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Spaces of Governance for Sustainable Transformation of Local Food Systems: the Case of 8 biodistricts in Tuscany

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Spaces of governance for sustainable transformation of local food systems: the case of 8 biodistricts in Tuscany.

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Abstract

Faced with higher risks from climate change, food systems will need to transition away from dominant industrial paradigms and move towards a more sustainable way of producing, distributing, and consuming food. For sustainability transitions to happen, there is increased acknowledgment that lower administrative levels and local territorial arrangements are fundamental for policymaking, implementation, and impactful action. To go beyond two well-known criticisms of local food sustainable initiatives, i.e., to be rather small and to be developed outside policy frameworks and/or in stark opposition to current food systems, we argue in this paper to look at new meso-spaces of transformation at local level such as biodistricts, where community members, professionals, and governments get together to share knowledge, deliberate, and collectively devise place-based strategies to address complex food systems issues. We analyse 8 biodistricts in Tuscany and, as a result of the analysis, we argue that biodistricts can potentially act as territorial meso-spaces at local level, favouring the transformation towards sustainability of food systems.

Keywords: food systems, sustainability transitions, governance, grassroots innovations.

JEL codes: Q12, R11, R58.

1. Introduction

A recent report from the Intergovernmental Panel on Climate Change (IPCC) highlights the current climate change risks that the world is facing, and it makes clear that society and policy are acting too slowly to changes, which seem to be increasing rapidly (IPCC 2019). The same report (ibid.) shows how agri-food systems have a deep impact on pollution and green-house emissions at world level.

In order to sustainably meet the increasing demand for food, agri-food systems will need to transition away from the dominant industrial agriculture paradigm (El Bilali 2018) to one of sustainable agriculture able to 'conserve land, water, and plant and animal genetic resources, and is environmentally non-degrading, technically appropriate, economically viable and socially acceptable' (FAO 1988).

The literature of sustainable food systems usually takes two general approaches to the topic. The first one sees a technological solution to sustainability, and it is referred to as agro-industrial paradigm: it is based on agricultural modernization, industrialization and standardisation of food production, and the globalization of food markets (Renting and Wiskerke 2010). In this approach, technological processes are favoured over social innovation.

On the opposite end, the integrated territorial paradigm (Kristensen et al. 2016; Lamine et al. 2012) sees the solution in reinforcing the capacity of agri-food systems in the valorisation of specific territorial embeddedness and social relations. This approach takes a holistic view towards food systems, acknowledging their interconnectedness with other local characteristics, such as nature and landscape conservation, tourism, care, and education (Renting et al. 2008; Van der Ploeg and Marsden 2008).

Furthermore, entailing a large set of actors at different geographical scales, sustainability transitions appear to be a complex process. Scholars and practitioners are starting to acknowledge the fact that one solution or one side alone might not have systemic change or might not capture the full complexity of the experiences in the agri-food systems. For this reason, policies, civic engagement, grassroots' activism, and firms' transformations are all equally important and need to be brought forward in a framework of intelligent planning. As highlighted by Lamine et al. (2012), this also allows to adopt an integrated vision, which focuses on relations among all relevant actors in the new food environment. A multi-scale, multi-actor approach therefore acknowledges the importance of lower territorial systems: while important legal frameworks and policy decisions are taken at national level, lower administrative and local levels are fundamental for policymaking and, especially, for implementation and impactful action.

The territorial approach is in stark contrast with the standardized and place-less agro-industrial approach, although it is facing two criticisms. First, as Lamine et al. (2012) point out, territorial short-food chains (e.g., diverse food networks and grassroot innovations), though usually characterized by higher sustainability performances, sometimes fail to play a leading role for systemic transitions: these initiatives in fact remain relatively small and localized, and dissemination models like up-scaling or out-scaling (i.e., multiplication) at local level are not sufficiently defined. Secondly, existing local sustainability initiatives usually develop outside policy frameworks or in opposition to current agri-food systems (Lamine et al. 2012).

In order to go beyond these two criticisms, in this paper we explore the concept and role of new governance spaces at local level where community members, professionals, and government(s) move away from an individual strategy and get together to share knowledge, deliberate, and collectively devise place-based strategies to address, in a more effective way, complex food systems issues (Bassarab et al. 2019). The aim of this paper is to understand the role of governance territorial spaces in food system transformation towards sustainability and to highlight the processes and dynamics that make these spaces successful in fostering a process of change.

By analysing and disentangling the actors, governance rules, and dynamics within selected cases in Tuscany, we have the objective to better define what could really be spaces of transformation. We aim at identifying the key characteristics of 8 biodistricts in Tuscany, Italy, and at looking at how these biodistricts act at local level when analysed as spaces for transformation of food systems.

Biodistricts are territories 'naturally devoted to organic [farming], where farmers, citizens, public authorities, realize an agreement aimed at the sustainable management of local resources, based on the principles of organic farming and agroecology' (as per the general definition of the

International Network of Eco-Regions - INNER given in 2014). There are currently 8 biodistricts in Tuscany, placed between the municipality and the province level (NUTS 3), all with similar but diverse histories, formation processes, degree of involvement of the different actors, and future prospects. Little is known about the processes within these initiatives and how effective they are, and, having the last years seen a surge in these initiatives especially in Italy, it is essential to understand their dynamics, and, ultimately, understand if and how to improve, transfer and accelerate their implementation. In order to go deeper in the internal organization, several semi-structured interviews have been conducted face-to-face with members of the biodistricts, technical advisers, administrations' representatives, and selected producers.

In analysing the biodistricts as spaces of transformation, we refer to the concept of spaces of governance, taking inspiration from Driessen et al. (2012), which define them as spaces 'where civil society, citizens, and private firms get together through different rules of governing, deliberation, and legitimization'. It is therefore interesting to understand whether biodistricts represent an opportunity to be considered territorial governance spaces for food transformation, where grassroots initiatives and bottom-up innovations are strengthened and spread to a wider audience and where institutions are working for acceptance of policies and norms through a work of informality and listening, by participating in open forums and discussions with the different actors and stakeholders. As put by Haasnoot et al. (2020) there is a need to create 'solution spaces' at territorial level, and biodistricts could represent these prevention and adaptation spaces where planning and action towards climate change happens, and where processes of replication and up-scaling of intelligent solutions for sustainable food systems find fertile soil to grow.

The paper is structured as follows: section 2 introduces the theoretical framework; section 3 analyses the selected case study; section 4 and 5 report the results and conclusion of our study.

2. The theoretical framework.

Sustainability in agri-food systems has attracted many scholars. Blay-Palmer et al. (2016) define sustainability as environmental integrity, economic viability and social equity. In the past, some scholars have considered only the environmental sustainability of the farming activities (e.g. polluting emissions or the use of natural resources), but there have been also attempts to increase the impact measures by looking at the full life cycle of the food, at first by using a Life Cycle Assessment (LCA) (Van Der Werf and Petit 2002). More recently, the so called 'farm to fork' approach (Barbera et al. 2014), has brought in the picture the consumption and logistic activities, looking not only at single commodity but taking the perspective of a complex commodity chain.

In a very simplistic vision, the 'farm to fork' approach has been connected by many scholars to the re-localization of food production. On the one hand, many consumers, due to the lack of trust in globalized food chains, have started to refer to local food purchasing, and 'local' has become associated with organic, seasonal, nutritious, natural, etc. (Lamine 2015; Brunori and Galli 2016). Therefore, 'local' has come out as an alternative model to global food supply, by having small, diverse and sustainable characteristics as opposed to big, standardized and destructive natural resources. On the other hand, some scholars (Born and Purcell 2006) stress the fact that some actors have tended to fall into what they call the 'local trap', assuming that something local would be inherently sustainable. They have highlighted how, no matter the scale (local or global), the outcomes produced by a food system need to be considered together with their contexts: they indeed depend on the actors involved and the agendas implemented by the particular social relations in a given food system.

Over the past years, a holistic approach has emerged in the international arena: agroecology, defined as the application of ecological concepts and principles to the design and management of sustainable agroecosystems (Altieri 2018). This definition explicitly includes processes of continuous transition towards the ecology of food systems and the adaptation to the cultural, ecological and social specificities of the places where agroecology is applied (Anderson et al. 2019). Moreover, agroecology puts governance, power and democracy at its centre, emphasizing social and political aspects like autonomy, community-self organization, and bottom-up place-based organizing. Agroecology can be referred both to local small family farmers and to large-scale farmers, so it has the ambition to represent the whole food system (Altieri and Rosset 1996).

The need for a more critical and grounded relational approach to food systems transformation has been recognized by scholars recently (Moragues-Faus and Marsden 2017), together with the need of understanding transformation crises and successes, and their uneven dynamics when looking at different spatial scales. When discussing about food system transformation, Renting et al. (2008) bring forward the integrated territorial paradigm, which aims to reinforce the capacity of food systems to re-value specific territorial resources and social relations of proximity. Agri-food systems in the integrated territorial paradigm are embedded in the distinctive characteristics of the place, including ecology (i.e. biodiversity, climate, ecosystem services), and they are integrated with other activities such as environmental conservation, tourism, care, education, etc., because the farm is open and interconnected with the 'outside' (Watts et al. 2005; Renting and Wiskerke 2010). This approach is in line with the framework of regionalism (Clancy and Ruhf, 2010; Ruhf and Clancy, 2015), which describes how economic, policy and program development usually respond to regional characteristics, differences and needs: therefore, according to some scholars (e.g. Marten and Atalan-Helicke, 2015), by offering a toolkit for analysing scale, trade, market, cultural dynamics, economics, politics, values and relationships at regional level, a regional approach could contribute to better food system resilience.

Similarly, Kloppenburg et al. (1996) already developed in the concept of foodshed, by analysing food systems as self-reliant, locally or regionally based, and comprised of a diversity of farms using sustainable practices. A foodshed can be understood as the territory around a metropolitan area that is required to feed its population (Peters et al., 2009; Brinkley, 2013). By asking oneself what the natural local characteristics of the place do or do not permit, the foodshed framework then allows to understand physical, biological and intellectual components of the space where people live and eat, therefore territorializing the approach to more sustainable food systems. Vicente-Vicente et al. (2021) recently highlighted how local food policies, by using a combination of diversifying regional food production, by applying sustainable managements and changing consumers' behavior, should explicitly consider the foodshed delimitation for a successful contribution towards more resilient and environmentally friendly food systems.

As we mentioned in the introduction, though, one of the limitations of these approaches, though, is the fact that, usually, existing successful initiatives remain relatively small and localized, with unclear solutions for upscaling or multiplying. Moreover, the combined role of public, private and civic actors in creating support strategies is still largely unexplored, although several authors have analysed the role of Food Policy Councils (FPCs) in shaping local transformation towards sustainable food systems. FPCs are defined as "a policy and governance innovation model that brings together diverse stakeholders to study a localized food system and offer recommendations for policy change" (Fox, 2010) and they offer potential interesting examples of food systems governance in urban contexts. In general, FPC members could be producers, farmers, gardeners all the way to government representatives and food security advocates, passing through

wholesalers, retailers and consumers. The key interest of the FPCs is, in general, to transform the food system through collaborative policy making: they organize at the local (city/county) or regional level to discuss, shape, and assess food system policies and programmes in their communities. Scholars have demonstrated how FPCs can serve as educators in food systems sustainability and as a centre point for gathering, coordination, networking, and facilitation, by enhancing and implementing goals that meet the broad range of concerns among food system stakeholders (Schiff, 2008; Clayton et al., 2015). Also, they have demonstrated how the fact that FPCs are organized outside of the government while maintaining strong collaborations with the government help them retain their independence while promoting more inclusive policy making processes that link community members to the government (Gupta et al., 2018). This is in contrast with the findings from Renting and Wiskerke (2010) which find how successful initiatives at local level for food system sustainability usually develop outside (and often in opposition to) existing policy frameworks.

For this reason, it is important to further explore hybrid organizational forms, which preserve elements of the localized initiatives but are also able to reach a wider audience, in other words, new spaces of governance allowing to scale-up from standalone sustainable pioneers and green innovators to a wider organization of food systems which is culturally accessible to a large audience. We mean 'culturally accessible' in the sense that it is not marked as alternative or anti-consumerist and then tending to be isolated and marginal in the food system. In this sense, the concept of hybridity can be used to analyse connections between alternative and conventional food systems (Sarmiento 2017; McCarthy 2006; Whatmore et al. 2003) that are, in fact, interrelated and mutually dependant.

Therefore, regional and local governments should increasingly take a role for policy development, with metropolitan regions, cities, and rural areas, all actively contributing in the agri-food related policies. Hassanein (2008) talks of a new food geography reflecting a territorial approach, opposed to the conventional global approach, where there is an integrated conceptualization of food and where food is more than a mere commodity: food becomes a product and process connecting environmental quality, social issues, public health, education, etc. In this perspective the farm continues to be at the core of food systems, but it is not stand alone and the innovation process is fostered by a mutual involvement in the transition towards sustainability of a multitude of actors within local communities.

The role of public-private partnership and coordination has also been analysed and highlighted within the innovation systems approach (Hekkert et al. 2007; Favilli et al. 2018). In this approach, interactions within a given innovation system depend on strong coordination mechanisms and motivated public intervention, but this is more so when considering innovation at territorial level: private and public sectors have to cooperate to co-govern innovation processes.

Along these lines, De La Pierre (2018) is proposing to go over the Corporate Social Responsibility concept of single firms, towards a more robust and solid territorial context. Indeed, the scholar is questioning how a single firm could change the course of the current environmental depletion, given the complexity and vastity of the climate change-related problems. For this reason, he is proposing to focus the attention on the concept of Territorial Social Responsibility (TSR), which is a re-valorisation of common values and principles aiming at increasing environmental and human wellbeing, by all social, economic and institutional actors at local level (Peraro and Vecchiato 2007). We believe that governance spaces at a meso-level are needed, where social innovations, cultural and social change, empowerment, and formalization of change are happening

to favour systemic change. These governance spaces could be spaces for transformation placed between (and including both) grassroots innovations (brought forward by citizens, firms and consumers) on the one hand and institutions (represented by administrations, policymaking, accepted social norms, laws etc.) on the other hand.

According to Banjade et al. (2007), meso-level spaces are all those below the national level policies and above the local-level management actions: meso-spaces are therefore bridging the two levels and are mediating policy implementation. A meso-space is at an intersection of state, market, civil society, and the ecological systems, where a nuanced and mediated governance happens: all actors at this level can mediate policies, influence social and environmental outcomes, implement policies, and provide feedback to policy formulation processes.

These governance spaces could therefore be meso-spaces of transformation and co-governance (Kooiman 2003; Vivero-Pol 2015), where several actors would work together to meet shared goals and where non-state actors are increasingly involved for the solution of complex public problems such as the transition towards sustainability. Co-governance, also defined as participatory governance (Symes 2006; Jentoft 2003), by challenging hierarchical top-down management of decision making at territorial level, puts together the state, user groups, firms and civil society. Symes (2006) has highlighted how, by utilizing co-governance, there is a stronger legitimization of policy processes and outcomes, together with a stronger sense of commitment and compliance to newly established practices among participants and local actors.

Therefore meso-spaces of co-governance, placed between firms, grassroots and institutions could provide, in theory, spaces for food system transformation towards sustainability, where social learning, new common and shared values and new practices of organic agriculture are brought forward and established. In conclusion, meso-spaces, such as FPCs or biodistricts, could potentially be drivers of territorial transformation of food systems, by providing a space where territorial social responsibility is created and where change towards more sustainable practices happens in a pace.

3. Spaces of transformation in Tuscany: the case of 8 biodistricts.

Tuscany is currently the Italian region with the highest number of biodistricts (8 out of 31 biodistricts, already developed or currently being set up) (Figure 1). Given the relative novelty of the concept of biodistricts and their (slightly) differing definitions (by either regional laws or varying associations, such as AIAB[1] or INNER), case study research allows in-depth exploration and understanding of complex issues (Yin 1994).

The Tuscany Region has issued the Regional Law 30.07.2019, number 51, which disciplines and details biological districts. Under this law, the biological district is defined as a territory

"where there is a local productive system with a high agricultural vocation and in which there is the presence of:

- Cultivation, breeding/animal raising, transformation, preparation and commercialization of agricultural products which are the result of organic methodologies;

[1] Associazione Italiana Agricoltura Biologica – Italian Association of Organic Agriculture. Definition of biodistrict: a geographical area which is naturally devoted to organic agriculture, where various actors from the territory make an agreement for the sustainable management of resources, aiming at organic production involving the whole chain until consumption.

- Safeguarding of productions and cultural methodologies, breeding, local typical transformations, and the consolidated integration between the different agricultural activities with all other activities at local level;
- Attention to the characteristics of territorial and landscape identity of the local spaces;
- Respect of criteria of environmental sustainability, conservation and amelioration of agricultural soil and the protection of agro-biodiversity."

Although the regional law has been passed, allowing for biodistricts to be legally and formally recognized, at the moment no biodistrict in Tuscany has yet completed all the procedures to set up also the legally recognized biological district under the regional law.

At national level, three additional regions (Lazio, Liguria, Sardinia) have decided to go forward with the development of specific laws for the definition of biological districts. At the moment, though, it seems like only two biological districts have decided to be recognized under their respective regional laws, one in Liguria (Biodistretto Val di Vara) and one in Lazio (Biodistretto Via Amerina e Forre) (CREA, 2019). This means that out of 31 biodistricts in Italy, almost all of them are still purely no-profit associations.

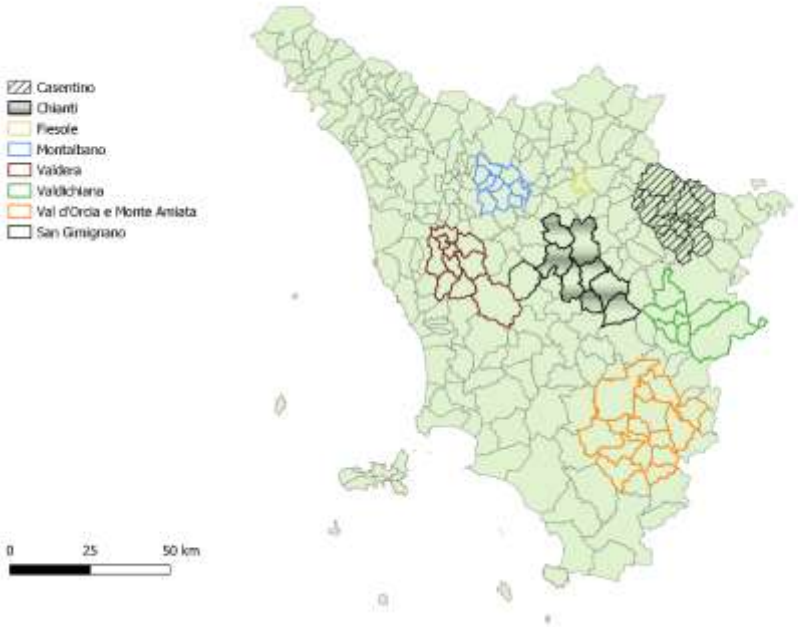

Figure 1: Biodistricts in Tuscany, with their administrative areas. Source: self-elaboration on QGIS

The biodistricts have been nonetheless selected through a purposive sample procedure, a technique widely used in qualitative research for the identification and selection of information-rich cases and for the most effective use of limited resources (the covid-19 pandemic at the time of research has made mobility across different territories troublesome, and, given the residency of the authors in Tuscany, the case selection has been more straightforward due to the geographical proximity of the biodistricts) (Patton 2014). Also, purposive sampling has been used with the aim of focusing only on particular characteristics, enabling us to explain the key research question (Ritchie et al. 2013), i.e. to understand the processes and dynamics within biodistricts and to investigate whether they can be considered as meso-spaces for transformation of food systems at territorial level. Table 1 shows the relevant information across the 8 biodistricts in Tuscany.

	Casentino	Chianti	Fiesole	Montalbano	San Gimignano	Valdera	Valdichiana Aretina	Val d'Orcia e Monte Amiata
Year of establishment	2014	2012	2016	2015	2012	2020	2016	2018
Nr. of municipalities touched by the association	12	7	1	10	1	10	8	15
Legally recognized under regional law	No	No	No	No	No	No	No	No
Rural district present	No	Yes, and strong connection	Yes, weak connection	No	No	No	Yes, weak connection	No
Driving actors for formation	Producers	Producers	Administration and producers	SPG/citizens	Producers	Producers	Producers	Producers and technical expert
Nr. of organic producers as members	20 (14 certified, 6 PGS[2])	55	25	60	40	50	10	50
Interactions with administrations	Not involved	Involved as party of interest (informed)	Involved as key driver	Involved as key driver along the way	Involved from the start	Involved from the start	Involved as party of interest (informed)	Not involved
Involvement of local consumers' associations, local associations, and citizens	- SPG[3] - citizens	No formal participation of SPG, local associations and citizens	- citizens - local associations	- SPG - local associations	- Small number of citizens and limited participation from associations	- SPG - Local associations	- Some local associations	- Some local associations
Aim behind initial formation	- Access to regional funds (unsuccessfully) - Unite producers and increase organic production - Sustainable development - Sharing of information	- Fight chemical solution mandatory law - Unite organic producers	- Deal with healthy diets - Increase organic production - Improve local sustainable development	- Connecting consumers to producers - Create an alternative to a nearby polluted area - Create a strong group of actors dealing with sustainability	- Sustainable development of the territory - Define ecological goals to reach - Build short food supply chain	- Gather organic farmers - Promote sustainable development and agriculture - Create a bioregion - Influence local policies	- Gather organic producers - Influence local policies for banning use of pesticides	- Preserve biodiversity - Promote territory
Activities	- Participatory guarantee system - Convivial events with local associations and citizens - Seminars - Organization of farmers market	- Technical meetings on plants' diseases - Training courses (e.g. apiculture) - events and dinners - No pesticides campaigns - Collaboration with Italian and European research institutions	- Seminars on biodiversity - Events with local and national associations, e.g. Slow Food - Organizations of festival to promote and preserve traditions and knowledge in agriculture and craftmanship	- Events and meetings, involving academic partners and representative from administrations - Creation of Green Office (offering agronomical consultation) - Consultation for no-herbicide draft - Creation of Plant Atlas, i.e. atlas of specific	- Organization of farmers' market - Organization of environmental festival - Environmental campaigns and no-herbicides campaigns	- Collaboration with SPG for sharing food storage and distribution centre - Events and meetings with agronomists and environmental experts - Continuous meetings	- Participation to no-herbicide campaigns - Small number of activities in the last two years	- Trainings and courses - Seminars

[2] Participatory Guarantee System
[3] Solidarity Purchase Group

				culture and seeds at local level		with local institutions		

Table 1: key characteristics of the biodistricts in Tuscany. Source: elaboration of authors based on the interviews.

The data collection and analysis has combined interviews with the study of relevant sources, like biodistricts' assembly reports, local municipality policy drafts and/or completed regulations, socio-economic documents drafted by the biodistrict steering committees (e.g., socio-economic territorial plans), all enriched with information from the biodistricts' websites, when available. Primary data was collected through face-to-face semi-structured interviews conducted in mid-2020 with the presidents of the biodistricts (one interview with each of the presidents, with 8 interviews in total), selected producers (members of the biodistricts – one interview with a representative of the producers from each biodistrict, with 8 interviews in total), citizens and consumers (members of the biodistricts – interviews with selected consumers from five biodistricts, with 5 interviews in total), technical experts (e.g. agronomists – two interviews with local agronomists advising biodistricts), and local municipality representatives (e.g. mayors or other local administrators – two interviews with selected mayors of two biodistricts), and the interviews were conducted by the authors of this research.

The interviews have been guided by a macro structure looking at the role of actors, territorial background, and governance, and inquired about:

- Formation process and ideation: analyse the formation process and motivations behind the structuring of the 8 biodistricts;
- Actors involved and role of producers: understand the type of actors present within the biodistrict association and investigate the type of farmers present (organic or not) and their degree of involvement in the activities;
- Interaction with administrations: highlight the formal and/or informal interaction with the local municipality representatives;
- Social cohesion and territory: investigate the functioning of the community and the interpersonal relationships with the territory.
- Governance: investigate the decision-making processes, governance methods, governing bodies, and in general inquire about formal and informal governance;
- Activities and general impact: what do interviewees believe has been the impact of the biodistrict activities on the territory?
- Strategy and institutionalization: general strategy for the association, informal institutionalization, and willingness to formally become institutionalized;

The interviews took place either in the farm or production field of the presidents and other members (usually farmers) of the biodistricts.

Formation and ideation – the biodistricts in Tuscany are generally of recent formation. Biodistretto del Chianti and Biodistretto di San Gimignano were the first to be set up, in 2012, while Biodistretto Valdera, with the first meetings between actors held in early 2020, is the most recent. Investigating the formation and ideation processes in the early stages of each biodistrict has allowed us to disentangle and understand the motivations behind the development of the biodistricts. In most of the cases (Chianti, Casentino, Val d'Orcia, Valdera, San Gimignano) the biodistrict was initiated with a strong push from the local organic producers, with the aim of gathering the local farms to promote sustainable development and agriculture. In two of these

cases, Chianti and San Gimignano, there was a relevant push from the local delegation of the AIAB association. In Montalbano, the consumers and citizens instead were the driving force behind the development of the biodistrict: the local Solidarity Purchase Group (SPG) contacted the farmers of the SPG network promoting the idea. In the case of Fiesole, there was on the other hand a strong push from the local administration. The reasons for the creation of the biodistricts vary: from getting together to combat a chemical solution prescribed by law (Chianti)(Chaminade and Randelli 2020), to the willingness of promoting sustainable development (Casentino, Fiesole, San Gimignano, Valdera), or also sometimes due to the initiative of a single agronomist (Val d'Orcia and Monte Amiata).

Actors involved and role of producers – The actors involved are varied: some biodistricts (e.g. Chianti) have a prevalence of producers, while others (e.g. Montalbano) have a majority of associations, citizens and consumers within their members (in the case of Montalbano: 90 non-farmers out of 150 total members). In general, all the biodistricts try to involve the majority of organic producers at local level. Sometimes local SPGs, when present, are active members of the biodistrict activities. Overall, biodistricts try to also involve tourism associations, craftmanship activities, local social associations. The involvement of the local administrations varies by biodistrict (see below). Producers are always organic or in transition to organic agriculture, with the special case of Casentino, where also non-certified organic producers participate to the activities, when they accept to undergo inspections carried through a Participatory Guarantee System (PGS)[4]. Although, in general, a high number of members is composed by wine and oil producers in almost all the biodistricts (also considering the specialized agricultural production in Tuscany), there is still a large part of member producers of vegetables, fruit, grains, honey, and other products.

Interaction with local administrations – Some biodistricts have decided to involve the administrations from the start (e.g. Valdera, and Montalbano with the municipality of Carmignano), by inviting them to the periodic assembly meetings and discussion forums, while others have decided to just keep the municipalities informed on the activities done by the biodistrict, without direct involvement. Some biodistricts (e.g. Casentino) decided not to involve the administrations from the beginning. While in general biodistricts stretch over a territory with around 5 to 9 municipalities, some interact with just one administration, while, on the other extreme, Val d'Orcia and Monte Amiata stretches over 15 municipalities. In some cases (Fiesole and Montalbano) some administration's representatives are also formal members of the biodistrict.

Social cohesion, and territory – The interviewees have highlighted how, among the participants in the biodistrict, there is a strong sense of identity and shared values. The promotion of organic agriculture and sustainable development, the implementation of more sustainable food systems and shorter food chains, are usually brought as key elements which are uniting the members of the biodistrict around a common cause. In some biodistricts (e.g. Casentino or Chianti), the interviewees pointed out how a stronger involvement of actors other than the producers would be highly welcome. In one case (Montalbano), the interviewees pointed out how the presence in the territory of a strong social activism and historical local associations active in the voluntary social works provided a solid base for the formation and development of the biodistrict: the shared identity and sense of belonging to the aim of the biodistrict, i.e. to foster organic agriculture and sustainable development at local level, were soon formed within the members of the biodistrict,

[4] According to IFOAM - International Federation of Organic Agriculture Movements, a PGS is a 'locally focused quality assurance systems. They certify producers based on active participation of stakeholders and are built on a foundation of trust, social networks and knowledge exchange.'

and influenced the whole territory in having a positive and constructive attitude towards the activities of the biodistrict. The interviewees also stated how the participation in the periodic meetings and assemblies was very high, with participants coming from all over the territory.

Governance – All biodistricts have a similar governance structure. There is an assembly, which meets periodically and is composed of all members (which can go from 40 to 160, depending on the biodistrict). The members can be organically certified producers (or participating in PGS), citizens, local social associations, consumers, administrations (participating with some representatives). In some cases (when we exclude PGS participants), also non-certified producers are allowed, as long as they are producing without using chemicals (but the interviewees did not specify how they are checking this): in this case these producers do not have voting rights. All members, apart from the case just mentioned, have one voting right in the assembly. It is important to highlight that the assemblies are open also to non-members, which can participate as interested audience. The assembly usually approves or asks for modifications to the strategic plan of a Steering Committee, which is composed of 7 to 13 members, depending on the size of the Biodistretto. The Steering Committee usually decides on topics like energy, agriculture, events, and can be composed of producers and or technical experts. Also, almost all biodistricts have a President, Vice-president, and a treasurer/secretary. All roles are voluntary (non-paid), ratified by the general assembly, and periodically changed. Decisions are taken by majority in most cases, even though some interviewees made clear that quite often there is a wide consensus on the decisions, with very few people critically against the decisions taken.

Activities and general impact – Activities of the biodistricts have been varied and plentiful along their years of operation. If we exclude the Biodistretto of Valdichiana Aretina, which has been dormient in the last couple of years, the others have all in a way or the other been active in their territories. Several aims have been listed by the interviewees when explaining the activities organized by the biodistrict: to create a space of knowledge sharing for the organic producers and to promote organic agriculture and sustainable practices among them, by organizing visits to the different farms, or by organizing seminars with technical themes discussed by experts and among the group; to educate the local population towards sustainable food consumption, by organizing seminars, farmers' markets and convivial events with local products; to promote biodiversity and sustainable land use, by drafting reports and documents to be shared with local producers and administrations; to influence local administrations, by advertising all the above mentioned activities, inviting the municipalities' representatives to the events, and trying to have a say with an expert opinion on the drafting of local policies for the socio-economic development of the territories.

It is here important to mention the case of Montalbano, which has been able to 1) collaborate with the municipality of Carmignano at local level, to set up a Green Support Office, offering free consultations for all local farmers on agronomical issues, with the aim of providing organic solutions; 2) collaborate with the mayor for the drafting of the first approved municipal law[5] in Tuscany which bans the use of herbicides in certain circumstances in the municipal territory, providing a benchmark for other municipalities to follow.

[5] Municipal Decree N. 8 of 29/01/2019. Temporary prohibition on the use of herbicides containing Glifosate on the whole municipality of Carmignano until 31st December 2019, to safeguard public health, drinking water sources and soil.

The general impact, therefore, changes among the different biodistricts: in some cases the interviewees were satisfied with the results (e.g. Montalbano and Valdera), either because of the impactful activities and the wide reach, or because of the good initial steps undertaken to involve all important actors; in other cases, the interviewees have listed a series of activities to work on to either involve more producers, more consumers or get in touch with the local administrations to have a wider impact at local level. The interviewees have highlighted that, in general, there has been an increase of organic producers becoming members since the start of the biodistrict association, with very few cases of members deciding to leave the association (in these cases, the interviewees have mentioned personal reasons of the producers as motivations for leaving).

Strategy and institutionalization – The histories of the different biodistricts make their strategy for the future and their willingness to start the institutionalization process (i.e. forming a biological district under the Regional Law of Tuscany LR 51/2019, where they would be, likely, the referee of the consortium of actors) very diverse. All the interviewed biodistricts have the objective of increasing the organic production of the territory, educating the consumers and citizens towards a more sustainable food consumption, sharing knowledge of agricultural tools and methods which are preserving biodiversity and the traditional seeds at local level, and some of them have already reached some important results (e.g. Montalbano collaborating with the local mayor). Almost all of the interviewees though highlighted how they would like to reach a wider impact at local level: either through the involvement of a higher number of citizens and consumers (e.g. Chianti), through the participation to the periodical biodistrict assemblies, or through the reconnection eventually with the local administrations (e.g. Casentino and San Gimignano), for a common planning for sustainable development actions and policies. Most importantly, some biodistricts have been able to reach a higher status at local level over the years, thanks to their actions and activities. In the words of the interviewees, for example, Biodistretto del Montalbano has become an 'informal institution', being seen as the go-to association, both in the eyes of the municipalities and the farmers, citizens and consumers: several actors from the territory see the Biodistretto del Montalbano as a source of knowledge about organic agriculture and sustainable development, representation of the small-medium farmers, consultation for local development. Other biodistricts are also recognized at local level by the administrations as a subject-matter expert on organic agriculture, like for example Biodistretto del Chianti. In terms of formal institutionalization through the Regional Law LR 51/2019, at the moment Biodistretto del Chianti, Biodistretto di Fiesole and Biodistretto Montalbano are the ones moving forward with the different documents required for the application: they are all, indeed, working on an PIT (Integrated Territorial Plan) to be presented to the regional parliament, and they are drafting the strategic plans and activities needed to move ahead (e.g. actions to increase the size of organic land cultivated in the territory of the biological district, mandated by the law). Also Biodistretto Val d'Orcia and Monte Amiata is moving towards becoming institutionalized, but here the size of the territory (spanning 15 municipalities) and the low frequency of meetings among the members (only 1 assembly in the last year), make it an unlikely candidate to reach a fast decision soon. For Chianti, Montalbano and Fiesole the institutionalization process seems like a natural step, solidifying the years of activity in the territory, and making it easier to access funds and to develop a strong line of communication with the local administrations. In all cases, the biodistricts have highlighted how they would like to keep the biodistrict as association, to be the referee organization in the consortium leading the legally recognized biological district. The other biodistricts are still discussing on the opportunity of institutionalization: two of them are either currently inactive (Valdichiana), or too young (Valdera); the other two are still discussing internally on the benefits of having, in parallel to the

association, also a more formalized and structured institution recognized by law (Casentino and San Gimignano).

4. Results and comments

The results from the interviews point out some heterogeneity among biodistricts in Tuscany as they all have different degrees of matching to the definition of meso-space and very different dynamics within the territory where they operate. Considering meso-spaces as territorial spaces positioned between individuals, citizens, and firms on the one hand, and institutions on the other, the interviews have highlighted how participation of grassroots actors and administrations are equally important, although at different stages of the development of each biodistrict.

All biodistricts had in the formation phase a strong base of organic producers, sharing ideas and knowledge among them. In biodistricts which considered themselves as successful experiences, for instance Biodistretto Montalbano, some features were highlighted as key: firstly, the social activism already present in the territory (done through associations and citizens' groups) was brought forward as an important factor positively influencing the formation of the biodistrict and supporting its activities; secondly, the grassroots actors were involved from the start, and the administrations' representatives were involved right after. In fact, in this case, the local SPG, together with active citizens, made sure to contact the local organic producers to create a first base for the biodistrict to be created; right after this step, the group involved the biggest local municipality (Carmignano), to be sure that it would remain informed on the activities and aims of the biodistrict. This process, in the words of the interviewees, created a sense of identity and shared purpose, which made participated and meaningful the organized events, seminars, and consultations for policies. In the case of Montalbano, the interviewees considered themselves as actors of change and education for sustainability in the territory. The early involvement of a strong grassroots base, and an incremental involvement of organic producers and administrations, also made sure that the biodistrict would have a solid structure with plenty of 'workforce' for the organization and communication of activities, while at the same time it would be able to be more institutional when the times required it, like for example in the set-up of the green support office or the consultation for the anti-herbicide law (see previous section).

Therefore, the results from the interviews showed how a strong social cohesion, thanks to historical social activism in the territory from local associations and civic groups, in a way fostered and favoured the impact of the activities of the biodistrict, increasing participation and reach. On the other hand, a self-declared lack of social cohesion, together with a lack of grassroots initiatives, made certain experiences (e.g. Valdichiana Aretina or Val d'Orcia e Monte Amiata) to struggle to maintain a high level of activism, with either a slow-down of activities (Valdichiana) or with a very low frequency of meetings and low participation (Val d'Orcia e Monte Amiata).

The results from the interviews also show how poor involvement of either grassroots actors (consumers, citizens, associations) on one hand, or local institutions on the other, made the biodistricts falter along the years of activity. In some cases, the grassroots actors which were promoting and driving the creation of the biodistricts from the start, failed to involve the local administrations (e.g. Casentino), and this meant that local sustainable activities and practices (e.g. organizations of farmers' markets, sharing of organic knowledge among actors, etc.) remained limited to an already consciously sustainable audience, with limited possibilities of reaching a wider audience through institutional channels, e.g. through administration's sponsored events or through consultation for policy drafting. The missing involvement of institutions was deliberately chosen

by the citizens, consumers, and organic producers in some cases, while in others was due to low level of interest from the local administrations themselves.

Sometimes, the biodistrict was born with the strong push from the organic producers: this might have made it easier to talk with the local administrations, being the biodistrict a relevant representative of the local agriculture, but, in some cases, there was some difficulty in reaching out to a wider audience of actors in the territory, like SPGs, citizens, and local associations (e.g. in the case of San Gimignano and Chianti).

In a specific case (Fiesole) the interviews highlighted how being recognized already as rural district and having a strong involvement from the administration would make it easier to be institutionalized and recognized at regional level, although it was unclear whether the involvement of the local population was successful.

It is interesting to note here how biodistricts might differ from FPCs. In fact, although both a biodistrict and a FPC bring together different local stakeholders from the food systems, a biodistrict does not have policy change as the main objective (which is, instead, the key objective for an FPC). From the cases studies analysed, it is clear that policy changes might be an indirect successful outcome of involvement of local institutions, but the main scope of a biodistrict seems to be primarily the sharing of knowledge across the producers and citizens of the territory, with the aim of transforming the agricultural production of farmers and the dietary education of consumers. Also, another key difference between biodistricts and FPCs is that the latter are usually started and chaired by the local institutions, while biodistricts are usually initiated by consumers and farmers. These results might also show that the biodistricts are much closer to some sort of Community of Practice (COP) concept (Cross and Ampt, 2017), where groups of people (usually farmers in our case) share common problems and practice towards more sustainable food systems.

In general, not all biodistricts are working as meso-spaces of transformation: the match to the definition depends very much on the maturity of the biodistrict, and their capacity and ability to really place themselves in-between grassroots and institutional actors. Although the strong base of the biodistricts, is made up of grassroots actors in fact, it is clear that to really have concrete results, a clear communication and involvement of the local administrations is recommended. This, though, does not always happen, and it makes the biodistricts at times remain a grassroots innovation with difficulties to transform the territory and have a wider audience (let alone a concrete impact).

In the interviews, all the biodistricts considered themselves as agents of change at local level, highlighting how they are more than just groups of organic producers, and how the involvement of grassroots actors like citizens and consumers and institutions is key for their activities. It must also be highlighted how, although all biodistricts mentioned the willingness to reach and involve more grassroots actors (organic producers, citizens, consumers, associations), not all of them had a willingness or a strategy to approach and involve local administrations: this is partly due to the fear of losing some freedom and control over activities, and partly to the fact that in some cases the interviewees felt they had not reached the maturity and the solidity to propose structured solutions to the local administrations. Some biodistricts, in fact, still saw themselves as pure spaces of discussion and not of deliberation or structured proposal. This also influenced the willingness of the biodistricts in becoming legally recognized at local level through the regional law.

From the interviews, it also appeared how the number of organic producers does not necessarily influence the biodistricts in their activities. In fact, there was in general an agreement that meetings

and assemblies are participated, and the decisions taken are shared with strong consensus. Although there was not strong evidence that a higher number of municipalities would be negative for the activities of the biodistrict, it was mentioned during the interviews that the complexity required to approach structured institutional problems would make it easier when the number of the administrations involved would not be too high (implying therefore that also the extension of the territory should not be too large). In the case of the biodistrict with 15 municipalities it was clear that communication between the biodistrict and the administrations was hardly effective. The extension of the territory within the biodistrict, irrespectively of the number of municipalities, was also brought by some interviewees as a point to pay attention to: in some cases (e.g. Casentino) the structure of the territory or the valley where the biodistrict operates makes it more difficult to aggregate people, mostly due to physical reasons, making it burdensome for some members to participate to meetings, activities and events due to the physical distance to the gathering points, causing time-consuming commuting.

To summarize the results from the interviews, a characterisation model (Table 2) has been developed with the aim of listing the most important characteristics of biodistricts found from the interviews.

Nine key elements are listed and are used as criteria to define semi-qualitative indices that take the form of descriptive scores from Low to Medium (a modified Likert-type scale). As an example, for the element 'Organic producers', the relevant indices are (Low) Low interest of organic producers in participation to the biodistrict, (Medium) Some interest in participating to activities. Not all of the local organic producers in the territory are members of the biodistrict, (High) Organic producers strongly support the biodistrict's activities and the majority of organic producers in the territory are members of the biodistrict.

Elements	**Score (intensity and presence) within the biodistricts (from interviews)**		
	Low	Medium	High
Base of citizens and consumers	Local citizens and consumers rarely participating in activities.	Local citizens and/or consumers participating in activities and events and/or having some roles in governing bodies.	Strong base of citizens and consumers from the start of the initiative, with frequent participation in events/activities and active role in strategic decisions.
Territorial activity of associations	Local NGOs and associations are not present or very seldomly participating in events.	Local NGOs and associations sometimes participating actively in events and assemblies.	Strong territorial base of associations, responding positively to events and activities and with active role in decisions.
Participation of organic producers	Low interest of organic producers in participation.	Some interest in participating to activities. Not all of the local organic producers as members.	Organic producers strongly supporting the biodistrict's activities. Majority of the organic producers in the territory are members.
Interaction with administrations	No interaction.	Some interaction, but not structured or continuous. Some communication about activities, but	Involvement of administrations in activities and strategic decisions. Continuous communication and information. Participation of local

		inconsistent. No participation of administration's members in the biodistrict's assemblies.	administrations' members in biodistrict's assemblies.
Assemblies/forums	Scarcely participated or infrequent assemblies.	Somehow frequent and/or some participation in the biodistrict's assemblies.	Frequent, participated, open assemblies.
Common cause within biodistrict	Lack of community feeling or shared sense of identity and common cause.	Sharing of common cause and sense of identity, but divergent views sometimes.	Common cause aggregating actors in defence of something (e.g. against use of chemicals or against neighbouring polluting region).
Activities	Few events and activities organized.	Some activities organized. Participation is not always high.	Continuous and participated organization of events (e.g. farmers' markets), seminars, and trainings for both citizens and farmers.
Governance	No clear rules and hierarchical governance structure.	Clear rules for decision-making, somehow participatory processes, but necessity of majority votes (i.e. consensus sometimes not reached).	Clear rules and participative democracy. Consensus on decisions and strategies almost always present.
Social cohesion within the territory	Low degree of solidarity, trust, and interaction among the local community, citizens, NGOs, or associations in the territory.	Some degree of solidarity, trust and interaction within the local community in the territory.	Strong degree of solidarity, trust, and interaction within the local community in the territory.

Table 2: Characterization model: what to consider for biodistricts as meso-spaces for transformation. Source: adaptation from interviews by the authors.

Taking the definition of meso-space from previous sections, we can say that a biodistrict as meso-space is the one that scores high in all the characteristics of the characterisation model. The characterisation model, therefore, can be used to analyse the biodistricts based on the information collected through interviews, reports analysis and desk research, and it can also be used to compare the biodistricts and reveal any differences in their dynamics.

The application of the characterisation model to the biodistricts is visualized in Figure 2: the 8 biodistricts all have similar but somehow different dynamics, actor roles and governance rules. The biodistretto Montalbano seems to be the experience that has been able to reach a certain maturity and effectiveness at institutional and grassroots level, by involving 'bottom' actors (e.g. citizens, associations, consumers, organic and non-organic producers) and 'top' actors (i.e. regional and local institutions). This effectiveness is also exemplified by the strong participation to organized events, high frequency of activities and the concrete results achieved through collaboration with

the local administrators (e.g. green support office, limited pesticide-use municipal decree, Atlas of local seeds for gastronomic and touristic use, etc.).

The other biodistricts are all performing well in some of the elements of the categorization model, with almost all of them being able to involve the local organic producers, both in membership and participation, and with the majority of them being able to develop a strong common cause and sense of identity within them. The involvement of consumers and citizens and the interaction with the local administrations, on the other hand, represent elements which are varied across biodistricts: in fact, while some are able to somehow involve top and bottom actors, in general there might be a stronger focus on producers than on achieving a wider audience at local level. This makes some of the biodistrict less close to the concept of meso-space at territorial level.

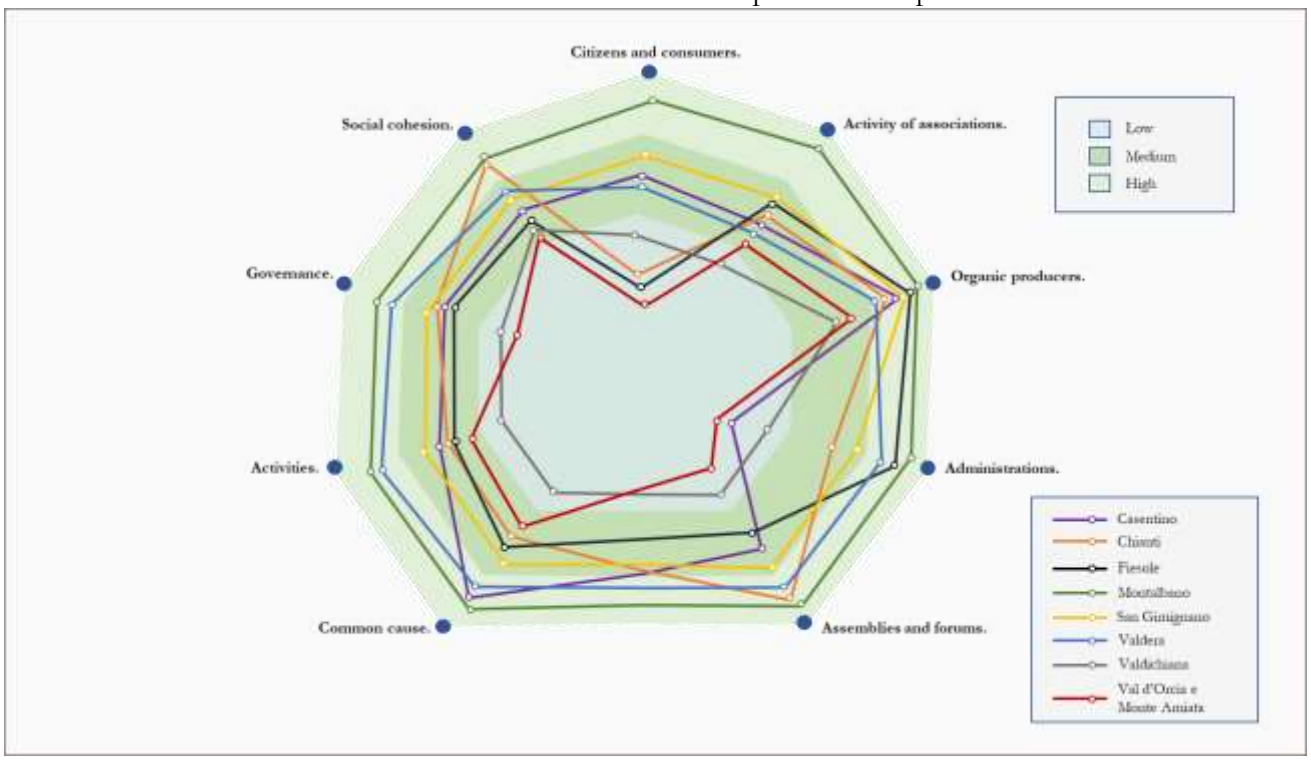

Figure 2: Visualization of the categorization of biodistricts: based on characterisation model from interviews. Source: adaptation from the interviews by the authors.

5. Conclusions and further research directions.

The need of a participated and inclusive commitment in order to foster a deep transformation towards sustainability of our food systems has arisen in the literature (Lamine et al. 2012; Driessen et al. 2012; Kristensen et al. 2016; Moragues-Faus and Marsden 2017). Since commitment and cooperation is fostered by geographical proximity, many scholars point out the need of a territorial based approach aiming at promoting and setting up meso-spaces of transformation and co-governance (Jentoft 2003; Kooiman 2003; Symes 2006; Vivero-Pol 2015).

The goal of this paper is to verify whether biodistricts could be considered as spaces for transformation of food systems at local level, therefore fostering scaling-up and scaling-out towards sustainability. We have used 8 case studies from the Tuscany region in Italy. By analysing and disentangling the actors, governance rules, and dynamics within selected cases in Tuscany, we aimed at better defining what could really be meso-space of transformation and we started to touch

upon which characteristics would make certain biodistricts better candidates for being actors of change within the local food and economic systems.

The main contribution of this paper is to bring further clarity to the role of certain territorial arrangements in the discussion on food system transformation. Doing this, we have looked at the role of agency, territorial pre-conditions, and network interactions.

General considerations and conclusions can be drawn from the analysis of the 8 biodistricts. Biodistricts cannot in general be considered by default meso-spaces of transformation. This depends on a series of characteristics which have to be met, first and foremost, the involvement of the actors at local level at the right time of the implementation. The interviews showed how a likely framework for impactful action could be: in some cases, biodistricts were able to reach better and more practical results than others, mostly due to their strong base in the territory, a high number of both organic farmers and local citizens, and the involvement and clear communication of local administration's representatives through informal and/or formal channels. Especially the informal connection with local representatives made it easier to formalize certain sustainability solutions, by being consulted and/or kept informed along the way of the policymaking of the administrations.

The interviews showed there is a high level of interest from small and medium farmers at local level in joining forces and work for a more sustainable way of producing food. The interviews also showed how the activities are more participated when there is a strong support from already active social associations and from citizens' groups. The biodistrict enabled the creation of local spaces of cross-fertilization in some cases, with knowledge and ideas shared among the actors, and an increase sense of identity. Open and participatory democracy, and clear governance rules also made sure that actors within the biodistricts felt empowered and that decisions would be taken always on a consensual way.

The results also highlighted how biodistricts have key differences with concepts like FPCs, mainly because of who's initiating them (mayors or local institutions for FPCs; farmers and citizens for biodistricts) and for the key reasons behind the implementation of the activities (policy change for the FPC; sharing of knowledge for biodistricts, with only an indirect objective of policy change). At the same time, biodistricts share essential characteristics with COPs, because of the mutual engagement of the actors (active within an organizational structure), the presence of a joint enterprise (a shared purpose of better food systems and agricultural practices) and the use of shared repertoire (through knowledge transfer of organic and regenerative agriculture practices) (Cross and Ampt, 2017).

In general, we can argue how certain characteristics are more important than others for considering the biodistrict as a true meso-space, able and capable of having an impact at territorial level. Based on the evidence, it is possible to say that the challenge of biodistricts as associations in being considered as meso-spaces for transformation of food systems and as contributors to a sustainable development of the local territory is not yet complete. Although some results have been achieved by some biodistricts and environmental and social sustainability is always the key objective in their activities, further research is needed. Biodistricts, though, represent a relatively young phenomenon and, as we have analysed through the paper, also specific regulations supporting these initiatives are still being developed.

Further research could focus on understanding and analysing the logical cause and effect linkages between key characteristics of the biodistricts and sustainability impacts, analyse how social and

geographical proximity of actors within biodistricts foster sustainability transitions of food systems at local level, and understand what a successful and impactful action of biodistricts for the citizens, consumers, producers and administrators is. Also, further research could try to disentangle how former processes already present in the territory (e.g. organic certifications, SPGs, etc.) influenced and favoured the formation of biodistricts, while another branch of research could aim at further drilling down on how the biodistricts perform across their maturity phases.

To summarise, the case of the 8 biodistricts highlights how these experiences could potentially be considered meso-spaces at territorial level and provide governance spaces to accelerate transformations of food systems locally: our research, while promising, needs to be further expanded and other regions, with different local characteristics, need to be analysed together with an analysis of sustainability impacts.

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