biodynamic farmers, processors and distributors, retailers, CSAs, HORECA) and research advisors, research foundations and biodynamic educational centres, to the administration represented through the municipal Diet Unit and Political Sustainability Committee and stretches beyond the municipal boundaries to incorporate national and international organisations. The overview of the key actors of the Södertälje OFS is given in *Table 11*.

Table 11: Overview of the main actors of the Södertälje OFS, their role in the system and performed activities

Actor of the Södertälje OFS	Function	Performed activities
Diet Unit of the Södertälje municipality	Responsibility for all the public meals in Södertälje (kindergartens, schools and elderly care homes)	Management and coordination of public meals in the Södertälje municipality
Södertälje school canteens	Sustainable catering for schoolchildren; raising awareness of healthy diets and food waste	Catering for schoolchildren (food preparation from scratch based on organic as well as local food produce); awareness-raising activities for children on issues of food waste (e.g. weekly food waste statistics charts displayed in the canteens) and healthy diets (displaying portion sizes and suggestions of meal compositions)

Nibble Gård farm	Food production	Dairy and meat production, fodder, grain and vegetable production
Skillebyholm farm and garden, training centre, farm shop	Biodynamic producer, retailer, education in biodynamic agriculture.	Production of meat, vegetables, eggs, fruits, herbs on the farm and in the garden; education and training biodynamic agriculture and gardening. The farm shop sells local produce as well as handicrafts.
Social therapy and rehabilitation centre Norrbyvälle (vegetable garden, apple orchard, greenhouse, herb garden, garden with berries and perennials, packaging and storage house, kitchen and lunch restaurant, Skäve Café)	"Complementary farming"– integration of farming and food production activities for social, education and cultural purposes	Food production and catering as a "green therapy" for rehabilitation and social therapeutic purposes as well as for education
Skäve Gård farm	Food production	Dairy, meat and grain production.
Salta Kvarn mill, bakery and café	The main flourmill and bakery in Järna, in 2015 has been awarded as Sweden's most sustainable brand.	Milling and baking in predominantly biodynamic (Demeter certified) as well as organic (KRAV certified) quality. Bakery and café sell break, coffee and cakes and, upon availability, fresh local produce.
Slaughterhouse Stigtomta Slakteri	Slaughtering cattle from Järna farmers.	Local slaughtering for Järna farmers, both organic and conventional producers, located within 50 km distance from the producers
Biodynamiska Produkter, wholesaler	The only wholesaler in Järna and the biggest	Distribution of hundreds of organic (KRAV certified) and biodynamic

	Demeter wholesaler in Sweden.	(Demeter certified) food products from all over the world to retailers worldwide.
Under Talarna, DOC	CSA cooperative producing and distributing seasonal organic produce to its members	Food production and direct distribution to CSA members
REKO store	Local retail outlet of the nation-wide retail chain	Retail outlet selling local produce as well as producer from Biodynamiska Produkter
AGRODYNAMIC	Agricultural advisor	Agricultural advisory services
Research and academia (Skillebyholm Biodynamic Research Institute, SLU – Swedish University of Agricultural Science, Stockholm Resilience Centre)	Research support and provision of external expertise	Collaboration in terms of research support, provision of external expertise, implementation of joint projects
International organisations and networks (BERAS International Foundation, European action planning network Agri-Urban)	Collaboration, action planning and projects' implementation	Networking, knowledge and expertise' sharing, joint implementation of projects

Source: own compilation based on Haden and Helmfrid, 2004, p. 20ff; URBACT and Södertälje kommun, 2018, pp. 6, 20, 22; One Planet Network (n. d.).

Vision and core principles

The Södertälje OFS's vision is to become a regional node for SFSs as well as research, innovation and planning of the Mälar Valley Region sharing its experience and knowledge with other cities (URBACT and Södertälje kommun, 2018). A sustainable and resilient future is the core of the vision aiming at achieving a balance between the people, environment and society, where future needs

are met with renewable resources (ibid.). Simultaneously, protection of habitats, enhancement of biodiversity and development of the city towards a sustainable future are to be safeguarded (ibid.). One of the concrete strategies on how to achieve this is the farming strategy of the Södertälje municipality incorporating several ideas and plans such as a farming incubator, agricultural parks, municipal vegetable farm and pollination plan described in *Table 12* below. While farming incubator could contribute to increasing the number of new farmers and entrepreneurs and hence contribute to the supply of locally produced food, the municipal vegetable farm could be used for complementary farming, while, at the same time increasing the Södertälje's self-sufficiency (URBACT and Södertälje kommun, 2018; see *Table 12*).

Table 12: Selected examples of municipal plans and strategies for realising the Södertälje vision

Agricultural parks (idea of the farming strategy)	
Objective	Establishment of agricultural parks in Södertälje
Vision	Becoming first city in Sweden to establish agricultural parks.
Background	The concept lays down the basis for an instrument ensuring sustainable use and protection of agricultural land from exploitation, while at the same time providing recreational services and enhancing biodiversity
Measurable goals	Protection of peri-urban land; increase in amount of locally produced food; employment opportunities; strengthening of the Södertälje's eco-profile; increase in tourism
Status	Idea phase
Farming incubator (agri-advisors engaged)	
Objective	Lowering the threshold for commercial farming in Södertälje while stimulating the increase in locally grown produce
Vision	A higher number of farming and gardening entrepreneurs producing local food
Background	Lowering the threshold for people willing to try to farm commercially within the risk-managed environment. The market for vegetables in Södertälje is vast.
Measurable goals	Increase in amount of locally produced vegetables and the number of vegetable producers; active increase in farmland area
Status	Planning phase
Municipal vegetable farm	
Objective	Establishment of municipal farm in Södertälje
Vision	Ensuring the supply of locally grown produce to kindergartens, schools and elderly care homes, while simultaneously providing rehabilitation and work-based training opportunities
Background	Difficulty with securing local produce for the Diet Unit's kitchens. A high number of unemployed people who are interested in trainee positions in the green sector.

Measurable goals	The amount of locally sources vegetables served by the Diet Unit; the number of people in trainee positions involved in the municipal growing activities; the number of schoolchildren getting pedagogic activities at the municipal farm
Status	Idea phase
Pollination plan	
Objective	Strategic document – Södertälje Municipality Pollination Plan
Vision	Actively decreasing the threat level to pollinators, while engaging farmers, companies, the municipality and its citizens
Background	Ensuring biodiversity through the focus on the ecosystem services related to pollination. The mission would be mapping and developing a plan for the required measures to improve the habitat and living conditions for pollinators and the municipality's role in controlling of for instance what is being planted and where
Measurable goals	Study visits inspiring other municipalities to implement similar strategic measures; increase in pollinator numbers and habitat in Södertälje; increasing awareness on pollinators and other ecosystem services; Chapter in technical Handbook – Pollinator Landscape Management; future commissions for working with other ecosystem services, i.e. grazing animals.
Status	Funded and on-going

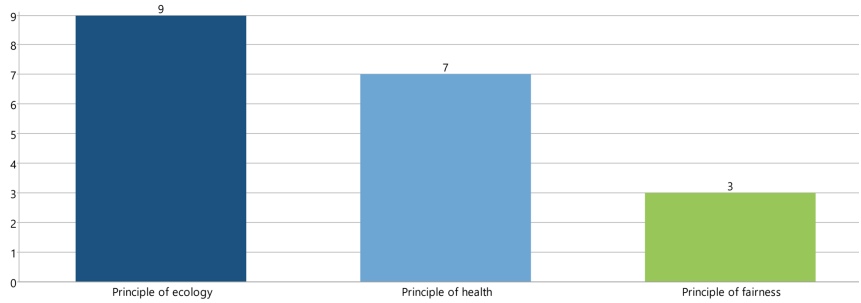
Sources: URBACT and Södertälje kommun, 2018, p. 32ff; updated based on a virtual discussion with the responsible personnel of the Södertälje municipality on December 4, 2020.

4.4.2.2 Findings from the interviews with key actors (Södertälje)

During the initial case documentation phase (master thesis project of Khaliq, 2020) 27 interviews with key actors have been performed, of which only 21 were used for the data analysis on the OFS outcomes due to issues related to quality of the interviews (see chapter 3.3.4.1). The present subchapter therefore presents the outcomes-focused results from 21 semi-structured interviews with

five organic and biodynamic farmers and gardeners, five distributors (wholesale, retail and CSA), three representatives of research and academia, two processors, two chefs, two employees of the Södertälje municipality, one educator and one agricultural advisor (the overview of the interviewees is presented in Annex IV-2, b).

When answering the questions about the perceived outcomes of the Södertälje OFS, the interviewees often mentioned the aspects laid down in the principles of organic farming. Likewise, the principle of ecology was reflected in the answers of nine key actors (see *Figure 40*).



(n=21)

Figure 40: Outcomes of the Södertälje OFS corresponding to the IFOAM-principles, as perceived by the key actors
Source: own data analysis (using MaxQDA 2020; based on raw data from Khaliq, 2020).

As the key actor 17 put it:

> *Ecological agriculture builds up the processes. In conventional agriculture, you destroyed the natural processes. I can see, the system is working well. Conventional agriculture is dead because it does not think about earthworms in the soil and the taste of the products for consumers. I can see, farm and earth - everything is alive. I try to manage farm that all the living things are interconnected to each other. Destroying one side destroys everything. I have timberland on my farm that is quite nice thinking. I want to do work in this living system to do the whole part.*

Furthermore, seven interviewees spoke of aspects anchored in the principle of health (see *Figure 40*). For instance, the key actor 7 stated:

> *(…) the taste of the food is good. Food is produced without chemicals. It's pretty controlled system for food: you do not put the chemicals. Organically produced food does not destroy the products.*

Finally, three interviewees pointed to the aspects anchored in the principle of fairness:

> *The organic food system provides thinking about how to change things in society as a whole. How can we create a fair food system, where farmers get reasonable pay, poor people buy this food and get access to that food? That is a longer questionable effect of engaging with the organic food system* (key actor 16).

Within the ecosystem-related outcomes of the OFS, the majority of key actors corresponding to eight interviewees pointed to the ecosystem stability (see *Figure 41*).

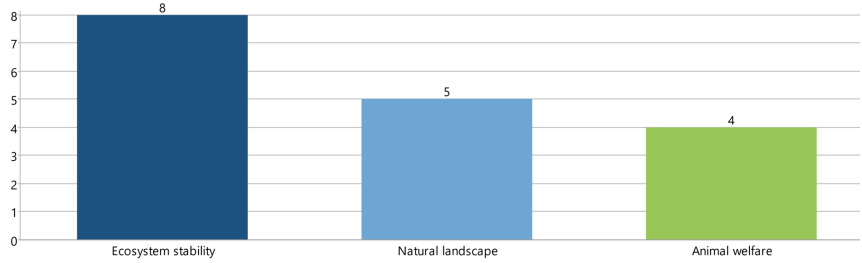


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Figure 41: Ecosystem-related outcomes of the Södertälje OFS, as perceived by the key actors
Source: own data analysis (using MaxQDA 2020; based on raw data from Khaliq, 2020).

Here, the aspects of enhanced biodiversity on organic farms, improved soil fertility, CC mitigation effects, genetic diversity of plants and seeds as well as lack of fodder transportation from overseas have been mentioned (key actors 19, 15, 13, 14, 18, 20,

17 and 16). The key actor 17 gave a concrete example of the OFS's contribution within this realm:

> *We grow all kinds of crops. Last year there was a severe drought in Sweden, but we had no problem. We cultivate old varieties, cultural varieties, and resilient varieties. We are trying small fields and big difference. We use own farm seeds. Old varieties or cultural varieties.*

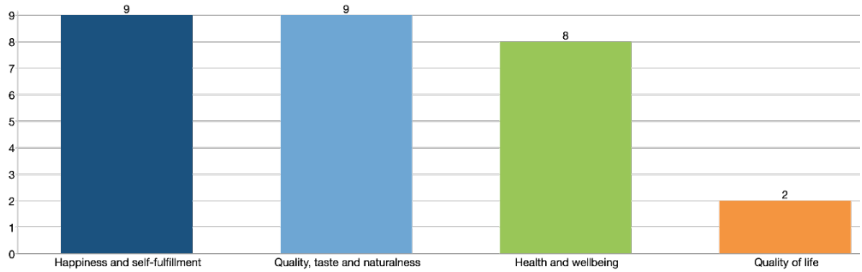
Natural landscape has been stressed by five interviewees as another ecosystem-related outcome of the Södertälje OFS (see *Figure 41*). As the key actor 20 explained:

> *(…) the organic makes... makes it more diverse than it would have been conventional - cause usually that is what happens when you have an organic farm - especially, when you have an organic farm that is... has a loop in its system, which many of the farms in Järna and Södertälje have - they have animals and they have... they grow food for the animals, and vegetables and so on... and it all stays within the loop - that gives a very dynamic and very complex and diverse landscape.*

Finally, animal welfare has been mentioned by four key actors (see *Figure 41*). As one of them explained:

> *I get personal satisfaction to see the cows are happy. Production of milk is in a natural way. I just support the animals in a natural way. My main task is about the harmony of animals. Cows are happy and move freely in the organic food system* (key actor 12).

Regarding the outcomes on individual level, nine key actors spoke of happiness and feeling of self-fulfillment they are getting from being part of the OFS and performing their activities in it (see *Figure 42*).



(n=21)

Figure 42: Outcomes of the Södertälje OFS on individual level, as perceived by the key actors
Source: own data analysis (using MaxQDA 2020; based on raw data from Khaliq, 2020).

As the key actor 20 put forward:

> *When I decided to become a farmer, I spent much of time outdoors. I think, to work physically is good for my body. Physically it made me happy... I do also think that growing things or farming can be a very social thing and, also, knowledge about nature can be also very satisfying. Because, in the end, this is how we will understand, why climate change is a problem and why biodiversity loss is a problem - you have to understand how nature works. And when you do, things fall into place. And, I mean, in general: just be outside in a farm and grow vegetables for a day, and you'll be happy by night, right?!*

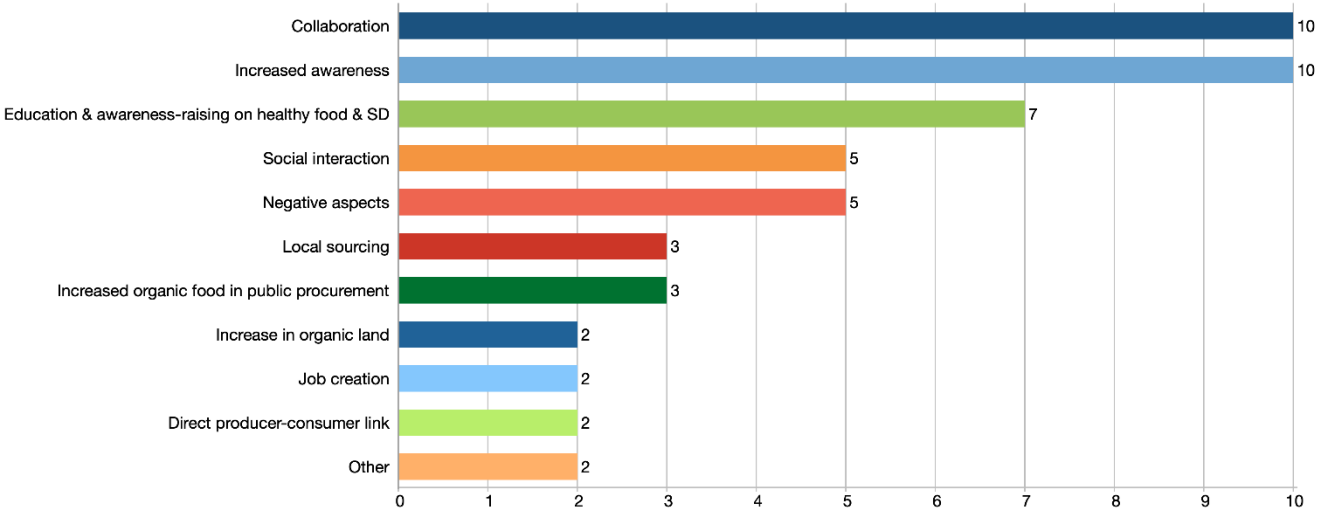
Or, as the key actor 16 concluded: "*For the first time, I feel what am I going to do. Sometimes work is frustrating. I would say, with the task I feel some kind of fulfillment.*". Quality, taste and naturalness have been stated by nine key actors (see *Figure 42*). As the key actor 7 explained:

> *(…) the taste of the food is good. Food is produced without chemicals. It's pretty controlled system for food: you do not put the chemicals. Organically produced food does not destroy the products. They want to make the best products. If you buy the eco-chicken, it lives quite long and it is quite bigger. It is not like the super grown very fast and when you slaughter, you do not put water inside it to increase the volume of it.*

As *Figure 42* shows, eight interviewees pointed to health and wellbeing. Most of them elaborated on nutritious and safety aspects: "*Food production without pesticides and artificial fertilizers, I think, is better for our health*" (key actor 8). Another key actor sees OA as an activity maintaining the wellbeing: "Organic agriculture is the key to defeat depression" (key actor 20). Finally, as *Figure 42* indicates, two interviewees emphasized QOL as another OFS outcome on individual level:

> *We work outside and in a healthy environment. We work with collaborative people and I feel a connection to the closed system. The organic food system is a game-changer for a simple lifestyle. It develops the quality of life* (key actor 19).

Lastly, the community-related outcomes perceived by the key actors have been also revealed through the interviews. The majority of interviewees perceived collaboration (ten interviewees) and increased awareness (ten interviewees) as the OFS outcome on community level (see *Figure 43*).



(n=21)

Figure 43: Community-related outcomes of the Södertälje OFS, as perceived by the key actors

Source: own data analysis (using MaxQDA 2020; based on raw data from Khaliq, 2020).

Regarding increased awareness the key actor 17 explained:

> *In general, people search more for ecological food. People have a personal identity with food. Our shop is working well. They see the things: chickens going outside and moving freely in the garden. They buy the eggs and taste them, and it is growing more and more. People know where the food comes from.*

Key actor 16 elaborated on collaboration as another OFS outcome as follows:

> *Especially in Södertälje, we have very nice development that Järna and Södertälje municipality are working together. Last 10 to 15 years we have a strong engagement with the municipality. Municipality transfers food knowledge to the other municipalities. We always learn from farmers. I can say both side knowledge transfer, produce research knowledge and share it. It works horizontally and vertically.*

As *Figure 43* shows, educational and awareness-raising activities stemming from the Södertälje OFS have been mentioned by seven key actors, best explained by the key actor 11:

> *We have funding from the municipality for education... The municipality provides food to the schools and old people. They are educated through meals. Every day they are educated about food, food waste, and vegetarian food versus meat that is implemented by the school. This is the biggest impact that we can see in Södertälje municipality.*

Furthermore, social interaction has been stressed by five key actors:

> *Garden has more biodiversity and it connects to a different level of human beings. It is so important to talk about city farming, gardening, and mills of the city. It creates magnetic, people come here and see each other. Everyone understands what is going on in the garden* (key actor 14).

Five interviewees revealed some negative aspects and challenges of the OFS (see *Figure 43*). Likewise, two key actors mentioned economic constraints, one key actor spoke of the problem with cabbage butterfly, one interviewee mentioned difficulties in reaching the consumer coupled with lack of consumers' willingness to pay

extra for organic products. Another key actor saw disappearance of small-scale organic farmers as another challenge:

> *(…) in the ever more pressed world we're living in, the disappearance of small organic growers is also a major concern, they disappear. And that's a huge problem - not just because small farmers are disappearing, but that leads to disappearing community... and that's also a threat here. In the 80s we were a lot more growers here, a lot more smaller operations. In the 80s we could have 12-14 milk cows, and it was Ok, it wasn't even that unusual. Today, Nibble farm where our school is, for example, has, maybe, 40 milk cows – that's a hobby, that's a hobby business. (…) So, that's a major change, and affects not just the number of small farmers there are, but it affects the rural community everywhere - from Sweden to the Dominican Republic* (key actor 4).

Other outcomes reported by the key actors were local sourcing (three answers), increased organic food in public procurement (three answers), increase in organic land, job creation, farmers' dignity and empowerment and direct producer-consumer link (two interviewees, each) (see *Figure 43*).

4.4.2.3 Findings from the focus group in Södertälje

The focus group session has been carried out by the researcher on January 30, 2020 in Järna. Initially nine people confirmed their participation, however due to one last-minute dropout due to emergency situation of the farm and one no-show participant seven participants took part in the session. The group consisted of two females and five males representing various stakeholders: local administration (politician), Diet Unit of the Södertälje municipality, research and academia, NGOs, project partners, wholesaler and catering (see *Table 13*). The farmer who had not been part of the focus group session due to unforeseeable circumstances on the farm has been interviewed separately later, on March 14, 2020, and

the results of this interview are incorporated into the below described findings (see *Table 13*).

Table 13: Overview of the focus group participants in Södertälje

	Stakeholder group / role in the Södertälje OFS	Gender	Estimated age group
Participant 1	Politician and member of Södertälje Sustainability Committee, Södertälje municipality	Female	Middle age
Participant 2	Södertälje Diet Unit, Södertälje municipality (in charge of public meals)	Female	Middle age
Participant 3	Research and academia, Biodynamic Research Institute	Male	Senior
Participant 4	NGO, financial manager	Male	Upper middle age
Participant 5	NGO, project partner	Male	Upper middle age
Participant 6	Chef, organic lunch restaurant, Skillebyholm	Male	Middle age
Participant 7	Wholesaler and Järna Naturbruksgymnasium (farming high school and agricultural college)	Male	Senior
Farmer (interview)	Biodynamic farm, with cattle, goat, chickens, vegetables	Male	Middle age

Source: own elaboration based on the focus group session conducted in Järna on January 30, 2020 and a follow-up interview on March 14, 2020 with the absent during the focus group participant.

The findings from the focus group session will be first discussed according to the session's thematic structure (see Annex V-1). The thematic sections covering the outcome categories as these were discussed during the focus group would incorporate the addressed SDG targets (in their short version), which built a basis for the

discussion. Afterwards, the general overview of the focus group findings will be presented as a snapshot of the session disclosing the topics and the SDG targets that were most prominently addressed in the session.

The Södertälje OFS: Retrospective view and the first outcomes achieved

The first part of the focus group discussion was dedicated to the retrospective view of the Södertälje OFS and its achieved outcomes from the point of inception (concerted action in 2001 to make food purchase a tool for SD) until today. This served as an introductory part to the session. The discussion has revealed that the initial political decision to increase the share of ecological food was a goal of the Green party at that time, which led to the creation of a new position – the Head of the Diet Unit. Before that, the schools did not have their own kitchens and a diet manager position responsible for the menus. So, the outcome of that political decision was the decentralisation of the school catering. Each school and elderly care homes got their own kitchen and a headmaster responsible for the kitchen menus. The kitchens started to cook with a new menu instead of warming up processed and convenience meals. Such reformation of the catering system required knowledge creation for the kitchen staffs as to how the food preparation should be done when using fresh produce and raw ingredients instead of pre-packaged and highly processed foods. Therefore, not only did that political decision increase the share of ecologically produced food in the public procurement, but it also stimulated the knowledge creation around the food handling and preparation, creation of the menus from scratch. It appeared to be that the similar attempts have been undertaken by the Södertälje municipality earlier. In 1990s, the wholesaler Biodynamiska Produkter was invited to carry out tests in five kitchens within the county comparing the quality of organic and conventional vegetables. And although these trials have revealed

more favourable aspects of organically produced foods in terms of quality, logistics and service, this did not lead to any municipal orders due to the resistance from the kitchen personnel. There were two reasons for that. First, the kitchen staffs were not persuaded by the quality perceiving certain aspects of organic vegetables rather negatively (i.e. non-uniformity of shape and size). Second and most important was the feeling to be left behind and not included into decision-making: "(…) *someone up there in the management has made a decision, and they felt like they have not been part of this*" (participant 2).

The political decision of 2001 was different in that it provided a better involvement for the kitchen personnel giving them a different status. New people have been employed; the recruitment process has changed; new roles and functions have arisen for the personnel, and employees received a higher status. Furthermore, the relations with the supply chain actors have been built. As has been put forward by one of the participants:

> *(…) when we started to educate the staff, then the knowledge came (…) and they started to create (…) like (…) relation with the farmers (…) with people that were working with the (…) with the food – in the food chain"* (participant 2).

Therefore, the implementation of political decision of 2001 resulted not only in the establishment of green public procurement, but it also yielded a broader set of outcomes linked to it: creation of knowledge and competences around the food, employment creation in the public catering sector, better inclusion of kitchen staff into decision-making process and the establishment of relations in the supply chain. Later, with the help of the EU project (BERAS-implementation) the entire food chain has been covered to better address the producer-consumer link.

Ecosystem stability

The category of environmental outcomes referred to in the session as ecosystem stability incorporated the variety of outcomes at the SDG target-level (see Annex V-2). First, it has been pointed out that the effects on the ecosystem stability from the Södertälje OFS would occur on various levels and in different places, including other countries, in case of imported foods. Since the current demand for ecologically produced food cannot be met through local supply of the system currently corresponding to 10-25%, there is a significant share of imported products entering the municipality for the public procurement. In this regard the outcomes of the Södertälje OFS can arise elsewhere in the world. Another aspect raised at the beginning of discussion of the ecosystem stability outcomes was the opposite one – protection from the negative impacts from outside of the system. In this context the resilience building has been mentioned, which can be, to a certain extent, seen as an outcome of the Södertälje OFS.

The participants then focused on the concrete examples of the outcomes as displayed on the projection screen. Here, improved soil health, reduction of contamination of air, water and soil, CC mitigation through reduction of GHG emissions, maintenance of biodiversity, decreased sea pollution as well as topics related to sustainable consumption and production have been mentioned. For instance, it has been stressed that concrete evaluations have been performed within the framework of the BERAS-project, which have compared ERA against conventional agriculture. These evaluations resulted in evidence of positive effects from ERA on the soil and water:

> *(…) we could see that we could reduce the pollution of water system with ecological recycling agriculture, with 50% reduction of leaching of… nitrogen to the sea, we could also see that we could reduce emissions of greenhouse gases. Compared to the conventional*

agriculture, we could also improve the fertility of soil, the humus content in soil (participant 3).

Regarding protection of biodiversity, the pollination plan and farming strategy have been named. Furthermore, the interviewed farmer stated that there are concrete measures for the protection of biodiversity on his farm: "(…) *we (…) choose different varieties (…) and we also work with flowers and herbs for (…) insects*" (farmer, Interview from March 14, 2020). The farmer's interview also revealed a contribution and further efforts towards CC mitigation and adaptation. Likewise, the farmer mentioned the intention to become climate-neutral, with some current efforts underway, such as absence of ploughing. This outcome can be therefore considered as intended and somewhat prospective, and it refers to integration of CC measures into planning, however it cannot be assigned to any SDG target since there is no mitigation-related SDG target under the SDG 13 (Climate action). Therefore, the intended outcome incorporated into strategic planning will be assigned to another SDG target within another dimension (see *Governance and partnerships*).

Furthermore, the topic of food waste reduction has been broadly discussed. Concrete measures to reduce food waste in public procurement included innovative approaches such as development of a new dairy product out of low-fat milk by the local dairy. This low-fat milk would have otherwise gone to waste because it was considered a by-product since full-fat counterpart is generally consumed. Similar example was given with regard to the newly developed in the school canteens fish burger containing bream fish. It was explained that normally these fish species would not be consumed in Sweden: "(…) *it's a species of fish that aren't popular in Sweden… we normally don't eat*" (participant 2). So, the school kitchens created a burger patty out of this fish. Another example was

cooking with chicken meat from egg laying hens, which was implemented in school canteens.

The respective SDG targets that have been addressed by the participants in the variety of provided examples are presented in *Figure 44*. Likewise, the SDG targets that represent the described outcomes contributing to ecosystem stability appeared to be linked to the SDG 2, SDG 3, SDG 7; SDG 12, SDG 14, SDG 15 and SDG 17 (see *Figure 44*). The degree of representation of the separate SDG targets as well as their respective frequencies suggest that the SDGs 2, 12 and 15 appear to be addressed the most in the outcomes contributing to the ecosystem stability. These appear to also represent the direct ecosystem outcomes.

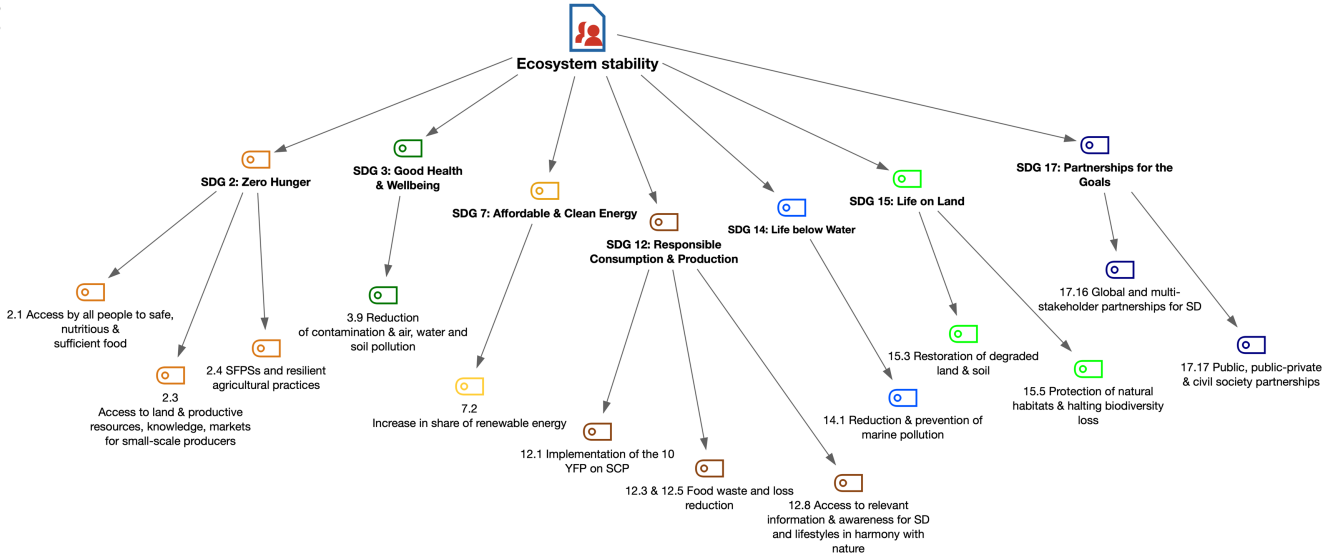


Figure 44: Overview of the outcomes and corresponding SDG targets of the Södertälje OFS within the category "Ecosystem stability" on the basis of the focus group discussion
(SDG targets are displayed in a shortened form as presented during the focus group session; target 3.9 represents a modified version of the original formulation applied to the FSs context).
Source: own data (data analysis using MaxQDA 2020).

Improved livelihoods and FNS

When beginning the discussion about the social outcomes of the Södertälje OFS and improved livelihoods specifically, the participants emphasized the inclusiveness and integration as one of the first apparent outcomes referring to the interaction between the two systems – the Järna system being more organic system and Södertälje being a more conventional one. This interaction has ultimately resulted in the merge of the two systems with organic and sustainability aspects having received more attention and recognition. This inclusion of the Järna sub-system into a bigger Södertälje system has been increasingly important for the Järna society in terms of providing the feeling of being part of the whole. As has been stressed by the participant 5:

> *I think, the kind of, the acceptance of Järna as a society by a larger society as Södertälje is giving some kind of credit to the people actually living there… seeing them… In my opinion, that is… that is a positive effect that can… that can strengthen their ability to really do what they do, also for the future.*

The result of this acceptance has been that at present, sustainable food is part of the Södertälje city brand and food in general is considered a third pillar.

Public and individual health has been addressed as another outcome contributing to improved livelihoods. Here, the example of a school canteen has been provided, where the implementation of healthy meals with an increased share of organic ingredients coupled with the efforts of canteen's chef led to the change in schoolchildren's eating behaviour. Children started eating, which has resulted in more energy (both in school and at home) and better progress at schooling, as has been later on reported by their parents:

> *(…) through the food, high quality, the students started to eat, they got more nutrition, they were feeling happier, they had more energy – and*

> *that changed the school… (…) they could learn better… (…) and (…) the teacher was not as exhausted… (…) the children, or students, came home after school with quite more energy than before. (…) So… and in that sense it changed the family* (participant 6).

Also, in relation to health, the role of social interaction observed in the Södertälje OFS has been highlighted.

Coming to the specific outcomes addressed in the discussion, the aspects of inclusion and resilience creation for vulnerable groups have been addressed. The participants emphasised the role of Järna in shaping this outcome, with the community's long experience in curative pedagogic and the corresponding movement dating back to 1930s. In this context it was mentioned that the Järna society is built upon two pillars – nature and human being, hence taking care of people, including those in vulnerable situations, has always been crucial. This has transformed into today's inclusion of disabled people or those with impaired development into the Södertälje OFS, where they can work in the restaurants, on farms and in the gardens being part of the society:

> *(…) the story of Järna was people, was taking care of people that were a little bit outside of the mainstream (…) and (…) letting them have the possibility to work, in nature, with farms* (participant 5).

Furthermore, the participants named the protection of cultural and natural heritage.

FNS was stated to have increased over time thanks to the Södertälje OFS, as was explained by one of the participants. Likewise, access to safe, nutritious and sufficient food was named as a specific outcome here. It has been stressed, however, that there would be more to be done in the realm of FNS, with some efforts underway to better address in the strategic planning. The latter specification indicates that FNS can be considered an intended outcome of the OFS.

Finally, access to information as well as the overall awareness-raising and knowledge-building on the issues of sustainability have been mentioned as further outcomes of the OFS contributing to the improved livelihoods. The interview with the farmer revealed another closely linked outcome, namely contribution to the 10 YFP on SCP, consumer information for SCP in particular:

> *(…) there are so many people living in the cities and don't have the relationship with the land and food production that it is important to educate the (…) people and to give them an impression of how food production is going (…) and on that way the food became (…) an individuality, and that means that the people can have a (…) can have a trust for our production* (farmer, Interview with the farmer from March 14, 2020).

The interviewed farmer has further addressed the aspects of employment and increase in number of youth and adults in entrepreneurship:

> *(…) so, we will try to give some young people the (…) possibility to start a production here. And… also… we like to start with (…) Agroforestry, so… (…) we planted the first trees, so (…) we'd like to start it also, but also give possibility to new and young people (…) to start it in our place* (farmer, Interview with the farmer from March 14, 2020).

Interestingly, it has been stressed by one of the focus group participants that a respectful way of presenting food in the catering coupled with a social interaction could help reduce food waste. This could which act as a leverage point for improving the performance in all the three dimensions of sustainability:

> *(…) So, this is the, according to me, the most important thing to change because if you just do that – you change everything (…) almost everything – in a long term, but also in short terms* (participant 6).

Looking at the concrete outcomes named by the participants reveals the contribution to the following SDGs at their respective target-

levels: SDG 1, SDG 2, SDG 4, SDG 8, SDG 10, SDG 11, SDG 12, SDG 16 and SDG 17 (see *Figure 45*).

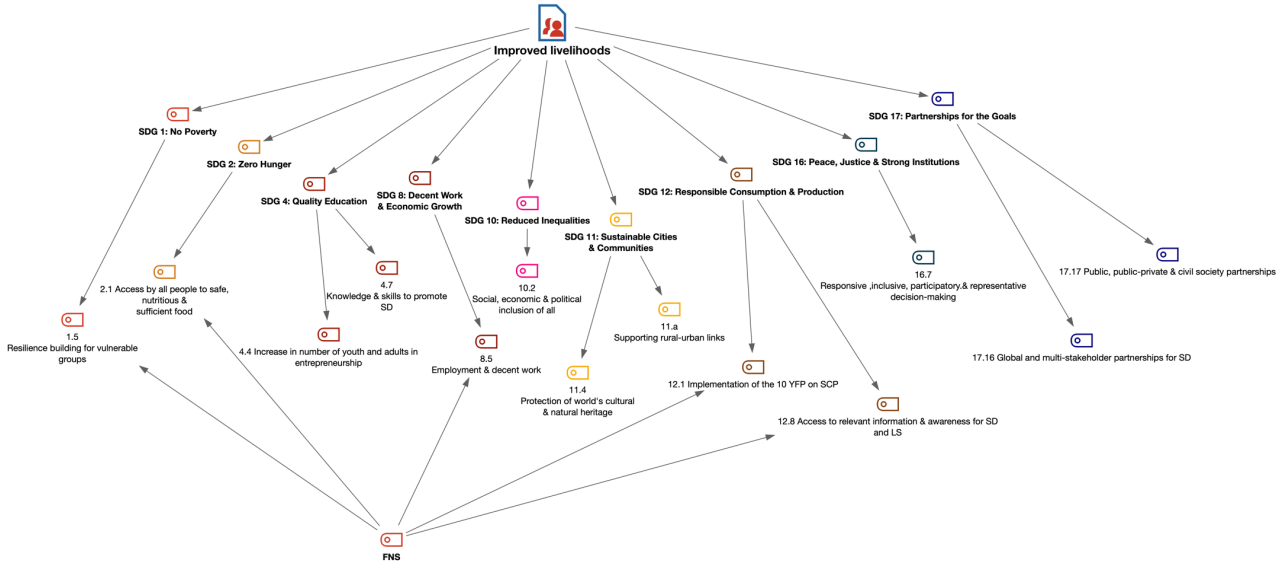


Figure 45: Overview of the outcomes and related SDG targets of the Södertälje OFS within the category "Improved livelihoods" on the basis of the focus group discussion
(SDG targets are displayed in a shortened form as presented during the focus group session).
Source: own data (data analysis using MaxQDA 2020).

Inclusive economic growth

The first outcome named within the economic dimension of sustainability was enhanced scientific research and knowledge dissemination, which has been explained to stem from a lot of activities organised through "MatLust" project:

> *(…) we are having activities all the time, and they are very popular (…) a lot of people (…) from the whole food chain in (…) Stockholm region and actually in the whole Sweden come here to (…) meet and (…) search for knowledge* (participant 2).

Next, food waste and the menus' adjustment in public canteens have been brought to attention in relation to economic impacts these measures have had. Likewise, it was explained that the reduction of food waste in public procurement is closely linked to economic affordability of public meals of higher quality, including the increased share of organic and local food in the canteens. The reduction of meat in the canteens has been explained to be another economic measure of increasing the overall quality of the meals. Likewise, having less meat in the meals allowed for supplying more expensive organic meat and meat produced according to Swedish legislation (with higher quality standards), while simultaneously improving the ecological performance in public procurement. An interesting example has been provided by the chef of a biodynamic lunch restaurant:

> *(…) one most important thing is the food waste. So, we take care of everything that's (…) going to be thrown (…) or (…) is going to get bad – at local producers and also with biodynamical products, imported (…) from other parts of Sweden… we take care of that and… and set our menu, directly after that – that's the (…) main goal. And, therefore, we can also (…) get lower prices on vegetables because they are going to throw it* (participant 6).

The participant has further given an example of two other measures – reduction in size of the plates offered at a buffet coupled with no

self-service for warm meals, so that these are always portioned by the staff (with a halved portion size). Both of these measures had a significant effect in terms of improved resource efficiency, economic viability, food waste reduction as well as the customers' health. Likewise, it became possible to use 30% less ingredients per customer while reducing per-person food waste from approximately 10% to 1% and increasing public health through reasonable portion size:

> *(…) we are increasing (…) public health… we're (…) changing our (…) possibility economically to run this kind of business because 30% less ingredients (…) per person – that's (…) that's a huge amount… that's big costs* (participant 6).

Support for rural-urban links has been identified by the participants as another outcome contributing to inclusive economic growth. The group unanimously agreed that this outcome can be considered central to all the activities being carried out by the Södertälje municipality. As one of the participants stressed referring to the support of rural-urban links:

> *I think, that's absolutely one of the super central aspects in all of the work we're doing here (…) is to establish those links and also to bring some (…) little (…) little bit of rural thought to the urban setting* (participant 7).

Secure and equal access to land and productive resources, knowledge and markets has been named as another outcome. As concrete examples, the activities of "MatLust" project as well as Järna activities and farmers market have been named. Employment provision has been mentioned as well, with an example of the biodynamic lunch restaurant. Due to a limited budget, full employment is not possible, hence part-time employment is being practiced:

> *(…) socially, we cannot afford (…) full employment (…) full salaries… but, according to this system (…) we have people who's practicing here*

(…) and we can also employ with a certain amount of (…) funding (participant 6).

The increase in exports of developing countries was identified as another outcome within the economic dimension, with the example of "Biodynamiska Produkter" having a long-term partnership with small-scale producers, for instance from Dominican Republic: "(…) *our company supports 2,000 families – just with the import of organic bananas*" (participant 7). Furthermore, it has been mentioned that the municipality has been purchasing organic fair trade coffee since 2010. In this regard, the participants mentioned that the fair trade certification the Södertälje OFS has received.

The participants have agreed that the projected slide displaying the examples of outcomes within the category of inclusive economic growth appeared as the best representation of the current situation of the Södertälje OFS in terms of its present outcomes: "(…) *this is much more like, we are here now, and we are working with it now*" (participant 1).

The farmer's interview revealed another outcome in the category of "inclusive economic growth", namely the increase in renewable energy. Likewise, the farmer mentioned the use of solar energy and electrically powered mini-loader as well as the intention to use rapeseed oil for powering a tractor.

The concrete outcomes mentioned by the focus group participants along with the corresponding SDG targets (including those addressed in the previously discussed dimensions) suggest that the following SDGs are addressed through their target-levels in the category "inclusive economic growth": SDG 2, SDG 4, SDG 7; SDG 8, SDG 9, SDG 10, SDG 11, SDG 12 and SDG 17 (see *Figure 46*).

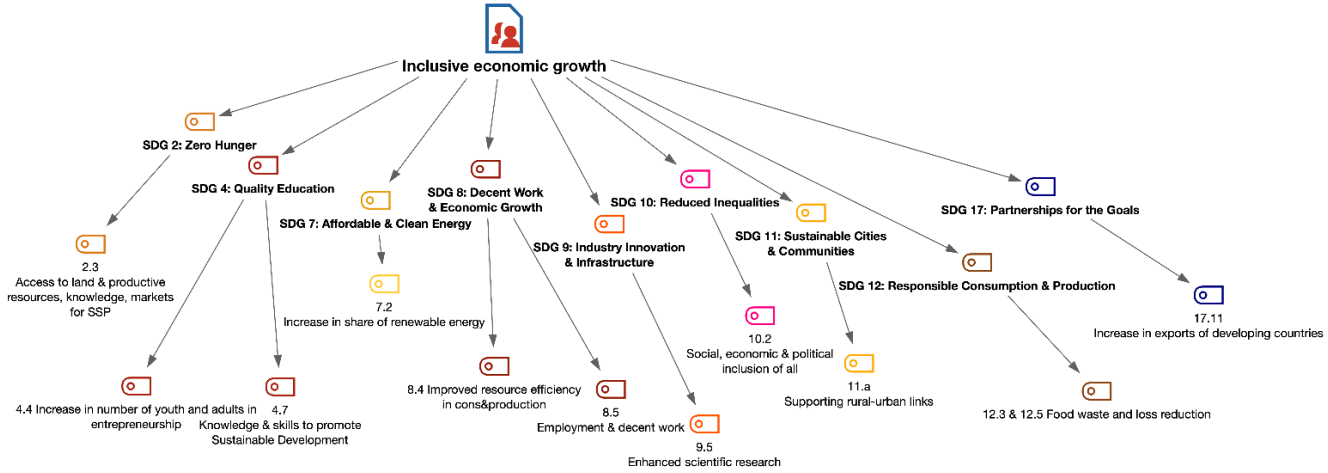


Figure 46: Overview of the specific outcomes and corresponding SDG targets of the Södertälje OFS within the category "Inclusive economic growth" on the basis of the focus group discussion
(SDG targets are displayed in a shortened form as presented during the focus group session).
Source: own data (data analysis using MaxQDA 2020).

Governance and partnerships

Within the last dimension of the outcomes – governance and partnerships – discussed in the session, the participants talked the most about the cooperation and the existing dialogue between the decision-makers and the experts as well as other stakeholders. The importance of listening to the needs of everyone involved has been emphasized, if the system is to succeed in the conceptualisation and implementation of the strategies:

> *(…) the activities in "MatLust" (…) I find, if we want them to be really successful, we have to all the time be very open to (…) the people that are in the activities (…) what they want and what they need (…) and (…) we have to do together… like, continuously… if we stop doing that, then (…) it isn't going to be very successful* (participant 2).

This example also reflects the inclusive, responsive, representative and participatory decision-making. Another closely linked outcome was addressed – sharing the best practices and spreading the knowledge that the Södertälje OFS has accumulated over the period of its existence through the partnerships:

> *(…) now (…) when we developed work with those things for a very-very long time (…) also other, other municipalities and regions are coming and ask, how to do this (…) I mean, like, the Gnesta, for example (…) they come (…) and (…) learn* (participant 1).

Furthermore, increased financial resources for conservation and sustainable use of biodiversity and ecosystems have been identified as another outcome related to the governance and partnerships dimension. In this regard it has been mentioned that with its current course of action, the Södertälje OFS is redirecting "(…) *economic resources going to (…) the disfunctional (…) system to (…) to what is more right*" (participant 1).

Another outcome discussed was the inclusiveness aspect. As one of the participants stated:

> *Södertälje has some element of…sharing, inclusiveness, giving something to the world from what they learned. So, this, for me, (…) I've been around also in Sweden, they (…) they're doing food in Malmö, but (…) only for them (…) but here, we have a concept called diet for a green planet – it's (…) it's for us, but also for other people* (participant 5).

Finally, cultural and natural heritage has been named as another contribution within the category of governance and partnerships. And the support for rural-urban links has been previously addressed during the discussion round on the outcomes of "improved livelihoods".

Considering also the outcomes addressed in the preceding dimensions the governance-related SDGs at their target-levels are the following ones: SDG 4; SDG 9; SDG 10, SDG 11, SDG 12; SDG 13; SDG 15, SDG 16 and SDG 17 (see *Figure 47*).

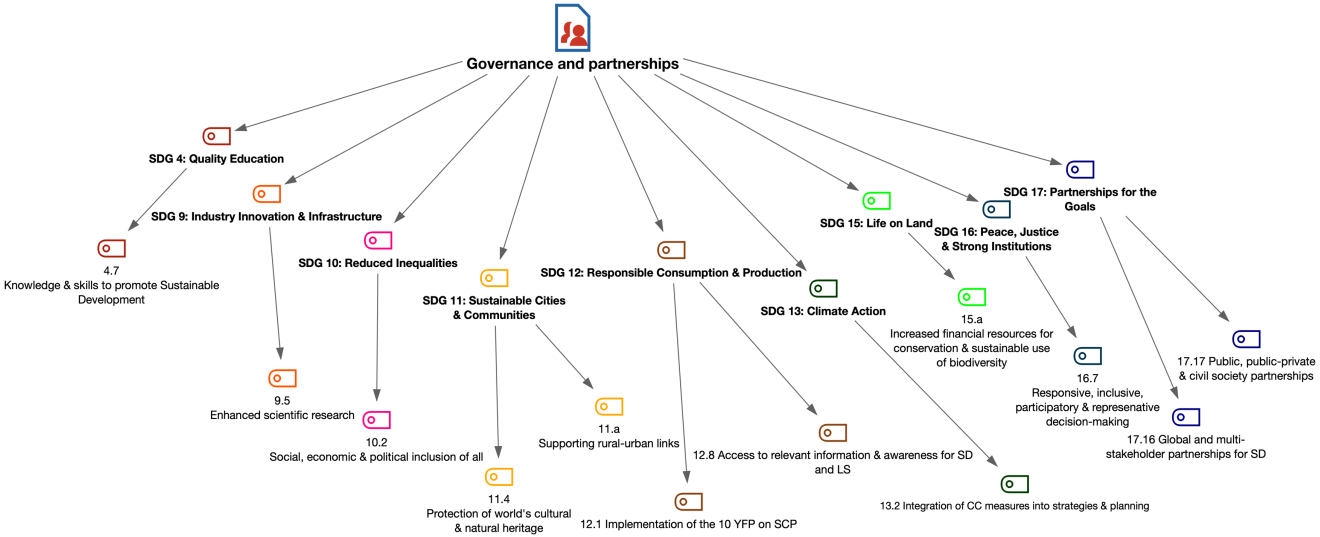


Figure 47: Overview of the specific outcomes and corresponding SDG targets of the Södertälje OFS within the category "Governance and partnerships" on the basis of the focus group discussion
(SDG targets are displayed in a shortened form as presented during the focus group session; target 13.2 represents a modified target' s formulation adjusted to the local context as opposed to original formulation referring to national context).
Source: own data (data analysis using MaxQDA 2020).

Overview of outcomes most frequently addressed by the participants

The focus group session in its entirety addressed various topics and the related SDGs to a varying degree. Judging from the frequencies of mention represented through the code-matrix-browser incorporating the focus group as well as the interview with the farmer, the following SDGs seem to have been addressed most frequently throughout the entire session: SDG 12, SDG 17, SDG 15, SDG 2 and SDG 11 (see *Figure 48*).

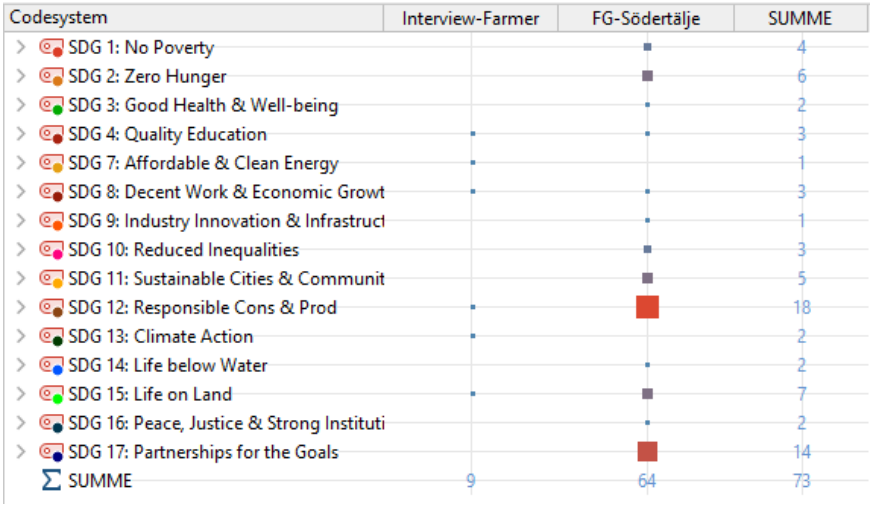


Figure 48: Code-matrix-browser of the focus group session on the Södertälje OFS outcomes, SDG goal-level
Source: own data (data analysis using MaxQDA 2020).

Looking further into the concrete outcomes discussed throughout the session, it becomes apparent that within the goals, the SDG targets that were linked to the outcomes under question have been addressed by the participants to a various extent (see *Figure 49*). As *Figure 49* indicates the outcomes that found the most representation throughout the entire focus group session being addressed by the participants numerous times in several outcome categories were in descending order:

- the implementation of 10 YFP on SCP
- food waste and loss reduction
- global and multi-stakeholder partnerships for SD
- public, public-private and civil society partnerships
- protection of natural habitats and halting biodiversity loss
- access to relevant information and awareness for SD and lifestyles in harmony with nature
- resilience-building for vulnerable groups
- SFPSs and resilient agricultural practices
- social, economic and political inclusion of all
- supporting rural-urban links
- increase in exports of developing countries.

Figure 49: Code-matrix-browser of the focus group session on the outcomes of the Södertälje OFS, SDG target-level
(SDG targets are displayed in a shortened form as presented during the focus group session;
formulation of targets 3.9 and 13.2 has been modified to FSs and local as opposed to national level).
Source: own data (data analysis using MaxQDA 2020).

4.4.3 Mouans-Sartoux municipality, France

4.4.3.1 Background information of the Mouans-Sartoux Organic Food System

Inception and developmental stages

Organic practices have been in existence in the Grasse district, which the Mouans-Sartoux municipality is affiliated to, since long ago having been adopted on a small scale by single families. For instance, family Federzoni started growing organic fruits and vegetables in 1970s-early 1980s after the family father had a pesticide-induced poisoning, which made the family reflect on the relationship between farming methods and human health (Perrot, 2012). It took longer, however, till organic food production and consumption became integrated into the municipal strategic planning to form a system. The 1998 outbreak of mad cow disease triggered a broader rethinking of the production methods and uncovered the links between food, health and environmental aspects for the elected representatives of Mouans-Sartoux of that time (MEAD, n. d.; Milan Urban Food Policy Pact, 2020). As a result of that, in 1999 local authorities of Mouans-Sartoux made a decision to serve exclusively organic beef in town's canteens, which corresponded to 4% share of organic food in all served meals (Perole and Cornuau, 2014; MEAD, 2017). In the same year it has been decided to equip municipality's schools with own kitchens, one per school, while maintaining the municipal control over the school canteens (MEAD, 2017). Since that time the efforts have been undertaken to develop an innovative school catering system that would take account of the environmental and socio-economic issues while aiming at safeguarding health of the planet and its inhabitants (MEAD, n. d.). The Mouans-Sartoux authorities focused on building a territorial food policy, and in 2005 the town joined the National

Nutrition Health Programme (Milan Urban Food Policy Pact, 2020; MEAD, 2017). The same year has been marked by integration of ecological gardens and composting sites on school premises (MEAD, n. d.). In 2006 the national programme "Eat well, move well" has been launched to promote healthy nutrition and active lifestyle among the schoolchildren (MEAD, 2017). Simultaneously, the menus of school canteens have been revised so as to better integrate seasonality aspects while incorporating greater amounts of vegetables, fruit and whole-grains (ibid.; Milan Urban Food Policy Pact, 2020). In 2008, to better address the demands of this new strategy, the municipality conducted a feasibility study aiming at exploring an idea of establishing an own municipal farm to supply the canteens with locally grown organic produce, which ultimately resulted in the inception of the municipal farm Domaine de Haute-Combe in 2010 (MEAD, 2017; MEAD, n. d.). By that time, 23% of all the food served in municipal canteens was organic (ibid.). The municipal farm that has been initially established with four hectares of land expanded to six hectares and received organic certification through Ecocert (MEAD, 2017). The percentage of organic food in public procurement has been gradually increasing over the following years and reached 100% by 2012, while the municipal farm has been stepwise reinforced through the employment of full-time farmers (ibid.). With three full-time farm workers, the municipal farm supplies its vegetables to the canteens of three schools in Mouans-Sartoux currently covering 100% of canteens' vegetable demand (MEAD, n. d.).

In 2012 the "Observatory for Sustainable Canteens" has been established to follow up on families' food consumption behaviour and evolution of consumption patterns (MEAD, 2017; URBACT, 2017). In 2016 the "Centre for Sustainable Food Education" – Maison d'Education à l'Alimentation Durable (MEAD) was founded as a municipal initiative of a holistic character creating a place for

training, conducting projects, sharing the ideas and shaping progressive food policies aiming at supporting the development of sustainable food models of tomorrow (MEAD, 2017; MEAD, 2020). MEAD's work is centred round five pillars: encouraging new agricultural settlements; transformation and conservation of food; awareness-raising about sustainable food; supporting research projects; communication and networking (MEAD, 2017). With the support of MEAD and collaboration from the University of Côte-d'Azur, Mouans-Sartoux is offering a University degree programme since 2017 (ibid.).

General information and jurisdiction

The municipality of Mouans-Sartoux is located in the region Provence-Alpes-Côte-d'Azur, South-Eastern France, and belonging to the Grasse district of the Alpes-Maritimes county (Insee, 2019; MEAD, n. d.). Mouans-Sartoux lies in the centre of a tripled agglomeration Cannes-Grasse-Antibes contained between mountains and the sea, which makes growth and extension towards the periphery impossible (MEAD, n. d.; see *Figure 50*). This geographical constraint puts pressure on the municipalities within the triangle such as Mouans-Sartoux, which is further exacerbated by urbanisation and the increased land demand for real estate (ibid.). The territory of Mouans-Sartoux is 13.52 km^2, or 1,352 hectares, and the total population reported for 2017 was 10,019 inhabitants (Map-France, n. d. a; Insee, 2017).

a) b)

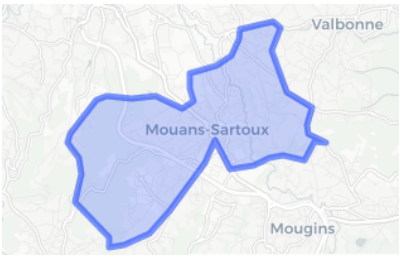


Figure 50: Mouans-Sartoux: town and municipality
(a – Mouans-Sartoux on the administrative map of France; b – the map of the Mouans-Sartoux municipality)
Sources: a – Map-France, n. d. b; b – Etalab, n. d. (copyright OpenStreetMap/CartoDB).

Supply chains and production diversity

Short and local supply chains and increased self-sufficiency for supplying organic, fresh and seasonal produce were the core principles underpinning the strategies implemented by the authorities of Mouans-Sartoux as part of the territorial food policy (MEAD, n. d.; Perole and Cornuau, 2014). While it was possible to reach 100% local supply of organic vegetables for the canteens, not all the organic produce can be supplied locally due to climatic conditions and geographic constraints (Umarishavu, 2019).
Likewise, fruits, meat and dairy products are supplied through Naturdis – the organic wholesaler located in Grasse district, while fish is delivered from the neighbouring municipality Saint-Jeannet located in the same county approximately 42 km away from Mouans-Sartoux (ibid.). Locally grown organic produce of the

Mouans-Sartoux OFS includes greens (salads, spinach, lettuce), herbs, tomatoes, cucumbers, onions, bell peppers, artichokes, beans, peas, corn and carrots (ibid.). For organic public procurement, the supply chain consists of 70% regional produce with a maximal distance of 200 km from Mouans-Sartoux and 30% of produce supplied from the outside (results of documentation by Umarishavu, 2019, based on the informant interview).

Organic quality assurance is guaranteed through a third-part certification. The municipal farm as well as school canteens are certified through by Ecocert (MEAD, 2017). At the same time some individual producers use the French certification label Agriculture Biologique (AB) (Umarishavu, 2019).

Activities and main actors

Activities performed within the OFS in Mouans-Sartoux include:

1. organic value chain activities:
    a. organic farming and gardening:
        - municipal farm Haute-Combe
        - organic farming association Les Jardins de la Vallée de la Siagne / the Gardens of the Siagne Valley (JVS)
        - private gardening within les Jardins familiaux / Family gardens
    b. processing mainly limited to freezing performed at food transformation and preservation unit of the municipal farm as well as limited processing activities performed by JVS
    c. direct and indirect distribution via
        - farmers' market
        - CSA (Association pour le Maintien d'une Agriculture Paysanne (AMAP) / Association for the Maintenance of Peasant Agriculture)
        - retail outlets: Epicerie Boomerang / bulk grocery store Boomerang, Epicerie sociale solidaire / social solidarity grocery store
        - wholesale channels (BIOCOOP, etc.)

d. private and public consumption (latter through HORECA, with a prominent role played by the school canteens)
e. research and academia
f. pedagogical activities, awareness-raising campaigns and educational programmes
g. networking, knowledge dissemination and experience-sharing

(MEAD, n. d.; MEAD, 2017; Milan Urban Food Policy Pact, 2020; Umarishavu, 2019).

Individual key actors playing an important role in the Mouans-Sartoux OFS are displayed in *Table 14*. Apart from the value chain activities, educational and awareness-raising activities of the OFS are worth mentioning, with the majority of them being performed through MEAD, municipal programmes or school canteens (see *Table 14*).

Table 14: Overview of the main actors of the Mouans-Sartoux OFS, their role in the system and performed activities

Actor of the M-S OFS	Function	Performed activities
Municipal administration of Mouans-Sartoux	Governance and policymaking	Municipal, territorial and food-related policymaking
Municipal farm Domaine Haute-Combe	Vegetable production; processing	Production of organically grown vegetables for school canteens in Mouans-Sartoux; food transformation and processing unit for freezing and canning
JVC (Les Jardins de la Vallée de la Siagne)/ the Gardens of the Siagne Valley	Production; processing; distribution; state reintegration activity and employment opportunity for socially deprived people	Production of organic vegetables and eggs; processing (olive oil, soups, spreads); direct distribution through solidarity food baskets and indirect distribution (through local distributors and markets)
Jardins familiaux / Family gardens	Membership-based local scale food production association; cultivation	Food production (on contractual basis, with a contract signed with the Town Hall)

	on 20 plots by the residents with no access to land; guiding principle – no chemical applications in the production	
CSA AMAP	CSA; cooperative	Production and direct distribution to the members via winter and summer baskets with vegetables and herbs; in collaboration with the neighbouring regions of France and Italy distribution of organic produce that cannot be produced locally (fruits, berries, meat, bread, trout).
Epicerie Boomerang / bulk grocery store Boomerang	Organic and zero waste grocery store (first one in the Southern France); reduction of food waste and distance between producers and consumers	Bulk retail; awareness-raising on food waste and locality
Epicerie sociale solidaire / solidarity social grocery store	Sale of products close to expiration date to marginalised people; social interaction place	Social solidarity retail (price reduction 70-90%) for recipients; educational and awareness-raising activities (i.e. workshops, budget managements assistance, etc.); voluntary organic vegetables production in solidarity gardens
MEAD / Centre for Sustainable Food Education	Education centre; support for research projects, communication and networking; support for new urban zoning plan	Education activities in partnership with universities (i.e. university degree programme in Management of Sustainable Food Projects for Territorial Collectivities in collaboration with the University of Côte d'Azur); awareness-raising activities on sustainable food (workshops on nutrition, cooking, organic farming and gardening, field trips, programme "Families for Positive Eating" targeted at parents and their children for encouraging

		healthier dietary changes without increased costs); support for research projects; communication and networking
MCE (La Maison du Commerce Equitable) / The Fair Trade Centre	Non-for-profit organisation promoting small producers in the Global South and local fair trade small producers	Voluntary-based retail for organic and fair trade products; awareness-raising activities on SD (zero-waste campaigns, conferences, demonstrations)
Parents' association, School Orée du Bois	Organisation of activities and events promotion a healthy environment for children's growth and development; efforts to support organic farmers' settlement	Activities supporting children' growth and development, including support for local organic products
Schools' canteens	Food preparation from scratch in the kitchens; awareness-raising on food waste and healthy diets (mainly through the animation service)	Organic public procurement / catering for schoolchildren; awareness-raising activities on healthy eating and food waste (performed through the municipally employed animation service – accompanying children during the time when the teachers are absent, i.e. before and after the lessons, during the lunchtime)
Research and academia (e.g. University of Côte-d'Azur, University of Nantes)	Research, scientific outreach and educational activities	Research and educational activities
Networks (Organic Food Territories, Urbact and its transfer network BioCanteens)	European territorial cooperation projects and programmes	Sharing experience and best practices; promotion of integrated sustainable urban development

Source: own compilation based on MEAD, 2017; MEAD, n. d.; MCE (n. d.); Umarishavu, 2019.

Vision and core principles

The joint vision of all the stakeholders involved in the Mouans-Sartoux OFS is to attain food sufficiency through the creation of a virtuous loop of circular economy in the territorial agri-FS (MEAD, n. d.). To achieve this, it is planned to increase farmers' settlements in the area so as to enable access to locally produced sustainable food on the one hand, while safeguarding the farmers' livelihoods from their activity on the other (ibid.). Ultimately it is envisioned that the Mouans-Sartoux OFS would develop local and short supply chains creating employment and economic activity related to SD, while reducing negative impact on health and the environment (ibid.).

4.4.3.2 Findings from the interviews with key actors (Mouans-Sartoux)

The total amount of 28 interviews were conducted by Umarishavu (2019) during the case documentation phase, out of which only 22 interviews were used for data analysis purposes to study the OFS outcomes due to the interviews' quality (see chapter 3, subchapter 3.3.4.1). Out of 22 interviewees, four were farmers, three were administrative employees, three were mayors and policymakers, three represented research and academia and the remainder were representatives of associations, distribution, advisors, certifiers (the overview of the interviewed key actors can be found in Annex IV-2, c).

When answering the questions about the outcomes of the Mouans-Sartoux OFS, regardless of whether on individual, communal or ecosystems level, the key actors have been often referring to the aspects laid down in the organic principles. The principle of health was clearly standing out, with ten respondents referring to the health characteristics described in the respective IFOAM-principle (see *Figure 51*). For instance, one of the respondents stated:

> *I may not say that I never fall sick, but I always keep in my mind that organic is good for health, and if I eat food with pesticides or any sort of chemicals, it would harm my wellbeing* (key actor 20).

Another answer revealed the same holistic understanding of health:

> *I have so much desire for well-being, especially from the level of childhood. I am convinced of the value of the organic products. No pesticides, so, the products are natural. I pay attention because of the impacts we see: on the health, on the nature, it is true that today it is necessary to do organic or a reasoned agriculture* (key actor 5).

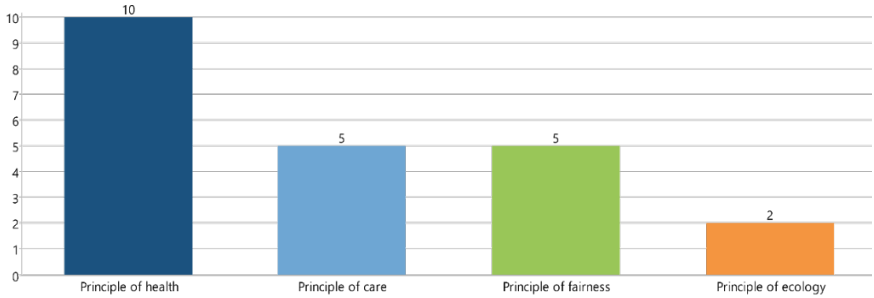
Next, the principle of fairness as well as the principle of care have been addressed by five interviewees, each. The latter principle is best reflected in the following statement:

> *(…) it has been found that it makes sense to do something about the production process. At the same time, it will improve the health of animals and the health of humans, and then we also see all the environmental issues: we live with pesticides and chemical fertilisers. The awareness was there since long ago and there was scientific work around this subject ... We had to take precautions ... and therefore the City Council wanted to implement this precautionary practice* (key actor 3).

The principle of fairness is best reflected in the following answer provided by one of the interviewees:

> *In organic, there is a reflection behind any choice that makes it possible to consider health, ecology, social justice when the biological procedures are often accompanied by questioning about workloads, the means of operating, income to producers* (key actor 22).

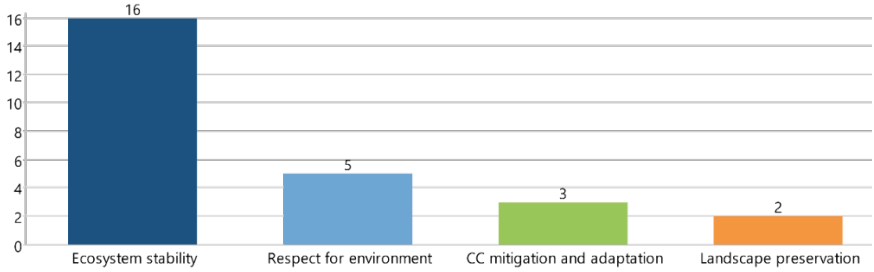
Finally, the principle of ecology has been addressed in the statements of two key actors. One of them explained that "*Virtuous ecological actions for the earth, reintroduction of biodiversity, actions on the landscape*" (key actor 20).



(n=22)

Figure 51: Outcomes of the Mouans-Sartoux OFS corresponding to the IFOAM-principles, as perceived by the key actors
Source: own data analysis (using MaxQDA 2020; based on raw data from Umarishavu, 2019).

Within the environmental outcomes, the vast majority of key actors corresponding to 16 interviewees pointed to the outcomes contributing to ecosystem stability (see *Figure 52*).



(n=22)

Figure 52: Ecosystem-related outcomes of the Mouans-Sartoux OFS, as perceived by the key actors
Source: own data analysis (using MaxQDA 2020; based on raw data from Umarishavu, 2019).

The specific answers revealed increased biodiversity, reduced pollution and contamination due to agricultural practices, improved soil quality and reduced greenhouse effects (key actors 13, 20, 17, 8, 11, 14, 16, 21, 1, 10 and 19). Another outcome category closely linked to ecosystem stability perceived by five interviewees was the

respect for the environment (see *Figure 52*). As the key actor 4 explained:

> *Organic is a form of production that favours the environment and healthiness… I would say, respect for the environment through organic farming and healthy eating, respect for human-beings, respect for wellbeing in society through good nutrition and respectful agriculture.*

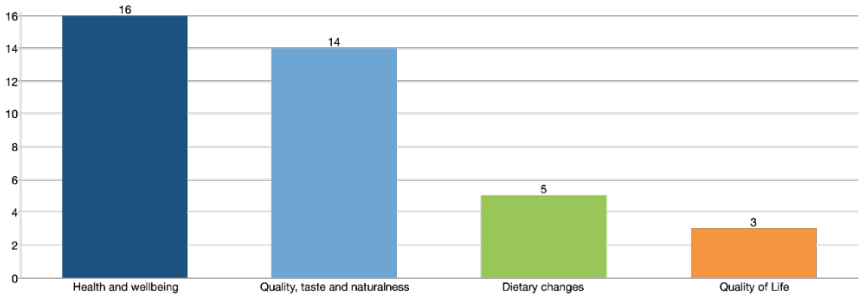
Three key actors perceived CC mitigation and adaptation to be resulting from the OFS (see *Figure 52*). Here, the interviewees referred to the reduced GHG emissions – either due to organic agricultural practices or, else, because of reduced transportation of food:

> *By buying locally we reduce the carbon dioxide because the products do not come from the other side of the world by boat or truck; it is our scale, but we contribute* (key actor 12).

Two interviewees spoke of landscape preservation:

> *The landscape is preserved. If we compare with neighbouring cities, we see that Mouans-Sartoux has had good land management that has made the city to not be dominated by buildings* (key actor 10).

Coming to the outcomes on individual level, the vast majority of key actors corresponding to 16 interviewees provided answers related to personal health and wellbeing (see *Figure 53*).



(n=22)

Figure 53: Outcomes of the Mouans-Sartoux OFS on individual level, as perceived by the key actors
Source: own data analysis (using MaxQDA 2020; based on raw data from Umarishavu, 2019).

As key actor 5 explained:

> *For us, the organic equals wellbeing… I have so much desire for wellbeing, especially from the level of childhood. I am convinced of the value of the organic products. No pesticides, so, the products are natural. I pay attention because of the impacts we see – on health, on nature.*

Furthermore, quality, taste and naturalness of organic food have been named by 14 key actors:

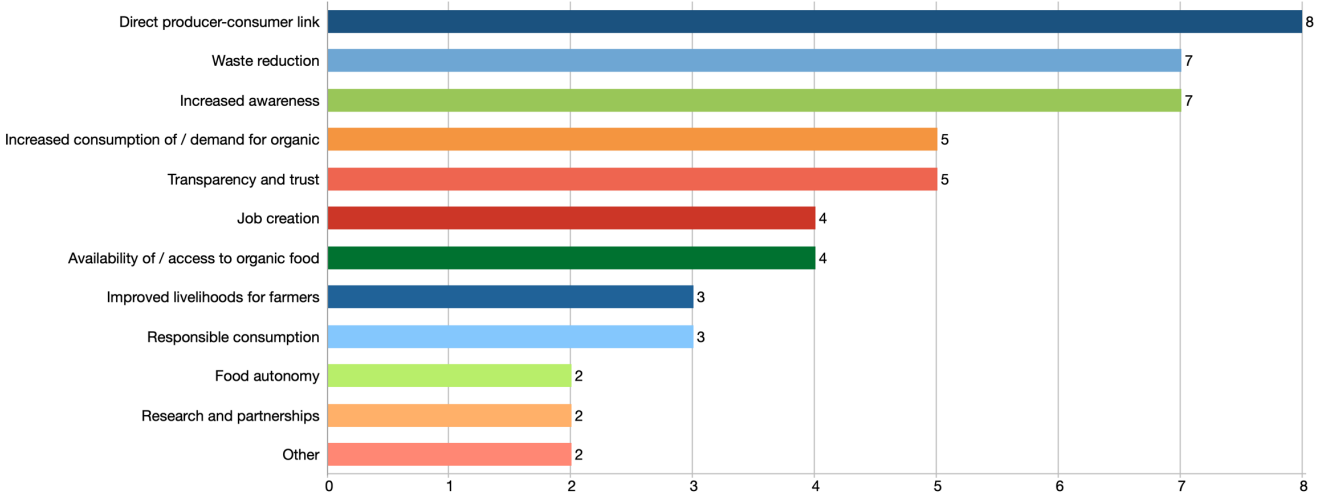
> *The quality of the food is with more freshness, and the food is 100% organic, which started from the 2000s... The quality is more satisfactory and appreciated. Salads have more taste* (key actor 9).

As *Figure 53* reveals, five key actors have pointed to dietary changes resulting from the establishment of the OFS in Mouans-Sartoux stating the increase (or total switch) in the share of organic and local foods in the diets, often accompanied by shift to more plant-based nutrition (key actors 6, 17, 3, 4, 19, respectively).
Finally, QOL has been specified by three interviewees. As one of the key actors revealed:

> *I also consume organic. I may not say that my health is better due to consuming organic, as this can be confirmed by science. But I am sure*

that the fact that I consume organic, has a certain impact on the quality of my life (key actor 4).

The interviews with key actors revealed a broad range of community-related outcomes. The majority of key actors emphasised the direct producer-consumer link (eight interviewees) as well as increased awareness and waste reduction (seven interviewees, each) (see *Figure 54*).



(n=22)

Figure 54: Community-related outcomes of the Mouans-Sartoux OFS, as perceived by the key actors

Source: own data analysis (using MaxQDA 2020; based on raw data from Umarishavu, 2019).

The first outcome category revealed benefits of short and local supply chains in terms of lack of intermediaries, better price for the producer and the connection between the producer and consumer (key actors 3, 11, 2, 1, 7 and 16, respectively). Increased awareness has been most comprehensively summarised by the key actor 6:

> *There is more awareness of the issues related to health and environment. We try to make demonstrations and explain people. Four or five events already took place: conferences, zero waste campaigns, and awareness of all the issues facing sustainable development… If our turnover grows, it means that people become aware, many go organic. Our turnover increased by 15% last year for local products.*

The food waste reduction through the Mouans-Sartoux OFS has been put in concrete numbers: "*In the field, there was a huge drop in waste, now it reduced from 40 kg of waste to 5 kg per day per canteen, so, only one bin per school*" (key actor 9).

Furthermore, increased consumption of and demand for organic food along with transparency and trust have been stressed by five key actors, each, while job creation and availability of and access to organic food have been stated by four key actors, each (see *Figure 54*). Improved farmers' livelihoods (three responses), food autonomy (two answers) and research and partnerships (two statements) have been also perceived as community-relevant outcomes of the OFS (see *Figure 54*). Finally, two key actors have perceived other outcomes such as improved solidarity between consumers and producers and farmers' acknowledgement (key actors 1 and 11, respectively).

4.4.3.3 Findings from focus group session in Mouans-Sartoux

The focus group session with a selected group of key actors has been conducted by the researcher in Mouans-Sartoux on February 13, 2020. Nine participants took part in it, out of which one was

having a dual role providing a simultaneous translation of the session. The participants represented a wide range of stakeholder categories – from value chain actors, associations, social activists to municipal employees and town administration (see *Table* 15). Both genders were almost equally represented, with four females and five males. In spite of all the efforts, it appeared to be impossible to find representation for the farmers' group.

Table 15: Overview of the focus group participants in Mouans-Sartoux

	Stakeholder group / role in the Mouans-Sartoux OFS	Gender	Estimated age group
Participant 1	School parents' association	Female	Middle age
Participant 2	Environmental and social activists' group	Male	Senior
Participant 3	Retailer; waste management	Female	Middle age
Participant 4	Municipality's Deputy Mayor	Male	Senior
Participant 5	Mouans-Sartoux Fair Trade centre	Female	Middle age
Participant 6	Centre for Sustainable Food Education (MEAD), children services / school canteens	Female	Middle age
Participant 7	Association for the Maintenance of Peasant Agriculture AMAP	Male	Upper middle age
Participant 8	Mouans-Sartoux Fair Trade centre	Male	Upper middle age
Participant 9	Municipality employee	Male	Middle age

Source: own data based on focus group session performed in Mouans-Sartoux on February 13, 2019.

Retrospective view of the Mouans-Sartoux OFS

At the beginning of the focus group session, the participants took a retrospective look at the establishment of the Mouans-Sartoux OFS

in the context of its first achieved outcomes. It has been confirmed that the mad cow disease outbreak of the late 1990s has been a trigger for the introduction of organic beef to the school canteens in Mouans-Sartoux. Afterwards, organic bread and a few other foods in organic quality followed. It did not take long till the 12% mark in the share of organic food in the canteens was reached. The time period 2005-2008 has witnessed a particular upwards trend in the share of organic produce, which was backed by parents and school councils. However, back then the supply of organic food was guaranteed through calls for tenders. The gradual increase in the share of organic foods in canteens continued. So, it was time to set a new goal – 100% organic foods in school canteens. Putting this goal into practice meant conducting an economic feasibility study first, to make sure local authority budget would not be significantly impacted. Moreover, it was critical not to affect family budgets either. This was the time when the solution has been found in municipality's own vegetable production for school canteens, which resulted in the establishment of a municipal farm in 2010. The farm was initiated with one professional grower who has been employed by the municipality. Afterwards, the municipal growers' team was reinforced. It became possible to supply up to 85% of the school catering. It has been emphasised that the local supply through municipal farm became possible due to the municipal strategy for land preservation, which has been initiated by the local authorities in late 1990s- beginning of 2000s. With this strategy the local authorities exercised their pre-emptive right over an area that could have otherwise been used for building purposes.

With the establishment of sustainable public procurement in school canteens, the Mouans-Sartoux OFS was established. The participants named some additional effects of the early phase of the OFS. Likewise, the active citizens' engagement coupled with the municipal council's policies started attracting people from other

places to settle in Mouans-Sartoux. Participant 3 provided herself as an example of such a resettlement since she came to settle in Mouans-Sartoux to open her own business to the town's pro-environmental policies. Furthermore, awareness-raising through education in schools has been named, with educational staff in collaboration with the kitchen staff taking an action on educating school pupils about the food waste and mechanisms of its reduction as well as proper waste separation. The food waste education has brought in far-reaching results not only in terms of waste reduction in canteens, but also in spreading the knowledge:

> *(…) children went home with a desire to progress on how they eat and how they behave for the environment. And what has come out of this has been magical, because families have been completely converted, to the point where people have been attracted to the town, who have come to live here specifically because the town had this feel of protecting the environment* (participant 6).

This indicates that the awareness-raising and education on the topics of environment, SD and sustainable diets as well as food waste reduction were observed as outcomes of the early phase of the OFS. It becomes apparent that resettlement in Mouans-Sartoux can be clearly seen as another effect triggered by the sustainability-oriented strategies of the municipality, which can be traced to the establishment of the OFS. Another outcome of the early phase of the OFS under study was the introduction of meat-free days in the canteens, which seemed impossible prior to the inception of the OFS in Mouans-Sartoux. Meet-free days have become mandatory suggesting that awareness-raising on sustainable diets can be viewed as an outcome of the OFS.

Ecosystem stability

Looking closer at the outcomes of the Mouans-Sartoux OFS contributing to ecosystem stability, the participants addressed a wide range of specific effects including direct environmental

outcomes such as improved water quality, reduced pollution, restoration of degraded land and soil and maintenance of biodiversity and indirect outcomes such as access to market for small-scale organic producers and enabling organisational mechanisms for the measures to protect the environment. Some facilitating outcomes have been addressed as well, for instance the reduction of food waste and awareness-raising and education.

Starting from the direct outcomes and the concrete examples of some environmental effects, improved water quality was named as a result of the municipal water management as opposed to management by a private company. Within this context, improved water quality can be viewed as a side-effect or an accompanying outcome of the general sustainability-oriented municipal strategies and not an outcome directly stemming from the OFS. Furthermore, another water-related outcome, yet resulting directly from the OFS and intended, has been named, which is increased water use efficiency:

> *(…) in the current term the local council has discussed encouraging farmers to use water responsibly, but on condition that they work organically. And in this case, if they agree to measure their water consumption and to work organically, we give them a subsidy based on the investment they make to install irrigation. We give them a subsidy pro rata for this investment, with a maximum value of 12,000 euro* (participant 4).

Among the land-based outcomes, restoration of degraded land and soil and preservation of biodiversity have been named. Likewise, it has been stated that the meadows are being kept, with wild flowers growing there and no weeding taking place. Apart from that, it was stated that the Mouans-Sartoux OFS is working on land use issues and undertaking efforts to restore and preserve the soil fertility:

> *(…) we have particularly worked on limiting the use of space – at a time when there is more general concern – so, land that was otherwise*

workable, fertile, becomes it again. Consequently, we have gone from 40 hectares to 112 hectares (participant 4).

Finally, composting was mentioned as an example of environmentally sound waste management practiced in Mouans-Sartoux. In this context one of the participants stated:

Composting has grown individually. We can see that it is increasing. We have changed the door-to-door collection system and we have also offered people individual composters, and over 600 have been requested. There's already voluntary action. Elsewhere, there are also communal composters that have been set up, which are run by the citizens, i.e. at the bottom of the collective housing areas. We're offering composting sites that are managed jointly by the citizens, the council and the company Univalom (participant 5).

Coming to some indirect outcomes within the category of ecosystem stability, reduction of energy consumption as well as the use of renewable energy have been addressed. For instance, participant 4 stated:

(…) there is also a photovoltaic system, which is placed on the school. There's a very large solar energy production park at Tiragon, which is important, with a private company that has developed it on the roofs of businesses. And we've signed a lot of permissions for the installation of photovoltaic panels on private properties.

One participant also stressed the municipal strategy of encouraging more efficient energy consumption behaviour in private households and businesses. Likewise, the shops are encouraged to not use illuminated signs and logos. Moreover, their special events for awareness-raising on the topic of efficient energy consumption: "(…) *some events are made when the stars are nice to see, and the municipality cuts the public lights on this day in order to see all the stars*" (participant 3). These examples of energy saving promotional campaigns and respective recommendations can be seen as the accompanying outcomes stimulated by the overall sustainability-oriented policies of the municipality rather than the direct effects of

the OFS. Reduction and prevention of marine pollution have been mentioned, but the example pointed rather towards an indirect character of this outcome since it referred to raising citizens' awareness on land-based pollution impacting the sea through the shields saying: "*The sea starts here*" (participants 2, 9).

Next, two examples have been emphasised, which can be considered as enabling, or supporting outcomes within the category of ecosystem stability. These are OFS's efforts on food waste reduction at municipal level as well as the preservation of land for farming in conjunction with securing access to this land for small-scale producers. It has been stressed that the awareness-raising and strategies for reducing food waste have been implemented not only in the school canteens, but they also targeted the general public. For instance,

> *(…) a positive eating family challenge (…) was created, that the families can (…) take part in this challenge, and they (…) learn how to reduce the food waste, for example, or cook a bit differently using more organic products* (participant 9).

In the context of environmentally sound waste management, it has been mentioned that composting is becoming more and more popular being encouraged by the municipality:

> *Composting has grown individually. We can see that it is increasing. We have changed the door-to-door collection system and we have also offered people individual composters, and over 600 have been requested. There's already voluntary action. Elsewhere, there are also communal composters that have been set up, which are run by the citizens* (participant 5).

Lastly, the participants have unanimously agreed upon the importance of preservation of land for farming as another vital outcome of this category. In this regard it has been stated that the citizens mobilised themselves to act of preserving local land for agriculture. The example has been provided, when citizens' action

coupled with the efforts of AMAP and Terre de Liens (a complementary organisation working on controlling land use) made it possible for an inland farmer to keep his farm on the leased land plot that would have otherwise been taken away from him and used for different purposes.

The examples provided by the focus group participants indicate that a number of SDGs is addressed through their target-level, both directly and indirectly, whereby some of the SDG targets seem to represent enabling outcomes for the environmental sustainability dimension. The SDGs addressed at their target-levels in this category are the SDG 2; SDG 3; SDG 6; SDG 7; SDG 12; SDG 14 and SDG 15 (see *Figure 55*).

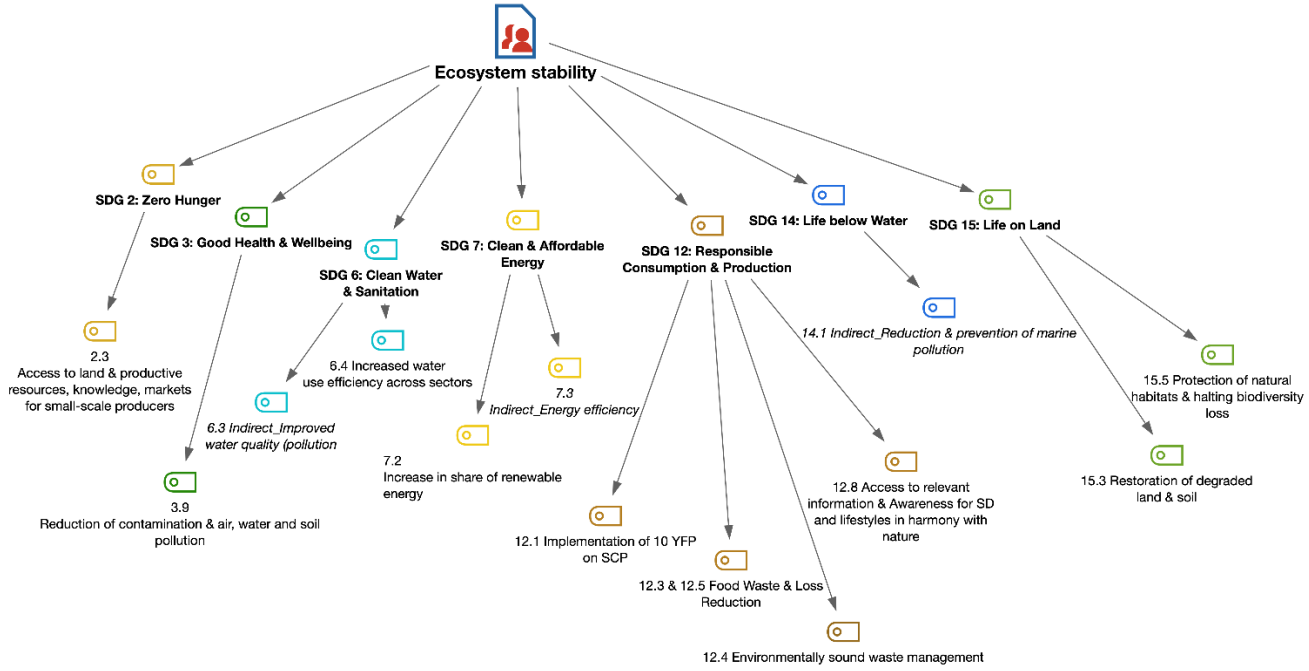


Figure 55: Overview of the specific outcomes and corresponding SDG targets of the Mouans-Sartoux OFS within the category of "Ecosystem stability" on the basis of the focus group discussion
(SDG targets are displayed in a shortened form as presented during the focus group session; target 3.9 represents a modified formulation applied to FSs context).
Source: own data (data analysis using MaxQDA 2020).

Improved livelihoods

Within the category of outcomes contributing to improved livelihoods, the examples of outcomes contributing to FNS as well as more general livelihoods outcomes representing social sustainability dimension have been discussed. Beginning with the FNS outcomes, the participants addressed a variety of topics representing a broad range of outcomes. Likewise, food access as well as access to land and productive resources have been mentioned coupled with SFPSs. Concrete examples such as enabling growing own vegetables for the residents with no access to garden as well as distribution of seasonal food baskets have been provided. These outcomes have been addressed in conjunction with the creation of knowledge and skills related to farming and gardening activities as well as awareness-raising on the aspects of food sovereignty:

> *We can mention the development of shared gardens for people in collective housing. Gardens have been made available to them, so that they can cultivate their little plot of land and grow their vegetables. And I've also noticed recently, we've organised participative workshops with the population and once again these have given rise to an increasing awareness, I think, in the population, of where their food comes from and the importance of being able to grow their food at home, as nearby as possible* (participant 5).

Increased access to healthy and 100% organic food for children through school canteens, but also availability of organic meals in colleges as well as deliveries to elderly people have been put forward. With regard to school canteens, specific emphasis was placed on affordability issue enabling families with low income level to still benefit from the same quality menu for their kids through the family budget-adjusted meal price. Hence, the vulnerable groups are also being addressed by the Mouans-Sartoux OFS. In fact, the municipality has specifically focused on marginalised groups not only through the resilience-building with regard to growing own

vegetables, but also through the opening of social grocery store. As has been put forward by one of the participants,

> *(…) there was the creation of the social and community food shop. And there's an average of 30 to 40 families who benefit from this shop. Not on a constant basis (…) there's a turnover over time, based on more or less difficult situations, and that allows them to benefit from accessible food at very discounted prices* (participant 4).

Moreover, dissemination of information and creation of knowledge about SD as well as awareness-raising through educative campaigns have been addressed:

> *We can mention the creation of GLAD (local group for sustainable food), as that is also a source of information with the aim of disseminating information and knowledge on sustainable development, sustainable food* (participant 1).

Fair trade was addressed as another topic contributing to FNS, particularly that of small-scale producers. In this regard, one of the participants said:

> *(…) on our small level, by helping small producers, MCE has taken this direction. And the fact we can have a food shop that distributes produce from these small producers, indeed, that has improved their living conditions and we've had positive feedback from them, as they have thanked us* (participant 8).

In the same vein, through effective partnerships involving parents, school canteens' facilitation teams and the Mouans-Sartoux municipality there has been a fair trade commitment enacted in a school canteen's procurement, which was yet to be acknowledged through a respective badge that the school was about to receive. Another example pointed to the provision of market access for small artisanal fishers. Likewise, it was explained that an artisanal fisherman sells his fish directly on the farmers' market.

Proceeding to the remainder of outcomes contributing to improved livelihoods, the participants mentioned examples, some of which

represent ecological dimension of sustainability, which indicates the interconnected nature of the broader outcomes as well as the sustainability dimensions. For instance, it was in the round dedicated to improved livelihoods that the participants mentioned preventive measures for the protection of marine ecosystems. The discussed example pointed to the special plates for collecting used cigarettes so that these do not end up polluting the waters:

> *(…) there are some plates (…) in some places on the ground, so that people don't throw out their cigarettes cause it says, like, something like if you throw it here it's gonna end up in the sea* (participant 9).

This example could be also seen as awareness-raising on environmental implications of individual consumption behaviour. The example of social reintegration for long-term unemployed people was given, when gardens association provides these people with market gardening jobs:

> *There's a communal structure there, which welcomes the long-term unemployed and to reintegrate them we offer them – well, it's the Siagne valley gardens association that offers them – market gardening work. That's it. And so, there's also an objective to produce vegetables, i.e. to integrate – yes, organic – to integrate in a real economic context. And that led us to take on additional staff, working on municipal agricultural management by recruiting two young people who were already at the Siagne valley gardens and who seemed interested in this development of their professional life* (participant 4).

This specific example points to a number of outcomes such as resilience-building for vulnerable groups, social and economic inclusion of all including marginalised as well as the provision of full and productive employment. Moreover, another example has been provided to indicate another resilience-building strategy for vulnerable groups – employment of disabled people in organic farming, which has been practiced in the neighbouring municipality Saint-Jeannet and inspired by the Mouans-Sartoux OFS.

Protection of cultural and natural heritage has been addressed as another outcome, with the example of continuation perfume plants' cultivation, which has historically been the strength of the area: "(…) *there's also one producer that decided to set up here, in Mouans-Sartoux, in organic production of flowers for the… the perfumes*" (participant 9).

Next, a number of educative and awareness-raising activities have been discussed. The importance of education has been emphasized multiple times and by several participants. As put forward by one of the participants,

> *(…) we were talking about MIP, which is a garden that aims to educate, train, teach, demonstrate… Indeed, there is a whole range of education that is extremely important. Then there are visits to Hautes Combes, the schools regularly go to visit the municipal farms* (participant 2).

Within the educative tools and campaigns, the university diploma has been named as well as cooking classes, meetings with dieticians and challenges for families organised in collaboration with the municipality (i.e. "positive food" challenge and "zero waste" challenge). Furthermore, it has been stressed that another contribution to improved livelihood is done through the OFS in that there is no pollution and contamination from pesticides anymore. The products have hence become pesticide- and insecticide-free. Finally, it has been mentioned that there is a positive effect also on small artisanal fishers because a local fisherman gets access to the market, which namely through the farmers market.

All the afore mentioned examples and linked outcomes represent the target-levels of the following SDGs: SDG 1; SDG 2; SDG 3; SDG 4; SDG 8; SDG 10; SDG 11; SDG 11; SDG 12; SDG 14 and SDG 17 (see *Figure 56*).

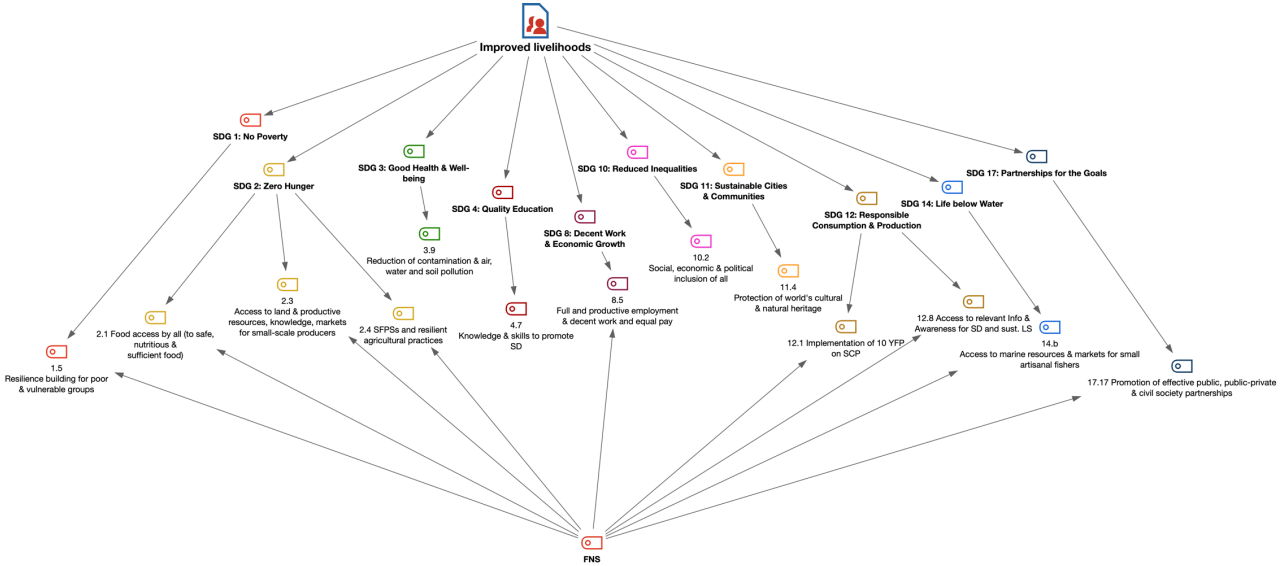


Figure 56: Overview of the specific outcomes and corresponding SDG targets of the Mouans-Sartoux OFS within the category "Improved livelihoods" on the basis of the focus group discussion
(SDG targets are displayed in a shortened form as presented during the focus group session; target 3.9 represents a modified formulation applied to FSs context).
Source: own data (data analysis using MaxQDA 2020).

Inclusive economic growth

Within the outcome category of inclusive economic growth, the participants brought up a variety of examples, beginning with the support for the developing countries through fair trade partnerships for sustainable procurement of foods that cannot be produced locally or regionally. The fair trade commitments of the Mouans-Sartoux OFS have been emphasised during the previous rounds dedicated to different outcome categories as well, which points to the broad range of outcomes resulting from these commitments. Social projects in Africa supported by the Mouans-Sartoux municipality have been mentioned:

> *(…) the local authority has voted to support developing countries, for specific villages with respect to local NGOs, to help them access the resource of water, which is sometimes complicated. Consequently, we're helping them to dig wells. And every year, they vote on 1% of the water budget, so that this money goes to help villages in Africa, in particular for digging wells – in such a way that it keeps populations in their villages rather than seeing them leave for urban areas* (participant 4).

Not limited to that, a multi-stakeholder partnership on sustainable food has been another outcome linked to the fair trade initiatives and solidarity with the developing counties. Likewise, a rural training centre in Togo has been established, which draws on the experience and work of the Mouans-Sartoux OFS:

> *They are in the process of trying to catalogue the local agricultural resources, so that they can be made available for healthier and more regular nutrition with respect to the pupils. So, they want to create a sort of MEAD adapted to Africa* (participant 4).

The latter example also indicates the dissemination of good practice and know-how of Mouans-Sartoux regarding sustainable consumption and production.

Social, economic and political inclusion as well as inclusive, participatory and representative decision-making have been emphasised, with the local group for sustainable food and multiple citizen groups taking the lead to be part of policymaking processes with regard to food and sustainability. Furthermore, issues of equal opportunities and reduced equalities, particularly regarding developing countries were addressed. Again, the example was linked to fair trade and pointed to the multitude of outcomes emerging from the given initiative:

> *(…) fair trade addresses everything that makes up development in developing countries, in maintaining populations against the rural exodus, for equality and for many things in fact. And Mouans-Sartoux has been a fair trade area since 2009. In this way, Mouans-Sartoux welcomes businesses that sell fairly traded products. The town helps with communication and is committed to communicating on "what is fair trade" and therefore addressing all that. And there's also popular education, which is undertaken with respect to educational institutions in this area. The town itself buys fairly traded products and therefore with criteria on the public procurement for certain products* (participant 5).

From the given statement it becomes clear that educational and awareness-raising campaigns take place to promote SD, equality and solidarity. In the same vein, another example has been provided – distribution of fair trade chocolates to children in schools for Christmas time.

The participants brought forward two more outcomes contributing to inclusive economic growth – increased scientific research and supporting rural-urban links. The former is supported mainly through MEAD as well as initiatives like +Bio. In this regard it has been mentioned that trustworthy research basis is crucial for implementing food-related projects. Therefore, the entire work carried out by the municipality is underpinned by research basis.

The example of the latter outcome pointed to the existing links between inland farmers and the coastal area:

> *There's a whole link being made in this inland area, which is very sparsely populated, but where there is farming, and the coastal area, which is very dense and where there's no farming. In recent years, we have seen growth in the relationship, interactions. And then, I think there are also farmers who settle inland. It's not obvious, but you can see it nonetheless* (participant 4).

In this context it has been mentioned, however, that more efficient pooling mechanisms would be needed to help the farmers distribute their products in the coastal area because at the moment it is done by farmers on the individual basis, which is too time consuming. Finally, increase in share of renewable energy promoted by the municipality coupled with energy-efficiency, which have been mentioned in the environmental dimension, apply to inclusive economic growth as well.

The afore described examples and corresponding outcomes address the target-levels of the following SDGs: SDG 7; SDG 9; SDG 10; SDG 11; SDG 12; SDG 16 and SDG 17 (see *Figure 57*).

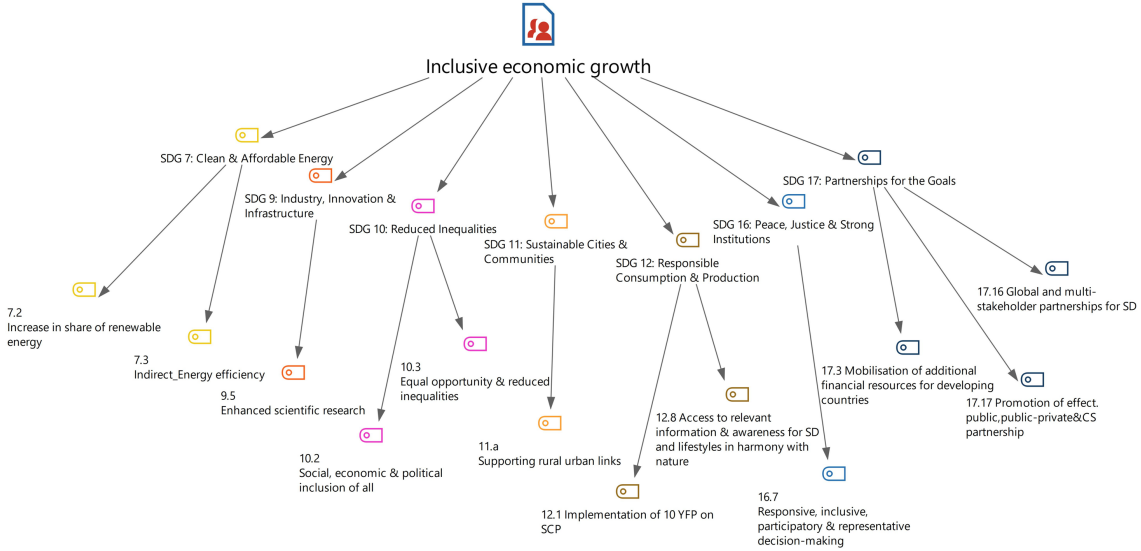


Figure 57: Overview of the specific outcomes and corresponding SDG targets of the Mouans-Sartoux OFS within the category "Inclusive economic growth" on the basis of the focus group discussion
(SDG targets are displayed in a shortened form as presented during the focus group session).
Source: own data (data analysis using MaxQDA 2020).

Governance and partnerships

The last round of the focus group session dedicated to the outcomes contributing to governance and partnerships brought up a range of aspects. For instance, the participants brought up examples of some educational and awareness-raising campaigns such as cycling week or preparation of the biodiversity atlas, with the latter one serving as an awareness-raising instrument of the critical role of biodiversity, not last in the context of CC. As one of the participants put forward:

> *Conservation of biodiversity with regard to climate change, and how the conservation of biodiversity can help people to live better in an urban centre, where they are, but also first to conserve biodiversity – that's the priority* (participant 4).

This indicated the integration of CC measures into municipal strategies. Moreover, the biodiversity atlas can also be seen as an outcome contributing to the environmental dimension through the protection of natural habitats and maintaining biodiversity.

Another example was the initiative "walking bus", where pair of parents gathers children for walking to school instead of taking a car – this example can be seen as contribution to the 10 YFP on SCP, particularly with regard to sustainable lifestyles and education. Even though this example cannot be seen as resulting directly from the OFS, however it is linked to the sustainability work initiated by the municipality and carried out through the Mouans-Sartoux OFS. One of the participants pointed to another awareness-raising initiative targeting the issues of plastic packaging: partnering with the region, Mouans-Sartoux has signed "Zero plastic waste" charter, which helps bringing this topic to attention of public stakeholders at the regional level.

Other topics have been also addressed, for instance protection of cultural and natural heritage. Here, it has been stated that the list of

heritage elements is being created in Mouans-Sartoux. The development process is carried out in a participatory and inclusive way involving all people. Likewise, citizens are encouraged to make suggestions on which object (constructed or natural) should be included on the list.

Finally, water management as an example of collective awareness was given, which represents responsive, inclusive, participatory and representative decision-making. The law has been passed, which would have handed water management into the hands of the urban district, Grasse. That would have led to the municipality losing control over water quality and price. One of the participants explained this further:

> *This means the town loses control of the water. But here, we have management that allows us to offer quality water at a lower cost. What happened? There was mobilisation – prudent, because there were legal problems, and we had to be sure it would succeed. We organised it so that the town – with a group of citizens – got together to retain control of the water. And now we can rest assured that the town will retain control of the water* (participant 4).

The examples provided by the participants along with the linked outcomes represent the following SDGs at their respective target-levels: SDG 4; SDG 9; SDG 10; SDG 11; SDG 12; SDG 13; SDG 15; SDG 16 and SDG 17 (see *Figure 58*).

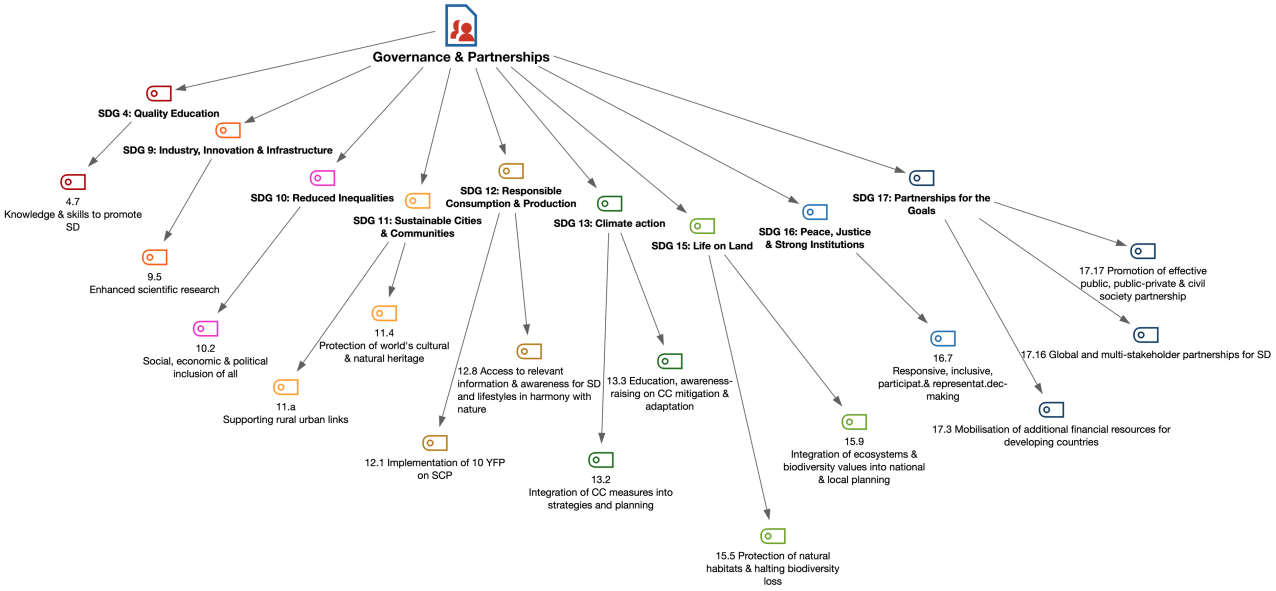


Figure 58: Overview of the specific outcomes and corresponding SDG targets of the Mouans-Sartoux OFS within the category "Governance and partnerships" on the basis of the focus group discussion
(SDG targets are displayed in a shortened form as presented during the focus group session; target 13.2 represents a modified to the local context formulation of the original target as opposed to national context of the original formulation).
Source: own data (data analysis using MaxQDA 2020).

Overview of outcomes most frequently addressed by the participants

The distribution of various themes and the related SDGs throughout the focus group session is shown in *Figure 59*. The code-matrix-browser displays the relative proportion of the topics addressed throughout the entire discussion round, which is made visible through the relative size of the coloured squares as well as the corresponding frequencies of mention (see *Figure 59*). As seen in *Figure 59*, the SDGs that appeared to be most frequently addressed throughout the focus group session (regardless of the outcome category discussed) were the SDG 12, SDG 2, SDG 17, SDG 4, SDG 15, SDG 10 and SDG 16.

Figure 59: Code-matrix-browser of the focus group session on the Mouans-Sartoux OFS outcomes, SDG goal-level
Source: own data (data analysis using MaxQDA 2020).

The concrete outcomes discussed throughout the focus group session represented, however, the target-level of the SDGs, hence looking at the distribution of the SDG targets provides more insights into the aspects that seem to be resulting from the OFS in Mouans-Sartoux to a greater extent, according to the key actors.

As *Figure 60* shows, the following outcomes appeared to be reoccurring most frequently throughout the focus group session:

- access to relevant information and awareness for SD and lifestyles in harmony with nature;
- implementation of the 10 YFP on SCP;
- knowledge and skills to promote SD;
- food access by all;
- promotion of effective public, public-private and civil society partnerships;
- responsive, inclusive, participatory and representative decision-making;
- social, economic and political inclusion of all.

Figure 60: Code-matrix-browser of the focus group session on the outcomes of the Mouans-Sartoux OFS, SDG target-level
(SDG targets are displayed in a shortened form as presented during the focus group session;
formulation of targets 3.9 and 13.2 has been modified to FSs and local as opposed to national level).
Source: own data (data analysis using MaxQDA 2020).

5 Data integration

The data on the outcome categories and SDGs addressed in the OFSs have been collected from multiple sources and employing several methods of data collection using a mixed methods design. Therefore, the findings of the present research consist of the results obtained through all these sources and methods (see *Table 16*; *Table 17; Table 18* and *Table 19)*. In order to combine the findings and identify a common pattern, the findings from various sources collected through various methods were integrated to display the joint results side-by-side in a table as described by Creswell and Plano Clark (2018, p. 227f). The data integration tables are presented and described in this chapter.

First, the findings on the OFS outcome categories were integrated into a matrix displaying the findings from literature, expert round, online survey and interviews with the key actors of three OFS case studies (see *Table 16*). While the outcome categories found in the literature built the basis for the categories revealed by the expert round and the survey, the latter two aimed at establishing a pattern with regard to the estimated degree of their representation in OFSs, at the same time complementing the categories (e.g. inclusive governance; see *Table 16*). Finally, the interview results from the case studies ultimately complemented the pattern through the addition of outcome patterns not commonly found in the literature.

Table 16: Data integration on OFS outcome categories

	Literature	Expert round	Online-survey	Interviews		
				Cilento-OFS	Södertälje-OFS	Mouans-Sartoux OFS
Ecosystem-related outcomes*	Enhanced biodiversity Improved soil quality Reduced water & air pollution CC mitigation & adaptation Animal welfare	Protection of natural resources Enhanced ecosystem's resilience	Ecosystem stability	Respect for environment Valorisation of territory Ecosystem stability Animal welfare	Ecosystem stability Natural landscape Animal welfare	Ecosystem stability Respect for environment CC mitigation & adaptation Landscape preservation
Individual outcomes	Nutritional quality Food safety Health & well-being	Improved health	Health & nutritional status Dietary diversity Improved QOL	Quality, taste & naturalness QOL Health & wellbeing	Happiness & self-fulfillment Quality, taste & naturalness Health & wellbeing QOL	Health & wellbeing Quality, taste & naturalness Dietary changes QOL
Community-related outcomes	Increased participation Improved livelihoods Revitalised community FNS Food autonomy	Improved livelihoods Revitalised community Inclusive governance Improved FNS	FNS Improved livelihoods Food sovereignty Revitalised community Food safety Waste & loss reduction Socio-cultural wellbeing Inclusiveness and fairness	Collaboration Reduced rural exodus Dignity of work / valorisation of activity Synergies in value chain Job creation Negative outcomes Network creation Availability & increased demand for organic	Increased awareness Collaboration Education & awareness-raising on SD & healthy food Social interaction Negative outcomes Increased share of organic food in public procurement Local sourcing Increased organic land Job creation Direct producer-consumer link Farmers' dignity & empowerment	Direct producer-consumer link Waste reduction Increased awareness Increased consumption of / demand for organic food Transparency & trust Dietary changes Job creation Availability of / access to organic food Responsible consumption Improved farmers' livelihoods
IFOAM-principles-based outcomes				Health Care Fairness Ecology	Ecology Health Fairness	Health Care Fairness Ecology

Source: own data; compilation is based on the results obtained through the analysis of literature, expert round, online survey and interviews with the OFS key actors in three selected case studies.

* – ecosystem-related outcomes include animals as part of the agroecosystems.

Identification of the SDGs addressed in OFSs have been carried out using mixed methods approach employing analysis of literature, expert round, online survey and focus groups with the selected key actors in three OFSs under study. Data integration has been performed to combine all the findings so as to disclose the central SDG pattern that comes across all data sources (see *Table 17*). While all of the SDGs identified through the employed methods are displayed in the table, the ones that score the highest in the empirical part are highlighted in red colour representing a central pattern of the SDGs' at goal-level (for the first three data sources, namely literature, expert round and web-based survey; see *Table 17)*. As shown in *Table 17*, the last data source, namely focus groups in the case studies aimed at disclosing the goals at their target-level provide deeper insight into the pattern indicating the intensity of representation of specific SDGs through their targets.

Table 17: Data integration on the SDG pattern addressed in OFSs

	SDG pattern	Matching pattern
Goal-level		
Literature	SDG 2; SDG 3; SDG 4; SDG 6; SDG 8; SDG 12; SDG 13; SDG 14; SDG 15	SDG 12; SDG 2; SDG 14; SDG 15; SDG 17***; SDG 8; SDG 13; SDG 3; SDG 11***
Expert round*	"desired" outcomes pattern: **SDG 12**; **SDG 1** & **SDG 2**; **SDG 3**; SDG 7 & SDG 10; SDG 4 & SDG 13 & SDG 16 & SDG 17	
	present situation: **SDG 13**; **SDG 15** & **SDG 12**; **SDG 3** & **SDG 17**; SDG 2; SDG 1 & SDG 8 & SDG 11; SDG 14	
Web-based survey*	**SDG 12**; **SDG 3**; **SDG 15**; **SDG 13**; SDG 6; SDG 8; SDG 11; SDG 17; SDG 14; SDG 2; SDG 1; SDG 16; SDG 9; SDG 4; SDG 10; SDG 5; SDG 7	
Target-level		
Focus groups**	7 targets addressed: **SDG 12** 4-5 targets addressed: **SDG 14**; **SDG 2**; **SDG 15**; **SDG 17**; SDG 8 2-3 targets addressed: SDG 3; SDG 4; SDG 7; SDG 9; SDG 10; SDG 11 1 target addressed: SDG 1; SDG 13****; SDG 16	

Source: own data; compilation is based on the results obtained through mixed methods approach incorporating analysis of literature, expert round, online survey and interviews with OFS key actors in three selected case studies.

* - the sequence of the SDGs' listing is based on the frequency of mention.

** - the sequence of the SDGs' listing is based on the total amount of SDG targets revealed in all three focus group sessions (as a total sum per SDG from all the cases).

*** - SDGs that have not been addressed in the literature, but revealed through the primary data.

**** - for the purpose of present study the word "national" has been omitted from the target 13.2 to allow for assessing the contribution to this target at local level. However, due to this reason the original target cannot be considered as an OFS outcome.

red colour – central pattern (based on the highest frequencies)

The findings from the focus group sessions provide deeper insights into the SDG pattern identified at target-level. The compilation of the total amount of targets per each SDG addressed during the focus group sessions in each of the three case studies sheds light on the degree of representation for each of the goals in each of the OFSs under study (see *Table 18*). Based on the total amount of targets addressed under each of the SDGs in each of the OFSs, it is possible to group together the goals addressed by multiple targets and those addressed by one target only. Such grouping reveals that the SDGs are addressed in the cases to a various extent, with the higher-order-SDGs addressed by three to two targets to a lower-order-SDGs addressed by one target solely (see *Table 18*).

Comparison between the three OFS cases makes it possible to identify a common pattern of the SDGs addressed to a higher extent in the case studies (three to two targets per SDG, highlighted in red colour SDGs in *Table* 18). Comparison also reveals those SDGs that are addressed to a medium extent (three to one target(s), with two targets per case on the average) and the SDGs that are addressed to a lower degree (predominantly one target) (orange and green coloured SDGs, respectively, see *Table 18*). Such grouping can be viewed as a three tiered-structure of the SDGs. The SDG 12 has been revealed in all studied cases as the central goal being addressed through five to seven targets depending on the OFS (see *Table 18*).

Table 18: Tiered structure of the SDG pattern at target-level

N	SDG-order	Focus group OFS-Cilento (Italy)	Focus Group OFS-Södertälje (Sweden)	Focus Group OFS-Mouans-Sartoux (France)
1	SDG 12 - central (5-7 Targets)			
2	1-tier / 1-order (3 targets / SDG)	SDG 8; SDG 14; SDG 15	SDG 2; SDG 15; SDG 17	SDG 2; SDG 15; SDG 17
3	2-tier / 2-order (2 targets / SDG)	SDG 2; SDG 4; SDG 17	SDG 4; SDG 8; SDG 11	SDG 7; SDG 10; SDG 11; SDG 13*; SDG 14; indirect outcomes – SDG 6
4	3-tier / 3-order (1 target / SDG)	SDG 1; SDG 3; SDG 5; SDG 7; SDG 9; SDG 10; SDG 11; SDG 13*; SDG 16	SDG 1; SDG 3; SDG 7; SDG 9; SDG 10; SDG 13*; SDG 14; SDG 16	SDG 1; SDG 3; SDG 4; SDG 8; SDG 9; SDG 16

Source: own data based on the findings from three focus groups in OFSs under study; compilation is based on the total count of the targets per each of the SDGs addressed in each case study.

Blue colour – central SDG.

Red colour – 1-tier-SDGs (3-2 targets / SDG addressed, predominantly 3 targets / case).

Orange colour – 2-tier-SDGs (3-1 targets / SDG addressed, predominantly 2 targets / case).

Green colour – 3-tier-SDGs (2-1 targets / SDG addressed, predominantly 1 target / case).

* – for the purpose of present study the word “national” has been omitted from the target 13.2 to allow for assessing the contribution to this target at local level. However, due to this reason the original target cannot be considered as an OFS outcome.

Finally, to identify the SDG targets that have been addressed across the cases, it makes sense to look at the exact targets revealed in each of the three OFS case studies (see *Table 19*). These targets will help reveal the joint pattern that could potentially serve as a basis for monitoring the transformation process towards SFSs. The targets that have been identified in all three case studies are highlighted in red colour, while the ones that have been revealed in two out of three cases are highlighted in green (see *Table 19*).

Table 19: Overview of the SDG targets identified in three OFS case studies through focus group discussions

	OFS-Cilento (Italy)	OFS-Södertälje (Sweden)	OFS-Mouans-Sartoux (France)
SDG 1	1.5 Resilience-building for poor & vulnerable groups	1.5 Resilience-building for poor & vulnerable groups	1.5 Resilience-building for poor & vulnerable groups
SDG 2	2.4 SFPSs & resilient agricultural practices with increased productivity & helping maintain ecosystems 2.5 Genetic diversity of seeds, cultivated plants & animals	2.1 Food access by all (to safe, nutritious and sufficient food all year round) 2.3 Secure & equal access to land & productive resources, knowledge, markets for small-scale producers 2.4 SFPSs & resilient agricultural practices with increased productivity & helping maintain ecosystems	2.1 Food access by all (to safe, nutritious and sufficient food all year round) 2.3 Secure & equal access to land & productive resources, knowledge, markets for small-scale producers 2.4 SFPSs & resilient agricultural practices with increased productivity & helping maintain ecosystems
SDG 3	3.4 Reduction of non-communicable diseases & promotion of health and well-being	3.9 Reduction of deaths & illnesses from contamination & air, water and soil pollution	3.9 Reduction of deaths & illnesses from contamination & air, water and soil pollution

SDG 4	4.4 Increase in number of youth and adults with relevant skills for employment, decent jobs & entrepreneurship 4.7 Knowledge & skills to promote SD	4.4 Increase in number of youth and adults with relevant skills for employment, decent jobs & entrepreneurship 4.7 Knowledge & skills to promote SD	4.7 Knowledge & skills to promote SD
SDG 5	5.5 Ensuring effective participation & equal leadership opportunities for women	–	–
SDG 6	6.4 *(intended) Increased water-use efficiency across sectors & ensure sustainable withdrawals and supply of fresh water* 6.6 (*intended) Protection & restoration of water-related ecosystems*	–	6.3 Improving water quality (pollution reduction) 6.4 Increased water-use efficiency across sectors & ensure sustainable withdrawals and supply of fresh water
SDG 7	7.2 Increase in share of renewable energy	7.2 Increase in share of renewable energy	7.2 Increase in share of renewable energy 7.3 Improvement in energy efficiency

SDG 8	8.2 Higher levels of economic productivity through focus on high-value added & labour-intensive sectors 8.5 Full and productive employment & decent work and equal pay for work of equal value 8.9 Promotion of local culture & sustainable tourism for job creation	8.4 Improvement of resource efficiency & decoupling economic growth from environmental degradation 8.5 Full and productive employment & decent work and equal pay for work of equal value	8.5 Full and productive employment & decent work and equal pay for work of equal value
SDG 9	9.3 Increased integration of small-scale enterprises (incl. those in developing countries) into value chains and markets	9.5 Enhanced scientific research & upgrading technological capabilities of industrial sector	9.5 Enhanced scientific research & upgrading technological capabilities of industrial sector
SDG 10	10.2 Social, economic & political inclusion of all	10.2 Social, economic & political inclusion of all	10.2 Social, economic & political inclusion of all 10.3 Equal opportunity & reduced inequalities

SDG 11	11.4 Protection of world's cultural & natural heritage	11.4 Protection of world's cultural & natural heritage 11.a Supporting rural-urban links	11.4 Protection of world's cultural & natural heritage 11.a Supporting rural-urban links
SDG 12	12.1 Implementation of 10 YFP on SCP Patterns 12.2 Sustainable management & efficient use of natural resources 12.3 & 12.5 Food waste and loss reduction 12.6 Sustainable practices and sustainability information in reporting 12.7 Sustainable public procurement practices 12.8 Information access & awareness for SD & lifestyles in harmony with nature	12.1 Implementation of 10 YFP on SCP Patterns 12.3 & 12.5 Food waste and loss reduction 12.7 Sustainable public procurement practices 12.8 Information access & awareness for SD & lifestyles in harmony with nature	12.1 Implementation of 10 YFP on SCP Patterns 12.3 & 12.5 Food waste and loss reduction 12.4 Environmentally sound waste management 12.7 Sustainable public procurement practices 12.8 Information access & awareness for SD & lifestyles in harmony with nature
SDG 13	13.2 Integration of CC measures into national strategies & planning*	13.2 Integration of CC measures into national strategies & planning*	13.2 Integration of CC measures into national strategies & planning* 13.3 Education & awareness-raising on CC

SDG 14	14.2 Sustainable management & protection of marine & coastal ecosystems 14.4 Restoring fish stocks through regulating fish harvesting & prevention of overfishing 14.5 Conservation of coastal & marine areas	14.1 Prevention & reduction of marine pollution (esp. from land-based activities)	14.1 Prevention & reduction of marine pollution (esp. from land-based activities) 14.b Access to marine resources & markets for small artisanal fishers
SDG 15	15.3 Restoration of degraded land & soil 15.5 Protection of natural habitats, halting biodiversity loss & protection of threatened species 15.a Increased financial resources for conservation & sustainable use of biodiversity and ecosystems	15.3 Restoration of degraded land & soil 15.5 Protection of natural habitats, halting biodiversity loss & protection of threatened species 15.a Increased financial resources for conservation & sustainable use of biodiversity and ecosystems	15.3 Restoration of degraded land & soil 15.5 Protection of natural habitats, halting biodiversity loss & protection of threatened species 15.9 Integration of ecosystem and biodiversity values into national & local planning & development processes

SDG 16	16.7 Responsive, inclusive, participatory & representative decision-making	16.7 Responsive, inclusive, participatory & representative decision-making	16.7 Responsive, inclusive, participatory & representative decision-making
SDG 17	17.16 Global & multi-stakeholder partnership for SD for sharing of knowledge and expertise, technology and financial resources 17.17 Effective public- public-private & civil society partnerships	17.11 Increase in exports of developing countries 17.16 Global & multi-stakeholder partnership for SD for sharing of knowledge and expertise, technology and financial resources 17.17 Effective public- public-private & civil society partnerships	17.3 Mobilisation of additional financial resources for developing countries 17.16 Global & multi-stakeholder partnership for SD for sharing of knowledge and expertise, technology and financial resources 17.17 Effective public- public-private & civil society partnerships

Source: own data based on the findings from three focus groups in OFSs under study; compilation is based on the total count of the targets per each of the SDGs addressed in each case study.

Shortened version of the SDG targets is presented as used during the focus group sessions.

* – for the purpose of present study the word “national” has been omitted to allow for assessing the contribution to this target at local level. However, due to this reason the original target cannot be considered as an OFS outcome.

Red colour – SDG targets coming across all three case studies.

Green colour – SDG targets coming across two case studies.

6 Discussion

The study focused on the OFS that could be seen as an example of a SFS having multiple positive outcomes in various dimensions of sustainability. For studying outcomes, an actor-oriented approach has been chosen to focus on people involved in the OFS. Mixed methods design was used to study the OFS outcomes approaching them in a stepwise manner. First, a pattern of outcomes and the SDGs (at goal-level) was identified through the literature on organic production and consumption, which were then discussed with a selected group of OFS experts representing different countries. The research assumptions representing OFS outcomes and SDG patterns (at goal-level) have been offered for a discussion, which were based on literature. The experts offered some modifications, which have been taken up to an online survey with organic experts from around the world. The survey provided further insights into OFS outcomes and the contribution to the SDGs (at goal-level). In parallel, a systematic review on FS outcomes has been carried out to uncover the general FS outcomes, the narratives within which they are contained and the role of outcomes for FS transformation towards sustainability. Afterwards, case studies were carried out to investigate the real-life OFSs and their outcomes. Three European cases have been selected for the study: the bio-district Cilento (Italy), the Södertälje municipality (Sweden) and the Mouans-Sartoux municipality (France). All three cases have undergone certain developmental stages and have more than ten years to look back on. Other selection criteria such as certified organic quality, variety of organic produce, clear geographic and jurisdictional boundaries were all fulfilled as well. The cases were then studied based on the available information as well as the documentation performed by the master students of the Department of Organic Food Quality and Food Culture (Kassel University, Germany). Semi-

structured interviews with the key actors of the selected three cases have been analysed by the researcher to identify the OFS outcomes revealed in the participants' answers. Afterwards, the researcher conducted focus groups with a selected group of key actors in each of the three cases as part of a multiple-case study. The focus groups sought to identify the SDGs addressed in the OFSs, which was done through revealing the respective outcomes at SDG target-level. Here, the focus was placed on the key actors' perception rather than on measurements.

The present study aimed at identifying the OFS outcomes as well as the SDGs addressed in OFSs in order to uncover a potential contribution of the OFS to FSs transformation towards SFSs. First, the identified OFS outcomes will be discussed and compared to the existing literature. This will be followed by the discussion on the revealed SDGs. Afterwards, bridging the OFS outcomes to the SDG targets and linking the findings to literature possible conceptualisation for potential monitoring of SDGs in OFSs will be discussed. After that, reflection on the methodology and limitations of the study will be discussed.

6.1 Organic food system outcome categories

The findings of the present study revealed that the categories of OFS outcomes are largely in line with those reported in the literature discussing the effects and benefits of OA and organic consumption. The disclosed outcomes provide the answer to the first research question of the present study. The outcome categories identified through the expert round, online survey and semi-structured interviews with the key actors of the analysed OFS case studies can be grouped into three broad groups – the ecosystem-related outcomes (with ecosystem including animals as part of agroecosystem), individual outcomes and community-related outcomes.

6.1.1 Ecosystem-related outcomes

The central outcome category within the first group is ecosystem stability disclosed in the expert round, online survey and interviews with the key actors of the OFS case studies (see *Table 16* in chapter 5). The exact contributions to ecosystem stability revealed in the survey responses as well as by the interviewees mainly pointed to improved soil quality, enhanced biodiversity, CC mitigation and adaptation, reduced pollution and contamination of soil, water and air. These outcomes are also well reported in the literature on OA (Niggli, 2015; Reganold and Wachter, 2016; Seufert and Ramankutty, 2017; etc.). Moreover, the interviews disclosed further outcomes related to natural world such as respect for the environment and natural landscape (see *Table 16* in chapter 5). While the former can be seen as closely intertwined with the values and principles of the organic movement, the implications of organic farming for the latter have been subject of investigation before. For instance, reviewing European studies and aiming at analysing the effects of organic farming on rural landscapes, Levin (2004) concluded that organic farms increase the content of semi-natural and natural landscape elements compared to conventional farms. Finally, the interviews revealed another outcome linked to natural world, namely animal welfare, which has been articulated by the key actors of two out of three case studies – in the OFSs in Cilento and Södertälje. The lack of this outcome in the French case can be explained by the fact that there is virtually no animal husbandry in Mouans-Sartoux, and hence the key actors did not consider this aspect as a relevant outcome. Animal welfare as an OFS outcome is, however, not to be underestimated since it represents an "integral part of organic farming" reflected in the organic values (Verhoog et al., 2004, p. 91). Indeed, animal welfare is part of the four organic principles articulated in principle of fairness (IFOAM, 2020) and regulations and standards (e.g. EU, 2018). Considering

the growing importance of animal welfare for the consumers (Alonso et al., 2020; Gottschalk and Leistner, 2013; etc.), the aspect certainly deserves more attention in the responsible consumption discourse.

6.1.2 Individual Outcomes

In terms of the OFS outcomes on an individual level, the present study revealed a range of outcomes spanning from dietary diversity, quality, taste and naturalness of organic food, health and nutritional status to happiness and self-fulfillment, wellbeing and QOL. Dietary diversity and nutritional status of organic diets have been brought to attention in previous studies, pointing to an overall healthier dietary composition with a higher proportion of plant-based foods as well as organic-based diets being, on average, in line with nutritional recommendations (Strassner et al., 2015; Baudry et al., 2016; Kesse-Guyot et al., 2017). Quality, taste and naturalness of organic food, which have been revealed in the interviews and in specific examples provided by the respondents of online survey represent another outcome category well reported in the literature. Likewise, various studies have assessed quality of organic food, focusing on nutritional composition in terms of higher concentrations of antioxidants and beneficial omega-3 fatty acids and safety in terms of significantly lower levels of pesticide and antibiotic residues as well as nitrates and traces of heavy metals such as cadmium (Baranski et al., 2014; Mie et al., 2017; FiBL and ORC, 2015; etc.). Taste and naturalness, on the other hand, seem to have a symbolic meaning for organic consumers representing rather subjective experiences and expectations associated with “authentic” and “pure” taste linked to organic food (Stolz et al., 2010, p. 49ff). The responses of the OFSs’ key actors in the present study supported this association. Concerning the taste differences between organically and conventionally produced foods, studies attempting

to assess potential taste differences between conventional and organic products using sensory evaluation found no significant taste differences (Woese et al., 1997; Basker, 1992; Tobin et al., 2013; etc.). With regard to the aspect of naturalness, Hemmerling et al. (2016) studied preferences for naturalness-related sensory attributes among frequent and occasional organic consumers in six European countries and found out that preference for freshness appeared to be important for the European consumers in all six countries, while other aspects varied between the countries. The interviewees from the OFSs under study have revealed similar association referring to freshness of organic food. Regarding health benefits linked to organic food, research found inverse association between organic food consumption and type 2 diabetes, metabolic syndrome and risk of overweight and obesity, while significantly lower levels of pesticide and antibiotic residues, heavy metals and nitrates in organically grown crops can be rated as beneficial for health (Baudry et al., 2018; Mie et al., 2017; Kesse-Guyot et al., 2020; Woese et al., 1997). Similarly, the present study found out that health benefits were primarily associated with the absence and reduced levels of pesticide residues, with the survey responses revealing potential nutritional benefits in terms of secondary metabolites and certain vitamins. Some interviewees, however, believed that their overall health might have improved since their switch to organic food – the perception supporting health experiences has also been reported by organic consumers in an Australian study (Oates et al., 2014).

6.1.3 Community-related outcomes

The present study revealed a broad range of community-related OFS outcomes, mainly through interviews with the key actors. The studies examining social outcomes of organic production and consumption systems in general and community-related

implications in specifics are, however, scarce. For instance, the present study disclosed improved livelihoods as an outcome of OFSs repeatedly stated in the expert round, online survey as well as in specific outcomes provided by the OFS key actors. The literature mainly links improved livelihoods to higher profitability of organic farming, mainly due to premium prices, and a better overall income of organic farmers (Seufert and Ramankutty, 2017; MacRae et al., 2007). Furthermore, improved livelihoods for organic farmers have been also associated with diversified production systems reducing the risks linked to economic dependence on a single crop as well as farmers' autonomy, mainly due to participation in AFNs (Seufert and Ramankutty, 2017).

Expert round and online survey uncovered FNS as next OFS outcome, while interviews with the OFSs' key actors revealed aspects of availability and access specifically. Similarly, Reganold and Wachter (2016) argue that due to diversification of on-farm activities and crop and livestock rotations a higher diversity of protein- and nutrient-rich crops are produced, which organic farmers could equally benefit from.

The revitalised community was another outcome, which was revealed through the expert round and online survey as well as in separate statements of the OFSs' key actors. This outcome is in line with the conclusion made by MacRae et al. (2007), who after reviewing studies examining social impacts of organic and other SFPSs, concluded that organic farming delivers community benefits offering a potential for improved farm finances and contributing to the vitality of rural communities. These effects could be explained by the fact that organic farmers tend to favour direct marketing facilitating better community involvement. Rebuilding of rural communities perceived as an outcome of organic farming has been also reported in another study with Irish organic farmers (Tovey, 1997).

With regard to the outcome categories reported by the key actors directly involved in the activities of the three OFS case studies, the present study revealed happiness and self-fulfillment as well as wellbeing and QOL, with the latter also articulated by the online survey's participants. The interview results revealed key actors' satisfaction with own occupation and the perception of own positive contribution. In the same vein, Mzoughi et al. (2014) investigated the relationship between organic farming and life satisfaction among French organic farmers of the Alpes-Côte d'Azur province and found out higher levels of life satisfaction reported by the farmers. Brigance et al. (2018) analysed factors contributing to mental health and wellbeing of organic farmers and farm workers. The authors came to a conclusion that there seem to be certain protective factors unique for organic farming, which positively contribute to farmers' mental wellbeing, such as knowledge sharing, bonding with co-workers, participation in farm-related community events as well as a shared life view incorporating feeling of responsibility and community. In the present study, the OFSs' key actors named wellbeing as one of the OFS outcomes, linking it to organic diet as well as work in the OFS. Similarly, a Swedish study revealed a relationship between organic diets and perceived wellbeing and vitality concluding that an organic diet-based lifestyle seems to connect an individual to the aspects of values, identity and wellbeing on psychological level while on the philosophical level it symbolises a return to the natural world (Essen and Englander, 2013). In the same vein, an Australian study analysed the relationship between organic diets and subjective wellbeing and found out that regular organic consumers had a high score above the mean for the Australian population, with particularly high scores for community connectedness, achieving in life and health (Oates et al., 2014).

Supporting the finding of the present study regarding QOL as an OFS outcome, a Spanish study comparing QOL and quality of work

life between organic and conventional farmers came to a conclusion that organic farms provide significantly better QOL as well as quality of work than their conventional counterparts do (Alvarez-Esteban et al., 2014). The study, however, provided no insights into the reasons behind this difference. The answers collected from the OFSs' key actors in the present study might shed light on potential reasons for higher QOL perceived by organic stakeholders. Likewise, the study at hand revealed that the organic actors perform activities in line with their values and beliefs, which, in turn, seem to be in line with the organic principles. This seems to contribute to the feeling of self-fulfillment and satisfaction with own activity and life in general. Similar findings have been reported by Mzoughi et al. (2014) and Sullivan et al. (1996). Mzoughi et al. (2014) argued that environmentally-friendly practices of organic farmers seem to increase their life satisfaction. Based on interviews with organic and conventional farmers in Michigan, Sullivan et al. (1996) disclosed a stronger perception of community, a greater concern for ethical living and a higher overall satisfaction with their lives among organic farmers compared to conventional ones.

The present study also revealed collaboration, increased awareness, direct producer-consumer link, network creation, social interaction as well as trust and transparency as further OFS outcomes perceived by the key actors involved in these systems. These findings are similar to the observation made by Brigance et al. (2018). They reported a high degree of community participation due to organic farming, mainly attributed to the direct link between producers and consumers through various activities creating spaces for community interaction and ultimately enhancing trust. Similar findings have been reported by Al Shamsi et al. (2018) who analysed organic production models in the United Arab Emirates and Italy. They concluded that through their engagement in short food supply chains both models are reconnecting production and

consumption circuits, enabling solidarity-based interconnection and ultimately developing a network between all the involved stakeholders.

Dignity of work and reduced rural exodus as OFS outcomes revealed by the interviewed OFSs' key actors fall in line with the findings of Tovey (1997), who interviewed Irish organic farmers and found out that for them, organic farming is associated with higher competence, skills and creativity, which tends to make the profession of organic farmer attractive contributing to people returning to or staying in rural areas. Similarly, the interviewees of the present study explained that due to the OFS, farming has become attractive again and a profession has regained respect in the society. Other stakeholders have made similar statements indicating a dignified status attached to a position of being an organic stakeholder. As for the reduction of rural exodus, the key actors explained that the OFS opened up new job opportunities in the area, which could counter the job-related migration of youth from the region.

6.1.4 IFOAM principles

In addition, it is noteworthy that the IFOAM principles-related outcomes have been uncovered through interviews with the key actors of the OFSs under study (see *Table 16* in chapter 5). This is in line with the observation made during the expert round, when the participants stressed the critical importance of the organic principles emphasising that sustainability as well as the SDGs are "inherent" in the principles. Indeed, the IFOAM-principles reflect values of the organic movement (Luttikholt, 2007). Therefore, it should not be surprising that the organic actors identify themselves with these values and perceive the OFS outcomes in relation to the principles.

6.1.5 Negative outcomes

Apart from a wide range of positive OFS outcomes, the study at hand did reveal some negative outcomes and challenges perceived by the key actors involved in the investigated OFSs. Likewise, a few key actors in two out of three case studies spoke about certain constraints linked to the OFS. The main downsides disclosed in the interviews were attributed to lack of support from administration, intensive external communication coupled with lack of financial support, time-intensity of activities' planning and economic constraints linked to crop losses due to pests. Regarding the lack of administrative and financial support as well as high demand for external communication, which have been mentioned in relation to the bio-district Cilento, these challenges have been reported before and mainly linked to fragmentation of financial sources, no long-term funding, frequent turnover of decision-makers and limited appreciation of an OFS's potential within a wider community (Pugliese et al., 2015; Stotten et al., 2017). Regarding economic losses due to pests, higher pest infestations in organic production systems have been reported by Muneret et al. (2018). Based on data from meta-analyses the authors demonstrated higher pest infestation levels in organic fields, however, a significant difference between organic and conventional fields has been only found for annual crops and considering multiple pest species (ibid.).

6.2 SDG pattern addressed in organic food systems

Using an actor-oriented participatory approach the study at hand identified the SDGs addressed in OFSs aiming at disclosing an OFS-specific SDG pattern. The identification has been carried out in a stepwise manner: first the SDGs perceived to be addressed at the goal-level have been disclosed, which has been accomplished through expert round and online survey. Afterwards, the focus groups with a selected group of key actors from three case studies

of European OFSs have been employed to reveal the SDGs addressed in these cases at target-level. The level on which the analysis of contributions to the SDGs is carried out (goals versus targets) has implications for the final results with regard to which SDGs are identified, as has been noted by one of the participants of the expert round. This has proven to be particularly applicable with regard to the SDG 3 (Good health and wellbeing) and SDG 13 (Climate action), which did score high implying its representation in OFS during the expert round and online survey when considered at goal-level, however, did not reveal the same prominence in the focus groups when regarded at target-level (see *Table 17* in chapter 5). In terms of the SDG 13 it could potentially be explained by the fact that this goal tends to cover processes towards the climate outcomes rather than the outcomes as such (Campbell et al., 2018). Furthermore, the online survey, interviews with key actors as well as focus group sessions in two out of three OFS case studies revealed the mitigation effects of the OFSs as an outcome, which, however, could not be assigned to any of the targets within the SDG 13 due to the fact that the corresponding target is non-existent. Indeed, neither the link to GHG emissions is made in the targets under the SDG 13, nor is the mitigation topic addressed (Campbell et al., 2018; Le Blanc, 2015). Another challenge with analysing the contribution of the OFS case studies to the SDG 13 was a mismatch in scope, when targets tend to focus on national (or international) interventions such as in case of target 13.2 (Ilieva, 2017). The target reads “Integrate climate change measures into national policies, strategies and planning”. In order to overcome this problem and assess the potential contribution to this target nevertheless the researcher has omitted the word “national” from the description of the corresponding outcome. This has been considered feasible for the purpose of capturing all the potential contributions taking place on local scale since as has been put forward by Ilieva (2017) in order

to effectively pursue the SDGs in practice it is vital to acknowledge and build on existing sense-making activities taking place at local levels. Yet, the target 13.2 itself cannot be considered under the SDG-contributions of the OFS due to the scale issue.

The identification of the OFS-specific pattern of SDGs at goal- and target-levels (second and third research questions) using mixed methods approach revealed a pattern consisting of the following SDGs: SDG 12; SDG 2; SDG 15; SDG 17; SDG 14; SDG 8; SDG 3 and SDG 11 (see *Table 17* in chapter 5). The goals that appeared to be addressed through multiple targets in the investigated OFSs are SDG 12, SDG 2, SDG 15, SDG 17, SDG 4, SDG 8, SDG 11, and SDG 14 (see *Table 18* in chapter 5). In contrast, the goals that have been addressed in the analysed OFS cases by one target only are SDG 1, SDG 3, SDG 7, SDG 9, SDG 10 and SDG 16 (see *Table 18* in chapter 5). Based on the total amount of SDG-targets per goal revealed in the focus group sessions of three OFSs under study, it is possible to present an OFS-specific SDG pattern (see *Figure 61*). The first tier represents the goals that have been addressed in each of the case studies by the highest number of targets, while the third tier is represented by one target mostly (see *Figure 61*). The SDG 12 (Responsible consumption and production) appeared to be the central goal in the studied OFSs addressed by the highest number of up to seven targets per case and triggering further outcomes and leveraging other SDG targets in the investigated OFSs, hence it can be viewed as a "binding element" of the "SDG-cake" (see *Figure 61*).

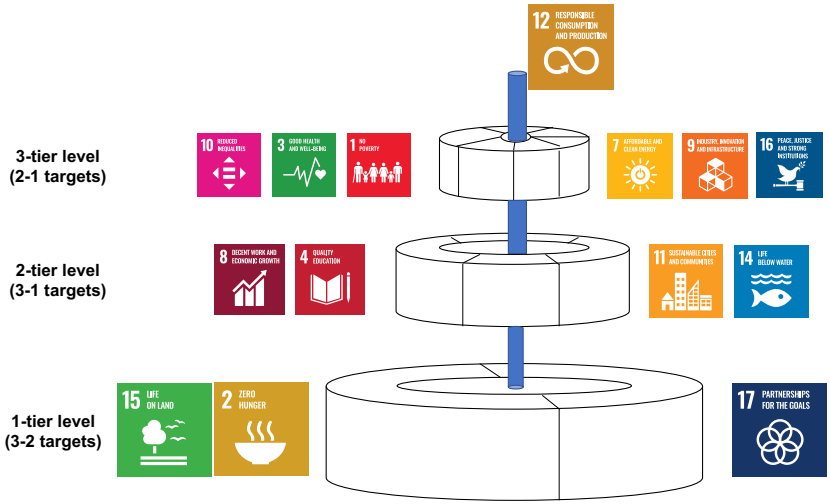


Figure 61: The OFS-specific SDG pattern in a tiered structure
Source: own elaboration based on results of the focus groups
(representation adopted from the model of Rockström and Sukhdev, 2016; in contrast to the original representation, the layers of the "wedding cake" are based on the number of SDG targets revealed in the OFSs and not the sustainability dimensions).

Regarding SDG 12 being the dominant SDG in the analysed case studies, similar finding has been made by Fassio and Tecco (2019) who analysed the connection of 40 case histories implementing circularity actions within the area of food supply chain to the SDGs at target-level. The authors found out that the SDG 12 had the highest representation among the case histories. Le Blanc (2015) discovered that through its targets the SDG 12 is connected with the highest number of other SDGs. Network analysis based on the targets' wording revealed connections with 14 other SDGs (ibid.). In line with this finding, the study at hand has revealed the existence of potential synergies between the SDG 12 and other goals. In contrast, other studies attempting to disclose the relationships between the SDGs through correlation using official data on SDG-indicators from 227 countries (Pradhan et al., 2017) or using SDG Index from 193 UN member state countries (Fonseca et al., 2020)

concluded that SDG 12 is mostly associated with trade-offs. The reason for this might be the difference in data sources and data treatment, namely index- or indicator-level, with numerical data treated statistically using correlation in the afore mentioned studies and target-level opposed to no quantification and statistical data treatment in the present study.

Considering the target-based SDG pattern revealed in the present study using participatory approach, it is worth stressing that, to the best of the researcher's knowledge, no similar attempts have been made until present. The efforts seem to be concentrated rather on SDG-indicators. For instance, Bertelsmann foundation published a comprehensive list of SDG-based indicators for the German municipalities (Assmann et al., 2018). The working group has elaborated 47 core indicators, with a detailed description for each of them in terms of placement within the Agenda 2030 (target and indicators), measurement details, relevance for sustainability and so on (ibid.). The tool aims at facilitating the monitoring using quantifiable parameters. Regarding the studies analysing the SDG performance at target-level, a few contributions are worth mentioning. Although different in scope and methodology, yet the study by Ilieva (2017) could be considered somewhat similar to the present project in that it disclosed the overlaps between the urban FSs (UFSs) strategies of five North American metropolitan areas and the SDGs. Five metropolises have been selected based on their long-term comprehensive SD-oriented plans adopted by administration, and comparative analysis has been carried out to identify gaps and convergence between the UFS strategies and the SDGs at goal-, target- and indicator-level (ibid.). Looking at the target-level the study revealed intersections between the UFS strategies and SDGs in the targets of SDG 2, SDG 3, SDG 9, SDG 12, SDG 15 and SDG 17. Comparing these findings with the

results of the present study, the overlap is found in targets 2.1, 2.4, 3.4 (marginal), 12.2 (marginal) and 17.7.

The already mentioned before study by Fassio and Tecco (2019) connected the actions taken in 40 food chain-associated cases implementing circular economy approach to the SDGs via target-level. The main contributions have been found within the SDG 12, SDG 9 and SDG 17 (ibid.). Comparing to the present study's results, the overlap is observed in the SDG 12 and SDG 17, with the convergence observed with regard to most of the targets of these both goals. In contrast, SDG 9 that appeared to also be addressed to a high extent in the study by Fassio and Tecco (2019) has not expressed the same relevance with regard to OFSs outcomes in the present study.

In a recently published report, Bortoletti et al. (2020) linked FS outcomes to the SDGs via target-level. Specific outcomes such as livelihoods and wellbeing, social justice and equality, resilience and CC adaptation, ecosystem services and others were assigned to three outcome categories – socio-economic, environmental and FNS outcomes and linked to SDG targets (ibid.). The categories are largely in line with those chosen for the study at hand, however, in contrast to the present approach Bortoletti et al. (2020) did not specifically include the governance pillar. The vast majority of the targets listed by Bortoletti et al. (2020) as relevant within each of the outcome categories have been revealed in the present study as the outcomes of the investigated OFSs. The main overlaps occurred within the SDG 2, SDG 3, SDG 12, SDG 14, SDG 16 and SDG 17, while main discrepancies – in targets of the SDG 1, SDG 6, SDG 9, SDG 13 and SDG 15. The major discrepancies are observed with regard to the targets of SDG 1 and SDG 6 that found a broad representation in the report by Bortoletti et al. (2020) attributed to socio-economic as well as environmental outcome categories. In contrast, the present study did not reveal such a variety in terms of

the SDG 1, which could be explained by the fact that the case studies have been carried out in three European countries and well-off regions, where the poverty issues might not be apparent for the inhabitants. As regards the SDG 6, surprisingly the study at hand did not reveal any significance concerning the targets of this goal, even though most of the targets under SDG 6 listed by Bortoletti et al. (2020) did find representation in two out of three investigated OFS cases, however in one of them these were intended and not current outcomes, while another case in fact did address two targets that are also named in the report.

Comparing the findings of the present study in terms of the OFS outcomes at the level of outcome categories and the SDG targets reveals that a range of outcomes is not embraced by the SDGs. For instance, a lot of health and wellbeing aspects covered by the survey participants as well as the OFSs' key actors are not captured by the respective SDG 3 (good health and wellbeing). Here, the core difference seems to lie in the holistic understanding of health intrinsic to the organic movement, with health having a meaning stretching well beyond the absence of disease (IFOAM, 2020). When looking at the answers provided by the interviewees in the present study, it becomes clear that the targets under the SDG 3 fall short in capturing the meaning of health and wellbeing contained in the organic system. Furthermore, animal welfare that was articulated in the interviews with the OFSs' key actors as well as in separate answers of online survey is not present under the SDG 12, responsible consumption and production. This shortcoming has been previously emphasised by Ilieva (2017) who noted that animal welfare could facilitate tracking the SDG 12 taking account of quality and not material footprints solely. Taking into consideration the role of animal welfare in OA as well as the increasing importance of ethical considerations of food production methods for the consumers (Korthals, 2007), this aspect should not be neglected.

It is important to stress that some OFS outcomes identified through interviews with the key actors do match certain SDG targets revealed in the focus groups. For instance, the examples of outcomes contributing to ecosystem stability articulated by the interviewees of all three case studies as well as in the statements of survey respondents correspond to the SDG targets 15.3, 15.5, 6.3 and 3.9. Furthermore, increased awareness on SD and healthy food revealed by the organic actors of two out of three case studies corresponds to the SDG targets 12.1 and 12.8. Job creation perceived as an OFS outcome in all three OFSs reflects the SDG target 8.5. Finally, reduction of food loss and waste articulated in online survey and disclosed in the interviews in Mouans-Sartoux corresponds to the SDG targets 12.3 and 12.5.

6.3 Conceptualisation for potential monitoring the SDGs in organic food systems

The range of OFS outcomes and the SDG targets addressed in three OFS case studies investigated in the study at hand suggests that there is a common pattern, which can potentially serve as a basis for monitoring the transformation processes in OFSs thereby answering the fourth research question. All three case studies analysed in the present research project have undergone certain developmental stages in the course of more than ten years, which implies that these OFSs have been transforming over this time. The cases share a similarity in terms of their initial phase, that is the inception of all three OFSs under study was linked to sustainable public procurement. From this common point of departure, the cases have been developing and transforming to embrace further aspects contributing to the multitude of outcomes (see *Table 16* in chapter 5). Nevertheless, responsible consumption and production, or SDG 12, seem to shape the performance of all three OFSs under study, implying that this SDG can be viewed as an important

leverage. The commonalities in terms of the SDG pattern disclosed at target-level in the analysed OFSs reveal the presence of all sustainability dimensions. Likewise, SFPSs and resilient agricultural practices coupled with responsible consumption enabled by the OFSs are generating positive environmental and social outcomes such as maintenance of biodiversity, restoration of degraded land and soil, CC mitigation, prevention of marine pollution, reduction of illnesses linked to contamination and water, air and soil pollution, improved rural-urban links, resilience-building for poor and vulnerable groups, full and productive employment and decent work, social, economic and political inclusion of all. In the light of transformation, these SDG-based outcomes are in line with the first part of the strategy offered by Gordon et al. (2017). The strategy aims at enhancing health and sustainability outcomes of FSs through "rewiring" FSs, which includes, among other things, improvements of food production and consumption systems (latter through dietary changes and waste reduction) (ibid.). Improved production and consumption systems should comprise nutrient-rich landscapes, efficient use of resources and enhanced biodiversity and multifunctionality of production systems and landscapes (ibid.). Furthermore, these outcomes correspond to one of the "desired" outcomes outlined by Béné et al. (2019), namely positive environmental and social feedback loops, which, among other things, should integrate rural-urban links, inclusive and resource-efficient food supply chains and render farming into viable and attractive livelihood option (ibid.). The SDG-based outcomes are complemented by the OFS outcomes revealed through web-based survey and interviews with the key actors of the investigated case studies. For instance, dietary diversity, improved livelihoods, collaboration and network creation, direct producer-consumer link, dignity of work, farmer's empowerment, transparency and trust all seem to represent the outcomes not covered by the SDG targets.

Comparing these outcomes with the SFS outcomes identified through systematic literature review on FS outcomes (see *Table 16* in chapter 5 and *Table 4* in chapter 4) reveals certain similarities. For instance, most of the OFS outcomes identified in the study at hand correspond to the "emergent" outcomes of FSs sustainability outlined by Eakin et al. (2017). The authors identified human health, livelihood security, community empowerment, agroecological integrity, ecosystem services, multi-functionality, food sovereignty, food democracy and food security as such "emergent" outcomes (ibid.). Moreover, some of the OFS outcomes are in line with the second strategy offered by Gordon et al. (2017) – "rewiring" FSs and enhancing biosphere stewardship aiming at reconnecting people and communities to food, enhancing transparency between producers and consumers, influencing consumers decisions and mobilising key actors to become biosphere stewards.

What is more, governance and decision-making seem to have been impacted by the OFSs as well in that important multi-stakeholder and even global partnerships have been established, and the decision-making itself has become more participatory and representative as a result of concerted action towards establishing SFSs. Moreover, governance aspects have been stressed during the expert round as an important dimension of OFS outcomes. In the same vein, governance-related aspects have been advocated for as part of the proposed collaborative framework for FSs transformation (Bortoletti and Lomax, 2019).

Based on the afore described it is possible to propose a conceptual framework that could potentially serve as a basis for monitoring the performance of the SDGs in OFSs. Building upon the four-part transformation framework for FSs offered by Caron et al. (2018) it is possible to link the OFS-specific SDG targets identified in the present study to the specific OFS outcomes as part of the FSs

transformation towards SFSs aligned with the SDGs. The framework elaborated by Caron et al. (2018) is based on four profound transformation parts – healthy and sustainable consumption patterns, a new vision of sustainable agriculture and food value chains (leading to viability and sustainability of ecosystems), contribution to CC mitigation and renaissance of rural territories. The four parts are, in turn, linked to specific variables and SDGs (ibid.). The variables can be conceived of as FS outcomes. Applying the framework to the present study and considering that the OFS links production to consumption uniting them within one value-based system, the framework will be adjusted accordingly. Furthermore, the findings of the study at hand suggest that CC mitigation is an outcome of the OFS. This implies that the contribution to CC mitigation would not represent a separate transformation part, but instead it would arise from the OFS (through sustainable production practices and consumption patterns) as an outcome. Moreover, the present study also revealed the governance- as well as knowledge- and awareness-related outcomes represented by corresponding SDG targets, which were not included by Caron et al. (2018). This implies that these targets could represent separate transformation parts that could be referred to as governance and human resources with relevant knowledge, competences and skills. Indeed, awareness-raising and governance are addressed as part of the transformation pathway towards SFSs laid down by Bortoletti and Lomax (2019). Lim et al. (2018) included governance-related SDGs into enabling framework as one of the critical focal points to support the SD.

Not limited to that, enhanced rural-urban links as well as focus on small-scale farmers and rural communities have been found to act as leverage points for FSs transformation (Johns et al., 2013; Schipanski et al., 2016; Niles et al., 2017; Vaarst et al., 2018; Caron et al., 2018). These aspects are included in the concept as two

components – renaissance of rural territories and enhanced rural-urban links and SCP systems (SCPSs). Furthermore, adoption of sustainable consumption patterns is also included as part of the SCPSs component. Change of consumption patterns and diets is increasingly recognised as another important enabling mechanism of FSs transformation (Gordon et al. 2017; Lindgren et al., 2018; Caron et al., 2018; Béné et al., 2019).

Based on the aforementioned the present study allows for offering a five-part transformation conceptual framework, which includes healthy and sustainable production practices and consumption patterns contained within SCPSs; viability and sustainability of ecosystems; renaissance of rural territories and enhanced rural-urban links; governance and, lastly, human resources with relevant knowledge and skills (see *Figure 62*). As *Figure 62* indicates, each of the transformation parts is linked to the specific pattern of SDGs at target-level. The SDG targets represent those targets that have been identified in all three or two out of three OFSs investigated in the present research project. In the OFS-based concept, all five transformation components are interrelated, whereby SCPSs largely influence the emergence of the outcomes related to other transformation parts. On the other hand, governance and human resources with relevant knowledge, competences and skills represent components largely capable of influencing the performance within other three components in the core part (see *Figure 62*). The concept does address most of levers revealed through a systematic literature review on FS outcomes. As shown in *Figure 62* (from the central three pillars outwards) the conceptual framework based on the findings of the study at hand consists of five parts:

- SCPSs containing healthy and sustainable production practices and consumption patterns;
- viability and sustainability of ecosystems;

- renaissance of rural territories and enhanced rural-urban links;
- human resources with relevant knowledge, competences and skills;
- governance.

As shown in *Figure 62* each of the transformation parts is interrelated and consists of specific SDG targets. Apart from being transformation components, governance and human resources can be viewed as enabling conditions important for driving the transformation progress. The concept also incorporates the OFS outcomes representing the ultimate effects of the transformation.

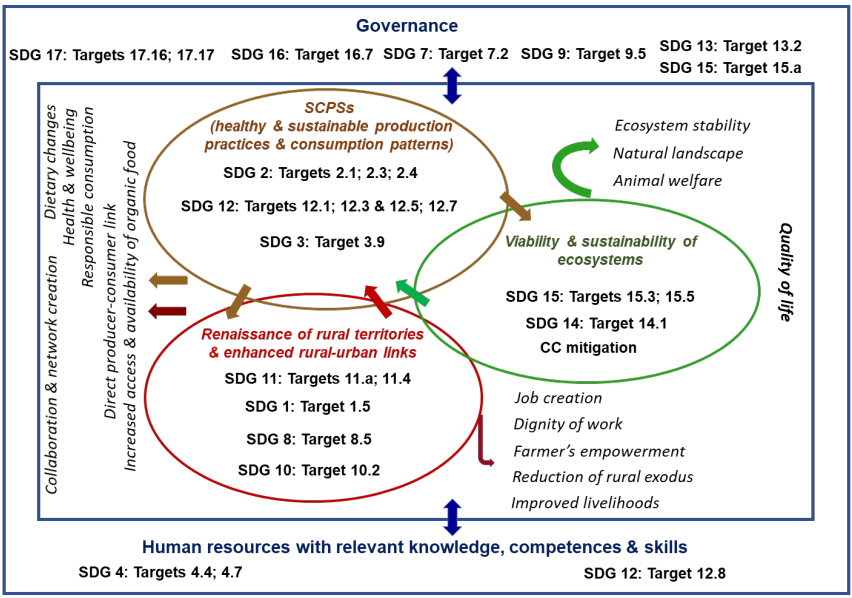


Figure 62: Conceptual framework for monitoring the SDG-perfomance in OFSs and its transformative potential towards SFSs

Specifications: specific outcomes listed beside the three inner pillars represent outcomes attributed to the respective transformation parts and their corresponding SDGs; likewise, SCPSs would result in dietary changes, health and wellbeing and responsible consumption (inner left part in the upper corner), while together with renaissance of rural territories and enhanced rural-urban links, SCPSs would lead to direct producer-consumer link and increased access to and availability of organic food (inner left part in the middle); renaissance of rural territories with enhanced rural-urban links would result in collaboration and network creation (inner left part in the lower corner) as well as job creation, dignity of work, farmers' empowerment, reduction of rural exodus and improved livelihoods (inner right part in the lower corner); viability and sustainability of ecosystems would lead to ecosystem stability, natural landscape and animal welfare (inner right part in the upper corner); all the three inner pillars corresponding to three transformation parts ultimately contribute to QOL (inner right part in the middle.[2]

Source: own elaboration based on own data.

2 Legend: SDG-targets 1.5 – resilience-building for poor and vulnerable groups; 2.1 – access to safe, nutritious and sufficient food by all; 2.3 – secure and equal access to land and productive resources, knowledge, markets for small-scale producers; 2.4 – SFPSs and resilient agricultural practices with increased productivity and helping maintain ecosystems; 3.9 – reduction of deaths and illnesses from contamination and air, soil and water pollution; 4.4 – increase of

number of youth and adults with relevant skills for employment, decent jobs and entrepreneurship; 4.7 – knowledge and skills to promote SD; 7.2 – increase in share of renewable energy; 8.5 – full and productive employment and decent work with equal pay for work of equal value; 9.5 – enhanced scientific research and upgrading technological capabilities of industrial sector; 10.2 – social, economic and political inclusion of all; 11.4 – protection of world's cultural and natural heritage; 11.a – supporting rural-urban links; 12.1 – implementation of 10 YFP on SCP Patterns; 12.3 & 12.5 – food waste and loss reduction; 12.7 – sustainable public procurement practices; 12.8 – information access and awareness for SD and lifestyles in harmony with nature; 13.2 – integration of CC measures into strategies and planning (local level versus national scope in the original target formulation); 14.1 – prevention and reduction of marine pollution, especially from land-based activities; 15.3 – restoration of degraded land and soil; 15.5 – protection of natural habitats, halting biodiversity loss and protection of threatened species; 15.a – increased financial resources for conservation and sustainable use of biodiversity and ecosystems; 16.7 – responsive, inclusive, participatory and representative decision-making; 17.16 – global and multi-stakeholder partnerships for SD for sharing of knowledge and expertise, technology and financial resources; 17.17 – effective public, public-private and civil society partnerships.

The system's performance in five transformation parts could potentially be monitored based on the SDG targets contained within each of the five components, if appropriate indicators are developed. The outcomes of the current transformation phase of the analysed OFSs represent the outcomes disclosed in the present study.

6.4 Reflection on methodology

The methodological approach chosen for the study at hand has proven to be adequate for answering the research questions. In specifics, the mixed methods design enabled the researcher to get deeper insights into the topic. Using multiple data sources and combining various data collection methods has proven its facilitating as well as complementary function in the present research, while at the same time ensuring triangulation, as described by Flick (2018). The sequence of the single methods in the research design has proven to be fit-for-purpose since each method was building upon the previous one and providing more insights. Likewise, findings form literature coupled with expert round provided the basis for the online survey. Afterwards, it became possible to deepen the perspective using the multiple-case study approach. The multiple-case study particularly helped deepen the perspective on the OFS outcomes beyond agriculture only providing insights from the real-life OFS cases. The methods chosen for the multiple-case study fulfilled their purpose, while the combination of data (and methods) from semi-structured interviews and focus groups has, to a certain extent, ensured data and methods triangulation as described by Schneider (2014) and Godemann (2017).

An actor-oriented approach provided insider perspectives underpinned by experts' and actors' experience in and knowledge of the OFS. Actor-based perspectives are capable of complementing the technocratic approach to viewing the outcomes

in that the social actors as co-creators are placed in the centre. Due to their practice-oriented knowledge and, in many instances, long-term experience in various OFSs, the actors are aware of intrinsic mechanisms and causal relationships within the OFS. This facilitated a different approach to studying the FS outcomes as well as a potential FSs transformation pathway paved by the OFSs under study. The focus on the perceptions of social actors engaged in the studied systems offers a promising angle from which to view and potentially approach the transformation towards SFSs, contributing to the so far scarcely represented participatory approaches.

Addressing potential methodological limitations, language aspect of the focus groups is worth stressing. Generally, it is recommended to conduct focus groups in local language, which should be native for the participants, while using an interpreter has to be avoided (Krueger and Casey, 2009, p. 169; Krueger, 1998b, p. 51).
Translation in focus groups is usually applied in cross-cultural research (Barbour, 2007, p. 98f). Even though the study at hand does not involve cross-cultural analysis, it did use simultaneous translation in two focus group sessions conducted in the participants' primary language (in Cilento, Italy, and Mouans-Sartoux, France), while another focus group (in Södertälje, Sweden) has been carried out in the participants' non-native language (English). This was done due to language barrier, which did not allow the researcher to communicate with the participants in their native language. In situations when focus groups are conducted in languages other than those spoken by the researcher, Esposito (2001) recommended adding a real-time interpreter for ensuring the researcher's participation in the process of data collection as it occurs. This way, the researcher is able to guide and redirect the discussion if necessary (ibid.). Since the focus group participants in Sweden were all fluent in English and one of the participants

appeared to be an English native-speaker capable of helping out in case of any difficulties with wording in the group, conducting the session in English was considered a feasible option for the Södertälje OFS. The focus groups where translation was used still differed in that in one session (Italy) a professional interpreter was used, while another focus group (France) has been simultaneously translated by one of the participants who was fluent in English. Due to this difference and based on recommendation of Esposito (2001) to rely on professional interpretation when translating focus groups, the French session has been later transcribed into French and subsequently professionally translated into English by a professional translation bureau in Germany. The comparison of the two translations did not reveal any significant differences, the only difference was in that the participants' comments were translated by the bureau, while during the session they have been omitted. At times, more details have been revealed in the participants' answers. Noteworthy is the impact of a translator on the atmosphere in a focus group. Where a professional interpreter was involved, the session resembled a group interview rather than a focus group discussion since at the beginning the interpreter asked the participants to provide time for the translation and to only talk one person at a time. As a result of this, the participants were not able to have a dialogue, but instead they were providing their answers one after another, with a break left in between to enable the translation. They did, however, issue comments on the previous statements complementing the answers of the previous speakers. In the focus group in Mouans-Sartoux where one of the participants was translating the session, on the other hand, the participants did have a dialogue and were issuing comments to each other's statements, and the overall atmosphere appeared to be more relaxed. This suggests that having a familiar to the participants person involved as an interpreter might have positive implications

for the discussion process in a focus group. However, this aspect along with the topic of interpreted focus groups in general has received very little to no attention in literature offering an interesting avenue for further investigation, as has been previously noted by Przepiorkowska (2010).

6.5 Limitations of the study

The study findings as well as offered conceptualisation should by no means be interpreted as universally applicable or representative of any OFS. The research project at hand aimed at investigating the outcomes of OFSs as well as their contribution to the SDGs in order to shed light on how OFSs could facilitate the transformation towards SFSs. Since this project was the first attempt of this kind, the findings should serve as a first orientation. Furthermore, due to the fact that the multiple-case study of the project included European countries only, it is highly likely that in different contexts the SDG pattern would differ, and so might the specific OFS outcomes. The importance of considering heterogeneity of local FSs along with the scale- and context-specific differences have been stressed before (Ericksen, 2008; Eakin et al., 2017; Caron et al., 2018; etc.). Therefore, the suggested OFS-based conceptual framework should be modified and adjusted when applied to different contexts and/or scales.

Furthermore, the focus group sessions in each of the OFSs under study have not been replicated within the same OFS. Instead, each of the sessions was considered a “replication” within the multiple-case study – a literal replication (Yin, 2014, p. 57). It might be speculated that having a replication within the same case would affect the results, and perhaps with additional focus groups in each of the case studies the findings would have looked differently. However, such replication was not feasible due to the limited number (and availability) of key actors representing various

stakeholder groups. Since the selection process has been carried out so as to ensure that similar or comparable (and diverse) stakeholder groups would be represented in each of the case studies, setting up another focus group complying with this selection criterion was unrealistic. Moreover, one more limitation should be stressed with regard to the focus groups' composition. Here, the session in Mouans-Sartoux has been carried out without farmers' representation due to the fact that it was not possible to recruit any farmer or grower at the time when the focus group was planned. Even though a similar situation has occurred in Södertälje when a farmer was not able to participate due to an emergency on the farm, yet a follow-up interview has been carried out later to ensure the inclusion of a farmer's perspective into the findings. In the French case, however, the attempts of a follow-up with farmers did not result in success, which can be explained by the outbreak of the Coronavirus-pandemic shortly after the focus group in Mouans-Sartoux took place. Lack of an important stakeholder group such as organic farmers, however, might have impacted the results since an important perspective in the French focus group was lacking.

Another limitation is linked to the time constraints in the focus group in Cilento, which resulted from the delayed beginning coupled with time taken by simultaneous translation. Due to this, the time dedicated to the last two dimensions discussed in the session was limited, which leads to assume that some outcomes (and hence, the SDG targets) might have not been named.

Lastly, the study employed an actor-centred participatory approach to investigate the outcomes as well as the SDGs addressed by the OFSs. In contrast to measuring and quantifying the specific contributions, the researcher relied on the perception of the key actors involved in the systems under study. The results might and should be complemented by quantifiable parameters and indicators. Therefore, the study by no means claims to be comprehensive or

generalisable. Instead, it provides first insights into the topic aiming at shedding light on the potential contribution of the OFS to the process of transformation towards SFSs. It is the researcher's hope that the findings of this research project provide a basis to build upon contributing to the attempts of supporting the FSs transformation.

7 Conclusions and outlook

The need to transform the contemporary FS is evident. The role of this transformation for the achievement of the 2030 Agenda is broadly discussed, both in academia and on political arena. The exact transformation pathway is still contested. It is necessary that the transformed FS should be capable of facilitating the achievement of preferably multiple SDGs, given the FSs approach is applied. One way to approach the transformation is to look at the FS outcomes and to use them as an entering point, or "gate" to FSs transformation, since these are the outcomes that need to be optimised in order for the FS to have a more sustainable performance in line with the SDGs. Taking an example of alternative FSs enables studying the outcomes of these systems as potential contributions to the transformation, given alternative FSs are taken as models. The study at hand was an attempt to do exactly that.

The results illustrate that the OFS delivers a broad range of outcomes that can be grouped into ecosystem-related, individual and community-related. The organic principles seem to shape not only the activities of the key actors, but they are closely intertwined with self-identification of the people involved in organic systems influencing the outcomes, which, in turn, seems to positively influence feeling of self-fulfillment as well as overall wellbeing. Part of outcomes perceived by the OFSs' key actors corresponds to the organic principles, which indicates that for organic actors, the OFS outcomes are associated with the principles of the organic movement. Among the ecosystem-related outcomes, soil quality, biodiversity and CC mitigation and adaptation clearly stand out. Apart from that, animal welfare is also considered by the organic actors as another outcome of the organic system. On individual level, quality, taste and naturalness of organic food along with health, wellbeing outcomes and overall QOL have been

emphasised. The understanding of health and wellbeing of the organic actors is in line with the holistic understanding found in the organic movement, which stretches well beyond the absence of disease. Community-related outcomes of the investigated OFSs cover a broad range of aspects from direct producer-consumer link, improved availability of and access to organic food, over job creation, dignity of work and valorisation of activity, farmer's dignity and empowerment, reduction of rural exodus, collaboration and network creation to transparency and trust and increased awareness in the society. These outcomes indicate that the OFS is capable of revitalising community, delivering FNS, while contributing to improved livelihoods and enabling more sustainable diets and responsible consumption patterns.

The OFS-specific SDG pattern varies depending on the level of investigation, namely goals versus targets. The reason is that at target-level some of the SGSs do not address important outcomes implied at their goal-level. Examples are the SDG 3 (Good health and wellbeing) and SDG 13 (Climate action). While the health-oriented SDG 3 mainly addressed health in terms of absence of diseases and hence lacks important in the organic system holistic approach to health, SDG 13 does not incorporate any mitigation-related target. Analysis of the OFS outcomes at the SDG target-level through focus groups in three cases studies revealed the SDG pattern shaped by the SDG 12 (Responsible consumption and production) – the goal addressed by the highest number of targets in each of the studies cases (up to seven). This goal seems to be acting as a leverage point in the systems under study, "activating" some other outcomes and related SDG targets. SDG 2, SDG 15, and SDG 17 were found to be represented by two to three targets per case, while SDG 4, SDG 8, SDG 11, and SDG 14 were addressed by one to three targets per OFS (two targets on the average). Finally, SDG 1, SDG 3, SDG 7, SDG 9, SDG 10, and

SDG 16 were addressed by one to maximum two targets in each of the cases (one target on the average).

Comparison of OFS outcomes and the OFS-specific SDGs identified in the study, placing them in the context of FSs transformation towards SFSs backed by the results of a systematic literature review enabled the researcher to offer an OFS-centred conceptual framework for monitoring FSs transformation towards sustainability (see *Figure 62*). The conceptual framework might be useful for municipalities and local administration bodies working on establishing SFSs. That said it could serve as a potential evaluation tool for monitoring the current state as well as progress made over time to achieve the SDGs through the implementation of SCPSs and strengthening of rural-urban links.

The study findings cannot, however, be considered as representative of any OFS around the world. Since the OFS outcomes and the SDG pattern have been identified in three European cases, no generalisation can be done in terms of results' applicability in different settings or on different scales. Caution should also be exercised with regard to the elaborated conceptual framework in general. The framework should serve as a first orientation, which could (and should) be further developed and tested in other OFSs.

The study sought to address the current research gap with regard to analysing the sustainability performance of OFSs using SDGs at target-level and applying actor-oriented participatory approach. The researcher does not claim that the results are transferrable on other settings or that the conceptual framework would apply to all OFSs to the same extent. Future research is needed to compare the performance of other OFSs in different countries and continents. The conceptual framework therefore serves as a first approximation towards monitoring the performance of the SDGs in OFSs. As such

it might need context- and scale-specific modifications as well as validation by experts, which could offer an interesting future research project. That said, it is imaginable to take the framework to the next level and design aggregate indicators to apply it for monitoring the performance of SDGs in OFSs.

The study at hand provides the first insights into potential contribution of the OFS to FSs transformation towards SD. The researcher attempted to analyse the performance of the SDGs in the OFSs, which has been accomplished at target-level using actor-centred participatory approach. To the best of the researcher's knowledge, to date comparable empirical studies are virtually non-existent, which might offer an interesting avenue for future research. Since findings of the study are based on European OFSs, an interesting follow-up project could be to investigate other OFSs in other countries and continents. Furthermore, after studying more OFSs in different settings, it could be possible to take the proposed conceptual framework to the next level to construct context-based indicators for measuring the performance and monitoring FSs transformation. For this, however, an iterative process would be needed, with the involvement of a broad range of experts. The proposed concept with identified SDG targets, if proven to apply to other OFSs in different settings, could potentially serve as a basis for building the EVs (Reyers et al., 2017) for monitoring the OFS's performance vis-á-vis the SDGs and the contribution to FSs transformation towards SFSs.

Apart from that, other FSs could be analysed in a similar way to uncover the potential contributions of various alternative FSs approaches such as CRFSs, agroecological systems and others.

Not limited to this, since QOL was revealed as an OFS outcome, investigation of the OFS's contribution to QOL offers itself as an interesting research avenue. Here, it could be interesting to analyse

different actors involved in the organic system beyond producers and consumers only. Finally, perhaps future research could look into how the performance of the SDGs in a FS is linked to QOL of the system's key actors as well as the community.

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9 List of Annexes
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ANNEX I – SYSTEMATIC LITERATURE REVIEW, SYNTHESIS MATRIX

ANNEX II – EXPERT ROUND (EXPERT MINI-DISCUSSION)

ANNEX II-1 – WORKSHOP PROGRAMME (EXPERT ROUND)

ANNEX II-2 – PROTOCOL OF THE EXPERT ROUND DISCUSSION "OFS OUTCOMES"

ANNEX II-3 POWER POINT SLIDES WITH A PRESENTATION ON FS OUTCOMES

ANNEX II-4 – CONSENT FORM EXPERT ROUND

ANNEXES III – WEB-BASED SURVEY

ANNEX III-1 – SCREENSHOTS OF WEB-BASED SURVEY (Q) ON OFSS

ANNEX III-2 – INITIAL QUESTIONNAIRE VERSION (PRIOR TO PRE-TEST)

ANNEX III-3 – MODIFIED QUESTIONNAIRE VERSION (AFTER PRE-TEST)

ANNEX III-4 – DROP-OUT QUOTA OF THE WEB-BASED SURVEY

ANNEX III-5 – TABLES OF FREQUENCIES FOR THE GENERAL PART OF THE SURVEY

ANNEX III-6 – TABLES OF FREQUENCIES FOR THE QUANTITATIVE QUESTIONS ON OFS OUTCOMES

ANNEX III-6, A – CONTRIBUTIONS OF OFS – TABLE OF FREQUENCIES

One way to approach the food systems transformation is through the prism of food system outcomes. The present PhD study employed a mixed methods research design and actor-oriented approach to investigate the outcomes and transformative potential of one of the alternative food systems – the Organic Food System. A stepwise analysis began with the identification of outcome categories along with the specific outcomes and proceeded with the investigation of the contribution to the 17 Sustainable Development Goals of the United Nations, from goal- to target-level. The revealed outcomes can be attributed to the three dimensions of sustainability. Higher perception of wellbeing and overall quality of life have been repeatedly reported by the organic actors. The Sustainable Development Goals were found to have a high representation in the investigated case studies, whereby the goal 12, responsible consumption and production, seems to be central in all the investigated cases acting as a leverage, activating further outcomes. The results enabled the formulation of a conceptual framework, which needs to be tested in other contexts and settings.

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