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Organic and Agroecological Districts. Methodological Approaches for Inclusive and Sustainable Food Systems in Argentina.

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Abbreviations and Acronyms

CBA	Canasta Basica Alimentaria
CIRAD	Centre de coopération internationale en recherch agronomique pour le développement
CNCPS	Consejo Nacional de Coordinación de Políticas Sociales
CENECOS	Centro de Estudios de Cultivos Orgánicos
CIAO	Comisión Interamericana de Agricultura Orgánica
ENGHO	Encuesta Nacional Permanente de Hogares
FBDGs	National food-based dietary guidelines
FAO	Food and Agriculture Organization of the United Nations
FAUBA	Facultad de Agricultura de la Universidad de Buenos Aires
FAS	Free Alongside Ship
GAPA	Guías Alimentarias para la Población Argentina
GAOD	Global Alliance for Organic Districts
IFOAM	International Federation of Organic Agriculture Movements
ID	Industrial Districts
ICA	International Cooperative Congress
IICA	Instituto Interamericano de Cooperacion Internacional
IPCBA	Indice de Precios Ciudad de Buenos Aires
INASE	Instituto Nacional de Semillas
INTA	Instituto Nacional de Tecnologia Agraria
INNER	International Network of Eco - Regions
ICA	International Cooperative Congress
ICCA	Institute for Cooperation on Agriculture
ICS	Internal Control Systems (ICS)

LMR	Limit Maximum Residues
LAFS	Localized Agri-Food Systems
LPS	Local Productive System
MAELA	Movimiento Agroecológico de America Latina
MAPO	Movimiento Argentina para la Producción Orgánica
MAGyP	Ministerio de Agricultura, Ganaderia y Pezca
PGS	Participatory Guarantee Systems
PRODAO	Proyecto de Desarrollo de la Agricultura Organica
PON	Pampa Orgánica Norte
PONIT	Pampa Orgánica Norte Implementation Team
RENAMA	Red Nacional de Municipios y Comunidades que fomentan la Agroecología
RIPESS	The Intercontinental Network for the Promotion of Social
SE	Solidarity Economy
SSE	Social and Solidarity Economy
SAAE	Sociedad Argentina de Agroecología
SDG	Sustainable Development Goals
SENASA	Servicio Nacional de Sanidad y Calidad Agroalimentaria
SMEs	Small and Medium Enterprises
SOCLA	La Sociedad Científica Latinoamericana de Agroecología
SSE	Social and Solidarity Economy
TAPE	Tool for Agroecology Performance Evaluation
VBSCs	Value Based Supply Chains
WHO	World Food Program

Chapter 1 - Introduction

More than 820 million people in the world suffer from hunger, whereas 1.9 billion adults are overweight or obese, (FAO 2020) representing the double face of the same global malnutrition crisis.

Nutrient-rich fruits, vegetables, and protein-rich foods (from plant and animal origin) are the most expensive food groups globally; healthy diets cost much more than $ 1.90 a day (FAO 2020), the international poverty line, making millions of people to base their diets on foods of lower nutritional quality.

Food security and nutrition are closely interlinked, according to the definition emanating from the World Food Summit: “Food security, at the individual, household, national, regional and global levels [is achieved] when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life ”(FAO 1996)

Poor diets are the leading cause of mortality and morbidity worldwide, outweighing the burdens attributable to many other major global environmental challenges (Willet W. Et al 2019). In this sense, the food sector ranging from manufacture of fertilizers, to the packaging and distribution is responsible for more than a third of all greenhouse gases, also directly affecting water scarcity, soil erosion, and the loss of biodiversity on the planet (FAO, 2018).

This reality, coupled with rapid population growth and the current inefficient process to address food infrastructure crises, highlights the need for profound change in global food systems, many of which are directly addressed by the United Nations within the framework of the Sustainable Development Goals (SDG).

In this scenario, there is relevant evidence that organic agriculture and agroecology can positively contribute to challenges related to the SDGs (Arbenz,

2018; Migliorini and Wezel, 2017;Eyhorn et al., 2019) where Localized Agro-food Systems can address and scale up (Guareschi et al, 2020) these practices, combine both local needs for food security with sustainable localized food chains with added value both at national and international levels.

During the completion of this thesis, two major events affected global food systems.

The global crisis generated by the COVID-19 pandemic (Altieri, 2020), and the recent war between Russia and Ukraine, have shown that although globalization provides a range of opportunities, overreliance on external resources, makes countries and communities more vulnerable to epidemic and political shocks while greatly endangering food security.

Argentina, the territory on which this work mainly focuses, is a paradigmatic case of this dysfunctional global phenomenon.

On the one hand, the country is among the main food producers and exporters: In 21/22 it ranked in the 6th place of wheat exporters worldwide with 16,000 tons, maize with 42,500 tons ranked 2nd after the USA, barley with 3,600 tons and recorded the 3rd place after Russia and Australia, and sorghum 2nd after the USA. Argentina's grain production represents 5% of the world's total production. (INDEC, 2022)

Agricultural Exports are the country's main income where soybean is in the first place with revenues of USD 23,841 million, representing 30.6% of the total revenue of the country. Soybean is followed by maize with USD 9,295 with a share of 11.9%, meat production with USD 3,608 and 4.6%, wheat with USD 3,488 and 4.5%, sunflower with USD 1334 and 1.7%, dairy with USD 1,164 and 1.5%, grapes with USD 1053, Peanut with USD 1042 and finally barley with USD 943 (INDEC, 2022). These reflect the utmost importance of the agricultural sector in the Argentine Republic.

These remarkable productive and export numbers in Argentina serve as a clear example that high levels of production of certain foods do not necessarily lead to global or local healthy food systems.

We find an Argentine population that suffers from malnutrition with rates reaching near 70% of the total population (Ennys, 2019) coupled with severe problems related to food safety. According to a recently published study, out of a total of 135 of the most consumed fruits and vegetables analyzed for 35 pesticides, 65% of the total samples detected chemical residues, of which 56% were above the Limit Maximum Residues (LMR) (Mac Loughlin et al 2018). In other words, 1 out of 3 of the foods in 2 food groups that are essential for healthy diets present hazardous chemical residues for human health.

So far, in Argentina, no in-depth study has been developed to highlight the local processes and international processes of the Organic and Agroecological systems, concerning their interaction and respective perspectives.

On the other hand, although the development of different localized agri-food systems (LAFS) has been studied (INTA, 2008). Since the collaboration between the Argentine National Institute of Agricultural Technology (INTA) and the French Agricultural Research Centre for International Development (CIRAD), started in 2006, there is very little research on LAFS with Organic and Agroecological production nor is there an active process of bio-districts or eco-regions (AIAB, 2012) developed and studied in the country.

Finally, although different economic analyses on the costs of healthy diets based on the recommendations by the Argentine Guides for Food (GAPA) have been studied and published (Britos et al., 2018), no research has been carried out considering other relevant international recommendations (Willett W, et al. 2019) that include the environmental dimension and at the same time, based exclusively on organic or agroecological foods available at the local level from short and alternative value chains (Luo et al., 2018).

In this way, the objective of the Doctoral thesis that I am presenting is to understand how the processes, mechanisms, and methodologies concerning organic and agroecological production can facilitate virtuous and functional processes for the Argentine food system in line with the Sustainable Development Goals outlined by the United Nations (SDG).

The first part, comprising 3 chapters, will be approached through the literature review methodology, carried out at two levels: on the one hand, relevant material was retrieved from 3 bibliographic references: Scopus, Web of Science, and Google Scholar. On the other, interviews were conducted with different International and Argentine actors active in the field of organic agriculture, agroecology, health, nutrition, and territorial development to understand what materials and experiences could be identified, considered, and included in the research.

This first part consists of the following chapters:

Chapter 1 covers SDG Global and Argentine approaches starting from the historical process and taking into account how food systems are integrated into the different SDG dimensions, its main recommendations, practices, and indicators.

Chapter 2 contains the definitions and processes both at the International and Argentine levels of organic and agroecological agriculture (Migliorini et al. 2017; Sarandon & Flores, 2014; Pais, 2002). Shared elements, differences, and challenges are discussed considering their link with scientific evidence and experiences concerning the objectives of Sustainable Development Goals (SDGs).

Chapter 3 presents and analyzes different approaches to territorial development and their relations with localized rural development including the development of productive districts (Porter, 1990; Beccattini, 2017), Local Agri-food Systems LAFS (Muchnik, 2009), and Bio-districts (Stotten 2017), the Neo-Endogenous development model (Ray, 2008), the Social and Solidarity Economy (Coraggio,

2014) and the Sumak Kawsay or “Buen Vivir” models (Morandi, 2014; Coral Guerrero et al, 2021).

The articulation of this first part seeks, first of all, to lay the foundations for global definitions and guidelines on sustainability and the global and national challenges in this regard. Secondly, to place the roots, approaches, and contributions that organic and agroecological production provide, and thirdly, the different approaches to territorial development are investigated to address the actual alternatives for implementing changes in the food system. This will serve as an initial analytical base for contextualizing the 2 case studies that are part of the second part of this thesis.

The second part is approached from a methodology of case studies analysis (Yin, 2013) related to the implementation of food systems based on organic and agroecological agriculture where both the production and the consumption dimensions are assessed using the conceptual frameworks included in the previous chapters.

Chapter four presents the case study of the Group Pampa Organica, where different dimensions of sustainability practices (Environmental, Economical and Social), the levels of articulation in terms of Local Agrifood System (LAFS), and bio-district are assessed using a set of methodologies that include: TAPE (FAO, 2019) as an instrument to measure agroecological sustainable practices at different dimensional levels, organic district monitoring tools and the participatory value chain identification (Zanasi, 2020) based on the Porter diamond model (2008) and the LAFS methodology (Boucher, 2011; Reyes Gonzalez, 2011), and Stakeholder analyses methodologies.

Chapter five presents the case study of the short alternative distribution chains of organic and agroecological products for the city of Buenos Aires, analyzing the availability and cost of these for the conformation of healthy diets based on the National Guidelines for the Argentine Population (GAPA) (Argentine Ministry of Health, 2016) and the guide produced by the EAT – Lancet Commission on healthy diets from sustainable food systems (Willett W, et al. 2019). Using the

linear programming method (Stigler GJ, 1945) 2 types of diets are defined. Costs are evaluated with their characteristics, and the economic accessibility from the population.

Finally, a concluding chapter includes an articulated analysis of the different methods used and the results obtained in the work.

My interest in the topics addressed in this thesis derives from the fieldwork matured over more than 15 years on the international cooperation for the development sector focusing on the processes of valorization of food systems based on organic and agro-ecological practices.

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Chapter 2. Sustainable Development

2.1 Origins of Sustainable Development

Sustainable development has become a *mainstream* theme, of international debate about the direction of human society interactions with the environment and its future.

There are many definitions that changed over time, taking different meanings often divergent from one another. Being an extremely challenging concept which is becoming a disputed and variegated new approach to reality, it will be considered as a *contested concept* (Bruyninckx et al. 2012) that will be deepened throughout the current thesis work.

The importance of sustainability for economic growth was underlined in 1972 by the Club of Rome where through its book “The Limits to Growth” they pointed out the misleading and incomplete ideas of focusing the development only on the economic and industrial growth without taking into consideration the scarcity of resources and the sustainability on its process: “if the present growth trends in world population, industrialization, pollution, food production and resource depletion remain unchanged, the limits to growth on this planet will be reached sometime within the next 100 years. The most probable result will be a rather sudden and uncontrollable decline in both population and industrial capacity” (Meadows et al. 1972, 23).

A first definition can be attributed to the Brundtland Commission and its report, *Our Common Future* where sustainable development “is development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (WCED 1987, 41).

This synthetic definition, emphasize two main elements at the same time, firstly development is not an aim in itself, but an instrument; and secondly this instrument should ensure the achievement of present and future generations’ needs.

The basis of this idea of sustainability no longer views the economic growth on its centrality but place the development on the relationship between human activities, including the economic ones, with the environment. In these sense, the idea of conceiving development as a multidimensional concept focused on this holistic approach linking economic development, social inclusion and environmental sustainability became clearer and resonant (Sachs 2015).

This is clearly stated in *The Future We Want* (United Nations General Assembly 2012) "Sustainable development demands action on its three dimensions and as long as these are activated through policies fostering economic growth, greater social equality and the reduction of negative environmental impacts, the needs of current and future generations are expected to be enhanced" (Guillén-Royo 2016, 13).

Since the publication of the Brundtland Commission's report, the concept of Sustainable Development has received different level of critics, mainly in terms of its lack of clarity for being successfully implemented in practical levels (Gibson 2010; the role and the weight to give to each component and the mutual relations among its three pillars: economic, social, and environmental (Alaimo & Maggino, 2020) and on it specific goals orientation "sustainable development calls for the conservation of development, not for the conservation of nature" (Sachs 1999, 34).

Despite the criticism, the tripartite model, remains dominant and hegemonic in literature and it is the basis of the indicator system proposed by the United Nations.

This model implies a new systemic vision that can be traced in the different attempts to deepen and scale worldwide development.

2.2 Global Partnerships for Sustainable development

The Earth Summit in Rio de Janeiro in June 1992 is stated as the first global comprehensive plan of action to build a global partnership for sustainable development, improve human lives and protect the environment.

More than 178 countries participated in identifying 27 principles and an action program, the so-called Agenda 21, to help governments in obtaining this goal and which primary objective was to produce a new blueprint for international action on environmental and development issues that would eventually help guide international cooperation and development policies into the twenty-first century.

The process enabled at the Rio Summit and its implications facilitated the organization of the Millenium Summit in 2000 in the UN headquarters of New York, where the Milennium Declaration was developed (by a team of officials working under the former UN Secretary-General Kofi Annan) and unanimously adopted.

The Declaration led to the creation of the eight Millennium Development Goals (MDGs) addressing the challenges of 8 specific goals by the target date of 2015: 1. to eliminate extreme poverty and hunger; 2. to achieve global primary education; 3. to empower women and promote gender equality; 4. to reduce child mortality; 5. to promote maternal health; 6. to fight malaria, HIV/AIDS, and other diseases; 7. to promote environmental sustainability; and 8. to develop a universal partnership for development.

The MDGs contributed to providing a common language and mainstream attention to reach global agreement on specific goals, considering them as a management tool to accelerate progress towards complex sustainable development outcomes (McArthur, et al 2013).

The introduction of Ban Ki Moon, former Secretary General to the United Nations, to The last UN official report (United Nations, 2015) states that: “The MDGs helped to take more than one billion people out of extreme poverty, to make

inroads against hunger, to enable more girls to attend school than ever before and to protect our planet. They generated new and innovative partnerships, galvanized public opinion and showed the immense value of setting ambitious goals. By putting people and their immediate needs at the forefront, the MDGs reshaped decision-making in developed and developing countries alike." (United Nations, 2015)

The report presents significant achievements on many of the MDG targets worldwide:

Between 2000 and 2015 among others: a decrease from 47% to 14% of extreme poverty, the primary school net enrolment rate in the developing regions has reached 91% from 83%, the literacy rate among youth aged 15 to 24 has increased globally from 83% to 91%, the global under-five mortality rate has declined by more than half and decent results addressing targeted diseases (HIV/AIDS, Malaria and Tuberculosis), 47 countries have met the drinking water target, 95 countries have met the sanitation target.

Regardless of the aforementioned partial achievements, by 2015 progress has been uneven across regions and countries, leaving significant gaps at different levels; in terms of climate change and environmental degradation; global emissions of carbon dioxide have increased by over 50 per cent since 1990, million hectares of forest were lost and over exploitation of marine fish stocks led to declines in the percentage of stocks within safe biological limits. In addition, strong inequalities persisted and increased between the poorest and the richest households, between rural and urban areas and in gender gaps, with millions of poor people being left behind, still living in poverty, hunger and malnutrition, without access to basic services.

2.3 The Sustainable Development Goals

The process that started within the Rio+20 conference in June 2012 involved a global consultation where civil society organizations, citizens, scientists,

academics, and the private sector from around the world were intended to be actively engaged in the process, culminated in the subsequent adoption of the 2030 Agenda for Sustainable Development, with 17 SDGs at its core, at the UN Sustainable Development Summit in September 2015 covering all social, economic, and environmental dimensions of sustainability as shown in Figure 2.1.

It represents a political compromise negotiated by the 193 member states of the United Nations that has been critically reviewed with goals that do not propose a hierarchy and are applicable to all countries, regardless of the development status where economic, social and environmental targets are intertwined in the unified framework forming an 'indivisible whole' (Griggs et al. 2014; Nilsson et al. 2016).

Figure 2.1 | The Sustainable Development Goals (SDGs) as adopted in 2015 by all UN Member States

Every goal have a set of indicators set by the global indicator framework for Sustainable Development Goals, developed by the Inter-Agency and Expert Group on SDG Indicators (IAEG-SDGs) and agreed upon at the 48th session of the United Nations Statistical Commission held in March 2017.

According to the Resolution of the Statistical Commission pertaining to the 2030 Agenda for Sustainable Development (A/RES/71/313) the indicator framework will be refined annually.

The global indicator framework is at the same time complemented by indicators at the regional and national levels, which will be developed by Member States.

The global indicator framework includes 231 unique indicators.

For each indicator, within the United Nations System, there is one or more than one organization that coordinates its monitoring and measurement, while different regional organizations, such as CEPAL (2018) in Latin America, complement this work by adapting indicators and following up on them. This also occurs at the National level where, generally, for each goal there are different National Ministries with specific monitoring responsibilities for each indicator.

It is important to point out that the relevance of the indicator framework, which provides an information-driven architecture to assist in policy-making, serves as a monitoring and signaling mechanism. “The optimal sustainability indicators are those that capture the essential characteristics of the system and show a scientifically verifiable trajectory of maintenance or improvement in system functions” (Moldan and Dahl 2012, 3) SGD indicators frame in this sense are useful to monitor the situation of each country in terms of each goal and target, and to plan and implement actions that take into account the strengths and weaknesses of the different national realities. (Aliamo & Maggino, 2020)

According to different authors, different attempts at international level are in practice. Decisions and actions are mostly focused on a single SDG, or small subsets of SDGs because institutions, government, and research funders are commonly fragmented or siloed, compromising research, innovation, policy, and management activities. (Aliamo & Maggino, 2020) In this sense, specific lens and methodological appraisals that can integrate goals and global and local realities in particular trade-offs, synergies and unintended consequences are required to put in place holistic approaches for integrated challenges. (Scharlemann, et al. 2020)

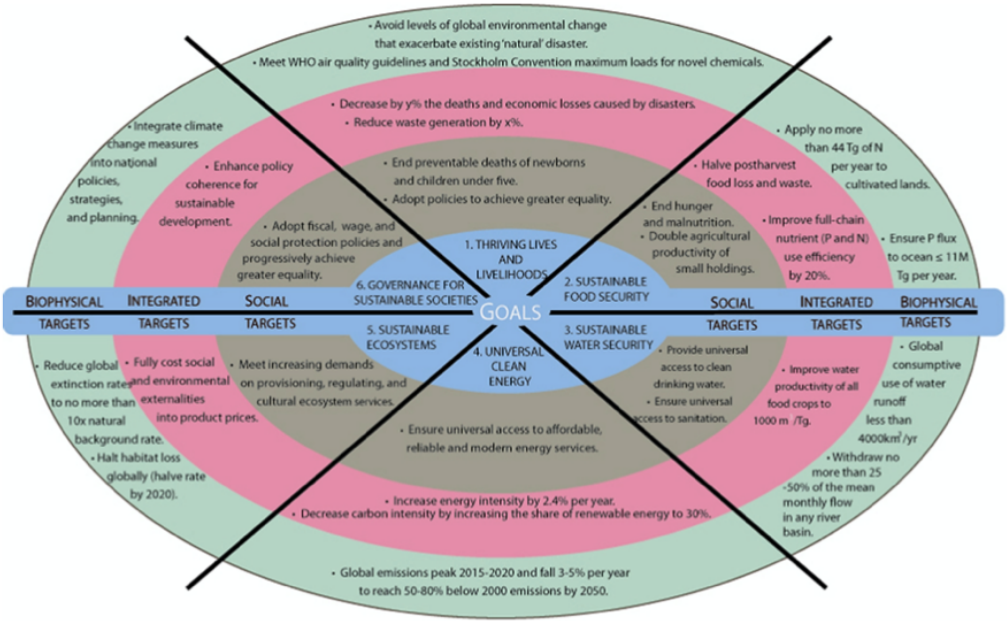
2.4 Assessments of interactions between SDGs

An analysis that is usually taken as the background of different conceptual systems of interaction between the SDGs is the one proposed by Griggs et al (2013) to facilitate a passage between the MDGs and the SDGs. (Scharlemann, et al. 2020)

In this sense, the authors warn that in the new era of the Anthrophocene the scale of humanity's impact on the planet, needs to be conceptualized considering the society sustained within Earth's life-support system which they represent in a concentric layers diagrams system and suggest a reframing of the Brundtland Commission's 1987 for sustainable development as: 'development that meets the needs of the present while safeguarding the Earth's life support system, on which the welfare of current and future generations depends'. Introducing the concepts of "life support systems" as main environmental priorities derived, in part, from the nine boundaries beyond which it would be unsafe to transgress without risking large-scale impacts (Rockström et al. 2009) and "Welfare" directly related with main socio-economical assets for human life.

Griggs et al (2014) advance in the integration proposal with 6 main goals including each biophysical only, socioeconomic only, and integrated targets as shown in figure 2.2 where underlying target interdependencies, trade-offs and synergies between two or more issues would expand desired outcomes.

Figure 2.2: Sustainable development goals. 6 main goals



Source: Griggs et al (2014)

Other relevant work was developed by Waage et al. (2015), which aimed to make a contribution through an interdisciplinary analytical review of the SDG process, in which experts in different SDG areas identified potential interactions through a series of interdisciplinary workshops, generating a framework that reveals potential conflicts and synergies between goals, and how their interactions might be governed.

In their framework, the 17 SDGs are represented in three concentric layers, reflecting their main intended outcomes (figure 2.3). The single health goal is in the inner layer of people-centered goals that aim to deliver individual and collective well-being through improved health and education, ensuring equitable distribution within and between individuals and countries. The well-being goals are supported by second-level goals that relate to the production, distribution, and delivery of goods and services including food, energy, clean water, and waste and sanitation services in cities and human settlements. They call these infrastructure goals, as they address essential functions of modern societies necessary to deliver the well-being goals and provide a platform for delivering the well-being goals. The figure's outer layer contains three natural environment goals which relate to the governance of natural resources and public goods in land, ocean, and air, including biodiversity and climate change. The biophysical systems that underpin sustainable development are all here. Although these systems are not dependent on human activities, human activities strongly influence them.

In the inner lay the wellbeing goals people-centered aim to deliver individual and collective wellbeing through improved access to health and education, with equitable distribution within and between individuals and countries it includes goals 1,3,4,5, 10 and 16.

The wellbeing goals are supported by second-level goals defined as Infrastructure which include essential functions of modern societies necessary to deliver the wellbeing goals and related to the production, distribution, and delivery of goods and services including food, energy, clean water, and waste and sanitation services in cities and human settlements from goals 2,6,7,8,9,11 and 12.

The figure's outer layer contains three natural environment goals which relate to the governance of natural resources and public goods in land, ocean, and air, including biodiversity and climate change, goals 13, 14 and 15.

Figure 2.3: **Framework for examining interactions between Sustainable Development Goals**

Font: Waage et al. (2015)

In this framework, according to the authors, the middle layer of infrastructure goals, represent a domain for global development goal setting with particularly strong effects on inner and outer levels.

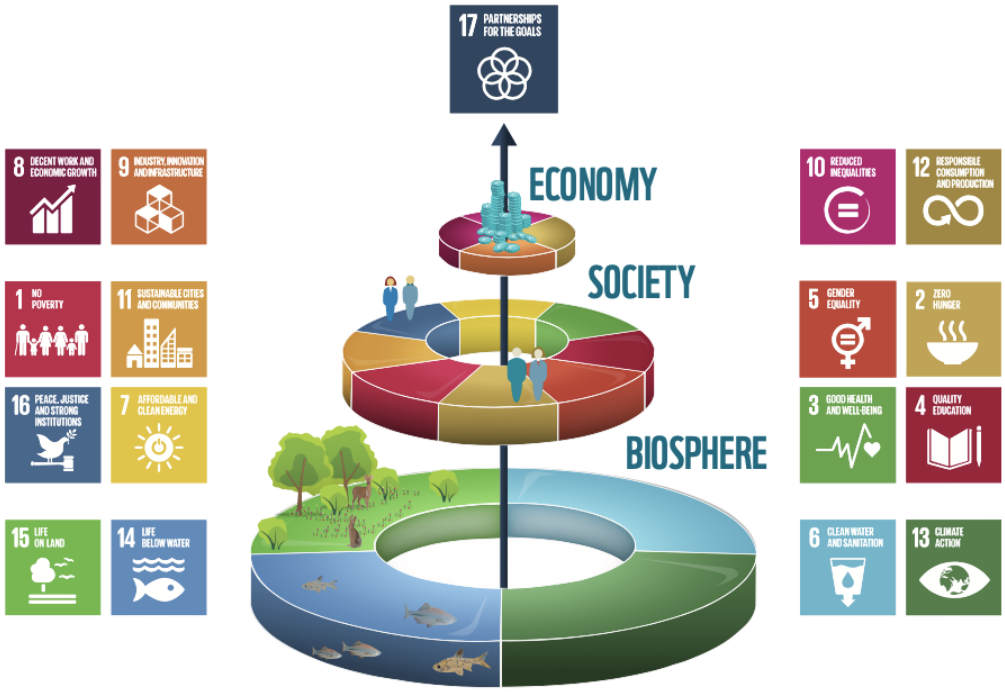
The potential combination of interests, accountability mechanisms, and transparency implemented at the infrastructure level are key elements for balancing natural environment and well-being goals, as will be seen in the present work these 3 elements suggested by authors will be approached from different lens and methodologies.

Another relevant assessment of goals interaction is Rockström and Sukhdev (2016) three- dimensional diagram of concentric layers (the "wedding cake")

model which is centered on how food can contribute directly and indirectly to the achievement of all 17 Goals established by the 2030 Agenda, consistent with the evolution of a sustainability model that goes from being anthropocentric to being eco-centric.

The illustration (Figure 3.3) identifies, at the base of the cake, that the biosphere dimension is what contains and supports any social and economic plan. Fassio, F., & Tecco, N. (2019) move away from sector approaches where social, economic, and ecological development are seen as separate parts.

Figure 2.3: Rockström and Sukhdev and Wedding Cake SDG model



Fonts: Azote Images for Stockolm Resilience Centre, 2016.

It is important to mention that their work asserting that SDGs connection to sustainable and healthy food is directly related with the further development of EAT-Lancet initiative for sustainable diets (Willet et al, 2019) that is taken into consideration in chapter 6.

2.5 Sustainable Development Goals in Argentina

The National Council for the Coordination of Social Policies (CNCPS) is responsible for coordinating and monitoring the Sustainable Development Goals in Argentina. To this end, it coordinates with the national Ministries and agencies the process of adapting the SDGs for their effective implementation and monitoring.

The institutionalized sphere is the National Inter-institutional Committee for the Implementation and monitoring of the SDG, which, coordinated by the CNCPS, has established itself as a cross-cutting body to build consensus and produce inputs for the implementation and follow-up within the umbrella of the Executive Power.

Since 2020, the Committee has endeavored to align 169 SDG goals with the political priorities of the current Government.

This task concluded in a new implementation and monitoring framework composed of the 17 SDGs, 121 prioritized goals and indicators for monitoring progress, public policies aimed at achieving them, and the budgetary resources necessary for the programmatic efforts. (CNPCPS, 2021)

In this study only Goal 2 will be analyzed in depth: “End hunger, achieve food security and improved nutrition, and promote sustainable agriculture”. Although this goal will also be dealt with in future chapters, priority is given at this stage to the understanding of the sector approach in the Argentine case.

A thorough analysis on the implementation of priorities, as well as on the alignment or shifting of the indicators, was carried out in the first instance. Secondly, the interventions and measurements of the results involved were briefly analyzed.

2.6 Argentina's Adaptation of SDG 2 "End hunger, achieve food security and improved nutrition and promote sustainable agriculture"

The adaptation of the SDGs at the national and regional levels fulfills the mission of adapting the objectives agreed at the international level to local realities. In this process of adaptation, however, there is the risk that the different political and productive positions, represented by the hegemonic power, may distort the intentions and give relief to their own interests over those concerning sustainability.

The process carried out by the National Inter-Institutional Committee was analyzed into detail in order to understand the implementation and monitoring of the Sustainable Development Goals. A comparative table of both systems was designed to identify the points that have been kept, changed, or left aside from the set of priorities, at both levels of specific targets and indicators. Secondly, main interventions implemented at Public National level according to the specific targets and its relation with the indicators selected were identified.

As can be seen in table 2.1, there are differences both at the level of specific targets and indicators.

Point 2.1 in particular shows that although the specific target is the same, in terms of indicators, prevalence of food insecurity is not considered at all. Besides, prevalence of stunting is only included in under 5 years old, whereas in the UN it is included on the next target 2.2

In point 2.3 the specific target of the Argentine version adds a relevant national sector that is agro-industrial, and the concept of ecosystems are changed into agro-ecosystems. Representative changes are visualized at the level of indicators where the attention to small holders, women and indigenous communities is changed for added value with respect to the total production of the food and beverage sector, and per capita consumption of animal protein. It keeps, in terms of small holders, only one indicator referred to the number of operating family farms.

Point 2.4 of the Argentine version aims at ensuring sustainable food production not through resilient practices, but through “good agricultural practices”. This last concept is mainly used at conventional level to describe a certain level of chemical inputs use identified through technical assistance recommendations directly related to the “Technological package” that will be discussed into further detail in the following chapters.

The most important indicator concerning the proportion of agricultural area under productive, sustainable agriculture in the Argentine version is changed into the number of meteorological stations installed for the registration and achievement of agro-climate variables.

In point 2.5, the Argentine version includes and details the application of scientific and technological knowledge to the use of genetic resources that later account for the indicator differences. Instead of genetic resources for food and agriculture secured in either medium - or long-term conservation facilities, the appraisal is clearly different since it highlights the new developments including entries/accessions documented in the Germplasm Banks, phylogenetic creations registered in the National Registry of Cultivars, and finally the number of genetically modified organism (GMO) events approved.

Finally, in terms of market oriented measures, the point 2a focuses on the increase of investment in the least developed countries, which indirectly can include the redistribution from two indicators: The agriculture orientation index for government expenditures and total official flows (official development assistance plus other official flows) to the agriculture sector are not included.

For the last two: 2b and 2c specific target descriptions are the same, and in terms of indicators, the most remarkable difference is between 2c indicators where instead of considering general price anomalies in the food sector, Argentine indicators refer only to the ratio of domestic soybean, maize and wheat market price and FAS: Free Alongside Ship.

Table 2.1: Goal 2 targets, indicators and responsible body according to the UN and Argentine Authorities.

Goal 2. End hunger, achieve food security and improved nutrition, and promote sustainable agriculture					
United Nations			**Argentina**		
Specific Targets	**Indicators**	**Responsible body:**	**Specific Goals**	**Indicators**	**Responsible body:**
2.1 By 2030, end hunger and ensure access by all people, in particular the poor and people in vulnerable situations, including infants, to safe, nutritious and sufficient food all year round	2.1.1 Prevalence of undernourishment	FAO	2.1 Same as UN	2.1 Prevalence of stunting (low height for age) in the child population under 5 years of age with exclusive public coverage (in percentage)	Ministry of Social Development
	2.1.2 Prevalence of moderate or severe food insecurity in the population, based on the Food Insecurity Experience Scale (FIES)	FAO			
2.2 By 2030, end all forms of malnutrition, including achieving, by 2025, the internationally agreed targets on stunting and wasting in children under 5 years of age, and address the nutritional needs of adolescent girls, pregnant and lactating women and older persons	2.2.1 Prevalence of stunting (height for age <-2 standard deviation from the median of the World Health Organization (WHO) Child Growth Standards) among children under 5 years of age	UNICEF WHO	2.2 Same as UN	2.2.1 Prevalence of wasting (low weight for height) in the child population under 5 years of age with exclusive public coverage (in percentage).	Ministry of Health
	2.2.2 Prevalence of malnutrition (weight for height >+2 or <-2 standard deviation from the median of the WHO Child Growth Standards) among children under 5 years of age, by type (wasting and overweight)	UNICEF WHO		2.2.2 Prevalence of overweight and obesity (high BMI/E) in the population of children under 5 years of age with exclusive public coverage (in percentage).	
	2.2.3 Prevalence of anemia in women aged 15 to 49 years, by pregnancy status (percentage)	WHO		Not included	
2.3 By 2030, double the agricultural productivity and incomes of small-scale food producers, in particular women, indigenous peoples, family farmers, pastoralists and fishers, including through secure and equal access to land, other productive resources and inputs, knowledge, financial services, markets and opportunities for value addition and non-farm employment	2.3.1 Volume of production per labour unit by classes of farming/pastoral/forestry enterprise size	FAO	2.3 By 2030, increase the productive potential with added value through balanced and sustainable agro-industrial development that achieves a diversified exportable supply, protects food security and supports small and medium-sized producers and rural workers by increasing their income and improving their quality of life favoring rooting.	2.3.1 Percentage of added value with respect to the total production of the food and beverage sector	Ministry of Agriculture, Livestock and Fisheries
	2.3.2 Average income of small-scale food producers, by sex and indigenous status			2.3.2.1 Per capita consumption of animal protein (beef + pork + avian) (in kg/cap/year). 2.3.2.2 Number of family farms in operation	
2.4 By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding	2.4.1 Proportion of agricultural area under productive and sustainable agriculture	FAO	2.4 By 2030, ensure sustainable food production systems through good agricultural practices that increase productivity and production, that strengthen capacity for adaptation to climate change and variability, reduce agricultural risk and progressively improve the quality of agroecosystems.	2.4.1 Number of meteorological stations installed for the registration and archiving of agroclimatic variables.	Ministry of Agriculture, Livestock and Fisheries

and other disasters and that progressively improve land and soil quality					
2.5 By 2020, maintain the genetic diversity of seeds, cultivated plants and farmed and domesticated animals and their related wild species, including through soundly managed and diversified seed and plant banks at the national, regional and international levels, and promote access to and fair and equitable sharing of benefits arising from the utilization of genetic resources and associated traditional knowledge, as internationally agreed	2.5.1 Number of (a) plant and (b) animal genetic resources for food and agriculture secured in either medium- or long-term conservation facilities	FAO	2.5 By 2030, maintain the genetic diversity of seeds, cultivated plants and farmed and domesticated animals and their associated wild species, through soundly managed and diversified seed and plant banks at the national, regional and international levels, and promote access to the benefits derived from the use of genetic resources, including through the application of scientific and technological knowledge, and fair and equitable sharing of benefits arising from the utilization of genetic resources and associated traditional knowledge, as internationally agreed	2.5.1.1 Number of entries/accessions documented in the Germplasm Banks. 2.5.1.2 Number of phytogenetic creations inscriptions in the National Registry of Cultivars. 2.5.1.3 Number genetically modified organism (GMO) events approved.	Ministry of Agriculture, Livestock and Fisheries
	2.5.2 Proportion of local breeds classified as being at risk of extinction			No Included	
2.a Increase investment, including through enhanced international cooperation, in rural infrastructure, agricultural research and extension services, technology development and plant and livestock gene banks in order to enhance agricultural productive capacity in developing countries, in particular least developed countries	2.a.1 The agriculture orientation index for government expenditures	FAO	Not Included	Not Included	Ministry of Agriculture, Livestock and Fisheries
	2.a.2 Total official flows (official development assistance plus other official flows) to the agriculture sector	OECD		Not Included	
2.b Correct and prevent trade restrictions and distortions in world agricultural markets, including through the parallel elimination of all forms of agricultural export subsidies and all export measures with equivalent effect, in accordance with the mandate of the Doha Development Round	2.b.1 Agricultural export subsidies	WTO	Same as UN	2.b.1 Average tariff of the main agricultural products (in % of the value exported).	Ministry of Agriculture, Livestock and Fisheries
2.c Adopt measures to ensure the proper functioning of food commodity markets and their derivatives and facilitate timely access to market information, including on food reserves, in order to help limit extreme food price volatility	2.c.1 Indicator of food price anomalies	FAO	Same as UN	2.c.1.1 Ratio of domestic soybean market price and FAS: Free Alongside Ship one. 2.c.1.2 Ratio of domestic maize market price and FAS: Free Alongside Ship one 2.c.1.3 Ratio of domestic wheat market price and FAS: Free Alongside Ship one	Ministry of Agriculture, Livestock and Fisheries

Fonts: Own elaboration from UN (2020) and CNPCPS (2021) sources.

2.7 Interventions oriented to goals and the relationship with indicators

As see before, the SDGs serve to guide actions from public spaces, which in terms of the Waage scheme (2015), previously introduced, are found in the intermediate ring, that is, in the structural actions that can affect both the inner and outer ones, meaning the quality of life and the environmental sustainability and the natural resources.

Below, we will see what main actions were taken in terms of public policies specifically based on goal 2 according to the "Argentina Country Report 2021: Tracking progress towards the 17 SDG targets" (CNCS, 2021)

Regarding Target 2.1: By 2030, end hunger and ensure access by all people, in particular the poor and people in vulnerable situations, including infants, to safe, nutritious and sufficient food all year round.

Different actions were implemented, mostly palliative, such as the Food Card within the framework of Argentina's Plan Against Hunger, which objective is to implement a system that complements the household income for the purchase of food, prioritizing fathers and/or mothers with children up to 14 years old, pregnant women from 3 months and people with disabilities who are in a situation of social vulnerability. This can be considered the most relevant action taken by the Government. It reached an estimated total of 3,885,067 beneficiaries until June 2021.

Other examples in this line are those referring to direct support to canteens in schools where the aim is to improve the vital services in schools by financing a reinforcement of the diet in schools attended by children who are in a situation of socio-educational risk. The reinforcement include higher quality portions, with better and greater amounts of protein, fiber, minerals such as iron and calcium, more milk or yogurt and the incorporation of fruits in breakfasts, reinforced snacks and meat, cheese and fruit at lunch and/or dinner.

Community Canteens are also supported on a monthly basis with technical and financial assistance as well as community organizations that provide regular food services to families in situations of extreme poverty.

The Prohuerta Program is at a more strictly structural level. It works in connection to the support for self and small-scale food production, which is implemented together with the National Institute of Agricultural Technology (INTA), and promotes agroecological production practices for food education, the promotion of fairs and alternative markets with an inclusive view of producer families. The general proposal focuses on the provision of training, technical assistance and the delivery of inputs and farm animals to promote poultry self-production in order to improve the nutritional status of the people involved.

Regarding Target 2.2: By 2030, end all forms of malnutrition, including achieving, by 2025, the internationally agreed targets on stunting and wasting in children under 5 years of age, and address the nutritional needs of adolescent girls, pregnant and lactating women and older persons.

The SUMAR Program was implemented by the Ministry of Health with the mission to register the nutritional deficiencies in children and adolescents from the actions of Primary Health Care, and the activities of promotion and protection of health and preventive medicine that until December 2020, had reached 1,518,279 children from 0 to 9 years of age, and offered to 799,365 adolescents basic health services.

2.3: By 2030, increase the productive potential with added value through balanced and sustainable agro-industrial development that achieves a diversified exportable supply, protects food security and supports small and medium-sized producers and rural workers by increasing their income and improving their quality of life favoring rooting.

At this point, in terms of policies, the programs included the exclusive support to the processes of the most unprotected groups, which are 3:

The comprehensive plan for women in Family, Peasant and Indigenous Farming “In our hands”. The objective is to improve the conditions of value-added production and commercialization for women, indigenous communities, family farming and artisan fishing; the National Program for Work, Roots and Local Supply (Protaal) objective of which is to generate new genuine jobs, strengthen rural roots and increase the proportion of the local supply of products from family farming initiatives; and finally the aforementioned Prohuerta program, which also has an impact on this specific target.

2.4 By 2030, Ensure sustainable food production systems through good agricultural practices that increase productivity and production, that strengthen capacity for adaptation to climate change and variability, reduce agricultural risk and progressively improve the quality of agroecosystems.

Here, as seen earlier, Argentina relates this specific target mainly to the National System for the Prevention and Mitigation of Emergencies and Agricultural Disasters. Its objective is to prevent and mitigate the damage caused by climate, and biological factors.

And as seen, the contested "Good Practices" in the use of phytosanitary products in agriculture, subject to adequate control and monitoring systems, especially in buffer zones adjacent to sensitive areas, that is, inhabited areas.

Finally, integrated risk management in the rural agro-industrial system (GIRSAR) whose objective is to strengthen the resilience of the agro-industrial system by reducing the vulnerability and exposure of producers to climate and market risks, especially among the most vulnerable actors.

2.5 By 2030, maintain the genetic diversity of seeds, cultivated plants and farmed and domesticated animals and their associated wild species, through soundly managed and diversified seed and plant banks at the national, regional and international levels, and promote access to the benefits derived from the use of genetic resources, including through the application of scientific and technological knowledge, and fair and equitable sharing of benefits arising from

the utilization of genetic resources and associated traditional knowledge, as internationally agreed.

For this goal, the following interventions are highlighted: Program for the control of the production of reproductive material of native species of the National Seed Institute (INASE), which contemplates the survey of the needs of vegetative material of this group of species and seeks to provide a tool of federal scope for the control of its production in order to promote the sustainable use of native materials.

INTA Genetic Resources Network. Its objectives are to manage and preserve genetic resources in order to contribute to food security and sovereignty, promoting the integration of institutions, organizations, communities and other actors for the consolidation of a national system of genetic resources.

2b: Correct and prevent trade restrictions and distortions in world agricultural markets, including through the parallel elimination of all forms of agricultural export subsidies and all export measures with equivalent effect, in accordance with the mandate of the Doha Development Round

At this point, there is a central historical economic element of Argentine development that needs to be underlined, and has to do with the sector redistribution of income. As we have seen, the agricultural sector is the country's main exporter, and has historically been taxed more than supported, contrary to what happens in different countries such as the European Union. Decree No. 1060/2020, regulates new rates of export duties on certain agricultural products withholding tax levied on exported goods based on the current international price. In theory, it seeks the short-term effect of reducing the domestic price of foods, increasing domestic demand and increasing tax collection. On the side of the distributive effects, the withholding plays in favor of the sector of domestic consumers who are favored by the decrease in domestic prices. Also, the State benefits from the higher collection it obtains. The fundamentals behind its

implementation include the use of the improvement in the terms of trade, the stabilization of prices and export earnings, the control of inflationary pressure, the protection of nascent industries, the increase in tax collection, regulation of extraordinary profits and improvement in income distribution.

2c: Adopt measures to ensure the proper functioning of food commodity markets and their derivatives and facilitate timely access to market information, including on food reserves, in order to help limit extreme food price volatility

For this goal, the following interventions are highlighted:

The first and most important one has to do with the purpose of containing the prices that in the last 3 years have seen a growing inflationary process. These are: the “Precios Cuidados” Program (a price control program) which is a government program based on an agreement with the business sector, to offer supermarket products at convenient prices throughout the country. It is linked to "essential prices", which sets some products of the basic basket at a fixed price for a period of 6 months (“essential prices” is part of the “precios cuidados” program). This will be thoroughly dealt with in chapter 6.

On the other hand, there is a program that seeks to structurally favor the sectors of the Social and Popular Economy through the Solidarity Markets Program. Created by the Res. No. 739/18 of the Ministry of Social Economy. Its objective is to identify, make visible and strengthen permanent marketing spaces for products and/or services of productive units, managed by government agencies or NGOs or non-profit organizations. It has the following objectives: to promote the development of capacities, mechanisms and specific marketing opportunities; to generate strategies to increase the marketing channels, to promote the generation of commercial exchange spaces that consolidate commercialization chains, and to strengthen the development of their specific markets.

As a brief discussion, it can be shared that most of the programs introduced above are disconnected from the identified indicators, demonstrating a significant disconnection with the monitoring of public institutional works. Whether for

circumstantial reasons or for political choices, most of them are centered on welfare and/or protection components while few have components toward “sustainable development interventions” to address structural conditions.

These disconnections are greater in several levels and are spread to the rest of the dimensions.

Despite the limitation posed by focusing exclusively on one SDG, as we have said, this analysis seeks to serve as an image and reflection of the processes developed in the country around the SDGs, issue that will be treated with a systemic, holistic approach in the following chapters of this work.

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Chapter 3: Organic Agriculture and Agroecology at the International and Argentine levels

3.1 The Origins of Agroecology and Organic agriculture at Global level

Agroecology was firstly mentioned in the 1930s (Wezel and Soldat 2009). It was described as a scientific application of ecological principles to agriculture, its history varies from country to country but certainly, its development was very strong from 1980's in Latin America enforced by its deep, rooted agrarian culture (Glissman 2017). The most common definition of agroecology at this time was the application of ecological concepts and principles to the design and management of sustainable agroecosystems, or the science of sustainable agriculture (Altieri 1995; Gliessman 1990, 2013) which mainly emerged as a form of resistance to an evolving "green revolution" characterized by an industrialization process of production simplification through monoculture , process that involved the increasing corporate control and dominance of the hole food system. (Wezel, Bellon 2018)

The concept of agroecology has evolved through the years and inspired an increasing number of people and institutions worldwide. It was perceived quite differently by different actors (Hilbeck et al. 2015; Calame, 2016) but there is the extensively shared agreement that the term incorporates a threefold dimension: it starts as a scientific discipline, it has also evolved into a set of agricultural practices, and finally as a movement that relies on social justice, food sovereignty and the preservation of cultural identities (Migliorini & Wezel, 2017; Wezel et al., 2018)

The Association of Agroecology Europe outlines agroecology as follows: "Agroecology is considered jointly as a science, a practice and a social movement. It encompasses the whole food system from the soil to the organization of human societies. It is value-lead and based on core principles. As a science, it gives priority to action research, holistic and participatory approaches, and transdisciplinary including different knowledge systems. As a practice, it is based on the sustainable use of local renewable resources, local

farmers' knowledge and priorities, wise use of biodiversity to provide ecosystem services and resilience, and solutions that provide multiple benefits (environmental, economic, social) from local to global. As a movement, it defends smallholders and family farming, farmers and rural communities, food sovereignty, local and short marketing chains, diversity of indigenous seeds and breeds, healthy and quality food." (Agroecology Europe, 2016)

Organic farming is largely rooted in agroecological approaches, both in vision, principles and actual practices, (Arbenz, 2018; Niggli, 2015) it shares with agroecology the beginnings of a "movement" with strong vision of social reform to the growing industrial agriculture.

Pioneer organic farmers gathered worldwide in different local and national organizations advocating practices of soil fertility, nutrient cycling involving livestock and compost, food quality and health, avoiding the use of artificial fertilizers and synthetic pesticides. (Herren et al. 2015). In 1972, the different national movements (mainly from EU and United States) conformed IFOAM the International Federation of Organic Movements.

The French Nature et Progres Association's invitation letter to its foundational congress, its roots can clearly be seen: "At the time when industrial expansion is questioned and notions of "Quality" and "Survival" are raised, it seems necessary to me that organic agriculture movements make themselves known and coordinate their actions".

Over the following decades, production and processing standards were developed and official certification schemes in great detail were introduced since the 80's around the world.

The EU Council Regulation (EC 2007) No 834/2007 on organic production and labeling of organic products define Organic Agriculture (art 1) as following: "Organic production is an overall system of farm management and food production that combines best environmental practices, high levels of biodiversity, the preservation of natural resources, the application of high animal welfare standards and a production method in line with the preference of certain

consumers for products produced using natural substances and processes. The organic production method thus plays a dual societal role, where on the one hand it responds to a specific market's consumer demand for organic products, and on the other hand, it delivers public goods contributing to the protection of the environment and animal welfare, as well as to rural development."

3.2 Organic and Agroecological Practices

Both Organic Farming and Agroecology share a common vision that favors ecologically based practices at the production level.

Most organic and agroecology practices proposed in crop production are similar and include processes of soil tillage, soil fertilization, crop and cultivar choice, including the preference for locally adapted seeds in order to foster pest and disease tolerance and resistance, crop rotation, and different pest, disease and weed management techniques. Differences can arise when using potential outsourced products in terms of origin, sources, and quantities used for soil fertilization and pest, disease, and weed management. (Migliorini & Wezel, 2017, 2017).

In terms of soil management, both base their practices on the maintenance of soil fertility; using as minimal tillage as possible and cover cropping against soil erosion protection, and preventing soil compaction. In Organic and in some Agroecological practices depending on the areas, a strong focus is posed on quantity of nitrogen from animal origin, like in the Pampas Region case study discussed in chapter 5.

In animal production, only practices proposed that are similar for organic and agroecology are based on the integration of cropping and animal systems and breed choice.

Meanwhile in Organic practices for animal management, including fishery, prevention methods for animal health, animal housing, animal welfare, animal nutrition, and veterinary management are structurally defined in agroecology this

practices even if there are some commonalities with the organic proceedings there are not yet defined nor commonly agreed across actors.

A similar thing is related to food processing. The organic process include regulations on additives, ingredients and substances used for food or feed, and its specific practices of processing shall respect the principles of good manufacturing practice. Moreover, traceability with a clear identification of organic ingredients has to be guaranteed. Regarding agroecology, so far there is no clear consensus at the processing level.

3.3 Certification and Labeling

Organic certification systems has rapidly gained the trust of consumers and policy makers in the last 40 years in terms of worldwide organic institutionalized standards, land certified and global markets.

In 2019, 84 countries accounted for organic standards and 17 countries were in the process of drafting legislation. The area of certified organic land arises to 71.5 million hectares and Global market has reached more than 95 billion euros (FIBL, 2020)

Different farmer organizations, institutions and scholars started drawing attention on how this system was falling behind at the practical level. The principles that motivated and pushed forward the development of organic agriculture movement where its fixed criteria ¨in or out" discourage the application of continuous improvement processes, in terms of sustainable practices and designs (Lamine, C.; Bellon 2009; Calle a. Et al 2013; Cuellar-Padilla, Ganuza-Fernandez 2018) favoring its "conventionalization", from actors who solely fulfill the legal requirements substituting inputs (Darnhofer et al., 2010; Herren et al., 2015)

In this respect, in September 2005 IFOAM the General Assembly passed a motion to establish a succinct Definition of Organic Agriculture, reflecting the four Principles of Organic Agriculture health, ecology, fairness and care redefining organic agriculture in this way:

Organic Agriculture is a production system that sustains the health of soils, ecosystems and people. It relies on ecological processes, biodiversity and cycles adapted to local conditions, rather than on the use of inputs with adverse effects. Organic Agriculture combines tradition, innovation and science to benefit the shared environment and promote fair relationships and a good quality of life for all involved."

It is important to emphasize that a year before this announcement, that is, in 2004, an event marked the birth of the nascent Participatory Guarantee Systems (PGS) community, which took place at the “First International Workshop on Alternative Certification”, co-organized by IFOAM - Organics International and the Agroecological Movement of Latin America and the Caribbean (MAELA) in Torres Brazil.

PGS were inspired by the first-party organic certification systems that were common in the 1970s and 1980s in different countries, particularly in Europe (Fonseca et al, 2004) before the advent of policy-based regulations and are defined as “locally focused quality assurance systems that certify producers based on the active participation of stakeholders and are built on a foundation of trust, social networks, and knowledge exchange” (IFOAM 2008)

Meirelles (2007) identifies on of the organizers of the 2004 International workshop, a set of common basic principles that identifies different experiences of PGS, which are:

- Shared vision. Both farmers and consumers who are part of the system must understand the principles of managing them in a common way.
- Participation. It seeks to encourage all stakeholders who have an interest in the products to get involved in the system.
- Transparency. The actors of the system must have the greatest amount of information at their disposal regarding its development.
- Confidence. Considered as a fundamental principle to ensure the functioning of participatory guarantee systems. Since the actors must

believe in the veracity of what is certified in the system to extend their involvement in it.

- Pedagogical process. It consists of training producers and strengthening their ties to enable their joint action to develop in the long term.
- Horizontality. There are no hierarchies of control, since all the agents of the system intervene in the same way in what is verified as organic agriculture.

PGS single operations are based on different types of rules, which may refer to compliance with the regulations where the system takes place responding to standards on organic agriculture carried out by international organizations, or they can be developed by and for the system itself (Boza Martínez, 2013).

In 2021, 242 PGS initiatives were active in 78 countries, involving 1,244,239 producers with an estimated 915,997 hectares of land. (Willer et al, 2021)

In countries like Brazil they are considered as a complement to third part certification taking part on the National Regulations and is recognized for local markets as organic at the same level of the third part one. In others like the European Union they are not recognized but implemented including alternatives that push forward the floor of third part certification, as the Italians Humus Association and the Parma District of Solidarity Economy (DES) (Guareschi et al, 2020). Other movements experiences reject third part certification and put it in a political disruptive field of contrasts (Cuellar-Padilla, Ganuza-Fernandez 2018).

Considering above concerns about organic “conventionalization” IFAOM launched its strategy for Organic 3.0 (IFOAM, 2017; Rahmann, 2017) which centered it campaign promoting the diversity that lies at the heart of organic and recognizing there is no ‘one-size-fits -all’ approach. And it include six main features: a culture of innovation, continuous improvement toward best practice, diverse ways to ensure transparency and integrity, inclusiveness of wider sustainability interests, empowerment from the farm to the final consumer and true value and cost accounting.

3.4 Evidence from Organic and Agroecological Practices

According to Badgeley (2007) Organic agriculture methods have the potential to contribute quite substantially to the global food supply and, based on researched models, could produce enough food on a global per capita basis to sustain the current human population, and potentially an even larger population, reducing the detrimental environmental impacts of conventional agriculture without increasing the agricultural land base.

Although until now different researches show that the worldwide average yield gap between organic and conventional agriculture is estimated to be between 20 and 30% with high standard deviations (±21%) (Seufert et al. 2012; Niggli 2014; Van Grinsven et al. 2015), a shift away reducing global intakes from animal products towards plant-based diets and a reduction in food waste, that currently reaches 35% along the food supply chain, and another 17–25% at the consumer level would reduce the overall requirements of the food system. (Willet et al, 2019).

Complementing this picture, Holt-Giménez et al. (2012) argue that current worldwide food production is already sufficient to feed ten billion people and that hunger and malnutrition are caused by poverty and inequality rather than a lack of production.

Empirical evidence in terms of sustainability distinctive elements in organic and agroecology already exists in various fields of knowledge such as farm viability, income and productivity (Aubron et al., 2016; D'Annolfo et al., 2017; van der Ploeg et al., 2019), crop protection mobilizing trophic networks and biodiversity (Niggli et al, 2016; Hole et al., 2005; Rahmann, 2011 and Tuck et al.,2014), carbon cycle and climate change (Munroe et al., 2012), ecosystem services (Palomo-Campesino et al., 2018), food security and nutrition (Reganold and Wachter, 2016; Kerr et al., 2021), among others.

Agroecology has gained prominence in scientific, agricultural and political discourses in recent years (Wezel et al.,2018, De Molina et al 2019). Since the 2008 world food crisis, various United Nations bodies have published important

documents recognizing their role to making agriculture and food systems more sustainable and confirming the notion that the agroecological approach offers consistent responses to the current accentuation, global spread and mutual interweaving of food, energy, ecological, economic, social, and climate crises (IAASTD, 2009; De Schutter, 2011; HLPE, 2019; UNCTAD, 2013, FAO 2018; IPCC,2019).

Empirical evidence gathered in different regions of the world (Brescia, 2017;Sarandon & Flores, 2014; Biovision, 2018; Food-IPES, 2018; Mier et al., 2018) also show that agroecological experiences are giving rise to non-linear and non-top-down change aimed at an abrupt transformation of the dominant regime, but on the contrary, agroecological experiences are giving rise to complex processes that are adjusted to local socio-ecological and historical specificity towards concrete contributions to many of the 17 SDGs, particularly 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. (Reganold, et al 2016; Seufert & Ramankutty, 2017).

In this process of growing global interest in Organic and Agroecological systems that can favor a necessary change towards more sustainable, inclusive food systems, different countries are implementing different collective actions for transition paths from their own historical paths and their realities.

Moreover, the processes developed in Argentina from its origins to the present day will be addressed in detail and will serve to better place the case studies that will be developed in the second part of this work.

3.5 Origins of Organic Agriculture and Agroecology in Argentina

The origin of organic and agroecological agriculture in Argentina, as it happened in most countries, has its roots in different experiences of environmental movements. The "ecological" movement in Argentina was nurtured in the late

'70s and early '80s with the contributions of pioneer producers, biological and ecological farmers, as well as doctors, nurses, educators, municipal officials, producers, journalists, and pacifits from different fields that began to question the agricultural production process that the country was going through in terms of concepts and practices associated to the "green revolution" that was making its first steps.

In this period, organic agriculture and agroecology overlapped in different aspects (Sarandón, 2015), participating in the same spaces and with the same objective to propose sustainable agriculture at the environmental, social, and economic levels.

The first National Meeting of Environmental Organizations was held in December 1983, with the participation of 30 groups from all over the country, despite the annulment of the prevailing constitutional guarantees in those last moments of the military dictatorship that was ruling the country. They finalized an extensive environmental document advocating for an agriculture free from the massive use of pesticides, herbicides, and fertilizers that led to the exhaustion of fertile soils, the economic ruin of entire regions, and the forced migration of the system, demanding a specific law for the use of agrochemicals and the encouragement of a new concept of agricultural uses based on organic fertilizers and bio-environmental control of pests. (Pais, 2002)

Shortly after this event in 1985, Cenecos (Center for Studies of Organic Crops) was created, becoming the first national institution to focus on organic production. (Souza Casadinho, 2014)

From Agroecology, a founding milestone that emerged in Latin America, with strong implications in Argentina, was the Latin American Consortium for Agroecology and Development (CLADES) in 1989, where 12 NGOs from 9 countries, including the Argentine Institute for Social Development and Human Promotion (INDES) and the Center for Studies in Appropriate Technologies (CETAAR).

Based on ecological principles, the consortium was set up to support the improvement of the technical capacities of small farmers. It implemented distance learning with courses that reached hundreds of people. It published more than 14 issues of the Agroecology and Development magazine that was widely distributed in the region (at a time when the internet did not yet exist). At the same time, it delivered training courses addressed to University lecturers in the region. It facilitated the starting point for fields of study, specializations, and research that flourished in the following years in different countries supported by the active participation of leaders who even today play a very active role in agroecological research and teaching (for example, Marta Astier and Julio Sánchez in Mexico, Santiago Sarandón in Argentina, Inés Gazzano in Uruguay, Gloria Guzmán in Spain, Darío Vélez in Colombia, Saray Siura in Peru, Aliro Contreras and Jaime Rodríguez in Chile (Altieri, 2015).

Still, in 1989, the Center for Studies of Appropriate Technologies in Argentina (CETAAR) launched a project for the dissemination and training in Agroecology. The objective was to investigate and promote the adoption of non-aggressive management practices for the environment, with a view to encouraging the participation of producers, as well as to alert about the dangers related to the management practices promoted by the green revolution.

Following the lines of CLADES, a demonstration center was created, dissemination materials were published, producers were supported, and workshops and seminars were held (Souza Casadinho 2002).

In the same year, in Latin America, the continental movement MAELA (Latin American Agroecological Movement) emerged. It was formally constituted in 1992, understanding Agroecology as "a system of principles, actions, and knowledge in the political, social, cultural and productive fields which starts from peasant and indigenous knowledge in the territory and the communities generating transformations in agri-food systems and guaranteeing the food sovereignty of the peoples” (Sarandon, J. S., & Marasas, M. E., 2015).

The structure is made up of the National coordinators of each country that is part of the Regional Political Council. Within it, there are the various NGOs of indigenous communities, peasant organizations, family farmers, consumers, organizations, and networks.

In Argentina, it is made up of more than twenty organizations from various provinces, regions, and ecosystems of the country, including The Institute of Popular Culture, (INCUPO), a not-for-profit organization with over 40 years of presence in Northern Argentina (Provinces of Chaco, Corrientes, Formosa, Santa Fe and Santiago del Estero). INCUPO works in popular education with peasant communities and indigenous peoples to improve their living conditions from the perspective of good living, BePe (Blessed are the Poor) and AcampA (Peasant Association of Catamarca Province), the Peasant Movement of Santiago del Estero (MOCASE), The Chaco Argentina Agroforestry Network (REDAF), and the Organic Agriculture Network of Misiones (RAOM).

In direct relation to the policies addressing food security from a public perspective, it is worth highlighting the inception of the "Pro-Huerta" program in the 1990s. It was launched with the participation and financial support of the Ministry of Social Development and the Secretariat of Agriculture, Livestock, Fisheries, and Food. It aimed at the self-production of food in the poorest sectors, mainly urban, throughout the country (Cittadini, 2014). Since its inception, the program addressed families and producer organizations in a situation of social vulnerability. It promoted a production strategy based on respect for natural resources and biological and cultural diversity. This approach, as Cittadini explains, was already based on the principles of Agroecology and Organic production, although in the early stages, INTA and its specialists did not present it this way. “Pro Huerta” experiences have been Internationalized through different cooperation activities and valued in different international events such as the First Forum on Organic Agriculture and Food Safety held in Rome in 2007.

Through this program, a network of 9,000 promoters was created, now publicly defined with an agroecological base, stimulating the development of family and community small farms and hundreds of fairs throughout the country through

strategic alliances with other local institutions of the civil society. The year 2020 marked 30 years of history of the program that reached 4 million participants in nearly 640,000 orchards.

3.6 Promotion of the National Law on Organic Production

In 1992, motivated by the growth of the sector both nationally and internationally, the Secretary of Agriculture, Livestock and Fisheries (SAGPyA) called up different actors from the organic sector to work on the design of the regulations for the sector based on delegating quality control to private organizations or companies supervised by the National authorities, in the same framework developed by the European Union. The elaboration of the Argentine System for the Control of Organic Vegetable Production was entrusted to the Argentine Institute of Plant Health and Quality (IASCAV) and that of Animal Production to the National Animal Health Service (SENASA). In both cases, the regulation was carried out in consultation through the formation of advisory committees with the participation of representatives of primary production, internal and external market traders, certifiers, consumers, education and NGOs, public institutions, and research organizations.

Thus, in 1992 the standards for organic plant production and in 1994 the standards for organic animal were concluded and implemented at the National level (Mateos and Ghezan, 2010). By mid-1992, Argentina submitted a request to the European Committee to be included on the list of equivalence of third countries under the provisions of Regulation No. 2092/91 of the Council of the EC. By the end of 1992, Argentina was included on a provisional list, and in 1996 it achieved its official inclusion.

In 1995, the Argentine Movement for Organic Production (MAPO) was founded to bring together representatives of the organic movement, environmentalists, certifiers, consumers, independent professionals, and scientists. Its objectives are stated in article 2 of the organization's letter of incorporation:

1) To promote the production and marketing of organic, ecological, or biological products, understanding these three terms as interchangeable synonyms.
2) To stimulate research, generation, and transfer of knowledge in agroecological activities.

That is to say since its inception the Argentine Organic Movement proposed recognition through the certification system for organic productions while at the same time encouraged an Agroecological approach with regards to research, practices, generation, and dissemination of knowledge.

It is worth noting both the acknowledgment and the warnings that Miguel Altieri offers in the prologue of the first book published by MAPO in 2002: "In summary, as MAPO proposes, the massive dissemination of organic production as the central axis of the new Argentine agriculture will require greater agroecological knowledge, institutional alliances and peasant networks, creative market initiatives and agricultural policies that lead to a more local, more biodiversed, more familiar and community model of agriculture that is projected intergenerationally to ensure food self-sufficiency and the conservation of agrobiodiversity ".(Pais, 2002)

Having obtained equivalence status with the European Union, Argentine exports of organic products, traditionally one of Argentina's main export markets, have considerably increased. The expansion of the organic sector accelerated, with annual growth rates exceeding 100% during the second half of the 1990s. (Country, 2002)

The important growth in exports of organic products did not match the growth in domestic consumption. Organic production has increasingly focused on producing for foreign markets, as shown in the yearbooks of certified products published by SENASA*. Certification for exports has been more than 98% since its beginning.

A central aspect for this to happen was the modality of the regulation of organic products and the consequences of the inclusion of Argentina as an equivalent

country. This privilege that Argentina had on the one hand facilitated the processes and in part diminished the costs of certifications under the European Union, but on the other hand, it limited alternative guarantee and certification systems in the country since for equivalent countries the certification of groups based on Internal Control Systems (ICS) has been banned until 2022 with the advancement of the new European legislation.

This, on the one hand, made it very difficult for family farmers to be certified under organic regulations, where very few cases can be found at the national level of cooperatives of family farmers that participate in certification processes, including the Ingenio Azucarero San Javier with the production of organic sugar cane in Misiones, the COOPSOL cooperative that produces honey in the province of Santiago del Estero and La Riojana that produces and certifies olive oil in the province of La Rioja. In this way, the Argentine regulations could not use, as happened in the neighboring country of Brazil, a modality that would facilitate participatory guarantees (SPG) or group certifications (SCI) and that could include in the same system different actors and organic food destinations and value chains. (Meirelles, 2003)

As for the local distribution of certified products, there were some pioneering experiences such as the Cocina de la Tierra, a retail business and distributor in the City of Buenos Aires, La Anunciación farm in La Plata, whose initiators were closely linked to MAPO and some experiences such as La Esquina de las Flores were also pioneers in specialized health food stores that included both certified and non-certified products.

At the same time, there is a large number of experiences of small producers who sell their products in direct and short chains, such as local fairs, with Misiones being a leader in this regard. In 1995, Misiones inaugurated the first fair organized by the Provincial Association of Free Fairs that integrated the Network of Organic Farmers of Misiones (RAOM). These networks linked to local fairs towards the end of the 90s reached more than 150 experiences at the national level (Mateos & Ghezán, 2010)

Another very important example is the Center for Studies of Agroecological Productions of Rosario (CEPAR). It was founded in 1987 to support agroecological-based urban agriculture processes, and since 2002, in conjunction with the INTA's Pro Huerta program, has planned the marketing spaces and logistics of retail fairs. The aim is for food produced with agroecological practices to reach consumers at the same price as those produced by conventional agriculture.

A groundbreaking event that positioned Argentine organic production worldwide was the 12th IFOAM International Scientific Conference held in the town of Mar del Plata in November 1998 under the title “Organic agriculture, the credible solution for the 21st century” (Lockeretz, 1999). At the event, the average attendance recorded 650 people from 60 countries per day. At the end of the event, local and international representatives of the Organic Movements, such as Vandana Shiva and others, signed a position paper named "the declaration of Mar del Plata" establishing the position of the Movement concerning the banning of Genetically Modified Organisms (GMO) and their concern, environmentally speaking, of its extensive use at Global scale and in particular in the Argentine Pampas (Country, 2002). The GMO's impact on the Pampas Region will be addressed in particular in Chapter 6.

As a result of the ferment and interest in positioning Argentina in global markets, in 1999 the National Congress passed the Organic Products Law (25,127), integrating the different existing resolutions up to that time. It is worth noting that its implementation is the creation of an Advisory Committee for Organic Production made up of representatives of both the public and private sectors, as well as other organizations directly linked to organic production. (Lacaze, G. 2009)

Parties of the Committee include:

- The Ministry of Agriculture, Livestock and Fisheries (MAGyP): chairing the Advisory Committee for Organic Production and coordinating it through its National Directorate of Agroindustry, which promotes Organic Production as a differentiation tool and is the body responsible for developing and executing

plans, programs and policies for production, marketing, technology, quality assurance and health in agriculture, fisheries, forestry, and agro-industrial matters, coordinating and reconciling the interests of the National Government, the Provinces and the different subsectors.
-The National Service for Agrifood Quality and Health (SENASA) is the national health agency within the MAGyP. It is responsible for the execution of national policies concerning animal and plant health and quality. It also monitors compliance with current regulations on the matter.
- The National Institute of Agricultural Technology (INTA), whose purpose is to "promote and invigorate the development of agricultural research and extension and to accelerate the benefits of fundamental functions such as the modernization and improvement of the agricultural enterprise and rural life",
- The Argentine Movement for Organic Production (MAPO), as we have already seen, brings together all the entities, people, companies, and NGOs that are related in some way to organic production: associated producers, processors, certifiers, researchers, scientists, technicians, educators, entrepreneurs, and organic traders.
-Fundación Exportar is a public-private institution that assists the business community in its efforts to market products internationally.

On the other hand, the provincial governments started to play a leading role through their respective agencies involved in the matter.

Last but not least, it is worth highlighting the incorporation of the Inter-American Institute for Cooperation on Agriculture (IICA), as a joint international organization that participates very actively.

Within the framework after the regulation of the law was completed in 2001, the Advisory Committee for Organic Production formulated and started the implementation of the “Project for the Development of Organic Agriculture in Argentina” (PRODAO). Priority actions included the study and development of domestic and foreign markets; the coordination with the corresponding government areas, promotion of associative forms of horizontal and vertical

integration, as well as the growth and development of agro-industrial organic value chains.

The aforementioned program focused on different areas for the promotion of organic production taking into account that the Agroecological systems were in a state of degradation or endangered due to agricultural practices. Direct action was needed in terms of the following: 1) the acceleration of the organic reconversion to obtain a higher value in the market or to access new markets; 2) the development of an alternative, sustainable and inclusive system for smallholder producers and 3) the protection of endangered species or varieties rooted at a local and cultural level.

In this sense, it is within the framework of this law that for the first time small producers called "smallholders" and associative forms, appeared as subjects to promote organic production. (Mateos & Ghezán, 2010) .

Although the constant work of the advisory Committee succeeded in positioning Argentine Organic production at an international level between the 1990s and 2000, there were no specific links between family farming and organic or agroecological production at the public level beyond the Pro Huerta program, which we have already mentioned; nor were there specific programs that facilitated the certification process or organic public procurement.

So much so, that the Agroecological approach practically does not appear in the National Research and Technological Development Program for Small Family Farming (PAF) created in 2005 with a national scope to generate, adapt, and validate appropriate technologies for the sustainable development of agriculture. (Domínguez et al. 2012).

3.7 Organic Agriculture and Agroecology in Higher Education Institutions

The university and agronomic research institutions in the country, as was the case in all the countries of the region, were dominated by the hegemonic

guidelines linked to the "green revolution" formed around the paradigm of simplification and specialization (Riojas 2000) of all production processes. In this context, the organic agriculture and agroecological approach that required a change of epistemological paradigm had not been, and is not, an easy task given that its incorporation at a general level would imply a redefinition of the same institutions.

In 1993, the 10th Latin American Conference organized by the Latin American Association of Higher Agricultural Education (ALEAS) in La Plata, Buenos Aires Province, was an important event that generated much attention. The event counted with the participation of key international icons of the Agroecological Movement such as Miguel Altieri, Andrés Jurjevic, and Eduardo Sevilla Guzmán. Eventually, both Agroecology and Organic Agriculture gradually began to influence different areas of educational programs nationally.

In 1993, the first extracurricular course on Agroecology was delivered by La Plata University. In 1994, an Agroecology seminar was offered again with the presence of Altieri and Sevilla. Several extracurricular courses followed until 1999.

In 2011, Agroecology became a compulsory subject in the Agricultural Engineering Program offered by the Faculty of Agricultural and Forestry Sciences at the National University of La Plata. At the time of the change in the course curriculum, there was already a consensus in the academic community about the need to incorporate Agroecology as a compulsory subject in the curriculum for the training of agronomy professionals. This event can be regarded as a milestone in the relationship between academic programs and Agroecology.
It is also part of the course curriculum of several Master's degrees, among them, the Master's Degree in Development of Arid and Semi-arid Zones (MADEZAS) since its inception, over 25 years ago; the Master's Degree in Plant Protection offered by the UNLP and the Master's Degree in Local Innovation and Rural Development Processes (PLIDER - UNLP, UNMdP, and UNS). (Sarandon, 2021)

Since 1993, the University of Buenos Aires has delivered an open course on Agroecology. In 2011, the course "Research and Extension in Agroecology" was offered as an elective (Souza Casadinho 2013).

The newly created National General Sarmiento University (UNGS), located in the suburbs of the Province of Buenos Aires, offered two doctoral programs in Agroecology, between the end of the '90s and the beginning of 2000. Later, the curriculum changed, incorporating Agroecology as a compulsory subject in the Ecology degree, in the two Urban majors, and Natural Resources.

At Córdoba National University, the Chair of Agricultural Ecology has been taught since 2006, in an attempt to give a more agroecological look at the training of agricultural engineers. The University of Río Cuarto (Córdoba) also has an Agroecology group, that develops academic activities, dissemination, and relationship with the environment, through lecturers of the Faculty of Agricultural Sciences. Some of the activities of this University will be described into more detail in Chapter 6.

In relation to Organic Agriculture undergraduate programs, it is very important to emphasize the work that the Faculty of Agronomic Sciences at the University of Buenos Aires (FAUBA) has carried out through the 3-year program in Organic Plant Production addressing the different productive dimensions concerning organic methods and their relationship or impact on environmental, social and economic spheres in terms of the different production systems and regions in the country. A Higher Education program was first offered in 2003, by the University delegation in El Bolson, in the Province of Rio Negro, and since 2008 in its headquarters in Buenos Aires.
Further to the experience of the program, in 2018 the Postgraduate Diploma in production and marketing of organic products began to be offered by the Faculty of Agricultural Sciences at the Catamarca National University, and later in 2020 by the Santiago del Estero National University.
In 2014, the Rio Negro National University, with headquarters in the town of El Bolsón, created the Bachelor's Degree in Agroecology.

In 2021, thanks to the continuous work of the Faculty of Agricultural and Forestry Sciences (UNLP) regarding teaching, research, and extension, the University launched a three-year program in Agroecology.

In all cases, the initiatives respond to those lecturers and researchers who have historically worked, and in some cases have been key players, in the formation of the Agroecological and Organic movements that sought transformation through Higher Education programs.

This process has been similar in all of Latin America, where the different experiences enriched one another. As a result, the Latin American Scientific Society of Agroecology (SOCLA) was created in 2007 under the leadership of Clara Nicholls and Miguel Altieri. This way, a broad and representative process was consolidated in a membership organization composed of lecturers, researchers, extension agents, and students distributed in 14 countries.

SOCLA's vision of sustainable development is not about fitting the environmental issue into already established agricultural regimes. It considers that a seriously realistic vision of Latin American agriculture must inevitably seek a real synergy in the sciences of ecology, economy, and agriculture including popular knowledge and the implementation of strategies that go to the root of poverty, environmental degradation, and inequity. (Sarandon, 2014)

With over 750 members, SOCLA held 5 Latin American Agroecology Congresses bringing together the main actors in the region.

A good example of the connection and feedback between SOCLA and Argentine institutions was the high attendance in the V Latin American Congress organized in 2015 at the University of La Plata which recorded the participation of more than 1,800 attendees, over 500 dissertations, more than 20 round tables, and 5 master conferences.
Understanding Agroecology from a multisector and multidisciplinary scientific perspective led several universities to incorporate agroecological proposals in terms of food safety and sovereignty from the social sciences which base their

approach on the solidarity economy. This will be dealt with from an economic approach in Chapters 3 and 6.

In 2012, 5 institutions: MAELA, SOCLA, the National Universities of Quilmes, and La Plata, together with the Provincial Board of Organizations of Family Producers of Buenos Aires joined to offer the Diploma in Agroecology and Social Solidarity Economy. It is implemented in different academic units of the Province of Buenos Aires. The Diploma aims to develop a training process of specific agroecological and socioeconomic tools that may contribute to the strengthening of the production and marketing of affordable agroecological healthy foods.

The University of Quilmes, which co-offers the Diploma, implemented different extension programs integrated into the practices of territorial development. A paradigmatic example is the case of the Territorial Markets program, which is a marketing and consumption network that articulates organizations of producers and producers of family agriculture through a tight circuit of commercialization of products in the process of agroecological transition. This proposal is coordinated by the Market Economy and Solidarity Finance Incubator (IEMF) of the University Program for Social Incubation (PUIS) (Yedrasiak, C. et al, 2019).

Another significant experience of these processes is the "Catedra Libre of Food Sovereignty" that the Faculty of Agronomy of Buenos Aires University (FAUBA) launched in 2011 under the coordination of Carlos Carballo, Professor of the Chair of Extension and Rural Sociology as a crosswise module, from which to contribute to the interdisciplinary construction of a new paradigm of a fairer, more sustainable development.

This "Catedra Libre" includes the participation of students and Lecturers from the programs in Agronomic Engineering, Agricultural Economics and Administration, Environmental Sciences, and Agri-Food Management, as well as the technical courses on Organic Plant Production, Floriculture, Gardening, and Rural Tourism.

Today the "Catedra Libre" of Food Sovereignty is present in more than 17 national universities and can be accessed by university students from different fields of study as well as interested people who are not necessarily enrolled in specific university programs.

The association of University institutions such as FAUBA and the University of Quilmes in the holistic aspects of organic agriculture and agroecology for rural development and food sovereignty, coupled with the joint action-research practices and extension services, has served to support the development of the instruments presented earlier. Among these instruments, some deserve particular attention and will be described below. Such instruments are the participatory guarantee systems (PGS) of Agroecological bases.

3.8 Constitution of Participatory Guarantee Systems (PGS) at the National level

The development of PGSs in Argentina is relatively recent with little articulation at the national level. Beyond the fact that this modality generated interest from the perspective of family farming and small producers, and that MAPO leaders participated in the first international meeting organized by IFAOM Latin America and MAELA in 2004 in Torres, Brazil (Meirelles, 2010), there are very few initiatives that have had continuous and consolidated development over the years.

Among the few pioneers, the PGS of Bella Vista in the Province of Corrientes stands out as a consolidated motivating experience for other groups across the country. Its beginnings started in 2007 when the Agroecological Group "Las Tres Colonias" in Bella Vista, and INCUPO – the Institute of Popular Culture – a national part of MAELA, promoted the formation of a Participatory Guarantee Council for Agroecological Products with the objective "to generate a political and regulatory framework that encourages the production, marketing and consumption of agroecological products within the framework of a Participatory

Guarantee System in the town of Bella Vista". The idea was to add more agroecological producers and to foster local supply. (Pereda, M. M., et al. 2015)

Influenced by the Bella Vista experiences, different meetings were organized at the national level for the dissemination of the SPGs. These included:
- In November 2014, the National Secretary of Family Farming, INTA, the Ministry of Social Development, MAELA, INCUPO, Agroecological Group Las Tres Colonias de Bella Vista (Corrientes), and the Goya Local Fair organized the: ”Seminar on Participatory Guarantee Systems within the framework of Family Farming marketing alternatives in the city of Goya” (Corrientes).
- In September 2015, the National Secretariat for Family Farming of Cordoba Province organized The “II Specialized Meeting on Participatory Guarantee Systems”
- In September 2016, MAELA, the Provincial Board of Family Producer Organizations of Bs As, the Secretariat of Family Agriculture of the Ministry of Agroindustry, INTA, the Faculty of Agricultural and Forestry Sciences of the National University of La Plata, and SENAF / SENASA organized the “National Seminar on Participatory Guarantee Systems” in La Plata, Buenos Aires.

From these initiatives, new realities and experiences were constituted around the processes of participatory guarantee systems.

At the public level, there is a paradigmatic case of Participatory Certification in the Province of Misiones, implemented in 2019 and contemplated within the framework of Provincial Law VIII - Nr. 68 for the Promotion of Agroecological Production passed in 2014 and directly linked to the Undersecretariat for Productive Development under the Secretary of State for Family Farming.

At the Municipal level, there are until now two SPGs experiences: one in Colonia Caroya (Córdoba), regulated by the Colonia Caroya Municipal Agroecological Production Regulation Nr. 1911 of September 2015, which entered into effect in 2017, and the aforementioned case of Bella Vista Municipality in the Province of Corrientes, which has regulated its implementation since 2009.

There are also cases, such as the Tucumán Huerteros Fair, which implemented a Comprehensive Quality Management System (Zelaya et al, 2015) with the participation of ProHuerta-INTA and the network of promoters and community organizations that make up the Organic Solidarity Network of Tucuman (ROST).

The role of public Universities in the promotion and support of PGS processes is worth highlighting, as is the case of the Faculty of Agronomy at the University of Buenos Aires, the Faculty of Agricultural Sciences at the National University of Mar del Plata, the Faculty of Sciences, National University at the Northeast, Faculty of Agrarian and Veterinary Sciences at the National University of Corrientes, and the National University of Misiones which through different initiatives have sponsored the process from its inception. (Fernandez, 2018)

The emblematic case of the Faculty of Agronomy of Buenos Aires (FAUBA), constitutes an institutional innovation practice, given that the Board of Directors of the Faculty agreed to a specific regulation for the creation of a PGS. The "PGS Pilot Project" with horticultural producers started in February 2017 and gave way to the establishment of a "Feria Franca" for agroecological producers within the premises of the University. This support by the Academia to the PGS constitutes a stepping stone for the fairs that are currently spreading out in Universities across the country.

This program was conceived following the analysis of the agri-food system carried out by the "Cátedra Libre" (Open Chair of Food Sovereignty), to integrate ongoing programs and projects concerning the development of sustainable alternative chains in the Buenos Aires Metropolitan Area. The objective was also to increase the articulation with institutions, and organizations of consumers and producers, which eventually will foster the agroecological transition and improve nutrition at all socio-economic levels.

In the case of peasant organizations, we should mention the initiative that the Union of Land Workers (UTT) is carrying out with the support of public agencies such as INTA and its Popular Technical Consultancy unit (CoTePo). They are developing a participatory certification that so far has included 60 families as pilot

cases with the idea to further implement it within its membership network and distribution mechanisms at the national level.

Unlike the experiences carried out in other countries, as seen in the first chapter, the participatory guarantee process in Argentina is not based on national regulations on organic production. Each institution generates its system of indicators which include both agronomic, social, economic, and cultural aspects and their own implementation procedures.

In this sense, as we have already seen, there are several experiences in the country constituting a living laboratory.

However, the growth of internal demand observed in recent years, as a result of the continuous work by the organic and agroecological movements, has called into question the processes that guarantee that a food is Agroecological or Organic.

Whereas for organic production there is a regulation that controls the sector, for agroecological production there is still no consensus on what food can or cannot be named and marketed as “Agroecological” given that for the time being there are very few PGS operating systems. It is mainly based on “trust” relationships without effective verification systems.

In this sense, and in order to generate greater consensus while facilitating a common agreement process, a "National System of Participatory Certification" (CNCP) is currently being designed. The inter-institutional technical coordination composed of the Ministry of Agriculture, Livestock and Fisheries (MAGyP), the National Institute of Agricultural Technology (INTA), and the National Service for Agrifood Health and Quality (SENASA) is anchored in Article 32 of the Law of Historical Reparation of Family Farming and covers the regulatory framework regarding food certification.

In other words, the focus of the process is centered on Peasant and Indigenous Family Farming (AFCI) as a key socioeconomic category.

This system will include a national committee of the SNCP, a Program for the Promotion, Training, and Support of Participatory Certification, the Technical Coordination (the Enforcing Authority), and a National Registry of SPG.

As an area of coordination between production and consumption, SPGs are developed in the territory as a demand to meet both local and national supply and marketing processes that eventually could be integrated or scaled up in Latin America at the regional level, seeking to contribute to the growth, visibility, and credibility of Agroecological productions.

At the moment, it is not clear how this process will relate to organic production regulations, an issue that is part of the debate both at the public level and within the different sector organizations.

3.9 Upscaling processes for Organic Agriculture and Agroecology in Argentina

In 2010, within the framework of the new institutional matrix of the National Institute of Agricultural Technology (INTA), a national project created by the strategic area of Natural Resources was approved: "INTA Project of Agroecological and Organic Technological Development Network" with the specific objectives to generate knowledge that contributes to the process of agroecological transition and organic production, increasing the agrobiodiversity of agroecosystems.

In 2013, INTA launched the Agroecology Network (REDAE) at the national level with the general objective to articulate the generation of institutional and extra-institutional knowledge and capacities in Agroecology.

In 2016, a group of agricultural engineers, Ph.D. specialists, and socio-environmental leaders created the National Network of Agroecological Municipalities (Renama); a staggering example of the process. The objective was

that more and more locations adopt a productive model that respects human health and the environment.

The network, which currently counts with the participation of over 40 municipalities, 85 advisors, and more than 100,000 hectares, seeks to facilitate the processes of an agroecological transition through the exchange of experiences and knowledge through the organization of events such as "the open gates" where agroecological and transition farms share their experiences with other farms in the region.

In 2018, the Argentine Society of Agroecology (SAAE) was founded to combine the work of researchers, extension agents, and lecturers, with the practice of farmers based on agroecological principles for the sustainable development of the territories.

In 2019, this institution organized the first Argentine Congress of Agroecology in the Province of Mendoza. The second was held in October 2021, in virtual mode due to the Covid-19 Pandemic. The motto was "Intertwining Knowledge towards Good Living", a phrase that aims to highlight the importance of dialogue between the practical and inherited knowledge of the inhabitants combined with scientific disciplines.

As we will see in Chapter 3, the practices concerning ancestral knowledge provide the space for the construction of healthier, more comprehensive product and life systems, including different dimensions of development from the productive to the artistic, taking the socio-economic, the political, and the cultural aspects summarized in the "Buen Vivir" approach.

Both congresses in which more than 300 works were presented in each of them were carried out in collaboration, at the regional level, with the SOCLA and at the national level with numerous National Universities, Public Institutions, and the Civil Society.

In 2019, as a result of the dissemination of agroecology, the National Agency for Agroecology was created.

Although at first it was speculated that the Ministry of Family Agriculture would incorporate this area, it was decided that it should have a more integrated perspective around the food concept, so it finally acts under the auspices of the Ministry of Food Bioeconomy and Regional Development. Under the same orbit is the Value Added and Quality Management Agency which includes both Organic Agriculture and Denominations of Origin.

Following the guidelines by RENAMA, the main objective of the agency is to take part in the design and implementation of policies, programs, and projects that promote intensive and extensive primary production based on agroecology at all scales, and at the same time articulate with producers, agricultural organizations as well as municipal and provincial governments.

In terms of the Organic production, the inter-institutional, public-private work carried out within the framework of the Advisory Committee for Organic Production, established by Law 1999, has held more than 65 meetings to date. Worth noting at the programmatic level is the 2010-2020 Strategic Agrifood and Agroindustrial Plan and the recently approved Argentine Organic Strategic Plan 2020-2030, inspired by the identification of adequate active policies that may contribute to the 17 UN Sustainable Development Goals (SDGs).

Following the Strategic Plan for the Promotion and Control of Organic Production in the Member Countries of the Inter-American Committee on Organic Production (CIAO), the following 8 strategic objectives were established:

1. To stimulate research, development, dissemination, transfer of knowledge, and adoption of technological innovations oriented toward Organic Production.
2. To promote fiscal, commercial, financial, and competition instruments for Organic Production that is socially equitable, and to encourage private investment.

3. To promote organizational forms (primary and industrial), such as productive networks according to value chains, clusters, consortiums, cooperatives, and foundations, among others, for the development of the organic sector in the region.
4. To strengthen the presence of Organic Production in national, regional, and international institutional settings.
5. To increase the number of producers and processors of organic products. More production with more producers.
6. To increase the volume, destinations, and participation of exports of organic products, especially those with higher added value.
7. To increase the volume and domestic market share of organic products with strategies to promote local consumption.
8. To promote the development and availability of necessary inputs for Organic Production.

One key element for the present is the constitution launched in June 2021 of the so-called Bio districts Table, under the scope of the 2030 Strategic Plan of the Organic Production, as an inter-institutional space. It quickly took on a life of its own, with a strong agroecological perspective and approach with the Municipalities as main characters and where Organic Production finds a strategic role in the scaling of associative economies of smaller size, and sustainable production which are intertwined with others with a local agroecological approach with typical products, ecotourism, and rural/territorial development. This process will be further developed in Chapter 5.

In 2018, for the first time in the national agricultural census that has been carried out since 1908 every 10 years approximately, Organic, Agroecological, and Biodynamic productions were included among the elements surveyed. The table 3.1 shows a recorded total of 5,253 agricultural units under this type of production out of a total of 250,881 farms representing 2% of the facilities surveyed. (INDEC, 2018)

Table 3.1: Organic, Biodinamic and Agroecological Production by Provineces in Argentina. 2018.

Province	Organic	Biodinamic	Agroecological
	Units		
Total of the country	**2.536**	**408**	**2.309**
Buenos Aires	180	58	312
Catamarca	108	3	155
Chaco	25	5	77
Chubut	49	16	36
Córdoba	108	30	114
Corrientes	25	5	62
Entre Ríos	84	26	143
Formosa	22	-	10
Jujuy	377	14	209
La Pampa	8	4	29
La Rioja	82	23	31
Mendoza	258	27	134
Misiones	348	36	170
Neuquén	81	12	44
Río Negro	193	35	119
Salta	183	20	282
San Juan	122	13	61
San Luis	13	5	11
Santa Cruz	9	-	5
Santa Fe	63	38	171
Santiago del Estero	146	8	31
Tierra del Fuego	2	-	2
Tucumán	50	30	101

Font: Indec (2018)

It is important to emphasize that the census reflects the perception of those interviewed concerning their agricultural practices, and does not refer to their participation in guarantee or certification systems that effectively certify their respective practices.

At the moment, for the Agroecological level, it is the main data available, since no other type of statistical data has been generated so far.

In terms of organic production, since 1994 SENASA has annually prepared the "Overview of the Organic Production in Argentina" report which provides information on the evolution of the sector. According to the latest data obtained by SENASA (2022), in terms of the number of certified producers, in 2021 Argentina recorded 1,336 certified operators. We can see that there is a relative difference between the certified units for national regulations and those declared in the census.

Considering that the area under organic monitoring in the country is around 3.9 million hectares, positioning Argentina as the second country in the world behind Australia in terms of certified area, the numbers of certified operators are relatively much lower than the most developed countries at the level of organic production. It is very important to bear in mind that, some 3.6 million hectares are dedicated to extensive livestock production mainly in the Patagonia region, and only 275 thousand hectares corresponded to the surface area set aside for plant production.

It should be noted that all the data provided here corresponds to organic products certified under official national regulations, whether they are sold in the domestic market or in other destinations that recognize them as such (such as the European Union) or not (as is the case of the USA), but for some reason, the national organic certificate is required. This situation occurs, for example, when producers want to obtain a fiscal benefit, such as in the case of refunds on exports of organic products (0.5%).

Certified only under US regulations (USDA-NOP), are not included in the SENASA annual reports so the total organic certified producers would be between SENASA and the Census numbers.

The United States accounts for 46% of Argentine exports of organic products being the main destination followed by the European Union with 38%.

At the sector level: the distribution of the harvested organic surface showed greater participation for the production of organic cereals and oil seeds accounting for 38% of the cultivated area.

Organic cereal crops occupied 22,683 ha of which the largest area corresponded to bread wheat (30%), corn (27%), rice (18%), and oats (7%); on the other hand in oilseed crops organic accounted for 13,535 ha, with the largest area corresponding to soybean (66%), sunflower (18%); following the same direction of conventional exports that were described in the introduction.

Among the organic industrial crops with 35,783 Ha and 37% of the national surface, sugar cane headed the list (44%) followed by vines (26%) and olive trees (23%).

The most important organic fruit trees with 10,895 ha and 11% of the harvested areas are pear (24%), apple (20%), lemon (18%), and blueberry (12%). Last on the list are vegetables and legumes representing 11% with the main crop being garlic (53%).

In relation to the area under monitoring for organic livestock, out of a total of 3,619,796 ha., 96% corresponds to organic sheep production in the Patagonia region and the remaining 4% corresponds to bovine activity, although this area is mainly used for breeding, and partially for dairy.

Regarding the domestic market, as pointed out before, since the origins of organic certification, the domestic market only represents a value between 1% and 1.5% of certified products, of which 90% corresponds to industrialized products such as wheat flour, whole wheat flour, pienso/animal feed, yerba mate, tomato puree, toast, cane sugar, and wine.

Finally, regarding the producers certified as Biodynamic under the private regulations linked to Demeter, we find a great difference compared to the Census,

given that according to data from the latter, the total certified units would reach only 28 operators by 2021.

3.10 Final considerations and perspectives

As we have seen so far, Argentine Organic Agriculture has managed to position itself at an international level through exports in certain sectors and foods, whereas Agroecology instead has positioned itself in the Academia and at the research level, with an important presence in social movements across the country connecting small producers and family farming that strive in the domestic market.

In a context where a paradigm shift is needed, there are shared complementary visions between both systems. It is important to emphasize that the participation in the same Government Agencies, with the Departments of Agroecology, and the value added by Organic production and Denominations of Origin, represents an opportunity for joint efforts and shared knowledge accrued by guarantee processes, research, extension, and promotion. The above aiming at the local and international markets, key parts in the creation of an inclusive, integrative alternative food system.

As we have seen, throughout recent Argentine history, the paths between Organic and Agroecological production intersect and strengthen each other. In this sense, the different case studies that will be presented below are examples of intersection and cohabitation that can feed a joint analysis for the conformation of deep sustainable food systems in line with the Sustainable Development Goals.

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Chapter 4: Territorial Development under Different Complementary Lenses

4.1 Social and Solidarity Economy

Social and Solidarity Economy are rooted in two centuries of numerous changes in their nature, definition and trajectory, largely conditioned by the relations with the market, state and society in different territories.

As we will see, both terms are intersected by different theoretical, practical, institutional and imaginary terms and concepts that will be dealt with in different parts of this work.

The notion of a modern solidarity recognizes the importance of a social link that is neither rooted in religious beliefs nor able to be reduced to a contractual relationship. This modern solidarity underlines the intentional aspect, which acknowledges the interdependency of individuals and groups (Laville, 2015).

Historically, Social Economy appears linked to the first cooperatives of the beginning of the 19th century, as a response to the social problems resulting from the negative effects of the Industrial Revolution in terms of increasing poverty and displacement of workers due to the spread of machines and the organization of factory production. The concept itself became known in France both with Charles Dunoyer, who in 1830 published “Nouveau Traité d’économie Sociale”, and through activities organized by the Société Internationale des études Pratiques d’économie Sociale founded by Le Play in 1854 (Poirier, 2014).

Singer (2002) identifies Robert Owen as one of the first thinkers to defend alternative proposals of a self-managed nature in a period when events such as the revolutionary wave of 1848 loomed - uprisings that put an end to a large part of the absolute monarchies of Europe-. In 1844, Owen became a critical influencer for the constitution of the Rochdale Cooperative, a milestone of corporativism and the solidarity economy. The promoters of the association, a group of 28 unemployed weavers, met under the aegis of an entity whose

objective was to forge an equitable distribution of income - benefits of work versus the profit model, and exacerbated exploitation that the capitalist system expanded globally. The Rochdale workers began to promote a new associative form to provide an affordable alternative to poor-quality and adulterated food and provisions using any surplus to benefit the community under the slogans of solidarity and common welfare.

These events influenced the organization of the first International Cooperative Congress held on 19 August 1895 in London with the participation of delegates from Germany, Argentina, Australia, Belgium, Denmark, the United States, France, the Netherlands, India, England, Italy, Serbia and Switzerland. At the event, the representatives founded the International Cooperative Alliance with the purpose to provide information, define and defend cooperative principles, and develop international trade. The ICA was one of the few international organizations that survived the two World Wars.

The Alliance represents and serves cooperatives worldwide. Nowadays, it is one of the oldest and largest non-governmental organization based on the number of people it represents: 1 billion cooperative members on the planet (ICA's 2021 website). This model was introduced into Latin America by the immigration of the late nineteenth and early twentieth centuries. With their work habits and culture, immigrants with a desire to improve their living conditions, contributed to the cooperative modality.

The first Latin American entity to be accepted by the ICA was the Argentine "El Hogar Obrero" ("The Working-class Home") founded in 1905 to promote the creation and development of other cooperative experiences. It was oriented towards consumption throughout the country.

The birth and expansion of corporativism worldwide was one of the symptoms of a social system in which dominant economists - the neoclassics- thought that the solution to economic problems had to be subjected to a *laissez faire*, i.e. they

conceived that the solution to unemployment would be found in the self-regulating market dominance (prices formed in the game of aggregate supply and demand), resulting in the reduction of wages. These economists assumed that, in a situation of unemployment, a fall in wages would develop from the interaction of offers and demands, expressed in the market. This would adjust and increase the level of employment since entrepreneurs would occupy a greater portion of the workforce considering the lower remuneration level profitable. It was also assumed that economies are adjusted on the basis of individual interests and that their aggregation leads to the massification of collective interest.

Alternative proponents to the neoclassics contested this approach and diagnosis, stating that it was necessary to move away from the interpretations starting from the individual, or from micro to macroeconomic perspectives based on large aggregates. Among these, Silvio Gesell, a German-born entrepreneur living in Buenos Aires, pioneered a version of the market economy centered on competitive entrepreneurship rather than on capitalism. His experience during an economic crisis in Argentina led him to view the exploitation of human labour as occurring primarily in the sphere of distribution due to structural defects in the monetary system (Gesell, 1891).

Gesell states that for the better of a nation of free entrepreneurial men and women, the financial interests of scarce bank financing and speculative land dealings should be “sacrificed”. In fact, the author attributes the market-dominating power to two characteristics of conventional money: a) money can be hoarded and temporarily withheld from the market for speculative purposes; and b) money enjoys the advantage of liquidity. In other words, it can be put into use at almost any time or place with a “flexibility of deployment similar to that of a wild card in a card game”. These two characteristics of money give its holders a privileged position over the suppliers of goods and services. (Onken,2000). It is the holders of money who ultimately has the power to decide whether money circulates or stands still. Money can’t flow “automatically” like blood in the human body.

Gesell's theory was intended to change the economic organization of society and to promote progress towards social justice and economic welfare by way of freeing the economy and thus establishing what he called a natural economic order (Gesell, 1891). This movement towards a free economy (*freiwirtschaft*) requires the freeing of land from rent and money from interest; this process would enable large sections of the population to give up wage and salary-oriented employment and to work in a more autonomous manner in private and cooperative business organizations (Blanc,1998).

Inspired by these ideas, a movement grew stronger in the 1920s, with the purpose to criticize the slow circulation of money and to speed up circulation by using new continuous-devaluing currencies, called demurrage.

In 1932, during the Austrian economic recession, the Wörgl town introduced a community currency. Unemployment rates decreased due to the increase in trading interactions within the community; the community currency served to pay for investments and employment. Demurrage forced the speeding up of money circulation leading to a social product nine times more efficient than conventional money. However, the central bank stopped the experiment six months after its conception. The idea was stalled until the 1990s. Since then, numerous community currencies have been introduced into both the Global South and North although the respective implementations took different ways. (Zeller, 2020). These "new" developments, undergoing a renaissance today, can be deemed as a possible model for a redesigned transition economy. This will be analyzed further on in different parts of the research.

Longe (2017) identifies how Gesell's contributions were relevant for Keynes with whom he shared the focus on a central problem in the economy of societies: global unemployment. Keynes argued (so did Gesell) that if the employment problem was solved by reducing wages, demand would fall and eventually exacerbate unemployment. He thus believed that inflationary processes that would deteriorate real wages were necessary.

According to Laville (2015), after the Depression of the 1930s and the sacrifices of two World Wars, social inquiry opposed economic liberalism and reaffirmed the concern for social cohesion thus proposing a holistic vision of society as more than the sum of individuals versus a form of “Philanthropic” form of solidarity based on individual responsibility; it stressed the public dimension of solidarity centered on rights.

The Keynesian state had the objective to enhance economic development through public investment in sectors deemed particularly viable; its labour market policy focused on working conditions and wages making it possible to match the particular interests of enterprises as well as the general interest of society. However, the main shift taking shape in this period, in different international contexts with different experiences, was in income redistribution by which the social state became the so-called ‘welfare state’ and whose aim was to fulfill the promise to protect citizens from illnesses, accidents, old age and unemployment. Laville (2015)

The work of Karl Polanyi addressed the same issues, warning that «the self-adjusting market could not exist for any length of time without annihilating the human and natural substance of society » [Polanyi, 1944 : 3] even being interpreted in different ways by thinkers of different political currents (Szelenyi & Mihályi ,2021) he can be considered one of the main contributors to the elaboration of schemes that help to unravel the meaning and possibilities of the practices known as Social and Solidarity Economy (SSE). (Coraggio, 2014)

Polanyi defines the economy as "an instituted process of interaction between the human and its environment, the result of which is a continuous supply of material means to satisfy needs." More diverse societies have maintained economic activity integrated within the logic of the relationships that constitute them. To put it in other words: there is no integration of the economy if production, distribution, circulation and consumption are not institutionalized in a way that cohesion is maintained and the material bases constituted, ultimately, by the life of the people and their natural environment.

Arguably, the most innovative contribution of The Great Transformation was the claim that none of these coordinating mechanisms (even not the market) is "natural," but they are all social constructions. Markets can become self-destructive. This is why "double movement" or "counteracting tendencies" are so central to Polanyi's thinking. Markets have to be disciplined; they have to be "re-embedded" to overcome the tendencies to self-destruct.

It is usually agreed that the author identifies and analyzes in the economic process three principles of integration by society: exchange (trade or market), redistribution, reciprocity.

These can be summarized as follows:

- The market = allows the supply of/demand for goods and services to meet – exchange happens on the basis of price setting;
- Redistribution = production is delegated to a central authority responsible for allocating it; and
- Reciprocity = the relationship established among groups or individuals interacting in such a way that there is a will to demonstrate "a social link among the stakeholders".

The solidarity economy approach thus stresses the mix of these three principles, even though their respective weight and form vary, recognizing that this solidarity rests on a particular relationship between reciprocity and redistribution, between the voluntary collective actions of equal citizens and the state's attempts to redress inequalities. (Mauss, 1954)

The interactions between public authorities and civil society initiatives translate into mutual effects, the intensity and the modalities of which vary greatly over time.

The concentrated growth and development of the mid-twentieth century funneled resources and surplus from local production areas, rural areas in particular, not only to urban centers but also to tax havens and speculative activities.

It is worth noting that the “welfare” model assumed a male breadwinner, therefore “full employment” meant full male employment whereas women were occupied in the chores of the home. Women would later enter the labour force but under ‘indecent’ conditions and assuming the ‘double burden’ of underpaid employment and unpaid care work (UNRISD 2005)

Over the last twenty years of the XX century, competitive strategies and technological developments, plus the transformations undergone by labour, states and markets - coupled with the implementation of neoliberal policies and exclusionary globalization- fueled informality. Growth proved to be incapable of absorbing the so-called surplus labour or ‘the precarity’ (Standing 2011) let alone the redistribution of wealth.

In mainstream circles, the concern that gross inequality impacts on growth and development poses a key ethical issue (UNDESA 2005).

In this context, in Latin America and Europe, the terms Solidarity Economy, coupled with Social Economy, expanded their influence as well as the fields and forms of representation. It is regarded beyond its different evolutions, as an alternative economy to the current capitalist system, showing that it is possible to introduce solidarity to economic relations. Its origins in South America are linked to Chilean Luis Razeto, thanks to whom the concept regained visibility. Razeto published his first SE book “Economía de Solidaridad y Mercado Democrático” (Solidarity Economy and a Democratised Market) in 1984 (Priorier, 2014) however it only started to be commonly referred to in the late 90s.

In Europe, Solidarity Economy is considered a subsector and part of the common trunk of Social Economy, thus having a greater recognition and research scope (Monzón and Chaves, 2008). However, Social and Solidarity Economy have been used to encompass organizations of social transformation and solidarity. (Battisti Telles,et al., 2020). According to Guerra (2004, p. 5), in Latin America the Solidarity Economy assumes “more radical characteristics than those found in other contexts, and a markedly more political discourse”, playing an important

role in the fight against endogenous social problems caused by the current economic system.

Solidarity economy unleashes social systemic transformation. Its focus is on redistributive justice. Solidarity economy is about ‘deep’ sustainability and alternatives to capitalism and the debt-based monetary system. It also encompasses participatory democracy and emancipatory politics driven by active citizenship and social movements. “This strand of SSE is very much associated with the alter-globalisation agenda popularised by the World Social Forum” (Arruda 2005; Santos 2007).

The Solidarity Economy implies producing, distributing, consuming, accumulating and developing where solidarity as a principle is introduced into the economy itself, causing a structural transformation that leads to new and true balances in the various phases of the economic cycle. It postulates an alternative development that is comprehensive including human development, sustainability and an emphasis on the local. (Razeto, 1999, 2002, 2010)

According to Singer (2008), the primary foundations of solidarity are the egalitarian division of profits and self-management, that is, it is characterized by equal rights, where the means of production are collectively owned by those who work with them and are managed by the workers themselves collectively in a completely democratic way (self-management). Thus Solidarity Economy is presented as a liberating experience that denies the separation between work and capital. These "enterprises" include various forms of voluntary associative organization in order to provide economic benefits to the associates as a means to overcome the social problems derived from the current economic model, i.e. poverty derived from the lack of opportunity to participate in the social production process. So, it recovers human dignity, self-respect and citizenship of men and women involved in it (Singer 2001,2005). In this sense, it is not only about producing the material conditions of life but at the same time contributing to realizing the human capacities associated with it.

As opposed to the capital economy, workers cease to be bearers of reified capacities that are only realized socially if they are valued for their direct or indirect contribution to profit (Wallerstein, 2006), to assume a collective function as organizers of these capacities and to make their productive potential effective together with controlled levels and forms of accumulation. Ultimately, it is about the construction of an economy for life with practices that are focused on the "satisfaction of needs that make life possible" (Coraggio, 2014; Hinkelammert & Mora, 2008) and not for the reproduction of capital or the making of profit.

Laville (2010, p.85), one of the main European exponents, defines the Solidarity Economy as the set of various economic activities that contribute to the democratization of the economy based on the commitment of citizens, where the activities of the Solidarity Economy seek to balance different resources: commercial, obtained by the result of sales; non-commercial, originating from redistribution; and non-monetary, coming from the voluntary contribution as per Polanyi's theoretical contributions (1944) previously mentioned.

The first international declaration referring to Solidarity Economy can be seen in the first international meeting held in September 1997 in Lima - Peru

The declaration included:

"We are taking into account that we are under the hegemony of a development model which shows, both in the North and the South, its limits while destroying the planet and generating poverty, exclusion, and ignores the set of human activities which are of paramount importance for the communities, representing thus a threat for the future of mankind…Solidarity economy is featured by bringing light on economic practices which used to be hushed up. It aims at transforming informal and popular economy into a common law economy, and to recognize the social production work which is mostly done by women, and which enables the functioning of the economy. It questions extra work and the transfer of responsibilities by the State and the market…Social solidarity economy is marked by development processes which simultaneously involve local, national, international, urban and rural aspects, starting from local capacity building based on education processes on quality… in an ethical point of view which is inherent

to life and the daily relationships of people with a view to harmony between the human beings and the nature" (Lima Declaration, 1997).

An important element in the solidarity economy movement that stands out from many other social changes and revolutionary movements of the past, are its pluralist approach - eschewing rigid blueprints and the belief in a single, correct path - and its progressive inclusion of environmental and social justice concerns.

The Intercontinental Network for the Promotion of Social Solidarity Economy (RIPESS) was formally established after the institutionalization process that started in Lima in December 2002. In fact, it chose to use the term Social Solidarity (without "and") in order to stress the solidarity economy's aim for transformative system change, which includes going beyond the social economy.

According to RIPESS, "*social economy" as a term* is commonly seen as a "third sector" of the economy, complementing the "first sector" (private/profit-oriented) and the "second sector" (public/planned). The third sector includes cooperatives, mutuals, associations, and foundations (CMAFs). On the other hand, the solidarity economy puts forth a different paradigm of development; it seeks to change the whole social and economic system. It pursues the transformation of a maximizing private profit paradigm of the neoliberal capitalist system to one that puts human beings and the environment at its core. As an alternative economic system it includes all three sectors – private, public and the third sector.

Yet many networks forming part of it continue to use the term Solidarity Economy. In fact, institutions usually refer to SSE as Social and Solidarity Economy. Defining the social solidarity economy framework is a long and ongoing process that can be seen in the norms and formulations supporting the sector in different European and Latin American countries.

Depending on the context and historical period, and the territory we are referring to, the interpretations of the different concepts included so far may vary, as well as the actors that come into play and the relationships among them.

According to Coraggio (2020), addressing the escalation of a social solidarity economy should start with the analysis of a mixed economy as an analytical process, combining three sectors of economic organizations: the capitalist business economy, the public economy and the popular economy, whose meanings are respectively, the accumulation of capital without limits, the common good and the realization of one's own work for the reproduction and development of immediate life. The three sectors generate diverse flows of exchange among them (market relations, transfers, taxes and subsidies). This initial classification does not presuppose internal solidarity relations among sectors, much less a specific and linear position for each of them (Aguilar Hernandez, 2016)

Coraggio defines the popular economy as the empirical economy of workers, dependent or self-employed, who live or want to make a living from their work. It is the economy of their families, communities, associations, organizations and formal or informal networks of cooperation or mutual aid. The social spectrum of the actors of the Popular Economy is variable and as wide as the diversity of qualifications and professions, possession of personal assets and income levels of the workers. It is not reduced to a poor economy. It is the main basis of a solidarity economy, with the opposite meaning to the competitive economy of capital.

In this sense, RIPESS includes the popular economy as a very important ally of SEE organizations, admitting that for some regions such as Latin America, it is a central key actor both in relation to its importance in the population as well as in its internal characteristics, which are not necessarily the same as those defined by Coraggio since he refers exclusively to economic activities that are not covered by formal arrangements such as taxation, labour protections, minimum wage regulations, unemployment benefits, or documentation. Many self-employed workers, micro-enterprises, traders, and mutual aid practices are part of the popular economy.

In any case, the escalation processes that RIPESS proposes have a lot to do with those that Coraggio maintains, since they focus on strength in a network of relationships between main actors and possible allies from different spaces of the mixed economy.

These processes include:

1- **Self-management and collective ownership:** Terms used worldwide to refer to collective ownership and management structures include: cooperatives (worker, producer, consumer, credit unions, housing, etc.), collective social enterprises, and participatory governance of the commons (for example, community management of water, fisheries, or forests).

- Legal recognition of these cooperative, collaborative and participatory practices is not a requirement for inclusion as part of the SSE.

2- Non-monetized work and exchanges

It includes labour that creates valuable output and provides the worker with satisfaction, happiness, and social recognition even if unpaid, such as childcare, etc.

Among the second There are many fertile bases that hold great potential to build alliances and mutually supportive collaborations.

Pastore (2010, 2014) offers an alternative perspective to those already presented and proposes that Social and Solidarity Economy be seen in relation to 3 dimensions, interactions of which the "reproduction of life" is organized; these dimensions include:

a) The economic dimension: ways and empirical trajectories of doing economy, combining the social purpose of life reproduction with associative, democratic and solidarity management dynamics;

b) The symbolic dimension: ways of conceiving human practices at the cultural, educational and communication levels in their economic relationship with the conditions for the reproduction of life, between people's connections among themselves and their vital habitat;

c) The political-organizational dimension: disputed society projects that are torn between adaptation to the hegemonic logic of economic

functioning and the capacity to transform those rules in order to deepen systemic democracy and solidarity.

In this process, the symbolic dimension becomes key to the political reappropriation of the meaning of development (development for what and for whom) by the actors and collectives themselves, taking into account their own social goals in terms of quality of life and lifestyles, form of political organization, social integration and inclusion, sociocultural specificity in the way they relate to nature, use of the territory and its resources.

Subjectivity in this sense is a central element in social relations and in the relations established with the rest of the universe; it includes expectations, hopes, fantasies. It is constituted as a way of giving meaning to social and individual experience, with its constitution process prior to any social power (Quijano, 2001).

Therefore, subjectivity control and the symbolic dimension become elements that allow for the control of imaginaries and knowledge, decisive elements in the historical production of meaning.

4.2 Sumak Kawsay or "Buen Vivir" and De-colonization Processes

In recent years, in the Latin American context, proposals such as the so-called *Good Living (Buen Vivir)* have emerged with a seminal importance in the symbolic reconstruction linked to the ways of "producing to live" as opposed to the hegemonic processes linked to producing for the capital market (Boaventura de Sousa Santos, 2011) in the imaginary of Homo Economicus.

"*Buen Vivir*" is the Spanish language term given to deep-rooted ideas coming from different territories and called by different names, such as: *Sumak Kawsay* (Quechua, from Ecuador), *Suma Qamaña* (Aymara, in Bolivia), *Ñande Reko* (Guaraní, in Bolivia), and in Mexico *Jlekilaltik* (Tojolabal) and *Lekil kuxlejal* (Tzeltal). These concepts are present in many other cultures and denote a

fundamental principle which native peoples of Latin America are usually associated with.

They are based on a strong ethical component; the rationality of the development of life is not based on individualism, economic growth, profit, accumulation, hedonism, among others, but on the achievement of balance and reciprocity that may contribute to harmony among the members of the community and with the greater community, the cosmic Pacha (Gonzales, 2015; Gonzales & Husain, 2016), that is, both among human beings and in other ways of life, including "nature" as a living territory (Huanacuni, 2010).

"Buen Vivir", in this sense, is characterized by a symbolism of unity and sustainability that may also be seen in the proposals of different international organizations and different collectives globally. In itself, it is another way of approaching economic, symbolic and political relations:

"What I propose here is to pose a key question to our crucial historical period: In order for the *"Buen Vivir"* to become an effective historical realization, it must be a complex of social practices oriented to the democratic production and reproduction of a democratic society, another mode of social existence, with its own specific historical horizon of meaning, radically alternative to the global coloniality of power and coloniality/modernity/eurocenteredness "(Quijano, 2011: 77).

The meanings recreating the notion of *"Buen Vivir"* combine an important part of the anticapitalism imaginaries. Within this practical-analytical exercise lies the effort to pluralize, based on local experiences, the local interpretation of the "good living" itself and to translate its most singular and universalizing meanings into a diverse and heterogeneous framework where the multiple "Buen Vivir" notions (López Córdova and Marañón Pimentel, 2013) may be recreated as a diverse set of ideas and forces acting in the daily construction of new decolonial horizons.

The approaches close to the ideas of "Buen Vivir" include positions that seek to decolonize subjectivity from the elements imposed from the outside in the form

of domination, through the separations of meaning that European colonization and the so-called "Eurocentrism" practiced in Latin America since the sixteenth century.

Wallerstein (2006) divides this separation into that of knowledge and that of disciplines. The first is related to 16th century science, which seeks to generate empirically based knowledge through two premises: on the one hand, the Newtonian model, which assumes a symmetry between past and future, and on the other, Cartesian dualism, with the assumption that there is a fundamental distinction between nature and humans, between matter and mind, between the physical world and the spiritual world.

In terms of the disciplinary division, the dominant social sciences were historically constructed between 1850 and 1914, and were finally institutionalized in 1945, on the basis of an epistemology of simplification based on the Newtonian model of an eternal present and the philosophy of Descartes. The disciplinary separation in the social sciences was organized on the basis of segmentations: history, economics, political science and sociology, anthropology and Eastern studies. Wallerstein (2006) also points out that the existence of three nomothetic social sciences: sociology, political science and economics, instead of a single social science, is explained by the dominant ideology of the 19th century, liberalism, for which, *state*, *market and society* were three distinct entities operating with a different logic, and therefore, had to be studied separately.

In this scenario, Boaventura de Sousa Santos (2018) proposes a theoretical pedagogical work where knowledge is manifested from the symbolic expansion given by questions and synchronic and diachronic comparisons from the articulations, translations and possible alliances between different disciplines and movements, clarifying or else dismantling the normative precepts and "facilitating the interaction between those who walk slower".

For this process the author conceives a “rearguard” theory derived from the construction of a testimony that participates in the processes in a crafted, intercultural dimension.

In this way, the "Eurocentric" positions, as usually called by some authors in Latin America, or Colonialist as they are sometimes conceived in Europe (Van der Ploeg, 2015) are detached. By creating such distance, the learning from the colonialist or Eurocentric historical processes is not canceled, but rather the distance opens up analytical spaces for other "surprising" realities, either because they have been made invisible, or because they emerge as new mechanisms in a much broader panorama of epistemological and political possibilities.

4.3 Exogenous, Endogenous and Neo-endogenous Development

It can be seen that very similar European concepts that in Latin America have been identified as “Eurocentrism” were attributed to the rural "modernization" processes as rural development imposed after World War II.

A model based on intensification, scale-enlargement, specialization and integration into agribusiness chains, treated rural areas as dependent (technically, culturally and economically) on urban centers, where the main function of rural areas was to provide food for the ever expanding urban populations, is usually termed as 'exogenous' (Lowe et al. 1998).

Main characteristics of the exogenous development include:

- *Dependent* development, based on external investment (and consequently the profits of the development are often exported and not diffused locally), and reliant on continued subsidies and the policy decision of distant agencies or centers; (Woods ,2005; van der Ploeg et al., 2000)

- *Distorted* development, which boosts single sectors, selected settlements and certain types of businesses, but leaves others behind and neglects non-economic aspects of rural life.

- *Dictated* development, as it is devised by external experts and planners with limited or nonexistent local participation

- *Destructive* development, as it erases the cultural and environmental differences and resources of rural areas. (Lowe et al. 1998)

In this sense, exogenous development is clearly based on a top-down approach, global parameters, such as the common market, the newest technologies and the notion of entrepreneurship, became the guiding principles both in markets and in public policies.

Entrepreneurs in agribusiness and farming derived their parameters largely from agricultural policies. The European Common Agricultural Policy (CAP) in particular has strongly supported generic new technologies to enhance productivity. Achieving efficiency levels as realized by top-regions became the guiding principle. (Van Dijk, G. and J.D. Van der Ploeg,1995)

This process generated two major consequences: firstly the internalization of these processes by some farmers triggered a local knowledge deconstruction putting at risk centuries of accumulated agricultural knowledge, and secondly the increasingly radicalized processes of rural industrialization began to exclude small farmers from marginalized areas.

As seen in the first chapter, these processes on its global expansion promoted a "counter-systemic" development led by the organic agriculture and agroecology movements.

Additionally, in Europe "re-embedded" actions were required at the local level in order to overcome these tendencies so since the 1990s, much of the focus on rural development practices have targeted what has been called endogenous development initiatives, (Gkartzios) exemplified by the European Union's LEADER Programme *(Liaisons Entre Actions de Développement de l'Économie Rurale*) (EC, 2006).

The essence of the endogenous development is situated in the contrast with exogenous development, as a *relational* concept in which economic activity is reformulated to be based on local resources, physical and human, from

¨indigenous¨ cultural identities (in contrast to the cosmopolitan culture of the urban domain).

According to Ray (1997) an endogenous approach to rural development has the three following main characteristics:

- It sets development activity within a territorial rather than a sector framework, with the scale of territory being smaller than the nation

- Economic and other development activity is restructured in ways so as to maximize the retention of benefits within the local territory by valuing and exploiting local resources - both physical and human

- Development is contextualized by focusing on the needs, capacities and perspectives of local people

However, in practice, while endogenous approaches became the norm in rural development policy prescription across Europe (Ray 2000), the LEADER experience has demonstrated problems of participation, elitism, the limitations of local action of marginal groups such as unemployed and young people (Bosworth et al., 2016) while favored those who are already powerful and with a greater capacity to act and to engage with the initiative (Gkartzios & Scott 2014).

In this sense, several authors point out that the endogenous approach should be inspired by Chayanov (1966) works, centering it on peasant production units structured according to the strategic deliberations of the families themselves, (Ploeg, 1993, 2007, 2015; González de Molina & Sevilla Guzmán, 1993b) conducting in the course of their life cycles which economic rationale organically follows an ecological rationale (Toledo, 1990).

Agroecosystems are regarded as an expression of strategic projects led by the peasant nuclei (be they families or rural communities), closely interacting with the dynamics of ecosystems and the political-institutional conditions of both the local and external environment.

It was consequently suggested that there is a need for a hybrid model that goes 'beyond endogenous and exogenous modes' (Ray 2001).

Neo-endogenous approach offers an alternative to the dual top-down or bottom-up perspectives, where the needs, capacities and perspectives of local actors engage with external influences from the extra-local environment in support of their regeneration strategies to increase local potential (Ray, 2006) in a process that also requires for being inclusive - a shift from pure economic benefits towards the empowerment of communities through trust and reciprocity.

The following table introduced by Lowe et al. (2019) includes a clear point of distinction among the different approaches:

Table 4.1: Exogenous, Endogenous and Neo-Endogenous

	Top down (or exogenous) development	**Bottom up (or endogenous) development**	**Networked (or neo-endogenous) development**
Key principle	Economies of scale & concentration	Harnessing local (natural, human & cultural) resources for sustainable development	Identifying and exploiting the place-based potential of localities; Socio-spatial justice
Dynamic forces	Urban growth poles	Local initiative & enterprise	Local-global networks and urban-rural flows; External interconnections through multi-scalar and multi-sectoral governance
Functions of rural areas	Production of food & primary products for expanding urban economies	Diverse service economies	A mosaic of consumerist and (re-)emerging productivist functions
Major rural development problems	Low productivity & peripherality	Limited capacity of areas/groups to participate in economic activity	Unequal relations between localities and external forces and institutions; Climate change and economic crises.
Focus of rural development	Agricultural modernisation; encourage labour & capital mobility	Capacity-building (skills, institutions, infrastructure); overcoming exclusion	Building local capacity to mobilise internal resources and respond to external pressures and opportunities
Focus of rural development research	Agricultural economics; Keynesian economic models and positivism	Rural sociology and rural geography; interpretive approaches and case study research	Action and activist research *with* communities; Inter/transdisciplinary
Sources of knowledge	Scientific research and external experts	Local community	Place based 'vernacular expertise'

Font: Lowe et al. (2019)

This table presents several general characteristics that help to visualize some conceptual common elements of different types of agricultural development.

Within the main characteristics of Neo-endogenous there are different approaches that have been structuring experiences and processes which will be dealt with independently, in order to understand the specific different aspects and processes that compose them.

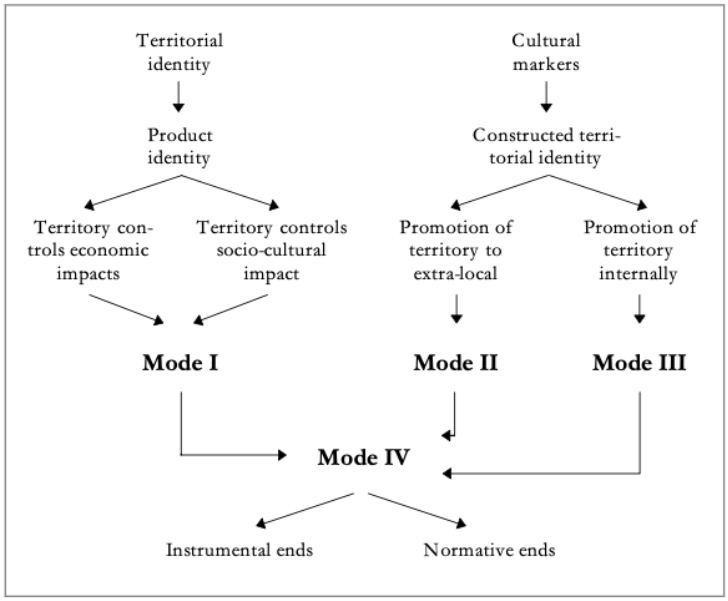
4.4 The Culture Economy approach

According to Lowe et al (1995), the word 'economy' indicates that one is dealing with the relationships between resources, production and consumption, while 'culture' tries to capture the reorganization of economies at the geographical scale of local cultures-territories-.

The endogenous part is concerned mainly with 'production' where actors construct a set of resources in the pursuit of the interests of the territory, whereas the exogenous part can be conceptualized as 'external consumers' to whom the territory seeks to sell, whether through markets or policy environments (Ray CPRD). Culture economy is thus developed as a neo-endogenous process fed by dynamic relationships and creative tensions from internal and external forces in a process of mutual recognition and feedback.

The four “operational modes” proposed by Lowe (2006) as a preliminary conceptualization of the culture economy are interesting to be described since by no means are they mutually exclusive but, rather, they represent the range of strategic emphases that may be employed by territorial initiatives in the pursuit to rural development at different levels, including different approaches.

Figure 4.1 Typology of the Culture Economy



Font: Ray (1998)

Mode I: commoditization of local/regional culture (including historical and environmental components). In essence, this refers to the creation and valorization of resources that have a place identity and that can be marketed directly or used in the marketing of the territory. Mode I emphasizes the encapsulation of territory/culture within products.

Mode II: occurs as the construction and projection of a (new) territorial identity to the 'outside,' i.e. the emphasis is made on the incorporation of cultural resources into a territorial identity with a view to promoting the territory. This relates to new territorial development initiatives in which, either using an existing organization (local authorities, development agencies, etc.) or through a new co-operative structure, a territorial initiative seeks to establish and promote its identity.

Mode III: the emphasis is still on territorial strategies however the new territorial initiative is engaged in selling itself internally: to the communities, businesses, groups and official bodies of the local area. This is an important component of the theory underpinning local development initiatives such as LEADER, which seeks to animate endogenous development in marginalized, declining areas. The

narrative of these programs and initiatives is about raising the confidence of local people and organizations, building trust in their own capacities to bring about development, and valorizing local resources. These resources include the local culture that, historically, may have been the object of suppression by a more dominant culture associated with the construction and maintenance of a nation state.

Local capital and entrepreneurship then commit to the culture-territory by presenting common territorial strategic images which businesses and other bodies can benefit from or exploit.

This territorial 'selling itself to itself' can face substantial inertia in those areas where the rhetoric speaks of local subjugation to centuries of indoctrination that has devalued the local culture, casting it as a 'barrier to development.' In such cases, for a new territorial initiative to act as an agent for local development, the construction of an identity may choose to employ historical revisionism to alter perceptions of the culture. Once the territory has been reconstructed as a coherent entity, the argument is that it can function as a catalyst for local co-operative action and to generate a sense of culture-territorial loyalty in people and enterprises (Ray 1997).

In this sense, local cultures in Europe as well as native and traditional communities that have lost their "confidence/self-esteem" in globalization productivity find vital elements towards a recomposition of their own culture.

Mode IV: emphasizes the normative capacity of the culture economy and can operate within each of the other three Modes.

Many of the representations of the culture economy intend to rebuild the state economy model at the local or regional levels. 'Development' means then to engage with consumer capitalism through international (or rather 'inter-local') trade but painting that type of trade with a light shade of green. They are attempts to compete more effectively in the global economy mediated through a soft form of local protectionism to control the impact - economic, social, cultural and environmental - on the locality.

However, Mode IV suggests that a local economy, as it draws from the indigenous culture of the territory, may choose to pursue 'alternative' development paths that for example, stress local self-reliance in the use of physical resources, a land stewardship ethic, or the cherishing of 'close community.'

Local culture eventually becomes more than an instrument to fuel trade in the global economy, it is instead rediscovered as the source of local wisdom and ethics.

4.5 The Industrial Districts Influence on the Development Processes

A. Marshall (1920) is considered the initiator of the "Industrial District" (ID) where the coordination of small sized independent firms, specialized in the same production segment, interconnected and grouped in the same geographical area, have a comparative advantage due to their collective capacity for innovation and benefit from the economies of scale.

During the 1970s and the 1980s, the neo-Marshallians took up the concept of the “industrial district” to explain the growth of certain regions of northern Italy. "The simultaneous active presence, in a delimited, natural and historically determined area of a community of people and a population of companies" (Becattini, 1989), generate intense inter-firm relations, tacit or explicit agreements of cooperation, exchange of information or "savoir-faire" (know-how), as Marshall (1920) had indicated, an "industrial atmosphere" where "the secrets of industry are no longer secrets, they are in the air we breathe".

This ID model was extended by the notion of “cluster”, developed by M. Porter who introduced the notion of cluster at the end of the 1990s, defining it as follows: “Geographic concentrations of interconnected companies, specialized suppliers, service providers, firms in related industries, and associated institutions (for example universities, standards agencies and trade associations) in particular fields that compete but also co-operate". (Porter, 1998).

According to Arfini et al (2016) and based on Porter and Ketels (2009), the interaction of three axes: Endogeneity (as a cognitive environment), Territoriality (as an effective space for relationships), and Institutionalism (as a system of values) would generate the conditions in an ID to create certain common advantages and results.

In this sense, Porter's Diamond (Porter, 1990) provides a set of 6 determinants for evaluating the interactions in a given potential or implemented ID or cluster: (i) context for firm strategy and rivalry (ii) factor (input) conditions; (iii) related and supporting industries; (iv) demand conditions; (v) history/chance; (vi) government. This methodology provides relevant elements to be used also in rural districts (Zanasi et al, 2020) and specifically in the analysis of bio-districts or ecoregions, which will be discussed later, to determine their conditions and potentialities in different territories given the fact that it shelters relevant elements in relation to the structural determinants for different conditions of development and in different context and environments. (Neven and Dröge, 2000).

In France, these analyses were taken up by Colletis and Pecqueur, (1993) and Courlet and Pecqueur (1996), who developed the Local Productive System (LPS) concept.

The economic analysis of LPS claimed the reference to the territory of the contributions on industrial districts, which consider localized networks of Small and Medium Enterprises (SMEs) inseparable from social, political or religious networks with a strong historical-local attachment.

These authors start from the hypothesis of a territoriality, where the actors privilege the space of proximity through an "interpretative filter" as the basis of local consensus on development trajectories, allowing the convergence of the actors' representations and strategies (Pecqueur, 1996).

This link constitutes a factor that explains the competitiveness of the territory, via the articulation between networks of companies and local institutions. The apparent relationship between the organization and the territory in the case of districts has led to the characterization of the territory as an organization.

SPL presents three main characteristics:

- The "small", for its adaptability and flexibility.

- The "close", because of its direct articulations and trust relationships.

- The “intense", due to the high density of activity.

4.6 The Localized Agri-Food Systems (LAFS) Approach

The concept of Localized Agri-Food Systems (LAFS) finds its origin in Economics theories that studied concentrations of companies linked to a territory, in particular Industrial Districts (ID) and Local Production Systems (LPS).

These had specific assets in common: know-how, institutions and forms of coordination that allowed for the generation of positive externalities and a better positioning in the market (Muchnik, 2006). The SIAL approach emerged in the late 1990s to propose an alternative model for strengthening the Rural Agroindustry (AIR) as the main axis of a "new rurality" with a territorial approach, generating new income and sources of employment in the most depressed areas, but also as a node of local development in a global environment (François Boucher & Juan Antonio Reyes González, 2013).

A first definition of Localized Agri-Food System (SIAL) is as follows: *"systems made up of production and service organizations (agricultural units, agri-food companies, commercial enterprises, restaurants, etc.) associated, through their characteristics and operation, to a specific territory. The environment, the products, the people, their institutions, their know-how, their food behaviors, their networks of relationships, combine in a territory to produce a form of agri-food organization on a given spatial scale"* (*Muchnik & Sauer, 1998, p.4) .*

The SIAL Approach incorporated features and elements from different disciplines. On the one hand, from social sciences such as Anthropology, Sociology and Economy: dealing with human geography, technical knowledge,

identity phenomena, food modalities, management of common resources, governance, power relations, institutionalism; the industrial economy and the economy of proximity, collective action, social capital (Poméon & Boucher, 2007). But it also involves important environmental and natural resource management issues related to biodiversity, watershed management, environmental degradation, to name but a few.

The explicit integration of the social and environmental dimensions of the SIAL Approach offers a broad, holistic vision. (Boucher and Reyes, 2013) strongly detaching itself from the processes of the epistemology of simplification and "compartmentalization" of knowledge and derived disciplines as we saw in Wallerstein's (2006) appreciations linked to the fields of study supporting capital markets systems.

LAFs experimental development process was oriented to the analysis of a variety of products and regions, especially from Latin America and Europe. (Boucher & Juan Antonio Reyes, 2013) In this sense, the approach is broad in terms of the specific characteristics of the territory, both geographical and cultural: "the territory of a LAFS is not a continuous space. It is one of belonging, in which a combination of different activities can be carried out in areas that are often physically far apart" (Muchnik, 2009:5) on the other hand LAFSs are processes in construction (Boucher, 2007) where collective processes of innovation are key elements for the increase in the number of producers and varieties of products and services linked to it (Fournier et al, 2018).

In this regard, Muchnik (2009) identifies four elements that define a LAFS: product qualification, coordination of stakeholders and collective action, resource management and dynamics of knowledge.

In this sense, one of the main elements in this process of building the LAFS is the capacity of local actors to mobilize the passive advantages or externalities of agglomeration and/or latent solidarity, horizontally and vertically, towards a process of "activation" in a coordinated way that enhances the value of the specific resources of a given territory. (Schmitz, 1997; Boucher, 2004). In this process of activation of generic and specific, territorially-anchored resources

(particular know-how, a common identity, environmental characteristics, reputation, etc.) they are manifested when they are "activated" in territorialized productive processes that reveal them as resources specific to the territory. (Boucher & Poméon, 2010).

Bocher distinguishes two important stages for the activation of a LAFS: the first being a "*structural collective action*", represented by the creation of a group such as an association, a cooperative or other form of organization where there are meetings and exchanges that favor collective learning. The second is a "*functional collective action*", by which institutions are generated and attached to rules that coordinate local actors around the management of the common good, according to the definition of quality parameters (criteria and indicators).

In this second stage, control mechanisms and sanctions are formulated and administered, so there are inclusion/exclusion and rivalry procedures (Gomez et al., 2004).

In this "club" idea there are actors that meet the requirements but do not want to join the club, and others who do want to join but are excluded because they do not meet certain criteria, or because of conflicts with other members.

In many cases, this second process of valorization and functionality is often related to what is considered Value based Supply Chains that differ in several ways from traditional supply chains. They are based on values beyond the economic value, which are shared by all partners along the chain. While some values are attached to the products and the mode of production, other values are inherent in the relationship between the partners involved (Marsden et al., 2000; Stevenson & Pirog, 2008). The asset of activation in this sense is achieved through accessibility to specific markets linked to different types of seals such as designation of origin, organic production and fair trade; in some cases favoring different direct sales circuits (Vandecandelaere et al., 2010; Boucher & Reyes, 2013).

It has been shown that these specific niches represent real opportunities for small producers, both in Latin America and in Europe, boosted by new consumer

demands in the evolution towards a more equitable consumption model that respects health and the environment (Requier-Desjardins, 2007). However, not all geographical places have the location advantages or possess suitable factor conditions to form a food cluster capable of distributing its products nationally or internationally.

In many areas of Latin America, the reduction of customs duties has favored imports of agri-food by multinationals that compete with the products of the AI. Issues with quantity, quality, price, presentation and promotion of the products together with a rapid entry of large-scale distribution companies is drastically transforming the patterns of production, consumption and distribution of food products in the main Latin American domestic markets.

In this sense, during the 1980s, policies to support the development of rural agribusiness (AIR) and the fight against poverty in marginalized rural areas in Latin America were promoted. Examples include the PRODAR network, although it had no significant results in terms of territorial activation.

Nevertheless, despite this context, Boucher and Pomenon (2010) highlight three important aspects in LAFS processes in the face of the challenges of globalization and the fight against poverty, which would justify the interest in continuing to support it:

1. The development of local capacities, linked to Amartya Sen's (1992) notion of capacities in the specifics of organization, business management, training in and for work, etc., while allowing farmers in these regions to increase the value of their agricultural production so that they find personal satisfaction (self-esteem, revaluation of cultural identity, etc.).
2. The integration of the different local actors, however difficult it may be, can offer important opportunities for the marketing of their products, reaching scales that small producers alone would not be able to access.
3. The economic valorization of work: through the recognition of its own quality characteristics, whether for typical products, local know-how, environmental values; but also the valorization that facilitates forms of solidarity and reciprocity, coordination and territorialized cooperation.

In this sense, LAFs activation processes may include those aimed at the "commodification" of culture or the productive processes that reposition in a neo-endogenous way. However, they may also serve to facilitate more endogenous processes of cooperation, solidarity and reciprocity which public policies can relate to either support the scaling up and activation of the multifunctional role of the SIALs, or in the construction of the "basket of goods" allowing for the joint valorization in the different spaces.

In this sense, the contribution of Arfini et al (2016) on the different typologies of agri-food systems looks interesting:

a) *The Closed System:*

Characterized by the strong link between producers and consumers (sometimes called co-producers) around the food supply chain that includes agricultural production, processing and the logistics involved in it. Direct relations often include fair prices to local farmers or even the co-design of cost processes, plus strong attention to the local environment and landscape between participants who belong to the same community.

b) The Open System:

Where local food industries can use inputs from outside the boundaries, but takes advantages from the local production system, its "know how", and capacity to generate innovations and services in the global market.

The food chain looks for larger markets outside the boundaries. Distance will depend on its reputation. It is characterized by the tight collaboration between outside agents and local actors.

c) The Mixed Systems:

There is the coexistence of "closed" and "open" LAFS models and the territory becomes a main part of the strategic development and reinforcement of all variables that characterize its development.

Reputation started from a main GI scheme affects the territory growth and is defined as "spillover effects" (Giacomini & Mancini 2015) expanding the benefits to the entire food sector and possibly others related to tourism and related activities, empowering, thus, local companies at different levels.

As it can be seen in the bibliography related to LAFS, most of the studies in Latin America and Europe have focused on different local products as an umbrella for development.

4.7 Biodistricts / Ecoregions approach

Biodistricts share their roots with the LAFS in the processes linked to the rural and industrial districts, but their fundamental axis for development has to do with organic production practices; especially those linked to organic 3.0 processes and agroecological principles, that is, with a strong link to economic, environmental and sociocultural processes in which the productive dynamics are inserted.

The International Network of Ecoregions (IN.N.E.R), defines a bio-district or ecoregion as "the innovative territories where farmers, citizens, public authorities and other local actors establish a formal agreement aimed at the sustainable management of local resources, based on the principles of organic farming and agroecology, in order to boost the economic and socio-cultural development of their territory. " (Biodistretto.net, 2020).

Bio-districts are marked by a multifunctional farming approach in which each presents singular lifestyles, cultural and social relations and specific natural environments. The development process can either be top down or bottom up; in most cases both approaches are part of the institutional relationship between the stakeholders.

Local specificities are usually an essential part of the agricultural products and involve a set of different interconnected activities such as: renewable energy production (solar and biomass), tourism, teaching-farms, agri-schools for

children, leisure activities as gardening, cooking, social agriculture, the maintenance of parks and public spaces, gardens and the landscape preservation. (Basile et al 2019, Darnhofer, 2005)

According to Cuoco & Basile (2014) Biodistricts can help face challenges in six main areas:

- Mix Farming: agriculture that mixes crop production with animal husbandry and the new frontiers of sustainability (energy, water, biodiversity, quality of life and work).

- Land access: in particular for young people who wish to become farmers.

- Fairer relations in the supply chain: establishing direct relations between producers and consumers, adopting alternative distribution channels such as the short supply chain and the fair trade groups, and urging public authorities to buy more local produce for canteens in schools, hospitals and other public facilities.

- Food sovereignty: granting local communities the right to decide for themselves what to produce and how to produce it.

-Simplified organic produce certification system: making it less bureaucratic, more effective and inclusive, making use of "group certification" and "participatory guarantee systems".

- Communication mechanisms are also based on the "short supply chain", bringing the communicators and recipients closer together to highlight the ethical, social, and environmental values of organic production.

The development processes in the ecoregions' territories focus on these specific and latent factors for development, also linked to the considerable potential of the hidden resources existing in these areas.

In this sense, the "activation" of the biodistrict is generally proposed by the promoting group so as to generate a harmonious development and thus help this potential to be enhanced.

In this sense in 2009, the first ecoregion was activated in Cilento (Salerno, Italy) with the leading role of the Italian Association for Organic Agriculture (AIAB) (Pugliese et al., 2015). It soon became an international reference (Zanasi et al., 2030), from then on, they grew in number and spread out creating different living laboratories of experiences and organizations that support their process worldwide.

Different experiences around the world added value and expertise to the approach, facilitating the establishment of the International Network of Ecoregions (IN.N.E.R.). In 2014, followed by the development of the Global Alliance of Organic Districts (GAOD), in 2020 integrated part of the work of the Organic Food System Programme, an initiative launched by the United Nations' One Planet Network, with the participation of different stakeholders in the organic sector from all the major five continents. It was supported by the IFOAM-Organics International and its regional bodies, IFOAM- Organics Europe, IFOAM-Organics Asia. and the Asian Local Governments for Organic Agriculture (ALGOA) among others.

The vision of the Global Alliance for Organic Districts (GAOD) is to co-create a global network able to support the local development of Organic Districts in different territorial contexts, and to scale up examples of practical solutions for the transformation of global food and farming systems in line with the United Nations Sustainable Development Goals (SDGs).

In 2021, over 50 ecoregions were operating in Europe and many more are under construction, mainly in Italy, Portugal, France, Austria, Switzerland and Spain. Different experiences are taking place in Latin America as well as in Africa and Asia.

As seen earlier, each biodistrict has its own characteristics. Given their young history, there is little research addressing the specific results that these processes are leading to; however, it is very interesting to analyze the work of Stotten et al. (2018) related to 3 case studies: The Italian case of Cilento which was, as we

saw earlier, the first international example; Bio-vallée in France and Mühlviertel in Austria .

These authors analyze the different processes of the 3 case studies integrating the frames of bioregions and organic farming, and their value-based supply chains with the neo-endogenous concept of cultural economy for regional development (Ray, 1998).

According to the authors, all the modalities of neo-endogenous development can be found in the three regions.

Regarding the first modality that recites the connection of the products to an already existing image of the region, in the 3 cases analyzed, common characteristics of an early development of organic productions are present.

Limits for implementing a modernization of agricultural processes and the low productive scale linked to characteristics of the land, mainly hills and mountains where determinant to approach organic practices. According to Stotten et al (2018), Mode II and III are part of a second moment where different actors, interested in regional development, started to redefine the already existing image, or to create the image of an 'organic region' to eventually start its process.

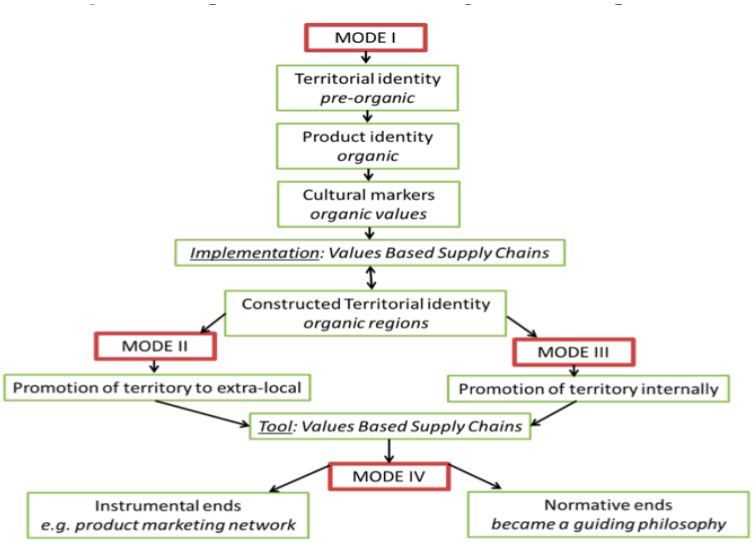
The strategies of the different examples derived from each agricultural context. In Austria the European Aid program LEADER was decisive; in France regional policies offered crucial financial support, and in Italy, the legal acts of the rural districts, and the quality districts were combined into the idea of biodistricts.

The strengthening of the internal cohesion of the region relied on two processes: the development of localized value supply chains internally and externally, and the creation of independent territorial associations. The cases demonstrate that Value-based supply chains, in the three organic regions, contributed to the territorial development in different ways by increasing visibility of the organic region while providing organic products to their local region. Examples include: food for school canteens in Biovallée and Bio-distretto, and beer for Mühlviertel.

In all three regions, logistic platforms were established through the integration of several economic institutions and actors, including the civil society and public institutions that established a membership structure that transferred ownership to the participating actors leading to the next stage.

At this stage (mode IV) bioregions were activated, institutionalized and became a guide on local rural development for a larger number of local actors. Authors in this short analysis argue that the modes of neo-endogenous development on bioregions are not performed in parallel, as Ray suggests, but in sequential patterns (see Figure 4.2).

Figure 4.2: Neo Endogenous model for Biodistricts activation



Font: Stotten et al. (2018)

The proposal offered by Stotten et al (2018) shares similarities with the 2 moments presented by Boucher (2007) for LAFS activation.

In this sense, we can see that modes 2 and 3 are crucial stages in which the activation takes part, and as suggested by Basile and Cuoco (2014), different elements (based on the experiences carried out by INNER) should be taken into account at the strategic level so that the greatest number of actors can be part of the initiative, so that it becomes representative and that internal risks of sabotage are minimized:

- Creation of a promotion committee to organize public forums to share objectives and to establish project road-maps. The committee conducts an initial analysis of the potential and problems of the area, leading to the drafting of programmatic documents.
- Once interest in setting up a bio-district has been verified, territorial actors willing to support the process (public authorities, producer associations, etc.) are identified and progressively get involved in the project.
- Depending on the actors involved, the perimeter of the biodistrict is then defined involving all key actors taking part.
- The participation of public authorities in the biodistrict project and coordination activities should be done through official channels. All levels of local government should preferably be involved (municipalities, provinces, regions, park authorities).
- The biodistrict's promotion committee then sets up an agreed program of activities to be carried out using existing resources (public and private) and through a communication strategy to find other resources and to establish partnerships with local and national actors.
- Local social farming associations and cooperatives are identified to provide management services for biodistrict activities (marketing, promotion, logistics, event management).

As it can be seen in the work done In the Parma bio-district (Guareschi et al. 2020), different methodologies can help in this important participatory process of shaping and activating of biodistricts, including those related to Stakeholder analysis.

At the key moment of the activation of an ecoregion, the outlined objectives and the founding elements can reflect the contradictions already evaluated in terms of moving from a “conventional” organic to a 3.0 value-based on deep agroecological approaches.

In these sense, González De Molina & Lopez-Garcia (2021) state that extensive literature adopts a "conventional economic approach" in relation to the VBSCs networks, usually oriented toward quality schemes such as the Protected

Designations of Origin, Certified Organic Agriculture, and Fairtrade as a way to increase a region's competitiveness via the national or international commercialization of products that pose comparative advantages.

When mainly oriented to the exogenous development, this process runs the risk of becoming standardized and conventional: benefiting larger operators with greater market access. (Barham 2002; Bowen 2010; Bowen and De Master 2011). On the other hand, foods at the local level would not be considered as a priority for accessibility. In such cases, they often become "niche" products, directed toward upper-middle class markets, and economically unaffordable in many countries for most of the population. (Goodman, Dupuis, and Goodman 2012)

In this sense, the emphasis which would guide the creation of Agroecology-based Local Agri-food Systems (ALAS) (González De Molina & Lopez-Garcia 2021) is detached from the approach of food commoditization to primarily satisfy the local population with healthy affordable food in terms of price and physical location, grown by producers who receive a fair remuneration. This approach is a more extreme proposal that would include only the closed model exposed by Arfini (2016).

Coinciding with many of the characteristics we saw in traditional LAFS systems, but seeking exclusively to generate processes more attached to endogenous developments act closely with social and solidarity economies actors and alternative food networks (AFN) (Maye and Kirwan 2010; Renting, Marsden, and Banks 2003; Whatmore, Stassart, and Renting 2003).

Examples would include: cooperatives and consumer groups, Community Supported Agriculture, solidarity purchasing groups and markets, direct sale or small food retailers; different kind of markets: "producer markets", "family farming markets", "agroecological and organic markets"; responsible public procurement (school canteens, food aid policies, etc.) (Ilbery and Maye 2005; Wilkinson 2008; Carvalheiro 2010; Hebinck, Schneider, and Ploeg 2014).

From these bases, Agro-Ecological regions can further evolve into different processes of alternative exchange systems, including mutualization of services, and complementary currencies at local, regional and international level. (De Molina et al 2019). This scaling up process, would put in motion a progressive replacement of the corporate food regime by a deep sustainable one (Gonzalez De Molina, M., & Lopez-Garcia, D. 2021) based on Agroecological principles.

As seen before, in relation to LAFS and bio-districts, regionalization cannot follow a common pattern in all territories; as example, in many regions of Latin America large geographical and productive extensions coexist with low demographic concentrations far from large urban centers, meanwhile in others the proximity between production and consumption can generate very different characteristics at the bioregion scales and territorial dimensions.

Thinking of a broader neo endogenous development system, upscaling agroecological and organic regions can identify processes moving from "micro" level experiences to “macro” scale processes in a comprehensive perspective (Lamine, Magda, and Amiot 2019) bringing about economies of scale but keeping a scope.

That process could include the mixed systems described by Arfini, the VBSC would leave aside the traditional circuits of commercial markets to focus exclusively on Alternative Food Networks (AFN) systems with the aim to generate Alternative Food Systems (AFS).

In the following part of this work, two Argentine case studies in these directions will be presented.

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Second Part

Chapter 5. Case study: Local Agri-food Systems and Organic Regions for Upscaling Agroecology and Organic Farming in Argentina. The Case Study of Pampa Orgánica Group

5.1 Introduction:

5.1.1 Productive System of the Argentine Pampas

The Pampa ecoregion extends over an area of 540,000 km2 comprising almost the entire province of Buenos Aires and part of the provinces of La Pampa, San Luis, Córdoba, Santa Fe and Entre Ríos (Burkart et al. 1999).

In this ecoregion, whose original plant formation corresponds to the temperate grassland, five sub-regions with different relief, soil, drainage pattern and vegetation are recognized (Soriano et al. 1991). Undulating Pampas, Interior Pampas, Depressed Pampas, Southern Pampas and Mesopotamic Pampas, according to the characteristics of the local climate and soil, there are about 1,600 species of vascular plants, 25% of which are grasses (Soriano et al. 1991).

The Pampas grassland has been, for many years, one of the most threatened ecosystems in Argentina (Bilenca & Miñarro 2004) as a result of the acceleration of a growing agriculturalization process origins of which date back to the 16th century with the introduction of domestic cattle, and continued with agriculture from the late nineteenth, and early twentieth centuries (Viglizzo et al. 2001).
This region maintained native grasslands until the early 1920s, when perennial grasses and annual crops began to be established (Solbrig and Viglizzo, 2000). In that period, extensive agriculture was accompanied by extensive livestock farming with low productivity and low environmental impact.

The relatively high net primary productivity of grasslands (Soriano et al, 1991) allowed for a rapid expansion of introduced livestock, leading to changes in the original communities of both flora and fauna. The presence of dominant native plant species was decreasing and together with the rural settlement, tree species

that attracted different species of exotic birds were introduced (Bilenca et al. 2012).

Starting in the 1960s, the new practices proposed by the "Green Revolution" were adopted by industrialized countries such as the USA and Europe; however, in Argentina as well as in other countries, these practices found cost barriers for their widespread implementation given the fact that the inputs that sustain the proposed “revolution”: fertilizers, herbicides and pesticides, imported at dollar value, found different constraints to accessibility by most local producers until the 90s.

At that time, the Pampas region still showed a marked predominance of pastoral livestock, but in the face of a much more convenient international price scheme for agricultural products. Since the 1970s, there has been a process of continuous expansion of the area planted with annual cereals and an even more accelerated expansion of soybeans at the expense of other crops, and of the area of pastures and agro-livestock rotations (Paruelo et al. 2005). That is verified in the exponential jump that occurs in that decade, going from 79,800 hectares for the 1971/72 campaign to 2,040,000 hectares in the 1981/82 campaign 10 years later. For 1986/87, the soybean planted area exceeded that of corn, the same with wheat in the 1991/92 campaign, thus becoming the most important crop in the country (Cadenazzi, G., 2009).

The continuous growth of soybean cultivation, thanks to an apparent positive profitability in the short term, was increased even more in the 90's where finally the main practices of the aforementioned revolution became visible in 1996/97 in the country, and where the effective arrival of chemical inputs in the region was strongly influenced by the introduction of genetically modified soybeans (RR-soy) resistant to glyphosate (Pognante et al. 2011; Aizen, Garibaldi and Dondo, 2009), with the increased consumption of fertilizers to more than 10 times; from 300 thousand tons in 1990 to 4.6 million tons in 2019, according to the "Argentine Fertilizer and Agrochemical Industry Trade Association" (CIAFA, 2019).

This "soybeanization" process has displaced traditional livestock production to areas less suitable for agriculture (Rearte 2010), and many mixed facilities became exclusively agricultural (Guibert, Grosso, Arbeletche, and Bellini 2011).

From this standpoint, research and productive development were oriented toward the search for general and universal technology packages, aimed at maximizing crop yield under a wide range of ecological situations that spread throughout countries in the Southern Cone (Argentina, Brazil, Paraguay and Uruguay) (Flores and Sarandón, 2014a).

This perspective of Industrial Agriculture, according to Sarandon (2002), is based on the Cartesian logic of epistemological reductionism based on the simplification of a complex problem and the resulting division of the production system into parts as small as possible to generate apparent "ideal" ecological conditions. This occurs through the elimination of competitors (weeds) and predators (pests and pathogens) with pesticides, and supplying the necessary nutrients in the form of synthetic fertilizers according to the specific needs of each crop with a clear vision focused on attention to symptomatic manifestations instead of developing structural regenerative strategies (Caceres, 2015).

The underlying idea is to modify the environment to make it adapt to a specific genotype of agricultural territory that can express its full yield potential based on the knowledge from dominant technologies.

Gras (2013) names this agricultural model as “agribusiness”, and characterizes it by its use of biotechnologies, the intense pace of technological innovation, high capital investment, growing participation of financial capital and the reorganization of work.

In addition to cattle migration to areas less suitable for agriculture (Rearte 2010), the production model based on fattening cattle in corrals known as "feedlots" (Herrero & Gil 2008) was strengthened. Industrial logic in this sense is part of a local and global process that seeks to maximize production in the field by

separating productive activities and seeking mono-productive specialization to increase the overall productivity of the system.

In recent years, this process has generated a strong environmental impact in different dimensions. The region has lost more than 80% of its grasslands, eventually leading to a steep decline in the abundance and distribution of many grassland-dependent birds and mammals (Bilenca et al. 2008; 2012; Codesido et al. 2011; Nanni et al 2020) such as the pampas deer (Ozotoceros bezoarticus), the common rhea (Rhea americana), partridges (Rynchotus rufescens, Nothura sp., Eudromia elegans), and the puma (Puma concolor) (Krapovickas & Giacomo 1998; Viglizzo et al. 2005). Moreover, the loss and compaction of soils (Casas 2006; Casagrande et al. 2009) and the increase in the water table increased the risk of flooding (Jobbágy & Santoni 2006). Contamination (e.g. eutrophication) of ground and surface water bodies derived from the excessive use of agrochemicals (Viglizzo et al. 2006; Vera et al. 2010), together with the excessive incorporation of nutrients, mainly phosphorous and nitrogenous compounds, due to the high animal concentration of livestock production system under feedlots (feedlots) (Herrero & Gil 2008; Rearte 2010). Contamination by agrochemicals has also generated a significant loss of biodiversity, recognizing some 29 species affected by the use of pesticides (Jergentz et al. 2004; Zaccagnini 2005).

At the human level, research on the negative impact of agrochemicals on human health show genotoxicity, teratogenicity and cell damage in populations close to agricultural fumigation areas (Carrasco 2010, Carrasco et al 2012; Lopez et al 2012). This situation has generated the emergence of different multidisciplinary social movements that, with high local representation, have been able to generate legislation at the national, provincial and municipal levels imposing non-fumigation barriers in the vicinity of towns and cities. (Rauchecker, M.2019).

Social-wise, the "simplification" of new technologies and the resulting reduction of the workforce at the end of the 90s had already expelled around 100,000 producers, introducing a gradual rural depopulation (Morello et al. 2006; Moreno 2017) and the consequent migration of rural populations to urban concentrations. Broadly speaking, the displacement of many producers was caused by the

impossibility to adapt to these new technologies, especially for those with fewer resources or less capable to access them (Ottmann, Spiaggi, Renzi and Miretti, 2009).

This new reality would include larger-scale production units (and the undeniable concentration of income) with greater investment per hectare (for the necessary increase in productivity), heavily based on the intensive use of natural resources, where the need to raise yields is accompanied by a continuous load of inputs and growing energy demands for production oriented toward exports of raw material for animal feed (Pengue, 2004).

This is partly associated with the emergence of a new business-type producer (investment pools or funds) that develops its production by renting land, outsourcing the workforce, with a higher investment per hectare (for the necessary increased productivity), and increased risk. They generally operate far from rural areas, isolated in urban centers where they take a great number of decisions autonomously.

This leads directly to a continuous concentration of land, a systematic decrease in smaller facilities (Gras, 2013) and a continuous increase in the average size of agricultural facilities in the Pampas (SAGPyA 2002; Gras & Hernández 2008). This trend was confirmed by the last agricultural census carried out in 2018, which showed a sharp decrease in agricultural holdings in the Pampas Region, decreasing from 333,533 as recorded in 2002 to 250,881 in 2018. This implies the disappearance of 82,652, approximately a quarter, at an average annual elimination of 5,166, thus confirming the downward trend that began in the 1990s.

Precisely, the input-dependent technological model marginalized family producers (INTA, 2005) who had played a fundamental role in the Pampas region (Gras, 2013). The predominance of new technologies over the experience of the producers themselves causes a loss of cultural diversity. The "local knowledge" of the farmers, understood as the range of personal and empirical knowledge, linked to the diversity of the territory and transmitted orally through generations (Toledo, 2005), is being lost. This process pushes for a single type of agriculture

"the best” (Sarandón and Flores, 2014) prioritizing “monoculture” in a hegemonic way and which universalist rigor calls “retarded” or “inefficient” all other knowledge that is not part of this productivity-oriented scientific trend (De Sousa Santos, 2011).

This process also entails the consequent loss of the multi-functionality of rural landscapes (Auer et al. 2017; Moreno 2017) and the dismemberment of social fabrics linked to rooting in the land, with its rural schools, and basic services for rural populations forming a new scenario that can be defined as agriculture without farmers (Dominguez and Sabatino 2010).

This scenario of new technologies, long considered good per se (Sarandón and Hang, 2002), facilitated the imposing of the know-how of the dominant technological package (Cáceres, 2013), causing many producers to decide to sell or rent their fields to the aforementioned planting pools, and others to completely adopt the logic of industrial agriculture and agricultural specialization, expanding its scale and using "advanced" technology.

However, an important portion of family-owned and small and medium scale productions in the Pampas Region, known for owning the means of production and producing mainly for the international market (Muzlera, 2011), has been able to preserve the rationality of the producer in the decision making process (Salembier, Elverdin and Meynard, 2016; Iermanó, 2015). Their own subjectivity defines the production process and strategies (Muzlera, 2011).

In this sense, some producers developed a technological hybridization of resistance (Ottmann et al., 2009), adopting the incomplete technological package with less use of inputs (Marasas, Cap, De Luca, Pérez and Pérez, 2012) and opting for different strategies that allowed them to keep their systems working with typical forms of Latin American development that Florestan Fernandes defines as “a process of modernization of the archaic and Archaization of the modern" (Fernandes, 1985).

On the other hand, since the 1990s, and as a response to these processes, as we have seen at the national and at the Pampas regional levels, different sort of experiences have been developed from the agroecological and organic perspectives that built knowledge and practices with approaches very different from the hegemonic ones.

Cases such as La Aurora facility in Benito Juarez (in 2017 recognized by the FAO as one of the 52 most representative experiences of agroecological production worldwide) have become true "agroecological lighthouses" over the years for many producers in the region (Cerdá, Sarandón and Flores, 2014) that is, experiences from which practices are developed and which are later transmitted and implemented in a multiplier way.

A paradigmatic case rooted in the promotion and experimentation work of the first organic demonstration module in operation at the Inta Villegas EEA (1992-2014) is the Pampa Orgaáica group.

This group developed an inclusive model of collective and collaborative construction based on organic production including, since its inception, different productive realities distributed throughout the Pampas region (Ghezan, G. S. 2010; Cabrini, S. M., & Elustondo, L. 2022).

In this sense, this chapter attempts to delve into the experience and perspectives based on this group as a case study, analyzing it from the various levels linked to its development process.

5.1.2 Pampa Orgánica Norte Origins

The Pampa Organic group has its roots in the processes that several producers in the region began in the years of the greatest change at the agricultural level, in the early 1990s.

During that period, there were few productive experiences based on organic farming, and there were neither a consolidated domestic market nor export mechanisms and channels established. In 1995, there were just over 10,000 hectares certified for plant production and other 100,000 hectares for livestock (SENASA, 1997).

Organic production was proposed as an alternative model to that of "chemical" agriculture, and detached from the processes of industrial modernization of the “Green Revolution”. This strongly idealistic stage, defined as organic 1.0, moved to 2.0 by the end of the 90s with the formalization of national regulations, certifications, and EU equivalencies generating the rapid growth of the sector.

It is at the height of the organic agriculture 2.0 in the Pampas region, characterized by a growing productive specialization, based on a few export-oriented products; mainly soybeans, cereals, and oil seeds, dominated in a semi monopolistic way by a few large companies that, although adding quality through the production processes based on organic models, are very close to the characteristics seen in the dominant system of the "technological package" which has the opposite founding principles of organic and agroecology. This process defined as "commoditization" and "convetionalization" of the organic (De Wit, J., & Verhoog, H. 2007) had a strong impact mainly due to the increase in demand from developed countries with surcharges that increasingly attracted larger companies to the organic sector, a phenomenon that has grown exponentially since the early 2000s.

In this sense, a strong concentration couples the characteristics described above for the traditional system in a "niche" market. The international growth discouraged those who participated in the concentrated mode from sharing their knowledge to guarantee the presence in a market where most of the organic production was developed in "closed" systems, with private technical advice, without contact with public organizations or with other producers, protected by the "confidentiality" of the certifiers in mostly rented fields, within their close circuit: from the seeds to inputs, freight, and even port to foreign markets.

This process, verified regionally, was nurtured by a vision that, as we saw at the national level, placed in organic production only an element of productive sustainability, functional to a dominant system of growing concentration.

Faced with this situation, a group of producers who shared spaces as the Argentine Movement for Organic Production (MAPO) in regional technical meetings in the incipient experimental stations developed by the National Institute of Agricultural Technology (INTA) started a process to establish a form of common space based on solidarity and mutual trust; with one side sharing knowledge, techniques, inputs, commercial activities; and the other breaking with the loneliness that means to be an Organic Producer, in particular for those in the extensive, mixed agricultural - livestock of the Humid Pampa.

Thus, Pampa Orgánica, after 5 or 6 preliminary meetings, on June 11, 2004, became the first extensive organic “Cambio Rural” Group. This program forms the basis of INTA's assistance and exchange system. This case will be discussed later.

With 8 producers in its origin, the cardinal points were Bordenave Municipality in Southern of Buenos Aires, Alejandro Roca in Northern Córdoba, and Agustoni in Western La Pampa; extreme distances were almost 1,000 km away.

The proximity aspect that is central to different LAFS and Organic District experiences is not related in this case to the geographical proximity, but to the appraisal proximity. In this sense, one of the most severe circumstances for the organic producer in this region has been loneliness, since in most cases the producers were islands within territories dedicated to conventional production.

This system, based on face-to-face learning, and learning-by-doing, has a lot to do with what Boucher, F., & González, J. A. R. (2016) consider foundational elements in LAFS constitution where institutional or organizational processes are built from reciprocity and trust, and whose functional collective action generates

dynamics of reflection and collective action that lead to constant innovation processes (Requier-Desjardins et al ., 2003; Cerdan and Fournier, 2007).

From 2015 on, due to distance reasons, the group decided to divide itself into 2 groups, calling themselves Pampa Orgánica “Norte” and Pampa Orgánica "Sur", taking the center of the city of Buenos Aires as the cardinal point. This facilitated the processes of visits and monthly meetings that will be dealt with later. As of 2018, the southern group is further divided into 2 groups: Pampa Organica Sur, and the “Percherones" group; they remain linked to each other and continue to hold regular face-to-face meetings after the annual plenary sessions.

This already shows the scalability of the proposal, whether in a bottom-up mode or in a way that could be called "centripetal" territorially, thus completing the descriptive movement. This definition will also be addressed in the discussion section of the chapter.

In this sense, the articulation between proximity of shared needs and organizational link promotes a spirit of "competition-cooperation" based on trust, and a shared identity to develop collective competencies, thus constituting one of the fundamental categories of Porter's theory of competitiveness of cluster systems (Porter 1998) based on which the current biodistricts are founded (Zanasi, 2020).

In this way, we can clearly see the guiding mission of the group since the beginning: "To promote support and help to members of the group, seeking to generate technical solutions for organic production in general, sharing values openly and inclusively, and seeking social, environmental and economic sustainability".

Given the growing interest in organic agriculture and agroecology, and their connection to territorial development, particularly concerning LAFS and biodistricts, to face the challenges of the SDGs, this chapter's main objective is to understand if the experience of Pampa Orgánica can be considered an agroecological/organic LAFS, and if so, to what extent this system can represent

a valid option to scale territorial development models based on organic and agroecological production.

5.2 Materials and Methods

Different methodologies were used in the general frame of the case study (Yin, 2013) using core elements of the monitor tool for Eco-Regions (Zanasi et al, 2020) and integrating both with different specific methodologies for group characterization from 3 different angles: (i) in their agroecological characteristics through the implementation of TAPE, (ii) in their productivity characteristics through the participatory elaboration of group value chains and (iii) through a stakeholder analysis from which the institutional relationships in which the groups participate are identified, classified and measured.

In a second stage, from the inputs of the different methodologies implemented, an analysis of the different alternatives, and stages of "activation" have been assessed, both at the group and territorial levels for organic agriculture and agroecology upscaling.

Each reality linked to the territorial development processes based on the LAFS and Biodistricts process is different, so it is of paramount importance to form, in the first instance, a representative group of representatives of the researched group (Zanassi, 2020) that could validate the relevance of the different methodological approaches, and that could facilitate participatory processes between the different members of the group and with the different interconnected organizations.

This group was composed by: German Cravero, the coordinator of the group, Enrique Cresta, President and founding member, and Gonzalo Roca, founding member.

The research goals, general objectives, and methodologies were shared, discussed, and finally confirmed by the whole group in 2 meetings held in March 2020, and April 2021.

5.2.1 General Description of the Group

The “Pampa Orgánica Norte” Group is made up of 11 farms covering a total of 8,673 hectares, 8 of which are under certified organic management covering a total of 7,892; 2 in conversion for a total of 724, and 1 field without certification for a total of 15 hectares; facilities of varied dimensions from 15 to 4000 hectares of extension. The group's fields are distributed in three provinces, Córdoba, Santa Fe, and Buenos Aires

Regarding the production of the fields, there is 1 exclusively agricultural, 1 that at the moment is preparing the land and the productivity organization, 1 dedicated exclusively to livestock, and 8 of mixed agricultural livestock production. At the level of land use, the group presents an important proportion of non-productive land occupied by containment spaces, nature reserves, lagoons, and ecological corridors.

Operating methodology of Pampa Orgánica Norte

The main axis of the Group's work is its monthly meetings, held from February to November on the last Friday of each month, except on the holidays.

The monthly meetings are a good platform for sharing experiences, and for addressing specific common issues on topics of interest to all participants.

Meetings can be:

- On the farm of one of the members of the Group, as an open-house event where the host shows the farm, the structure, and the activities to the other members. The host also shows the management, going through it and raising, if necessary, doubts or problems so that the group can work out during the meeting in order to settle suggestions for a solution.

- At the INTA Experimental Station for specific demonstrations or coordinated activities.

-In other places where experiences that add transferable knowledge are visited.

There is an annual plenary meeting in February in which the other 2 groups participate.

The Group has a coordinator dedicated to preparing the monthly meetings, his job is to prepare each meeting in advance in order to maximize efficiency on the day of the meeting. For this, the coordinator previously visits the meeting place and works on each case to confirm that the information presented is accurate for analysis during the Group's visit. The coordinator (together with the producers) is also in charge of looking for topics of group interest to keep the Group with an updated level of information for the management of the production systems. The coordinator also looks after the communication email that the Group has on its website www.grupopampaorganica.com.ar, and replies trade inquiries which are filtered and prepared to forward to the producers according to the type of query.

Since 2014, the coordinator of the Group has been Ing. Agr. Germán Cravero, who has worked since 2010 in extensive organic production, was trained in organic production and certification, regenerative production, and biodynamic production. The coordinator is not a technical advisor. This role can be chosen freely and individually by each participant of the Group.

The operating costs of the group are covered by its members and by a subsidy from the Cambio Rural program of the MINAGRI. Costs include the job of the coordinator to prepare the monthly meetings (based on the meeting agenda), the follow-up of the work that the group has been developing, the search for technical information of interest, and maintenance of the web page. Other costs that may arise are agreed upon by the members, for example, hiring a specialist to deal with a subject that requires it.

The total costs for one year are divided by twelve months. Half of the resulting monthly cost is divided by the number of companies that make up the group, and the other half is divided proportionally according to the billing of each company. For this, the companies must pass the annual amount of turnover of the previous

year of the organic company (or in transition). The costs generated individually for the participation in each meeting are covered by each company.

Methodology of Admission to the Group

Every producer who is interested in taking part in the group is invited to participate in a group meeting to introduce themselves and to observe the group work methodology. After the first meeting, the coordinator will visit the interested producer in order to learn how they work, what the plans are, and what capabilities are available (during this visit, the producer must pay the coordinator the fees and mobility costs). After the coordinator's visit to the facility, the interested party is invited again to a group meeting where the business plan for organic production will be presented. After this second participation in the Group meeting, both parties decide on the incorporation. Each new member agrees to participate in the 10 monthly meetings (with excused absences) and agrees to comply with the monthly payment of the Group's operating costs for a period of one year. The participation of each member is automatically renewed every February, with the possibility to unsubscribe at the beginning of that month.

5.2.2 Application of FAO Agroecology Performance Assessment Tool TAPE

5.2.2.1 Introduction

The “Agroecology Performance Assessment Tool” (FAO, 2021), or “TAPE” (FAO, 2019), is an analytical framework that incorporates key attributes of several existing multidimensional assessment methodologies, developed by a panel of international experts. It uses agroecology to assess sustainability and to measure the multidimensional performance of agricultural systems (Mottet et al., 2020).

The present methodological work will be based on Step 1 of TAPE which is the Characterization of the Agroecological Transition (CAET) (FAO, 2019), based on

the 10 elements of agroecology (FAO, 2018) disaggregated into 36 indicators (table 5.1) including the 13 principles of agroecology considering the multidimensionality of agricultural systems (Wezel et al., 2020) .

Table 5.1 Dimensions and Indicators of TAPE

1. DIVERSITY	CROPS
	ANIMALS (INCLUDING FISH AND INSECTS)
	TREES (AND OTHER PERENNIALS)
	DIVERSITY OF ACTIVITIES, PRODUCTS AND SERVICES
2. SYNERGIES	CROP-LIVESTOCK-AQUACULTURE INTEGRATION
	SOIL-PLANTS SYSTEM MANAGEMENT
	INTEGRATION WITH TREES (AGROFORESTRY, SILVOPASTORALISM, AGROSILVOPASTORALISM)
	CONNECTIVITY BETWEEN ELEMENTS OF THE AGROECOSYSTEM AND THE LANDSCAPE
3. EFFICIENCY	USE OF EXTERNAL INPUTS
	MANAGEMENT OF SOIL FERTILITY
	MANAGEMENT OF PESTS & DISEASES
	PRODUCTIVITY AND HOUSEHOLD'S NEEDS
4. RECYCLING	RECYCLING OF BIOMASS AND NUTRIENTS
	WATER SAVING
	MANAGEMENT OF SEEDS AND BREEDS
	RENEWABLE ENERGY USE AND PRODUCTION
5. RESILIENCE	STABILITY OF INCOME/PRODUCTION AND CAPACITY TO RECOVER FROM PERTURBATIONS
	MECHANISMS TO REDUCE VULNERABILITY
	INDEBTEDNESS
	DIVERSITY OF ACTIVITIES, PRODUCTS AND SERVICES
6. CULTURE & FOOD TRADITION	APPROPRIATE DIET AND NUTRITION AWARENESS
	LOCAL OR TRADITIONAL (PEASANT / INDIGENOUS) IDENTITY AND AWARENESS
	USE OF LOCAL VARIETIES/BREEDS AND TRADITIONAL (PEASANT & INDIGENOUS) KNOWLEDGE FOR FOOD PREPARATION
7. CO-CREATION & SHARING OF KNOWLEDGE	PLATFORMS FOR THE HORIZONTAL CREATION AND TRANSFER OF KNOWLEDGE AND GOOD PRACTICES
	ACCESS TO AGROECOLOGICAL KNOWLEDGE AND INTEREST OF PRODUCERS IN AGROECOLOGY
	PARTICIPATION OF PRODUCERS IN NETWORKS AND GRASSROOT ORGANIZATIONS
8. HUMAN & SOCIAL VALUES	WOMEN'S EMPOWERMENT
	LABOUR (PRODUCTIVE CONDITIONS, SOCIAL INEQUALITIES)
	YOUTH EMPOWERMENT AND EMIGRATION
	ANIMAL WELFARE [IF APPLICABLE]
9. CIRCULAR & SOLIDARITY ECONOMY	PRODUCTS AND SERVICES MARKETED LOCALLY
	NETWORKS OF PRODUCERS, RELATIONSHIP WITH CONSUMERS AND PRESENCE OF INTERMEDIARIES
	LOCAL FOOD SYSTEM
10. RESPONSIBLE GOVERNANCE	PRODUCERS' EMPOWERMENT
	PRODUCERS' ORGANIZATIONS AND ASSOCIATIONS
	PARTICIPATION OF PRODUCERS IN GOVERNANCE OF LAND AND NATURAL RESOURCES

Font: FAO, 2019

5.2.2.2 Methods

Each index has a descriptive scale with 5 transition levels (scores from 0 to 4). The scores of the four indices are summed (e.g., 2+3+3+4 = 12) and the totals are standardized on a scale from 0 to 100% (12/16 = 75%) to obtain the general score for the element "Diversity" which is used to calculate the percentage and level of agroecological transition, called the CAET level (Mottet et al., 2020).

First, the questionnaire was translated into Spanish (later a translation was available from FAO) and the questionnaire was programmed through the Kobotoo box system[1] (1 call at the bottom of the page) pursuant to the guidelines of the TAPE methodology (FAO, 2019).

The questionnaire was presented to all the members of Pampa Orgánica in an online meeting held in May 2020 where each of the 36 indices and the Kobotool box system for the compilation was discussed and presented (the survey was carried out during the pandemic). Data was gathered through remote assistance between the months of May and July 2020.

The objective of this survey was to put the general features of the different facilities on the same plane, and to be able to have a clear picture of the process of the group in general broken down into the different dimensions of sustainability proposed by the system.

In July, different meetings were held with the coordinating group to evaluate the complete modules by the members and to identify possible issues that might need to be complemented or clarified. In this process, some elements were identified not to have been well interpreted by the members. The general preliminary results were presented and evaluated together, trying to understand

1 KoBoToolbox is a free open source suite of tools for field data collection developed by researchers of Cambridge and implemented for analysis in humanitarian emergencies and other challenging environments. (https://www.kobotoolbox.org)

in a collective process the global responses that would serve to calibrate the different appreciations in the responses.

In August 2020, the final version was presented and agreed upon by different members and whose results will be presented in conjunction with the main considerations that emerged in the process.

5.2.2.3 Characterization of the Agroecological Transition (CAET)

In order to carry the characterization out, it is very important to take into account 2 fundamental elements in the analysis:

In the first place, some of the proposed indicators refer to specific practices or mechanisms implemented by the different producers. They can be evaluated either in an operational or a descriptive way based on observable reality. On the other hand, other indicators refer to perceptions that they have of the general reality in which they carry out their activities and that would not be directly attributable to their specific or observable personal actions, but to assessments that have more to do with the context. This has led to different points of group discussions, where different visions of reality were confronted. Throughout the description of the different dimensions, reference will be made to these specific characteristics and briefly to the processes and discussions that resulted thereupon.

Secondly, it was decided to take the scales proposed by Lucantoni, et al (2021) but taking into account that most of the producers are certified organic or in the conversion period. In order to avoid misunderstandings, they will be described as follows:

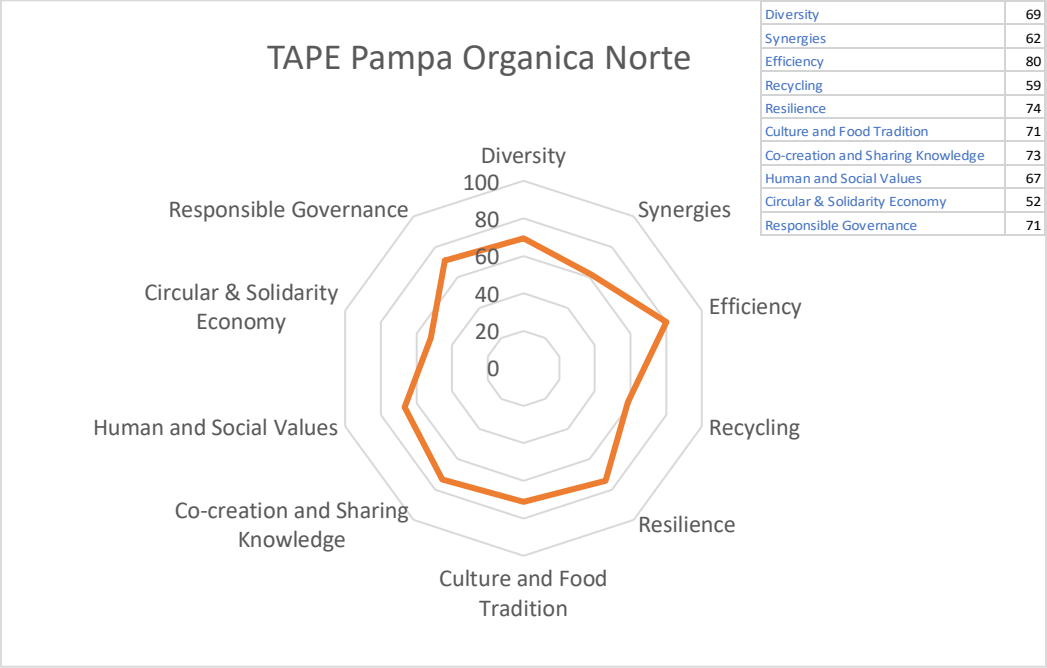
Table 5.2: CAET scales

< 40	Without elements of Agroecological Sustainability
40-49	Some elements of Agroecological Sustainability
50-59	Initial transition to Agroecologicy
60-69	Advance transition to Agroecology
>70	Agroecological Farm

Font: Adapted form Lucantoni et al (2021)

As can be seen in graph 5.1, five dimensions: Efficiency, Resilience, Culture and Food Tradition, Co-Creation and Knowledge Sharing, and Responsible Governance are over 70%; in advance transition, very close to the 70% rate are Diversity (69%) and Human and Social Values (67%), and few steps behind Synergies (62%). Finally, in 2 dimensions the group is in its initial transition: Recycling (59%) and Circular & Solidarity Economy (52%).

Figure 5.1: Pampa Organica Norte CAET Group Results



Finally, in 2 dimensions the group is in its initial transition: Recycling (59%) and Circular & Solidarity Economy (52%).

Regarding Diversity, as we can see in table 5.3, most of the members are at a high level of productive diversification. It should be taken into account, in this sense, that 8 out of the 11 enterprises are mixed agricultural-cattle which, as we saw in the introduction of the chapter, it is increasingly rare in the Pampas region, and is part of a traditional system that facilitates different virtuous processes of biodiversity.

At the level of synergies, in general, the scores of the members are high, and only in 2, there are cases of relatively low levels due to the lack of mixed production and the absence of or limited integration with trees.

Table 5.3: Single member CAET results

	Diversity	Synergies	Efficiency	Recycling	Resilience	Culture and Food Tradition	Co-creation and Sharing Knowledge	Human and Social Values	Circular & Solidarity Economy	Responsible Governance	CAET
PV	44	25	69	44	67	92	58	33	58	58	55
DR	69	50	94	56	83	92	100	100	83	75	80
LC	94	75	69	63	75	67	75	81	42	100	74
LG	63	63	81	56	75	75	67	75	67	75	70
LB	75	56	88	69	75	67	67	50	25	50	62
AV	75	69	81	56	75	58	100	69	75	83	74
ER	81	69	69	56	75	75	83	63	50	58	68
NF	63	75	69	81	75	83	75	88	63	100	77
SC	56	75	88	56	75	58	50	63	42	58	62
QU	63	31	88	50	67	42	50	50	25	50	51
DH	81	92	88	56	75	75	83	63	42	75	73
Average	**69**	**62**	**80**	**59**	**74**	**71**	**73**	**67**	**52**	**71**	68

From the efficiency side, thanks to the diversity mainly sustained in the mixed production model, none of the members uses external nutrients. The production cycle of each facility is based on a clear rotation and integration between agricultural and livestock production, achieving productive autonomy in terms of soil nutrients.

In terms of recycling, while very high values are found at the level of biomass and nutrient recycling; for the indicator of water saving, it was agreed to include a score of 3 for all the members, since none of them has irrigation and by not using chemical synthesis products, there is no contamination of water bodies. On the other hand, despite that different actions are being carried out based on seed management and renewable energy in the fields, in these two last indicators, the values were generally low.

Regarding resilience in general, the values were very high in aspects concerning individual management and related to income and production stability, the capacity to recover from disturbances, and indebtedness. They were markedly lower in the mechanisms focused on community mutual support systems and

mechanisms to reduce vulnerability. Available access to loans and insurance are aspects that have been unforeseen up to now by the group.

There were high levels of response in culture and food tradition focused mainly on the tradition linked to the production and consumption of meat that in the region is part of the main food culture and legacy. This, in a certain way, also has a negative impact, in some cases, due to excessive consumption. Some of the members considered lower scores to the lack of local varieties in vegetable production, but as historically seen, they have not been part of the productive food culture in the region.

Scores for Co-creation and knowledge sharing have been high, mainly due to the relationships established through Pampa Organica. However, from this dimension, it has been confirmed that there are different visions based on participation. Some members are very active, both as part of the group and in relationships with other institutions, and at the individual level, as leaders of Pampa Organica. Others, are less participatory and see the co-creation relationships available to the group to a lesser extent. Lower scores are seen, however, in their relations with grassroots organizations linked to local realities. Some of the members do not live all the time in the countryside.

This last aspect is strongly linked to the dimension of Circular and Solidarity Economy, where the lowest scores were obtained, specifically in relation to the local market proximity and the link between producers and consumers. Given the general dimensions of the fields and the productive typologies, and the geographical location and territorial distribution of the populations, these elements are of great difficulty for most of the members of the group, especially those that have larger productive extensions.

Finally, human and social values and responsible governance are the dimensions that, as we said at the beginning, partially refer to a greater degree to the perception of the members of the territorial reality in which they live.

On human and social values, high level of women empowerment and animal welfare scores, with relatively lower scores in terms of youth empowerment and social integration, and inequalities. This last element is more visible in bigger farms where different roles are clearer and defined in terms of decision-making and income.

Lastly, with regards to Responsible Governance, the participation of producers in Pampa Orgánica group guarantees their capacity to participate at different levels of institutional participation, but on the other hand, the producers' empowerment and their participation in natural resources were recorded with lower rates. These last 2 indicators are strongly related to public authorities and policy aspects, even if private rights are guaranteed, many issues are not addressed by local, provincial, or national authorities in terms of public support for the general improvement of conditions, and support to producers in conserving and preventing contamination produced by main agricultural actors.

These aspects should be taken into account in terms of possible actions concerning specific programs or joint actions at the level of public policies and awareness, but certainly, in the way that they are addressed on the TAPE, they are less accountable to each member's actions.

5.2.3 Participatory Value Chain Analysis in Pampa Orgánica Norte

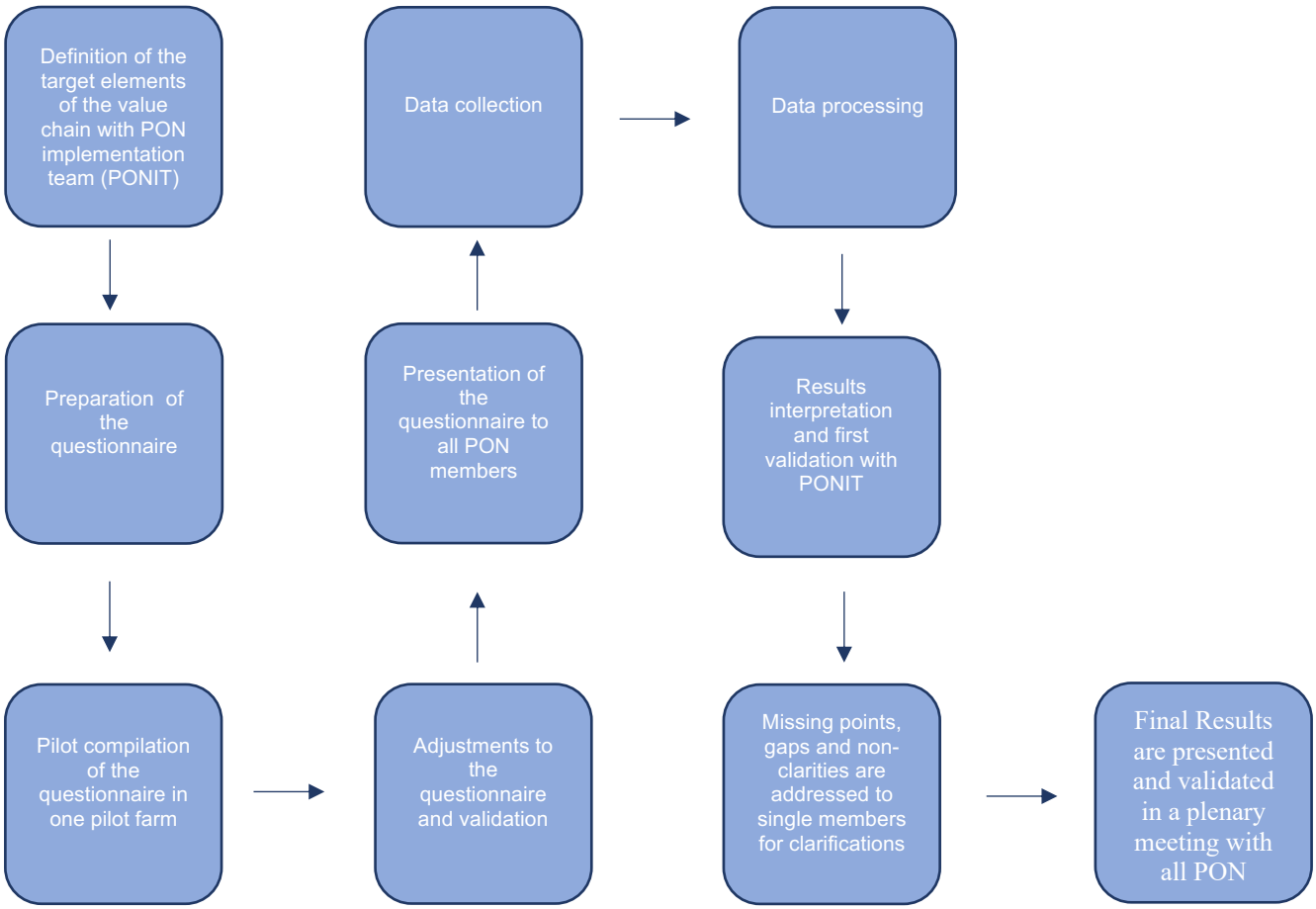
In order to carry out the value chain analysis, a participatory process was carried out with the promoter group. The aim was to identify the key elements that could provide a complete picture of the group that would serve to highlight the existing productive diversity and the potential for external economies of scale, due to the presence of a critical mass of activities at the different links of the supply chain (Zanassi et al.2020).

It is important to mention that, as we have seen in the introductory part, the groups' initial mission was to share experiences at a productive level and to foster relationships among members, so far, no common databases have been

developed that could serve to systematize the productive capacities or the production choices that the different members make, or their infrastructural capacities nor their market channels.

The methodological process implemented in the research had the following steps as shown in figure 5.2:

Figure 5.2 PON Value chain Methodological frame



In the first instance, 2 meetings were held with the PONIT to define the target elements of the value chain. Following the discussions, it was decided to approach the process through 3 different levels of investigation:

(I) to identify main characteristics at a quantitative level of production, both at the agricultural and livestock level, (ii) to identify installed and available capacities in the different undertakings (in terms of cleaning, elaboration, storage and processing) and (iii) to identify market destinations of the different productions.

For the development of the questionnaire, different implementation modalities were evaluated, with the main objective of generating a tool that, on the one hand, would be consistent when including the aspects of the different productive, processing and distributive processes, and on the other, versatile enough to generate a process that implementation could have continuity in time.

Carrying out a first questionnaire in the field of a member of the PIT served to identify elements that, despite being able to provide specific information from the field, would have been very difficult to systematize in terms of the whole group practices. Based on different reviews, a first questionnaire model meet the needs and objectives identified and explained in its details in a plenary meeting to all members and each producer completed the questionnaire individually with the continuous assistance of the researcher and the PONIT from February 2022 to April 2022 giving time to producers to finalize the winter season of 2021/2022 in order to get the results of the harvest and sales included.

The final questionnaire and the results obtained after different reviews and final verification processes with the members are detailed below.

5.2.3.1 Production:

5.2.3.1.1 Agriculture

At the agricultural level, it is important to bear in mind that in the region there are 2 types of annual crops: one in the summer, also called coarse, and one in the winter or fine, were different crops are cultivated as can be seen in the table.

Table: 5.4 Crops seasons and varieties

	Summer or coarse season:	Winter or fine season:
Crops	Corn, Sorghum, Soybean, Sunflower, Pumpkin, Peanut	Wheat, Barley, Rye, Oats, ChickPeas
Planting period	October to December	May to June
Harvest Period	May to July	November to January

Elements Requested in the questionnaire:

-Number of dedicated hectares by crop and yields in the following seasons:

-Winter season 2020/2021.
-Summer season 2020/2021
-Winter season 2021/2022
-Summer season 2021/2022

At the agricultural level, 4 productive cycles were taken into consideration, 2 in winter and 2 in summer. As table 5.5 shows, the cultivated hectares notably change between the winter and summer cycles, from 113 to 811 hectares in the 20/21 season and from 405 to 1079 for 21/22. This is due to the fact that generally in the winter cycle more land is used for grazing or planted with crops for livestock feeding that were not included in the study since only those productions that were used for marketing or for the generation of seeds were included. On the other hand summer corn, soybean and sunflower crops, as we saw in different parts of the thesis, are the ones with the largest international market up to now and to which the region has mainly turned to since the 90s.

Table 5.5: PON Production records

Winter Season									
20/21					21/22				
Crop	Hectares	Total Yield	Average Yield	Number of Producers	Crop	Hectares	Total Yield	Average Yield	Number of Producers
Wheat	48,0	51,0	1,1	2	Wheat	199,0	377,4	1,9	2
Barley				0	Barley	194,0	477,0	2,5	4
Rye	83,0	64,2	0,8	3	Rye	5,0	6,0	1,2	1
Oat	8,0	15,7	2,0	2	Oat	5,0	7,5	1,5	1
Chickpeas				0	Chickpeas	2,0	3,4	1,7	1
Total	139,0				Total	405,0			
Summer season									
20/21					21/22				
Crop	Hectares	Total Yield	Average Yield	Number of Producers	Crop	Hectares	Total Yield	Average Yield	Number of Producers
Red flint corn	228,0	1124,5	4,9	7	Red flint corn	470,0	1890,9	4,0	6
Purple corn	20,0	20,0	1,0	1	Purple corn	16,0	16,0	1,0	1
Pisingallo Corn	39,8	139,1	3,5	2	Pisingallo Corn	36,8	128,6	3,5	1
White corn	7,0	28,0	4,0	1	White corn	5,5	22,0	4,0	1
Soy	289,0	420,2	1,5	4	Soy	239,0	364,0	1,5	4
Sunflower	192,8	368,0	1,9	2	Sunflower	255,0	369,2	1,4	3
Sorghum	25,0	15,0	0,6	1	Sorghum	40,0	40,0	1,0	1
Peanut	2,0	3,6	1,8	1	Peanut	7,0	10,5	1,5	1
Pumpkin	7,5	60,0	8,0	1	Pumpkin	7,5	45,0	6,0	1
Total	811,0				Total	1078,8			

In winter cycles we can see that 3 varieties were cultivated in the 20/21 crop. Rye was the one that most producers cultivated, 3 in total, and that more hectares were dedicated 83, followed by wheat with 2 members and 48 hectares, and finally oat with 2 members and 8 hectares. For the 21/22 season, wheat production with 2 members widely increased the surface passing to 199 hectares, followed by barley which was consistently included by producers, 4 in total, based on a high growth on its demand, which will be analyzed in the third point referring to supply chains and marketing. These two products are the main crops in terms of agricultural surface, to which Rye, Oat and Chickpeas are added and together account for 12 hectares.

At the productive level, we can see that wheat's yield for the year 21/22 was higher, from 1.1 to 1.9 tons/hectares, whereas rye was from 0.8 to 1.2 ton/hectares, and with oats lower from 2 to 1.5 tons/hectares.

Referring to summer crops, it can be seen that in both periods the same type of crops were grown, but with an increase of a 33% in the total dedicated land during 21/22. In both periods, red flint corn was the most cultivated seed, by 7 producers

covering a total of 228 hectares in 20/21 and by 6 in 21/22 for a total of 470 hectares, increasing the allocated area by over 100%.

Followed by soy in both seasons produced by 4 members with a greater area allocated on 20/21 passing from 289 hectares to 239 on 21/22 and the sunflower that was produced by 2 members on 20/21 on 192 hectares and by 3 on 21/22 for a total of 255 hectares.

The pisingallo followed with 2 members cultivating it in 20/21 for 40 hectares and only 1 in 21/22 for 37 and finally, the crops cultivated by only one member each season: sorghum 25 and 40 hectares, purple corn 20 and 16 Hectares, pumpkin 7, 5 both seasons, White corn 7 and 5.5 hectares, and peanut 2 and 7 hectares.

In terms of yield for the summer season, it is not possible to make a comparisons because the yields of the 21/22 season were presented as a forecast based on the progress of the crop in the field and its relationship with previous seasons, given that at the time of completion of the questionnaire had not yet harvested the crops.

5.2.3.1.2 Livestock

The approach to beef cattle farming in the Pampean Region can be divided schematically into two stages (1) breeding, with cows and bulls to produce calves, and (ii) wintering, where the calves are fattened for sale as steers or heifers.
Generally, the two stages are connected by an active calf buying/selling market, but occasionally they are integrated in the same establishment in a so-called "full cycle" scheme.

Elements included on the questionnaire:
-Type of livestock approach and quantitative description of the production.

Within the group 8 producers are currently producing livestock. Of these, 5 breed and 3 follow the complete cycle.

In total, 4,090 hectares of the plots are dedicated to the livestock sector. Depending on the year, lands for agricultural use are added to these hectares if head of cattle are added, or it is necessary, based on conditions, to extend the grazing land.

In the interviews carried out among the producers to complete the questionnaire, all of them expressed that the livestock sector in Argentina is very changeable and challenging because, being a basic product of the national diet and that it is strongly rooted in the national culture, its production and price generally have a strong presence in country's policy that influences the generation of highly variable sectoral measures that include the prohibition of exports for periods and the generation of temporary taxes, which makes it difficult to generate long-term predictability.

In total there are about 7,200 head of cattle that are partially sold every year as we will see further on regarding 2021 market sales.

Each year that amounts changes and as a reflection changing the cultivated area as it has been seen in the previous point.

On the other hand, one of the producers has a small production of lambs of 100 heads and another two members have small farm of laying hens for another 310 chickens.

5.2.3.2 Farm Capacities / Infrastructures

With the aim of generating a complete picture at the group level on their capacities, a set of 3 different core dimensions where addressed.

Elements included on the questionnaire:

It was requested a description of the capacities of each member in terms of cleaning, storage and processing inside their structures

As we saw in the agricultural and livestock part, there are different dimensions of producers present in the group, there are also different capacities at the level of cleaning, storage and processing, as will be presented below.

Cleaning capacity:

At the grain cleaning level, 4 establishments have their own cleaners
of which 3 do all the cleaning of the crops and one hires an extra cleaner in some periods. The rest of the establishments that produce grains, meaning another 5, hire companies to do the cleaning, outsourcing this service.

Storage capacity:

As for storage in stainless steel silos; 6 members have structures ranging from 35 tons to 8,000 tons to storage where 3 of them use their capacity for the total of their crops, 2 in partial mode completing the rest in plastic silo bags and another 2 have excess capacities, so they store other producers grains; finally 2 members use plastic silos bags and on some occasions they use stainless steel silos from other members of the group.

In total, the available storage capacity in stainless steel silos among the members is 10,900 tons.

Processing capacity:

2 members have 2 small stone mills and one hammer mill with cooler and girder for production of between 300 and 400 kilos of wheat per day each, 1 member has a soybean extrusion press of 200 kg/hour (occupied at 10% of its annual capacity) and its own industrial plant for the production of cookies and hamburgers and finally

1 member has an industrial plant for oil and expeller that processes 48 tons of grain per day, greatly exceeding the yields of all members and working with different organic and non-GMO produce

5.2.3.3 Market destinations

With the aim to understand better the characteristics of the PON members value chain different element where included in the questionnaire:

-Quantities sold of every product, market destination and supply chains involved if possible until final consumer, describing when possible the different operators characteristics considering the following seasons:

Agricultural Summer season 20/21

As we have seen, the largest crop sown was corn of the red flint variety.
Regarding sales, as can be seen in the figure 5.3 , 765 tons meaning 68% of the harvest was sold as organic to dairy farms, most of them close to the farms, of which 5 were small (up to 100 cows) and 4 medium-sized (between 100 and 300) these 9 dairy farms are part of the project that the multinational Nestle developed in the region, where it accompanied and assisted 17 milk producers for more than three years, with the support of a team of specialized local technicians who functioned as assistants for the project.

Nestlé, which has its production plant in the town of Villa Nueva, province of Córdoba, in the Pampas Region, is one of the main players in the Argentine dairy industry. It leads the powdered milk segment, which represents 28% of the total milk category in the local market. In addition, it exports dairy products to more than 25 countries for more than 100 million dollars.

The sales of the members of Pampa Orgánica Norte to the dairy farms were made directly from each one of them with each dairy farm, and in many cases they were made with the corn already harvested.
Until now, it is not common for medium or long-term agreements to be made between producers and dairy farms, nor for agreements to be generated between the group as a whole with the dairy farmers, nor with Nestle.

The objectives of the company are to export organic milk from Argentina to the rest of the world through its global channels, given that until now Nestle's organic powdered milk is not available in the local market so in the table it has been considered production only for export as the final destination.

It is important to note that up to now there are no certified organic milk available in the Argentinian market, although there are a few cheese producers and that surely once the process expands it will be available on the national market.

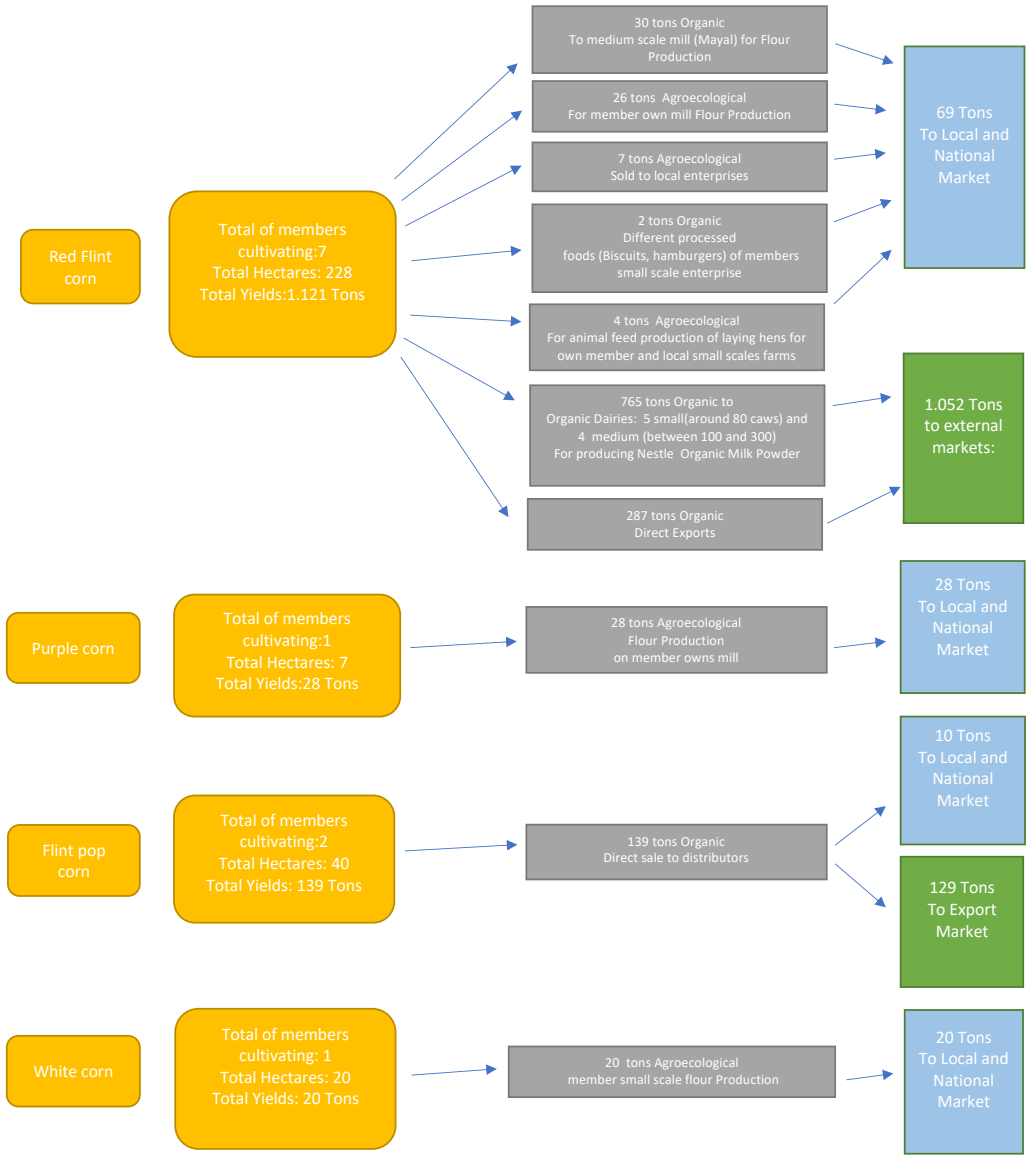
A second destination of the red flint corn was the direct sales to international markets with 287 tons, 25.5% of which was carried out directly by a member of the group, given that it has the storage and management capabilities to export directly to the United States.

Finally, as the final destination for local and national consumption, 67 tons were accounted for, 6% of the total produced by the group, of which most for the production of flour, both for baking and for polenta, in almost equal parts as organic and as agroecological. In the case of certified flour, it was sold to a mill that has marketing channels focused on small and medium-sized specialized shops and bakeries throughout the country. In the case of agroecological production, mainly as polenta, it is directly marketed by the member of the group at provincial and national level.

Another of the destinations of the production was used by one of the members for the production of biscuits and other products in its own processing facilities, which sells mainly at the provincial level in the largest urban centers. Finally, some 7 agroecological tons were sold directly to different local companies and consumer groups, both for animal feed and for the production of flour and polenta.

At the level of other varieties of corn, white and purple with a total production of 48 tons of agroecological production were also processed into flour and distributed nationwide.

Figure 5.3 Agricultural Summer season 20/21 Value chain (part 1)



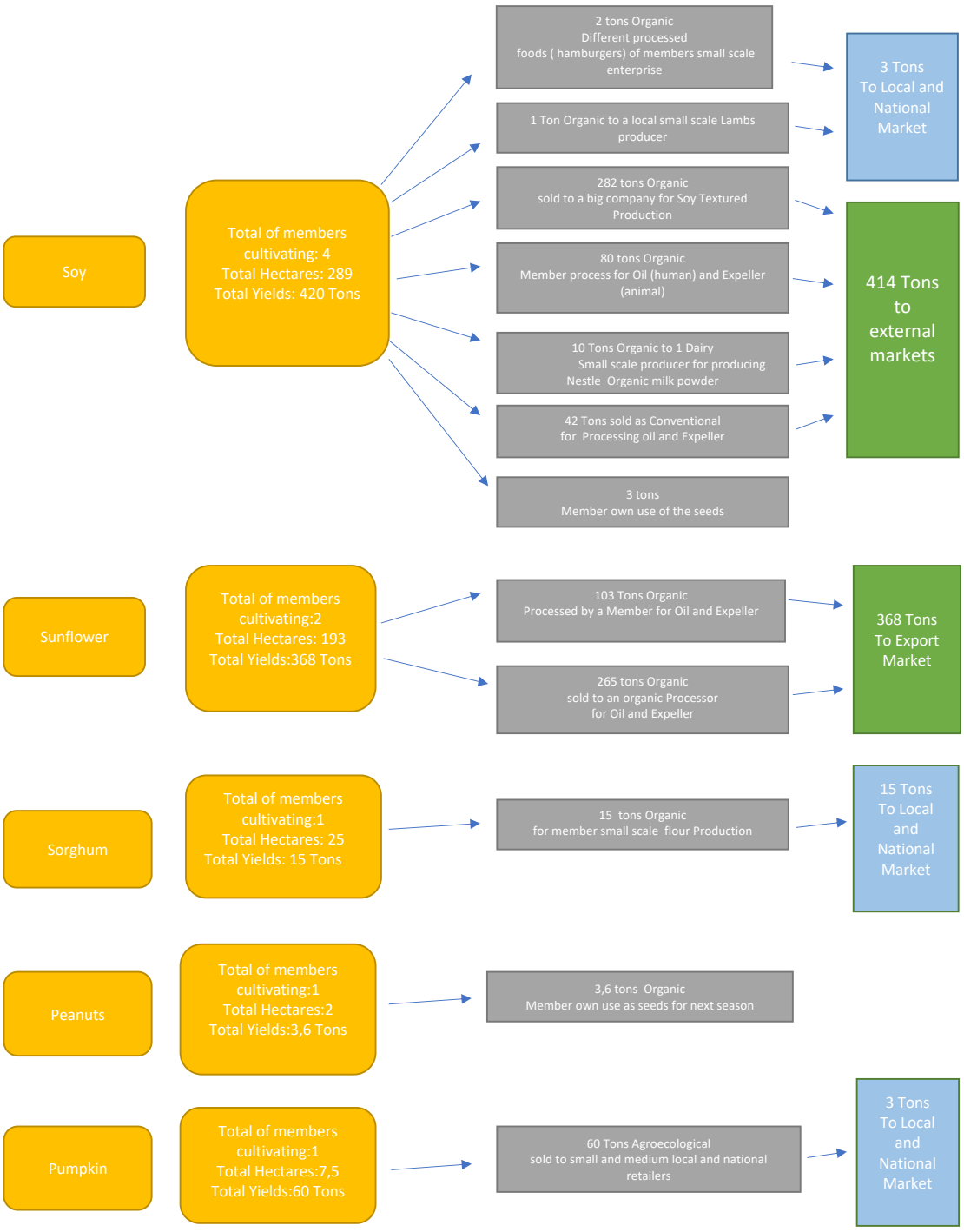
Finally, among the varieties of corn, the flint type used for pop corn was mainly exported abroad for a total of 129 tons and another 10 were absorbed by the local market, all in certified organic mode.

The second most cultivated product has been soybean, as can be seen in table 5.6, with a total of 420 tons harvested.
A representative part of the crop for a total of 282 tons, that is, 67%, was sold by one of the producers to a large company that produces organic textured soybeans for export, another important part was processed as an expeller for animal feed and oil mainly for human consumption of which 80 were exported as organic and 40 sold locally to processors, as one of the producers is in the conversion period, it was sold in the traditional market without being able to add value despite the distinction of the productive model implemented.
10 Tons were sold to a small dairy that also produces for Nestle.
Finally, for local consumption, 2 tons were used for the preparation of hamburgers by one of the members that distributes at the provincial level, 1 ton for feeding lambs in small-scale production that are sold locally.

As for sunflower, 103 tons were processed and exported by a member and 265 were sold to local processors for export in both cases certified organic.

15 tons of sorghum were also harvested and processed as organic flour, distributed at national level and finally 60 tons of agroecological pumpkin were distributed locally and nationally. Finally, 2 tons of peanuts were harvested that served as seed for the next season, which, as can be seen in table 5.4, in terms of production the member increased the number of hectares under production to 7. This last element is very important to consider because the province of Cordoba is one of the areas with the highest peanuts production at the national level and is of global relevance for high-quality exports. At the moment, the production of organic peanuts has been a challenge for the producers in the area, but after a few years of testing, it seems that the path has been found, which can open up new productive alternatives with high returns, given the international demand that exists in this product.

Figure 5.4 Agricultural Summer season 20/21 Value chain (part 2)

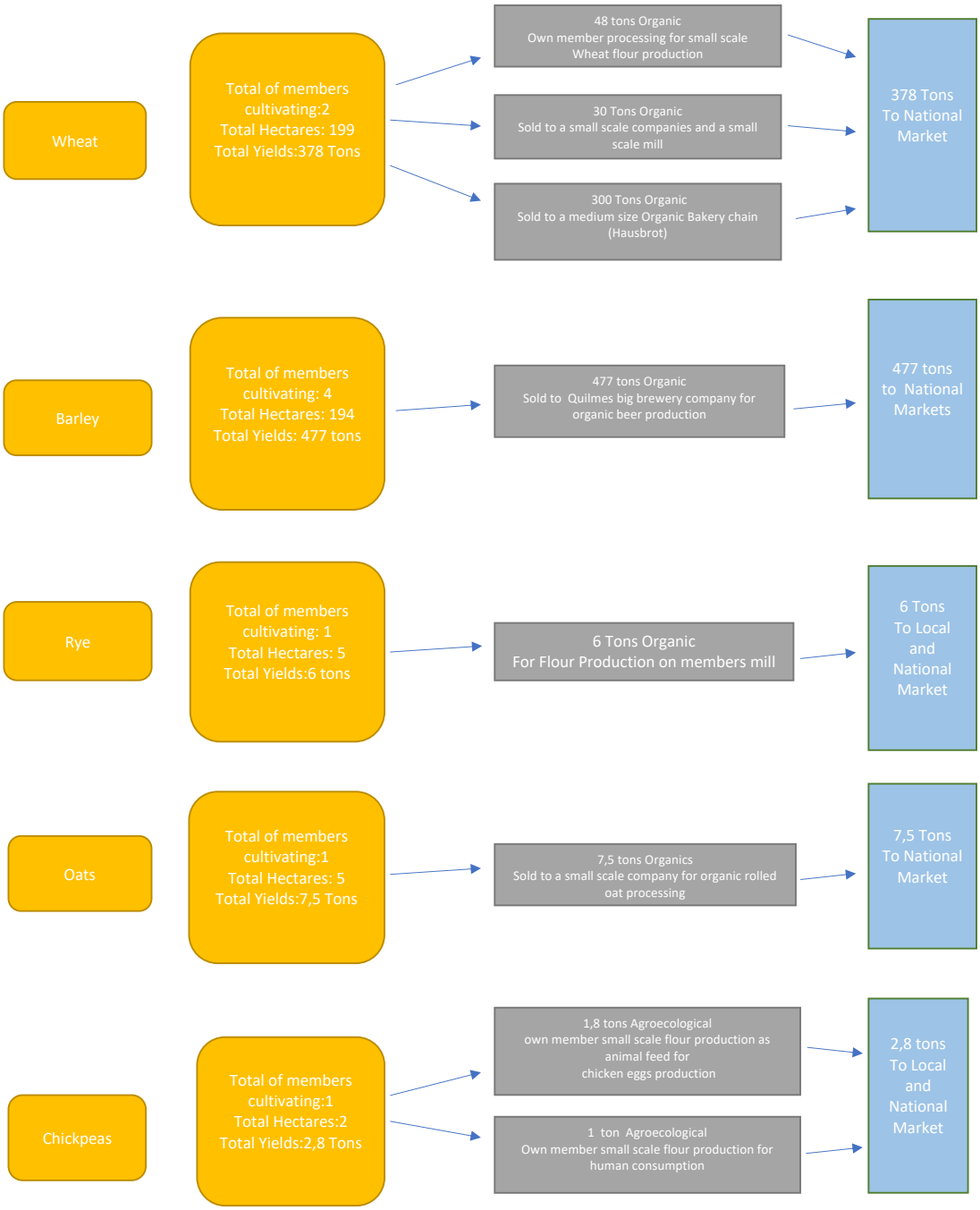


Agricultural Winter season 2021/2022

The most cultivated products as seen were wheat and rye.
The first, with a productive total of 378 organic tons, was totally destined for local consumption, as can be seen from figure 5.5.
The most representative sale of wheat was made by one of the producers to the Hausbrot company owned by one of the members of the Pampa Orgánica Sur group, the company is a pioneer in producing 100% whole foods with a history of more than thirty years. The firm produces more than 100 products from wholemeal flours, including dry pasta, wholemeal flours, cookies, grissini and frozen foods, under Organic certifications and has a production capacity of 40 tons of food per day that can be doubled according to demand.
At the same time, it has more than 50 stores, mainly in the city of Buenos Aires, but also in different provinces of the country from where they sell their products.
Another 2 modalities where implemented one through member own milling for the production of flour with a total amount of 48 tons, and other 30 tons were sold by a member to a nearby mill and to a small entrepreneur for distribution at the national level in all the cases mentioned, the destination was both for baking companies and as flour for sale in specialized shops and consumer groups.

Barley was widely produced, strongly increasing the numbers of recent years and reaching a total production of 477 organic tons as a result of the launch in 2020 of the first national organic beer. This was produced by the Patagonia company owned by the multinational Ab inveb, which initially launched a limited edition of 480.000 liters that were distributed only in points of sale in Buenos Aires and Patagonia.
Then, given the high demand and diffusion that the company found in the country and the availability of producers to increase the barley production it decided to launch a second edition at the national level with a production of 1 million liters, starting to stabilize production to initially sustain it at the national level with the expectations of exporting in the region, given that the Patagonia brand already exports in the neighboring countries of Brazil, Chile and Uruguay.

Figure 5.5 Agricultural Winter season 20/21 Value chain

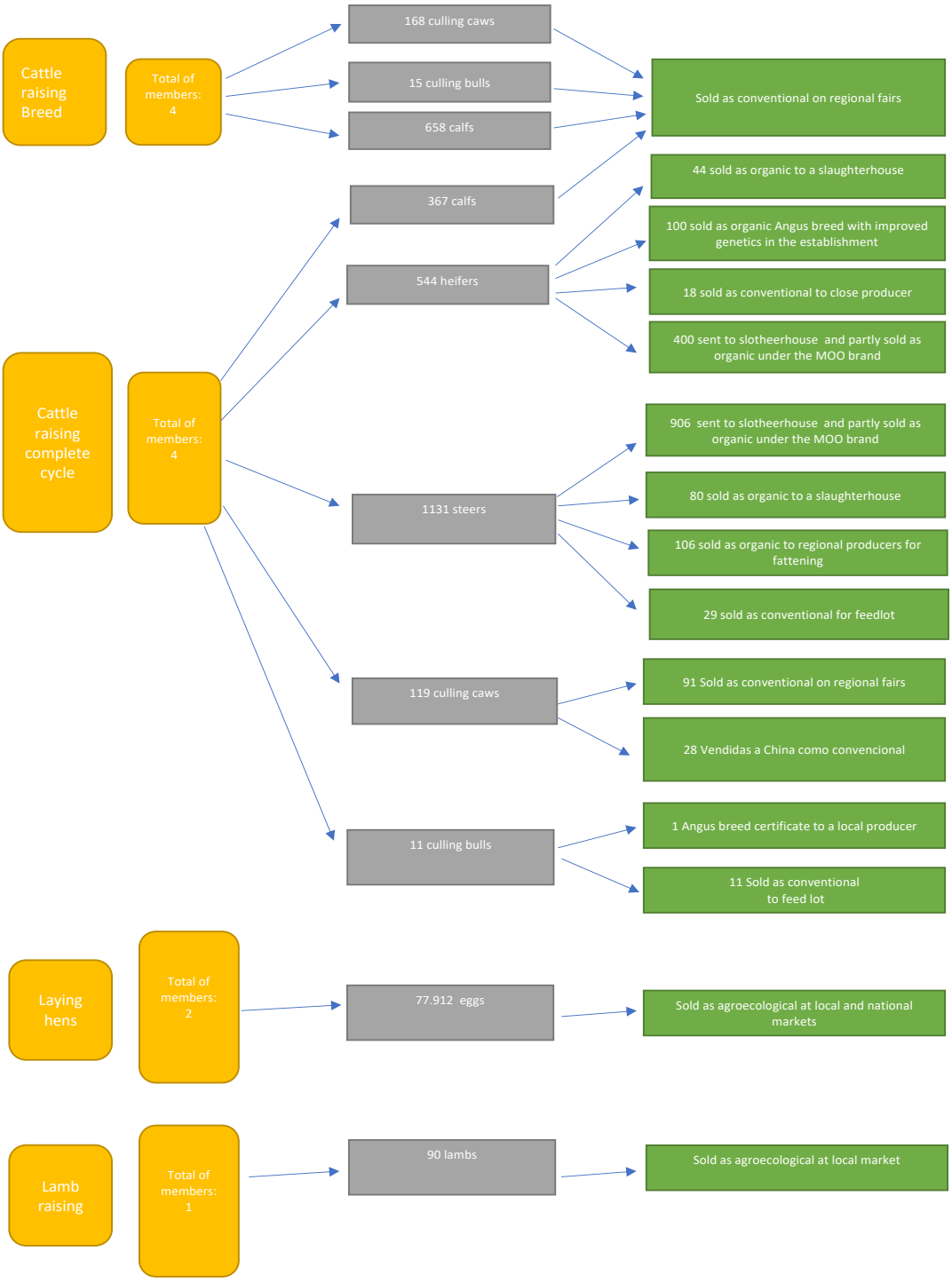


At the moment the 4 members who have sold their productions have done so on an annual contractual basis, without a medium or long-term program with the Patagonia company.
The rest of the products with smaller amounts were rye, which was processed and distributed as organic flour for 6 tons, oats for a total of 7.5 tons, which was sold to a company that processes organic rolled oats for national distribution, and finally chickpeas for a total of 2.8 tons, of which 1 were used to feed a small laying hen establishment and 1,8 ton was distributed nationwide.

Livestock Production year 2021

As we can see in the figure 5.6 and it was explained in the previous part, the cattle production system in the group is divided into 2 types of practices, one for breeding and the other as a complete cycle.
For the first, based on the rearing of calves that reach a maximum of one year are sold in traditional channels for fattening. Up to now the volume of the organic market is not allowing the development of an integrated organic chain where the production could be valued in the market. In this way, although the land used for livestock in most of the fields is certified as organic, members are not certified at the animal production level.
In 2021, a total of 658 calf were sold by producers dedicated to breeding, to which must be added another 367 by full-cycle producers who followed the same line of being sold in the traditional market for a total of 1,025 calfs.
In any case, it is important to mention that for the regional market, the production model implemented by PON producers is recognized and prices are usually higher than those of the market as a result of the quality differentiation and recognition.
These producers usually have a sales cycle of culling caws and bulls that they replenish always in the conventional market to maintain a high production level.
As for the full-cycle producers, as we can always see in figure 5.6, the situation changes because through this approach, the producers can value the most important part of the production through the channels linked to organic certification, in this sense the 4 producers are also certified for animal production.

Figure 5.6 Livestock Value chain



In this process, two substantial elements should be highlighted in relation to the experiences of the group and the potential it presents. In the first place, 1306 helfiers and steers from a total production of 1578 was absorbed by the company

MOO (Meet Overgrass Organization) created in 2017 by, among other partners, one of the members of Pampa Orgánica Norte and another member of Pampa Orgánica Sur.
The company was born with the purpose of valuing the meat of the organic production system both in the country and abroad. Due to different measures applied by the national government, the export was severely limited in the recent years and until now it is focused only on the local market.
At a productive level, the company delegates the beef processing to a slaughterhouse with organic certification always in the Pampa region and different cuts are distributed vacuum-packed by the company as organic through three channels, direct online sales to families or buying groups, to specialized shops (organic stores and dietary stores) and at large distribution channel (Carrefour).
At the moment, MOO has not come to value the whole animal as organic and, depending on the offer, they introduce to the market different cuts as organic meanwhile other are sold to other recognized brands in the market, also with differential prices.
From the rest of the heifers and steers 124 were sold to different slaughterhouses as organic, 116 sold to growers in the area for fattening as organic and 47 were sold as conventional.

The second interesting example is that of one of the full cycle members with a Pedigree Pure Angus herd and a controlled Pure Angus herd.
From these it specializes in full cycle Angus breeding, further valuing the organic production. In this sense, it was able to value in the market 100 organic Angus pregnant caws and 1 organic Angus bull.

To finalize the picture of cattle production, we also find culling practices among full-cycle producers, which in the 2021 cycle had a total of 119 culling caws and 11 culling bulls, in these cases the producers replace them with animals within the same production cycle without the need to buy them on market.

Finally, we find the lamb production of one member that yearly distribute 90 lambs as agroecological in local butcher shops and with direct purchases from nearby

consumers and the production of chicken eggs by 2 members counting around 78.000 eggs every year also distributed as agroecological locally and nationally.

5.2.3.4 Discussion

The mixed agricultural and livestock systems that characterized the Pampas region for decades and that are nowadays strongly affected by the dominant monocultural farming system, have a number of advantages at different levels; extensive livestock grazing is a major determinant of local biodiversity and ecosystem functioning increasing the microbial activities and carbon storage (Oggioni, et al 2020), it promotes nutrient recycling within the farm, facilitates the rotation between annual crops and pastures over time and it reduces the need for transport and/or processing of bulky biomass with more opportunities for ecosystem service provision at landscape level (Tittonel et al, 2020).

According to PON members with more than 20 years of experience strictly pastoral livestock has two key functions on the organic production for the region:

(i) weed control ; well-managed cattle in the forage stages of the rotation consume the "weeds" exercising a control that is essential to favor the agricultural stages. Within the history of the Pampa Organic they have witnessed several agricultural proposals without livestock and all of them ended up including some type of livestock to improve weed management.

(ii) soil fertility ; the passage through the bovine rumen of the plant material from forage crops and agricultural stubble transforms these materials into manure for the fertility and health of the organic soil that also sustains productivity without the need of use of any bio-fertilizers.

In this sense, the mixed agricultural-livestock model, as we have seen in the previous point, has several market alternatives at the value chain level.

In the case of crops, we have seen that the members are changing their productions depending on the system as a whole and the possibilities offered by the market.

From the systematized data we can see that an important part of the production of the summer cycle, mainly corn and a small part of soybeans, had the purpose of animal feed, first of all as a destination for small dairy farms in the region that add value to the regional system and whose final product as organic milk powder with high added value that has a large potentiality in international market and that can be introduced in the national market as well. Corn was also exported without further processing.

As for Soybeans, it can also be seen that a very important part of the production exported, as textured soy for human consumption which is a very important source of protein for healthy diets, as we will see in the next chapter. Another part of the production was exported processed as expeller and oil.

Finally, sunflower processed in the form of oil and animal feed was another product mostly exported by the members of the group.

At the level of productions that destinated to the national and local market, we can see that a variety of foods were produced on different scales, such as rye, which recently had a strong growth from the initiative of Patagonia for the realization of organic beer, and there was also a wide variety of production of different types of flour (flint, white, purple corn, wheat, sorghum, rye) for local, regional and national distribution, adding to this different processed organic biscuits, hamburgers and streamed oats, concluding with pumpkin and chickpeas.

Finally, at the agricultural level, peanuts after several years of attempts, one of the members seems to have found a way to produce it organically, which may represent another new product with high distribution capacity both nationally and internationally for the coming seasons. .

Regarding livestock, we can see that there is a consolidated reality among the members of the group, given that some have more than 20 years of experience

in the organic livestock sector that required from them a strong capability of adaptation, in addition to the climate and productive conditions, to the changing conditions both at the economic and fiscal level of the country.

They distributed in the market more than 3,000 heads of cattle with a high level of differentiation, which ranged from high differentiation with organic Angus breeds, to an organic brand in which livestock producers directly participate, to regional informal “recognition” of the breeders members that do not count, in most cases, specific quality certifications.

It is important to emphasize that, as can be seen in the different tables presented, there is a wide variety of channels and so far the main action of the group has been to share the information of these existing channels. No joint sales or any type of identification of the production as part of the group have been carried out so far, each of the members made commercial agreements autonomously.

On the other hand, at the infrastructural level, the members despite the fact that in some cases there are surpluses, whether for cleaning, for storage or for processing, in very rare occasions these have been shared and integrated with other members.

We will see how these elements could be taken into account at the time of a possible "activation" of the system in the last point of this chapter.

5.2.4 Stakeholder Analysis

5.2.4.1 Introduction

The complex and dynamic nature of food systems based on Agroecology and Organic Agriculture requires flexible decision-making that embraces diversity of knowledge and capabilities. Therefore, multi-stakeholder approaches have become an important instrument for analyzing specific contexts and designing effective interventions matching local needs. (Guareschi et al, 2020)

Approaches of Stakeholder Analysis methods have progressed from awareness raising in the late 1960s (Van Tatenhove and Leroy, 2003) to incorporating local perspectives in data collection and planning in the 1970s (Pretty, 1995); moreover since the '80s have become increasingly applied on different enterprise management sectors, including socio-ecological analysis (Pronti et al, 2018). Its development of techniques addressed local knowledge and participatory rural appraisal (Chambers, 1983).

SA can be seen as an approach that provides a series of guidelines and methods for analyzing and understanding social relations and mechanisms through the identification of the key actors involved in it, with their specific functions and interests (Gimble et al 1997; Reed, 2008).

Its methodology has been classified at different levels from different authors:

- Reed (2009) distinguishes it according to the research interest as either descriptive, normative or instrumental, where the descriptive approach is used as a preparatory tool for subsequent studies or organization of a participatory process (Donaldson et al, 1995), the normative approach aims at engaging all representative stakeholders and incorporating them within the process under analysis (White et al, 2017) and finally, the instrumental one analyses the behavior of stakeholders and its relationship with the implementation of policies to achieve the desired results (Reed et al, 2009).

Rowe and Frewer (2000) focus on the nature rather than on the degree of engagement. They identifying different types of engagement according to the communication flow between different parties. Thus, information dissemination to passive recipients constitutes ''communication'', gathering information from participants is ''consultation'' and ''participation'' is conceptualized as a two-way communication between participants, where information is exchanged in a form of dialogue or negotiation.

Okali et al (1994) distinguish between ''research-driven'' versus ''development-driven'' in terms of the objectives of participation. Likewise, Michener (1998) contrasted ''planner-centred'' participation that is focused on outcomes with

‘‘people-centred’’ participation, building capacity and empowering stakeholders to define and meet their own needs.

As SA is extremely adaptable, a wide variety of tools and approaches have been used for stakeholder analysis in different contexts, producing and analyzing qualitative data to weigh their interests, importance, influence and resources, and in this manner assess how they can influence a specific process (Brugha & Varvasovszky 2000).

5.2.4.2 Methods

In the same perspective developed for the realization of the TAPE and the Value Chain analysis, the methodological process of SA had the aim to empower stakeholders through the co-generation of knowledge together with researchers and participants’ capacity to use this knowledge (Greenwood et al., 1993; Wallerstein, 1999; Beierle, 2002).

The descriptive and normative approaches (Reed 2009) were mainly used in this research driven (Okali et al 1994), people-centered (Michener 1998) process.

The methodological process was implemented following 2 steps:

(i) identification, classification and description of the actors (ii) Stakeholder Analysis through an influence – interest matrix

5.2.4.2.1 Stakeholder Identification, classification and description

Being the focus of the analysis, the Pampa Organica Group sought to identify in this process the different actors with whom the group or members of the group carry out or carried out common programs or projects. Whether formal or informal, and that from different perspectives that could have a role of empowerment in the first place of the PON system. Secondly, as a consequence

of the enhancement of the PON, the upscaling of agroecological practices for territorial development in an LAFS approach (Fournier & Muchnik, 2012)

In this sense, a consultative process (Rowe and Frewer, 2000) was firstly developed among the participants of the PON group to identify different relevant actors for the current development of the initiative using a bottom-up ‘‘reconstructive method’’ which allowed them to actively participate in the categorizations and parameters as a way to improve the perceptions of the stakeholders themselves (Dryzeck and Berejikian, 1993; Hare and Pahl-Wostl, 2002).

This way, the main stakeholders and a possible classification was identified with the PONIT, ultimately shared with the rest of the members in plenary to verify if any actor was missing.

As can be seen in table 5.6, 14 stakeholders were finally identified and broken down into 5 groups: Producer groups that are directly related to PON, movements and organizations related to the organic, agroecological and biodinamic practices, research institutions both as extension and sustainability impact-oriented, biodistrict-related initiatives and institutions, and business organizations.

For the classification of the stakeholders, coordinating interviews were organized with the PONIT in a consultative way, with at least one member of each of the 14 organizations identified and the PON members active or related with them, in order to include in this phase (i) the general characteristics of the organizations (ii), the activities implemented or in the process of implementation with PON. Then, a documentary analysis of the processes of each actor was carried out, and finally, based on this, it was first shared with the referents in documentary mode, and then asked to eventually expand.

In this way, each of the organizations included and the actions that in some cases were or are being developed jointly by several institutions will be presented below.

Table 5.6 Stakeholder Classification

	Producer groups	Movements and organizations	Research		Biodistricts	Economy and Entrepreneurial
			Extension oriented	Impact in sustainability oriented		
Public	-Cambio rural program		-INTA - Marcos Juárez Agricultural Experimental Station (INTA) -INTI	-National University of Río Cuarto		
Private/ Civil Society	-Pampa Organica Sur - Percherones	-MAPO -IAABDA	- Bioleft		- GAOD	- Mayma Entrepreneurial Humanity - Territorial Bank Foundation
Mixed					-Bio districts National Table	

Cambio Rural program:

"Cambio Rural" (Rural Change in Spanish), is a program under the umbrella of the Secretariat of Agriculture, Livestock and Fisheries of the Ministry of Agriculture, that promotes the growth of rural production through its producers, in collaboration and with the technical support by INTA.

Through the methodology of group work, and the exchange of experiences, it seeks to facilitate productive transformation, enhance the skills and abilities of the members of the group, and the generation of knowledge in all productive, organizational and management aspects. Moreover, through the meeting of producers, it aims at generating collective actions and investments to improve the production conditions, and to enhance the country's agro-industrial development.

Supported by technical assistance, the purpose of "Cambio Rural" is to promote and facilitate the intensification and reconversion of production as a means to improve the productive and socioeconomic situation of small and medium-sized

rural producers. Its objective is also to promote agro-industrial development throughout the national territory, promoting group learning.

“Cambio Rural” makes a contribution available to producers to finance part of the fees of a professional advisor (the advisory promoter) who coordinates and facilitates group work and acts as the nexus between the group and the rest of the actors in the Program.

It also offers to the groups training tools and technical advice. Moreover, it organizes networking activities for the members of the Program, as a way of promoting the exchange of experiences within the same region and between the various regions. At the same time, it facilitates access to different tools and other State programs that may be useful for the members of the groups.

Relations and Activities between “Cambio Rural” and PON

As previously introduced, PON was first set up as a rural change group. It helped to partially finance the work of the group coordinator over the 8 years that the program lasted with the 2 editions in which the group participated. Beyond this contribution to date, given that the reality of organic production is marginal within both the Ministry of Agriculture and INTA in terms of assistance programs, the group did not have broad support or specific options to generate exchanges and training related to organic agriculture or the agroecological approach. In this sense, the program contents are directly related to the involvement of INTA in organic and agroecological practices.

Pampa Orgánica Sur

As described above, the “Pampa Organica Sur” group shares its origins with the “Pampa Organica Norte” group. It is part of another Rural Change program with another group coordinator, and has its own internal dynamics, but remains linked to the Norte group in various aspects.

The Group is currently made up of 9 producers who work on some 12,000 livestock-agricultural hectares, certified organic. Their fields are located in the Province of Buenos Aires and La Pampa, distributed among the towns of Espartillar, Darregueira, Bordenave, Tres Arroyos, Sierra de la Ventana, Sierra de los Padres, Orense, Pringles, Pedro Luro and Hucal (La Pampa).

Percherones:

The “Percherones” group also shares its origins with the Pampa Orgánica Sur group. With a strong agroecological-driven approach, the group is distributed along different locations in the Province of Buenos Aires such as Tandil, Pringles, Tres Arroyos. It has 12 members covering approximately 3,580 hectares, with horticultural family producers with 5 hectares up to mixed agricultural-livestock productions of 2,000. As with the other groups, they also have fields that are nature reserves and/or protected areas.

Relationships and Activities of Pampa Organica Sur, Percherones groups, and PON

The two groups are part, along with Pampa Organica, of an informal group that unites them from the beginning. Each coordinator of the groups shares information about the processes. Likewise, the different members share knowledge, practices and in some cases commercial links of different types. The 3 groups hold an annual 2-day plenary meeting in a field where updates, processes and perspectives are shared.

Argentinian Movement for Organic Production (MAPO)

Mapo was founded on September 25, 1995 and registered as a Not-for-Profit Organization in 1996. It is formed by producers, consumers, certifiers, researchers, scientists, technicians, educators, entrepreneurs and organic marketers. It has subsidiaries in the form of regional delegations in the interior of the country.
The first and second articles of Certificate of Incorporation include:

1) To promote the production and marketing of organic, ecological or biological products, understanding these three terms as synonyms. 2) To stimulate research, and to geenerate and transfer knowledge into agro-ecological activities. Today it represents around 200 members throughout the country. Its main activities include: Promotion of organic production, dissemination and exhibitions to show the community the benefits of the production system and organic food, to ensure the quality and transparency of organic markets, to voice in defense of the Organic Movement and its members.

Relations and Activities between MAPO and PON

Since MAPO's origins, the members of PON have historically participated. They have also covered positions at Board level such a the presidency, vice-presidency among others. In turn, Mapo was an important get-together and reflection place for the creation of Pampa Organica.

At present, 1 member from PON and two from Pampa Orgánica Sur take part in the Board of Directors.

As a movement, in recent years there have been some specific actions of interest where part of the group participated. These include the simplification of the procedures for the authorization of small mills in Organic production, and the cancellation or reduction of rates and taxes to exports of which organic production was beneficiary. In addition, there are the informal relationships that, in some cases, develop between members in aspects related to certification and product marketing.

In recent years, common activities have decreased and it has not been possible to structure links that could involve the realization of common objectives, programs or action projects.

Association for Biological-dynamic Agriculture of Argentina (AABDA)

The Association was formally constituted in 1998.It is integrated mostly by farmers, but also professionals, consumers, sympathizers and friends of Biodynamic Biological Agriculture also participate either from Argentina or

neighboring countries. Companies that certify their products, such as Demeter, and other ecological movements are partners are also part of the Association.
The Association's main activities include:

-Training. Introductory and specialized regional courses are delivered in different parts of Argentina where there are qualified teams and premises.
-Seed Area – Seed Constellation
Constellation is an agroecological Seed Factory established as a social enterprise in the town of Merlo, San Luis. It works in a collaborative way and is part of a Network of Seed Multipliers of small producers located in different provinces of the country and who produce seeds in a careful and coordinated manner.

Main activities include: (i) Workshops on self-production of seeds, (ii) research on the adaptation of varieties for use in biodynamic contexts, and (iii) production and marketing of biodynamic seeds.
Institutionally, it holds understanding agreements with INTA and the Bioleft Organization at the national level. It also has agreements with Kultursaat (Germany), Bingenheimer (Germany), and Sativa (Switzerland) in Europe.

Relations and Activities between AABDA and PON

Until now, relations have been mainly linked to joint participation in projects related to seed development and particularly to the coordination of a regional training course delivered by one of the members of PON, who is at the same time part of the executive committee of AABDA.

INTA:

The National Institute of Agricultural Technology (INTA) is a decentralized state agency with operational and financial autonomy. It operates under the National Ministry of Agroindustry. It was created in 1956 and since then it has been carrying out research and promoting inter-institutional cooperation for

technological innovation in value chains, regions and territories to improve the country's competitiveness and sustainable rural development.
The institution has a presence in the five ecoregions of Argentina (Northwest, Northeast, Cuyo, Pampeana and Patagonia), through a structure that includes: headquarters, 15 regional centers, 52 experimental stations, 6 research centers and 22 institutes, and more than 350 Extension Units.
INTA has 15 National Programs for the management of innovation in production chains and in the territories, two Research Networks (Plant Ecophysiology and Agroecology) and 120 Regional Projects with a Territorial Approach (PRETs) for the institutional approach.

Relations and Activities between INTA and PON

Relations with INTA have been discontinuous and informal with the different political referents and general program coordinators. Currently, based on a political push for agroecological practices, different programmatic lines are being added to the most representative pro-huerta agroecology program of this institution that we have already presented and which does not include extensive production.
Until now, the only links sustained over time and with specific content have been channeled through the Agricultural Experimental stations and different technicians referring to the organic programs within them.

INTA Marcos Juárez Agricultural Experimental Station

The Marcos Juárez Agricultural Experimental Station covers an area of 1,451 hectares.
It has an area of influence that includes 6,362,149 hectares, in the southern half of the province of Córdoba, and covers the departments of Marcos Juárez, Unión, Presidente Roque Sáenz Peña, General Roca, Río Cuarto and Juárez Celman (South of the Arroyo Chucul).

It produces and markets seeds, grains, cattle and pigs, and the profits obtained are reinvested in the experimental station as a contribution to research, extension and infrastructure maintenance.
It is made up of five areas, whose main lines of research and work are:
(i) plant genetic improvement (ii) Soils and plant production (iii) animal production, (iv) economics, statistics and information technology and (v) rural development.

INTA Pergamino Agricultural Experimental Station

This Station was created in 1912 as an Experimental Farm and initially fulfilled the task of selecting wheat and corn, use of flax straw, management and use of corn for breeding and fattening pigs and poultry, later incorporating forage seeds.

With the creation of INTA in 1956, it became the INTA Pergamino Regional Agricultural Experimental Station and new possibilities for agricultural research, experimentation and extension were opened up.

Currently the Experimental Station has 748 hectares, where its various facilities (buildings, laboratories, greenhouses, etc.) and 15 Rural Development Agencies are located with more than 130 professionals from different specialties that carry out their research, experimentation and rural development activities based on sustainability, equity and agri-food competitiveness.

Relations and Activities between INTA Marcos Juárez and Pergamino Agricultural Experimental Stations and PON

Since the founding of the group, it has directly collaborated with the stations which carry out different exhibition activities in the field. Over the years, different group meetings have taken place in both structures where concerns and experiences of the members are jointly evaluated with pilot processes developed by INTAs organic experimental fields, mainly focused on maize, sunflower, soybean and bovine production.

Currently they are working together with Bioleft on a participatory maize seed improvement program that will be described in detail later.

Bioleft

Bioleft is an open seed breeding and exchange community of an interdisciplinary research team, made up of members specialized in economics, agronomy, environment, genetics, law and intellectual property, collaborative production and research, and communication.
It combines local and scientific knowledge to enhance the role of farmers in the conservation and improvement of seeds through three main "tools" of frameworks:

Legal: based on seed licenses that remain open for research, development and registration of new varieties. It includes a viral clause: improvements derived from Bioleft material will also be Bioleft, that is, open.
Technological: a web platform to record and map the varieties of seeds that are exchanged, the exchanges, and the continuous improvements. Collaborative improvement projects are supported creating a living seed bank and a network of experimental fields.
Methodological: Bioleft is co-designed through participatory and cross-cutting processes and methodologies, enriched by a great diversity of participants.

It is articulated with INTA, and other organizations and Universities at local level and take part on different international platforms.

<u>Relations and Activities between Bioleft and PON</u>

For more than 4 years, there has been a dynamic collaboration fueled by the active participation of one PON member in Bioleft.
Currently, the PON group gets all their seeds from the market and, as previously seen, the organic sector in the country does not have the means of research and improvement that conventional production has, so the variety of organic seeds in the market are very limited.

In this sense, the group becomes a benchmark within Bioleft for experimentation and extension in organic and agroecological production.
For the time being, field research has focused on the participatory improvement of maize through a joint program between the INTA Pergamino Agricultural Experimental Station, Bioleft and PON called "Program for the genetic improvement of non-GMO maize for organic and agroecological production".
So far, the experimentation has given very good results that are currently being taken as inputs for the publication of a scientific paper on the one hand, and on the other, to start developing a variety of seeds to distribute in the group and thus expand both the field of research and the productive improvement of the most planted crop in the group.
Based on this project, the idea is to extend the methodology to other seeds based on the main needs identified by its members.

National Institute of Industrial Technology (INTI)

It is the benchmark of the National State in matters of industrial technology and metrology. It was created in 1957, within the framework of the emergence of a set of national institutions aimed at putting public investment into science and technology for the implementation and the articulation of policies and strategies defined by the National Ministry of Productive Development.
Its mission is to contribute to the development of the industry through the generation and transfer of technology, the certification of processes, products and people, and the quality assurance of the goods and services produced throughout the country.
Today, the Institute strengthens its federal vision and its close bond with the productive network throughout the country, fundamentally aiming at the competitive improvement of SMEs, the strengthening of value chains throughout the country, the substitution of imports, the development of suppliers, the consolidation of the production system from a sustainable perspective, innovation as a way to promote exports with added value and the adoption of the industry 4.0 paradigm.

Relations and Activities between INTI and PON

INTI has been developing different activities to support organic production in different regions with varied intensity. Within the framework of these works, in 2020 a specific technical assistance agreement was signed with the MAPO and the program "Value Added to Regional Organic Food Production" followed.
The planning horizon aims to generate added value in regional organic production based on the incorporation of technology and good practices; the scaling of products at an industrial level; the generation of pilot productions for use as samples and export items; and the implementation of quality and differentiation systems according to the demand of the target markets; as well as the provision of technological assistance for the improvement of processes and products by INTI.
The PON group participated in several meetings and 3 of its members presented different individual proposals that until now have not found operational capacity or funding.

National University of Río Cuarto

It was created on May 1, 1971 after the local and regional mobilization of individuals with the purpose to build knowledge, develop teaching and learning, carry out research, promote university extension, promote national culture, produce goods and provide services with social projection, and contribute to the solution of the Regional, Argentine and Latin American problems.
For this reason, the potential of the UNRC is inextricably linked to its community and region, based on which it defines its dimensions, the pace of its expansion, its investigative work and capacity for innovation to contribute to its development.
The University autonomous pursuant to the current legislation.
The UNRC is academically structured in Faculties, which are the units in charge of organizing, teaching and managing the wide and diverse educational offer.
It is integrated by five Faculties: Agronomy and Veterinary; Economic Sciences; Physical, Chemical and Natural Sciences; Human Sciences and Engineering, all located on the university campus.

Annually around 1,000 professionals graduate from the 50 undergraduate programs. In addition, more than 40 fourth-level programs are taught and organized by the Faculties and the Postgraduate Secretariat, addressed to UNRC lecturers and external professionals and from which around 750 students graduate annually.
It counts with a University Campus located 6 km. from the center of the city of Río Cuarto, and has 165 hectares to which are added the 1445 hectares of fields of experimentation and diverse cultural practices.

Relations and Activities between National University of Río Cuarto and PON

The National University of Rio Cuarto is the closest to the producers of the group and this has led to the establishment of different links aimed at carrying out research in the field.
Among them, the links with two teams of professors and researchers stand out: on the one hand, a group from the Faculty at Agronomy and Veterinary Medicine led by Claudio Sarmiento focused on the multidimensional sustainability of provincial agroecological systems and, on the other hand, the Department of Geology at the Faculty of Physical-Chemical and Natural Sciences led by Anahi Dominguez who, since 2012 has carried out several types of research related to biodiversity and the evidence of differentiation between conventional and organic fields' impact on the region.

Bio districts / MAGYP (National Ministry of Agriculture, Livestock and Fisheries) Table

In June 2021 the so-called Bio districts Table was launched under the 2030 Strategic Plan of the Organic Production sector that was conceived within the Advisory Committee for Organic Production.
Although the origin was that, given the complexity it addresses and the ambition it seeks as a broader inter-institutional space, it quickly took on a life of its own, with a strong agroecological perspective and approach and whose main protagonists are the Municipalities.It has 2 main objectives:

• To create and strengthen capacities at the local / municipal and provincial level on organic and agroecological farming.
• To constitute an innovative space, focused on governance at the municipal level that encourages dialogue, inclusion, planning, knowledge management and shared learning, thus achieving legitimacy and continuity in public policy.

Its genesis is associated with the growth and conformation that is evidenced in Europe and much of the world (Asia, Latin America, Africa) of organizational networks with a strong base on sustainability and responsible consumption, focused on food production, its added value, local typicality and opportunities offered by both the development of the local market and its internationalization.
During 2021, 9 (virtual) meetings were held with the presence of numerous public and private sector institutions.

Relations and Activities between Bio districts / MAGYP National Table and PON

PON was invited to participate in its first stage of consultation and programming activities as a reference for the producers and members of the group. It has participated in the 9 meetings hold to date. The main objectives of linking into this space are, on the one hand, to provide the vision of the producer and, on the other, for the group to develop better common understandings about the alternatives of bio-districts in the Pampas region and to create links, with public municipal and provincial bodies at the national level, and with public policies and research groups, thanks to the wide participation from different public institutions and Universities.

Global Alliance for Organic Districts (GAOD)

The Global Alliance of Organic Districts (GAOD) was established in February 2020 at the Ministry of Agriculture in Rome with the participation of diverse stakeholders in the organic sector from all the major five continents. In October, the Inaugural GAOD Summit in Goesan, South Korea, was held with the attendance of more than 400 from 46 countries.

A first important attempt to create a link between these experiences has already been started by one of the main actors of the Summit: the OFSP - Organic Food System Program, the United Nations Core initiative with the main goal to use the Organic food systems as models and living laboratories for transformation processes, toward sustainable food systems.

The GAOD aim is to become the “global space of change” for the exchange of knowledge, ideas, resources, projects by people of all continents, who have decided to act with an ecological worldview, with a clear and shared vision.

To this end, GAOD has worked from the beginning to widen the Alliance as much as possible and has organized working groups, which have the task to provide good practices and support in local activities with clear guidelines.

Task groups include: (i) Organic Districts Integrated Management, (ii) Tourism and Gastronomy, (iii) Regenerative, Organic Farming and Agroecology, (iv) Natural Resources Management and Energy generation, (v) Social issues: social agriculture, communities’ enforcement, (vi) Urban-Rural relations, Communication and (vii) Youth and Organic Agriculture.

Relations and Activities between GAOD and PON

PON has been part of GAOD since 2021 and is the only group from Argentina in the network.

Members of PON have participated in different thematic meetings that have served to deepen the knowledge of the international realities concerning the formation and management of bio-districts, giving on the other hand a territorial vision of the Argentine Pampas’ reality that has been of interest to the alliance and presented at different international events.

Mayma Entrepreneurial Humanity

It is an organization that has promoted a more humane and conscious economy for over 16 years, through the training, networking and visibility of entrepreneurs from Latin America. It has already supported 3,000 startups from Argentina, Chile, Colombia, Mexico and Uruguay.

It seeks to accelerate the transition to agroecology in the region, by strengthening small producers who want to produce with a positive economic, social and environmental impact, or who are already doing so.
Mayma supports to strengthen their management and business with tools so that they can be economically viable and independent and, at the same time, become key players in the provision of sustainable food for themselves, for their communities and for the market.
It organizes 17-week BIO Transition programs for acceleration of agroecological and organic transitions. Such programs include coordinators in the territory, tailored mentoring, regional experts, peers who propose to share their learning, consulting on +10 relevant topics to all entrepreneurs, kick-off events and celebration of closing.

Relations and Activities between Mayma and PON

PON members support the program from the beginning, aiming at agroecological and organic acceleration, forming an institutional part of the initiative that it also promotes territoriality through its members.Several of the PON members were mentors in the different editions of the initiatives, and provided the knowledge and contacts made over the years to those who are in the acceleration processes, some of whom have generated professional or commercial links with PON members.

Territorial Bank Foundation

It is a non-profit organization whose main objective is to implement sustainable development projects with a positive economic, social, environmental and productive impact in communities and municipalities, applying paradigms and postulates of a Natural, Social and Solidarity Economy.
It builds and manages a public-private territorial alliance articulating local public, social and business initiatives and design, plan and execute a local strategic development plan, which implements projects based on generating sustainable productive development.

Relations and Activities between Territorial Bank Foundation and PON

Recently initiated, relations are linked to jointly understanding possible alliances between PON and the foundation linked to implementing complementary monetary systems through the “tokenization” of productive assets by members that can boost investment, capitalization and insurance relations against natural events.

5.2.4.2.2 Stakeholder Analysis through influence and interest matrix

The identification and selection of the influence and interest elements to be evaluated involved the PONIC and the GAOD scientific coordinator, and author Zanassi (2022) taking into consideration LAFS main elements, and Porter's (1998) dimensions with the main objective to be aligned with other researches that are ongoing for the evaluation and monitoring methods on Bio-district sector.

For influence, the focus was on evaluating how, in the first instance, an organization with which it has collaborated or is currently collaborating, can have a positive influence to generate virtuous activations at the level of development in two levels of interaction, in the first instance and the core one: on the reality of PON. Secondly, through the collaboration for the upscaling of the organic and agroecological agriculture in the hole Pampas Region.

For this second passage, it is key to take into consideration the openness of the group in relation to knowledge and the dissemination of practices as a base for understanding its deep collaboration practices.

On the interest side, the availability/intension that an actor beyond its structural capacity may have to get involved in a real collaborative process with PON is mainly evaluated.

Final elements used include:

Influence:

Innovation: ability to provide knowledge, goods and/or practices that lead to changes with a positive impact at different, production or commercial processes.
Quality: Ability to improve the quality of processes and products, mainly based on local and regional peculiarities including the process of guaranteeing or demonstrating through research the quality values in terms of sustainability, origin, nutrition, and others.
Resources: resources that an actor can mobilize to support the process, whether in goods, communication, management, networking, etc.
Institutional Legitimacy: contribution that can be generated to value the activities and networking that can open connections with other institutions or relevant actors to support the processes.
Territorial development: collaboration that can generate a change at the territorial level that serves to scale organic and agroecological production processes.

Interest:

Vision of the process: adherence to the vision of Pampa Organica Group centered on the principles, methods and practices that it develops in connection to territorial development through organic and agroecological production.
Coherence: coherence between the main activities of both organizations.
Utility: Confidence that improved collaboration will improve conditions for both organizations.
Visibility: confidence that the collaboration will improve the visibility of the actions of both organizations.
Predictability: ability of the institution to be able to maintain interest in the medium and long term.

The implementation of the matrix serves to identify, on the one hand, the key players with high interest in the project and high influence, and, on the other, actors to be involved, with high influence and medium interest.

For the evaluation of the final score of interest and influence it has been considered each subcategory of elements using a minimum value of zero and a maximum value of five for each element of each stake holder.

The evaluation was implemented with the PONIT in a participatory approach based on the documentary analysis of the specific characteristics and involvement of each organization, the interviews as well as indications and suggestions from PON members.

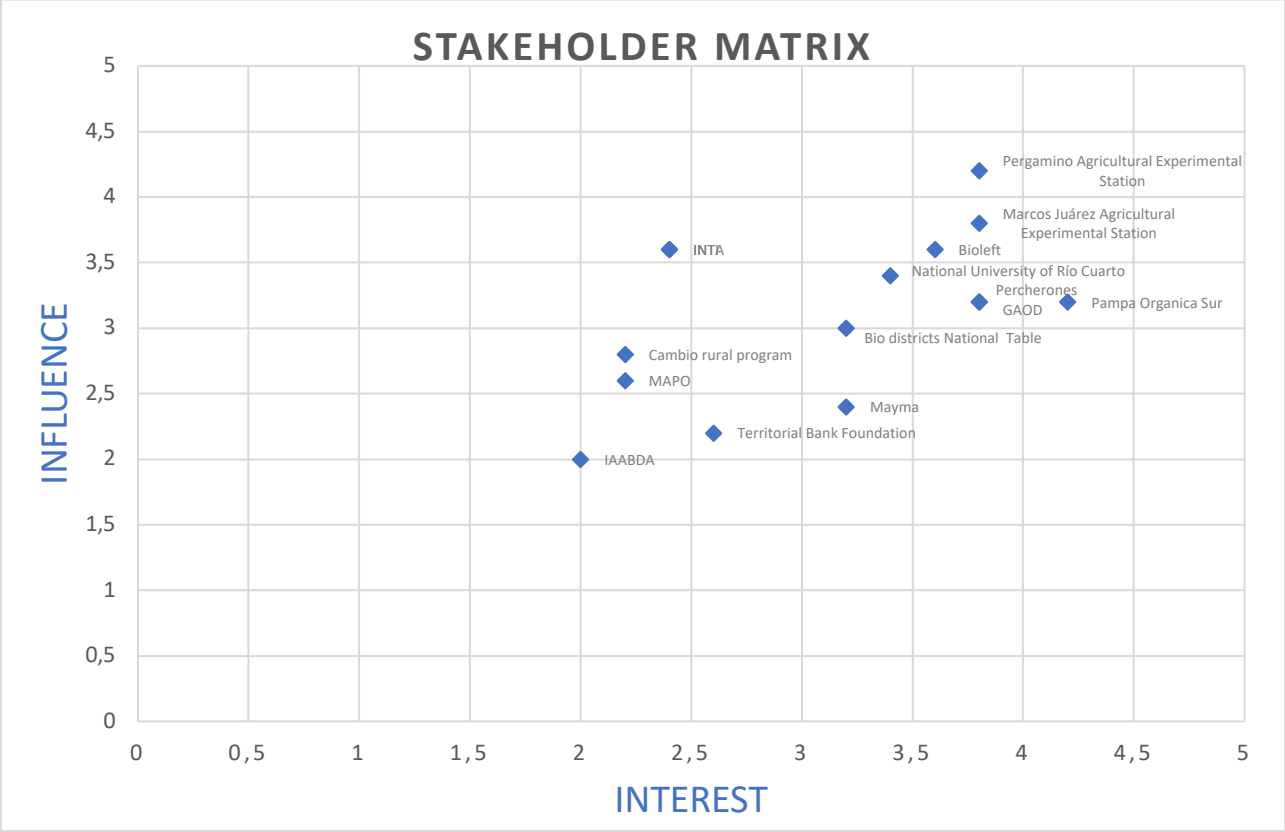
5.2.4.2.3 Results

According to Reed (2009), key stakeholders are characterized by having high influence and high interest in the observed process. They are actors who must be actively considered; in this group we can find in the influence/interest matrix, Figure 5.7, the two experimental stations of INTA in Pergamino and Marcos Juarez and the two producer groups Pampa Organica Sur and Percherones and Bioleft.

It is evident that both realities make up the nucleus of belonging and represent key partners for the development that the group sees.

On the one hand, the experimental stations are identified as a space for legitimation and collaborative learning. Up to now they constitute the fundamental partners for technical processes of agricultural development. On the other hand, the relations with Pampa Orgánica Sur and Percherones are being articulated from different areas, starting from the representativeness and communion between organizations that were born together and still organize common meetings for collaboration at different levels, which in some cases include processes of entrepreneurship shared between different members of the different organizations.

Figure 5.7 Stakeholder Influence – Interest Matrix



Stake holder	Innovation	Quality	Resources	Institutional legitimacy	Territorial development	Influence score	Vision on the process	coherence	utliity	Visibility	Predictability	Interest Score
Cambio rural program	2	1	3	4	4	2,8	2	2	2	3	2	2,2
Pampa Organica Sur	3	3	3	4	3	3,2	4	5	4	4	4	4,2
Percherones	3	3	3	4	3	3,2	4	5	3	3	4	3,8
MAPO	2	1	2	4	4	2,6	2	2	2	3	2	2,2
IAABDA	2	2	2	2	2	2	2	2	2	2	2	2
INTA	4	4	3	4	3	3,6	2	2	3	3	2	2,4
Marcos Juárez Agricultural Experimental Station (INTA)	4	3	4	4	4	3,8	4	4	4	4	3	3,8
Pergamino Agricultural Experimental Station	5	4	4	4	4	4,2	4	4	4	4	3	3,8
INTI	4	3	4	4	3	3,6	1	2	3	4	2	2,4
Bioleft	5	4	3	3	3	3,6	3	3	4	4	4	3,6
National University of Río Cuarto	3	4	3	3	4	3,4	3	3	4	4	3	3,4
GAOD	4	4	2	3	3	3,2	4	4	3	4	4	3,8
Bio districts National Table	3	3	2	4	3	3	3	3	4	4	2	3,2
Mayma	2	3	2	3	2	2,4	4	4	2	2	4	3,2
Territorial Bank Foundation	2	2	2	2	3	2,2	3	3	1	3	3	2,6

Those in the context setter category are highly influential, but have little interest which are basically the main public institutions related to rural development: INTA and INTI, their interest in organic agriculture and agroecology until now has been extremely marginal in general, but a mixed of local awareness for sustainable

consumption and production, and international opportunities for export markets are slowly giving more alternatives and spaces to its practices.

A category that definitely would be important to involve in this study and that emerged from the consultation, are middle actors which could be considered with more influence for certain aspects becoming specific partners for certain activations related with LAFs and Bio-district approach; in this group we could include the National University of Río Cuarto in terms of scientific validation of sustainability processes; GAOD and the Bio districts National Table and the Cambio Rural Program, and MAPO in terms of local, national and international involvement with territorial development, group valorization and visibility the stakeholders in this category can be defined as important for supporting the process.

In a last group considered as crowds with less representativeness Mayma, Banca Territorial and IAABDA mainly act in an adaptive way, and should be monitored taking into consideration possible future alliances.

So, the result can be analyzed in terms of the 4 groups identified in the following part of this chapter. The result will be combined with the other previously presented on the TAPE and value chain implementations for a deeper discussion regarding PON state in terms of LAFs and Bio-districs approaches.

5.2.5 Analysis of Pampa Orgánica Norte's activations in terms of LAFS and Bio-districts

As seen in the conceptual development of the LAFS in chapter 4, the notion of a "localized agri-food system" (LAFS) originated in France in 1996 in a context of worsening crises in rural societies, aggravating environmental and food constraints.

In Argentina, since the 1990s, many agricultural activities have lost competitiveness in the world market and consequently suffered serious crises, as shown in various passages in this work.

In this context a 'new paradigm' of Local Development with a focus on the integration of territorial actors around activities that enhance economic growth and sustainable development arise.

Among different orientations, institutions such as INTA and the Faculty of Agricultural and Forest Sciences of the National University of La Plata, with the support of INRA and CIRAD from France, were promoters of the mobilization for the conception of a Localized Agrifood System in Argentina. Since 1999 university extension proposals have been implemented steadily in this field, with the participation of INTA, through the National Extension Coordination program, facilitating training assistance, and sponsoring several publications.

Among the main characteristics noticed in the process of identification, assistance, and investigation of the LAFS as detailed in the compilation of experiences published by INTA (Velarde et al, 2008), there is a group of experiences linked to the practices and knowledge resulting from the European immigration combined with a strong local anchorage as seen in the Berisso coast wine; as well as the cheese and salami from Tandil. On the other hand, there are crops such as tomato and artichoke from La Plata, and other products more loaded with indigenous cultures - like the yerba mate of Misiones- that in the encounters between indigenous and European migrant cultures such as the Patagonian goat and the cattle production of the Pampas Region have followed the line of the Denomination of Origin for the protection and valorization of their practices.

Parque Pereyra Iraola is the only case that was analyzed from an agroecological production approach and presents strong features of endogenous development, mainly linked to local production and distribution of agroecological vegetables.

Regarding the constitution of biodistricts or bioregions, although there are some experiences of collaboration between institutions, it was only in 2021 that a table of biodistricts started with the purpose of advancing toward the possible activation

of different territorial realities, but until now have not been institutionalized or conformed under this specific form.

From this standing point, Pampa Orgánica can be seen as a clear example of articulation from the bottom-up that, as a group of rural change, multiplied and generated a process of territorial articulation which, without being counter-hegemonic in productive terms, is within the processes of participation, construction and agricultural methodologies based on organic and agroecological production. We can say that, in this sense, it has launched an alternative development path to the conventional system.

If we consider the definition of LAFS as: *"systems made up of production and service organizations (agricultural units, agri-food companies, commercial enterprises, restaurants, etc.) associated, through their characteristics and operation, to a specific territory. The environment, the products, the people, their institutions, their know-how, their food behaviors, their networks of relationships, combine in a territory to produce a form of agri-food organization on a given spatial scale"* (Muchnik & Sauer, 1998, p 4).

PON, as presented in previous passages, could widely re-enter these characterizations.

One of the main elements in the process of building the LAFS is the capacity of local actors to mobilize the passive advantages or externalities of agglomeration and/or latent solidarity, horizontally and vertically, toward a process of "activation" in a coordinated way that enhances the value of the specific resources of a given territory. (Schmitz, 1997; Boucher, 2004).

In this sense when Pampa Orgánica makes its constitution, becoming a formal Cambio Rural group, it starts a process of activation around the organic production valorization of all participating members.

In this phase, it is important to point out that in Argentine history there has been a remarkable difference between the organic and agroecological orientations and goals of the practitioners.

Organic producers historically focused their production on exogenous processes, linking production almost exclusively to international markets. On the other hand, agroecology focused on endogenous processes, that is, mainly on seeking to satisfy local and national needs for food sovereignty. Over the last 20 years, both related movements and organizations have worked separately at the national level.

As shown from the analysis of PON's value chain, there is a representative variety of production and orientations within the group, given that members of different sizes direct their production to the local, national, and international markets in a process that could well be framed in the new endogenous characteristics presented by Ray (1997).

This core characteristic of the group is distinctive and can be an important key when it comes to harmonizing the principles of organic agriculture in its 3.0 version with the principles of agroecology in a common and shared praxis.

A reflection of this is, in the first place, the great interest manifested by the group in undertaking the TAPE evaluation process where the results were high in most of the dimensions and, on the other hand, in the participation in organic certification processes which include almost all members and where pioneers are among the first certified farms in the country.

Boucher (2004) distinguishes two important stages for the activation of a LAFS: the first being a "structural collective action", represented by the creation of a group such as an association, a cooperative, or other forms of organization where there are meetings and exchanges that favor collective learning, that in PON case would be represented by the conformation of the group under the Cambio Rural program. The second stage is defined as a "functional collective action", by which institutions are generated and attached to rules that coordinate

local actors around the management of the common good, according to the definition of quality parameters (criteria and indicators).

in the case of PON, this last functional action is until now only partially implemented. Although there are established rules already, as shown earlier, and an internal process for inclusion and participation, until now there is no developed formal set of defined practices, nor management of quality issues among members, therefore control mechanisms and sanctions are not formulated and administered including inclusion/exclusion and rivalry procedures (Boucher, 2004).

It is precisely between the first phase and the second that the PON group would need to develop different types of “activations” (Correa Gómez et al, 2006) to achieve the second stage of LAFS.

For the development of these activations, two levels can initially be visualized, one internal and the other external.
In the first case, although there is a guide and a method of entering the group, represented in an initial presentation based on organic and agroecological practices, there is not a common presentation format where specific issues are addressed and there is not any kind of specific monitoring system that may represent the operational realities of each field.

Firstly, the implementation of a common guide/questionnaire that could have elements of the TAPE with some specific variables identified, and eventually expanded, by the group and that has a temporal recurrence, would provide important structural elements to pose challenges and identify processes over time.
On the other hand, it would activate more clearly the modalities of inclusion and belonging in the group.

Secondly, up to now and by the group's initial decision, the commercialization of the production is not carried out in a typical way, and for the time being, the only

facilitation channel is based on the mutual exchanges of information between members.

In other words, no information channel to date can centralize planting and harvest information that describes the productive reality of the group with their availabilities, nor a record of sales or the destinations of each of the members and their productions.

In this sense, a first step facilitated by the research was to establish a simple and clear questionnaire/survey model that may provide precise information at the time of sowing, harvesting, and post-harvesting, and which can serve to facilitate different levels of information, available to both internal or external communication.

This first step of activation through these two processes could contribute to the group activation on 3 levels, firstly by establishing a "quality" parameter beyond organic, linked to organic 3.0 and agroecological principles. Secondly, from a commercial standpoint, to identify the quantitative information of production that may be useful in different instances, both at the individual and group levels, and finally at the performance level, being able to establish the yields of each member and harvest to be able to identify the productive levels over time.

Regarding the external part, although there are different types of relationships, as the stakeholder analysis showed, there are no specific programmatic agreements between any of the organizations, but rather they are developed firstly through the interest and voluntarism of their members, and the limited time available from the group coordinator.

Thus, based on the internal activations that we have already mentioned, different agreements could be formalized with the different institutions related to PON.

Regarding the first aspect of quality, an internal control system could well be implemented to guarantee the practices of the group and that could easily be implemented together with Pampa Orgánica Sur, Percherones, and INTA's

experimental centers that were considered key actors in the matrix of influence and interest.

On the other hand, the practices implemented under a specific protocol could be evaluated at the impact level by the University of Rio Cuarto, which has implemented different research activities in the group's fields concerning the practices carried out by different members. A specific framework agreement that may include different dimensions of analysis in a long-term project could support and feedback on the provisions related to the same protocols put in place.

Additionally, this activation would widely enable the possibility to establish a group brand that commercially values the productions of each member of the group. This brand could be used by each of the members without necessarily modifying the marketing processes carried out individually by each member.

Thirdly, the realization of joint programs and long-term framework agreements with research institutions such as INTA experimental centers and Bioleft, based on the specific needs of the group linked to increasing the productivity of the members would be essential to guide and capitalize on long-term productive improvement practices.

These activations evident in a road map developed from the incomes of the different methodologies implemented could put the group into the second stage of activations previously defined.

The experience of Pampa Orgánica itself would generate a direct “spill” of territorial development, given that in the same process it would activate a participatory collaborative relationship (Rowe and Frewer, 2000) between the different institutions that have been identified as main partners. In turn, these would act territorially and the implications in this open model of development would have a possible territorial impact. This activation stage would remain in any case within a perspective based on a sector approach.

For Boucher et al (2016), for a LAFS system to become a territorial LAFS system, the approach must become from sector to territorial, it is in this sense that the third stage of activation emerges.

This third activation would be closely linked to the INNER definition of bio-districts which are “innovative territories where farmers, citizens, public authorities and other local actors realize a formal agreement aimed at the sustainable management of local resources, based on the principles of organic farming and agroecology, to boost the economic and socio-cultural development of their territory. " (Biodistretto.net, 2020)
This third stage would involve the formalization of new instances where different actors identified in the Stakeholder Analysis would play a relevant role; particularly the National Table of Bio-districts coordinated by the Argentine Ministry of Agriculture, Livestock and Fisheries together with GAOD. These two initiatives would be key for the process of the third activation stage since both are centered on developing instruments to support Bio-districts activations. The first one is at the national and the second at the international level.

In this regard, the national table involves different local, provincial and national public authorities that are crucial partners to get involved in this stage.

PON that is actively participating in the table representing the producers would be a relevant actor that could play a founder role involving its identified partners and related actors introduced in the value chain analysis.

This third process, as presented before, would include the two main directions that most of the time require "successful o sustainable bio-districs" a mix between a bottom-up (represented by PON) and a top-down (represented by the national table) approaches.

Conclusions

The LAFS systems developed and studied at the end of the 1990s find common roots with the origins of Organic Agriculture and Agroecology in Argentina, both tackling the same problematic issues derived from agricultural industrialization.

As we have seen, each LAFS has its particular characteristics that make them the reason for its existence, that is, at the same time their characteristics enable them to interact with different approaches and visions on territorial development as described throughout the thesis.

In this regard, it has been verified that to carry out an analysis of the context and thus of the LAFS activation opportunities, the methodologies of TAPE, the participatory generation of group Value Chain and Stakeholder Analysis when integrated, can give a comprehensive vision of the conditions in which a constituted reality is found at the LAFS and bio-district activation level and in what way it can be further activated territorially.

Therefore, Pampa Orgánica Norte can be seen as an organic and agroecological LAFS in its first stage of activation. Its road map of activations, based on previous methodological works, can be considered a pilot case study in Argentina. On the one hand, these characteristics and models could be monitored over time based on the possible activations identified and, on the other, serve as methodological inspiration for the realization of new case studies both at the national and regional levels. In turn, it could be integrated through the GAOD network into other experiences that begin to take shape internationally.

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Chapter 6: Case study:
Organic and Agro-Ecological Short and Alternative Value Chains for healthy diets. A case study: City of Buenos Aires - Argentina.

6.1 Introduction

The introduction is divided in 3 parts that are relevant to understand how as we have seen in the first part of the work, food dimension came across different dimensions of the SDGs, in this chapter we will see from a comprehensive approach how food influence health of the population and its linkage with indigence and poverty rates taking the City of Buenos Aires own characteristics as a case study.

6.1.1 Nutrition and Health in Argentina

Chronic Noncommunicable Diseases (CNCDs) that are directly related with nutrition, constitute a global epidemic, represent the main cause of premature death and disability, and cause 60% of all deaths worldwide.
In Argentina, they are responsible for 73.4% of deaths, 52% of years of life lost due to premature death following the global trend.

Their attributable risk factors explain 3 out of 4 deaths from NCDs, and they share common problems and strategies for prevention and control both at the level of social determinants and in a large part of the policies designed for their control, either at the population level or in the field of care services and networks. (2018, ENFR)

As was seen in the introduction to this thesis, underweight and overweight are part of the same problem attributable to the food system crisis as a whole.

The proportion of underweight and wasting in the population under 5 years of age in the year 2019 in Argentina was 1.7% and 1.6%, respectively and the proportion of short stature at the national level was 7.9% while for girls and boys

from 5 to 17 years old the proportion of thinness in this population was 1.4%.and the short stature at the national level was 3.7% (Ennys, 2019)

According to the fourth National Survey of Risk Factors (INDEC, 2019), Argentinian population presents critical results derived from health habits regarding sedentary lifestyles (64.9% of people present low physical activity) and inadequate eating patterns.

As a result there is an overweight rate of 33.7% and obesity of 32.4 % for a total of 66.1% meaning that more than 6 persons every 10 are overweighed.

Direct consequence of these unhealthy habits seriously increases health-related risks evidenced by the survey :
- high blood pressure (greater than or equal to 140/90 mmHg) in 40,6 % of population
- high capillary blood glucose (≥110 mg/dl) 8.4%
- High cholesterol (≥200 mg/dl) 30,7 %

The rise of overweight and obesity is associated with a shift towards energy-dense diets, which are characterized by highly processed foods; high in sugar, fats, refined starches and salt, accompanied by an insufficient intake of fresh fruits and vegetables, wholegrains, pulses, nuts and seeds high in nutrients but high in costs too. (Britos 2019, FAO, 2020)

It is important to considering that nutrient- dense foods that presents better nutritional quality have less energy (kcal) per unit of weight or volume and, on average, more essential nutrients are relatively expensive (Jones et al, 2014; Darmon et al, 2014) conditioning people, especially those on low incomes, to buy less and this increases risk of nutrient inadequacies.

Argentina take part on group represented by the majority of the countries where overweight and obesity kill more people than underweight.(WHO, 2019)

Another relevant element to take into account in terms of health and nutrition is related to the excess of chemical substances present in food, and the limitations of the public system in carrying out the corresponding controls (Cabaleiro 2016). According to a recent study from a total of 135 of the most widely consumed fruits and vegetables analyzed for 35 pesticides, 65% of the total samples detected chemical residues, from them 56% were above the maximum residue limits (MRLs) according to national regulation (Mac Loughlin et al, 2018).

6.1.2 Indigence, Poverty and its relation with Economical Food Access

Health, access to food and poverty are intrinsically linked. The National Institute of Statistics of Argentina (INDEC) defines and measures the lines of indigence and poverty according to access to the Basic Food Basket (CBA) which is defined as "the set of foods that satisfy certain nutritional requirements, and whose structure reflects the pattern of food consumption of the reference population" (INDEC, 2016)

In the 1980s, several Latin American countries instituted a definition and methodology developed at the Institute of Nutrition of Central America and Panama (INCAP): the basic food basket (CBA). It is a methodological instrument based on the formation of a theoretical and fixed basket of food and beverages that reflect the eating pattern of people or households with medium-low income.

The first CBA put in place in Argentina in 1988 has been determined taking into account the normative kilocalorie requirements essential to cover these needs for a month according to different kinds of households. The foods and quantities were selected based on the consumption habits of the population, from the information provided by the National Household Expenditure Survey (ENGHo) 1996/97.

A key element is that CBA is not a reference on what the population should eat, but rather a photograph of what it buys and what it spends per month; that is, a reference value of the consumption patterns that arise from the ENGHo and whose use has a statistical purpose.

To determine the total basic basket (CBT) which settle the poverty line, the CBA is extended, considering non-food goods and services. The estimate is obtained by applying the Engel coefficient (CoE), defined as the ratio between food expenditures and the total expenditures observed in the reference population.(INDEC,)

Every single province settle the CBA each month according to the prices surveyed by implementing a consumer price index in the case of of the City of Buenos Aires the IPC-BA.

Basic Food Basket methodology is highly contested by different actors and researches one of the most relevant Action-Research related to this was the “Czekalinski Project” implemented in 2019, with the titled inspired in the Czekalinski family, that In 1951 the American magazine Times published on the cover of the “issue of Better Living” with the amount of food they consumed in a year.

The research project that professors from the National Council for Scientific and Technical Research (CONICET) and National University of Córdoba (UNC) carry out with a group of volunteers, put the body to an experiment with which they seek to test the foods of the basic basket through which poverty is measured. During six months a group would have taken exclusively the food included in the CBT at the same time, another group would be fed with the recommendations of the Dietary Guidelines for the Argentine Population (GAPA), developed by the Ministry of Health. To compare the data, a third group would continue with their usual diet, taking note of each food eaten.

The project was interrupted after 3 months since, the three members of the group that dedicated themselves to CBT had to abandon it due to negative results in medical controls to which they underwent, unfortunately there a not yet scientific publications on its results but is important to point out that main objective of the project at that pointed reached the result, meaning to put in light the contradictions between the poverty and indigence Argentinian Index, the project created a lot of awareness at different levels and was nominated as finalists in the Global Media Awards 2020.

As can be seen in the descriptive table of the different foods and daily amounts included in the basic food basket currently taken as a reference, the most recommended foods mentioned above are poorly represented and the least recommended appear with significant excesses at the level of amounts present.

Table 6.1 : Basic Food Basket ingredients and intakes

Basic Food Basket	
	g/day
Bread	222
Rice	39
Pasta	57
Wheat flour	36
Corn flour	7
Potato and sweet potato	231
Dry beans	8
All vegetables	188
All Friuts	163
Milk	305
Yoghurt	19
Meat	206
Menudencias	9
eggs	20
oil	40
Biscuits	21
sugar	40
Marmalade and other	11
fiambres	2
Cheese	11
Butter	2
Soft drinks	113
Alcoholic drinks	36
salt	4
Mayonnaise and others	4
Vinegar	2
Caffe	1
Yerba	17

Font: (Indec 2020)

On this direction According to the Center for Studies on Food Policy and Economics Britos (2019) director of the Center for Studies on Food Policies and Economics (CEPEA) Healthy Food Basket based on the recommendations of the Guidelines for the Argentine population of the Ministry of Health (GAPA) on 2018

would cost up to 112% more than the Basic Food Basket from where national statistics of indigence and poverty are measured.

6.1.3 Main Characteristics of Buenos Aires city

The City of Buenos Aires or Autonomous City of Buenos Aires – also called the Federal Capital for being the seat of the federal government – is the capital of the Argentinian Republic. It is located in the central-eastern region of the country, on the western shore of the Río de la Plata, in the middle of the Pampas plain.

The urban area limits to the south, west and north with the province of Buenos Aires and to the east with the La Plata river. Officially the city is divided into 48 neighborhoods that derive from the parishes established in the 19th century.

The surface of the City is somewhat greater than 200 km2 and its perimeter, 60 km. Close to three million inhabitants reside in it distributed in neighborhoods that, from the political-administrative point of view, are grouped into fifteen communes. The population density is more than 15,000 inhabitants per square kilometer.

The Inequality gaps in the City are evident when addressing problems such as poverty, unemployment, income, access to education, housing and health considering the differences by gender, age and area of residence. In this sense, men have relative advantages over women, adults (31-65) over young people (18-30) and the inhabitants of the northern zone (neighborhoods of Recoleta, Belgrano, Palermo) over those of the southern zone (neighborhoods of La Boca, Villa Lugano, Villa Soldati)

Households in the richest decile in the City receive 8.3 times more income than those in the poorest decile. This gap has been registering growth over the last few years, expressing an increase in inequality in the City. In 2015, the households belonging to the richest decile had incomes 6.7 times higher than

those of the households belonging to the poorest decile, and as has been pointed out, currently this gap has risen to 8.3. (Sosa & Smith,2021)

Poverty reaches 27% of people and 20% of households in the City. During the last year, poverty in the CABA increased by 2.5 percentage points in households and 3.6 percentage points in people.

More than half of the households in the southern zone have incomes lower than those necessary to cover the expenses of the basic food basket.

In terms of food supply chains in the city of Buenos Supermarket–including only those typically retail chains– have a majority share in three sectors: warehouses products that includes pasta, flour, rice, oils biscuits, ecc (65%), beverages (47%) and dairy products (50%). In the remaining sectors, sales are channeled primarily through other types of businesses: in the case of meat through butchers, fruit and vegetable products through greengrocers and baked goods in bakeries (Perez, 2019).

The fruit and vegetable sector, which only represents 3.2% of the total sales of supermarket chains in 2018, is a marginal business (INDEC, 2019), with a few exceptions, in general all products are located in the segment of low volumes and high prices, being between 30 and 40% more expensive to buy in the supermarket than in a greengrocer, with maximums that can reach up to 80%.

A specific survey of prices confirms this: supermarket chains have prices 34% higher on the average of 17 fruit and vegetable products than greengrocers with personalized attention, while the latter have prices 8% higher than self-service greengrocers (Secretariat of Commerce, 2017).

Exceptions to this where prices that can be very similar to those of greengrocers or even lower are some fruits, such as bananas, apples, grapes, lemons or oranges, some heavy vegetables such as carrots, onions, potatoes and pumpkins, and others such as cabbage or different types of lettuce where the suppliers with whom the supermarkets negotiate are a few large-scale marketing

companies for each type of fruit, which generally range from primary production or from packaging to commerce.

Considering this introductory elements the present case study has the main objective of analyzing the cost and affordability of an organic healthy diet within the city of Buenos Aires.

It particularly seeks to identify: Which are the available organic and agro-ecological products? Which are the main alternative channels of distribution? Which is the minimum cost an of organic and agroecological food baskets according to national and international diet recommendations? Finally compare it with the basic food basket and analyze it costs in relation to the population incomes.

6.2 Materials and methods

6.2.1 Healthy Diets Identification

A Healthy diets provides adequate calories and nutrients, provides not only adequate calories but also adequate levels of all essential nutrients for a healthy and active life, through a balanced mix of carbohydrates, protein, fat, vitamins and minerals, within the upper and lower bounds needed to prevent deficiencies and avoid toxicity.

This kind of diets helps protect against malnutrition and diet-related noncommunicable diseases such as diabetes, heart disease, stroke and cancer. (WHO, 2019)

Diets are based on global guidelines that are nationally adapted to a country's individual characteristics, cultural context, locally available foods and dietary customs through national food-based dietary guidelines (FBDGs).

At National level the "Guias Alimentarias para la Poblacion Argentina (GAPA)" origins from the model developed, validated and used by INCAP in Latin America, later adapted by FAO for the Caribbean and are built through of a wide

series of consultations with all interested parties, and regularly updated taking into account the evolution of dietary habits, the characteristics of the morbidity of the population and the development of new knowledge on food and nutrition. (GAPA, 2016)

Research will take from one side the recommendations of the last update made in 2016 and will involve complementing with the GAPA, the recommendations emanated from the EAT-Lancet Commission that brings together 19 Commissioners and 18 coauthors from 16 countries with an interdisciplinary approach including experts in human health, agriculture, political sciences, and environmental sustainability with the main goal to develop global scientific targets based on the best evidence available for healthy diets and sustainable food production aligned with the UN Sustainable Development Goals (SDGs) and Paris Agreement for win-win diets "healthy and environmentally sustainable" can be identified. (Willet et al 2019)

The EAT-Lancet proposal has it innovation and core element that distinguish itself from national FBDGs on providing scientific boundaries to reduce environmental degradation caused by food production at all scales at the time that insures healthy diets and environment taking into consideration six key Earth system processes: climate change, biodiversity loss, freshwater use, interference with the global nitrogen and phosphorus cycles, and land-system change.

Finally the commission propose an Universal framework for all food cultures and production systems in the world, with a high potential of local adaptation and scalability. Taking into consideration both frameworks: GAPA and EAT-LANCET as we can see in the table 6.2, a common model has been identified regardless the differences between food aggrupation and the target (female with low physical activities and Male whose physical activities is moderate to high).

Table 6.2: GAPA and EAT- LANCET Recommended Diets

GAPA			EAT- LANCET		
Target	56,3 Kg Women 1,60 m; IMC: 22,5 kg/m2 whose level of physical activity is low		Target	70 Kg man aged 30 and 60 kg aged 30 whose level of physical activity is moderate to high	
Total Kcal per day	2.000		Total Kcal per day	2.500	
Carbohydrate sources	44,7 % energy intake		Carbohydrate sources	60 % Energy intake (maximinu range)	
Proteins	15,7 % energy intake		Proteins	10% Energy intake	
Fats	26,1 % energy intake		Fats	30% Energy intake (maximun range)	
	g/day			g/day	Caloric intake, Kcal/day
Bread	120		Rice, Wheat, corn, and other	232	811
			Potatoes and cassava	50 (0-100)	39
Cereals, pasta, legumes, starchy tubers	250		Dry beans, lentils, and peas	50 (0-100)	172
			Soy foods	25 (0-50)	112
All vegetables	400		All vegetables	300 (200-600)	
			Dark green vegetables	100	23
			Red and Orange vegetables	100	30
			Other vegetables	100	25
All fruits	300		All fruits	200 (100-300)	126
Milk and Yoghurt	500 cc		Whole milk or derivative equivalents	250 (0-500)	153
Cheese low in fat (max 22% fats)	30				
Meat (max 7% fat)	130		Beef and Lamb	7 (0-14)	15
			Pork	7 (0-14)	15
			Chicken and other poultry	29 (0-58)	62
			fish	28 (0-100)	40
Eggs	25		Eggs	33 (0-25)	19
Oil, seed and dried fruits	30		Peanuts	25 (0-75)	142
			Tree nuts	25	149
			Palm oil	68 (0-68)	60
			Unsaturated oils	40 (20-80)	354
Added fats, and sugars: Mayonnaise, butter, cheese, sugar,		270 Kcal	Lard or tallow	5 (0-5)	36
			All sweeteners	31 (0-31)	120

Fonts: GAPA (2016) Willet, et al (2019)

6.2.2 Mathematical diet Optimization

Mathematical diet optimization, also called diet modeling or diet optimization, started in the 1940s with Georges Stigler (1945). After 30s economic crisis he started using Linear programming, a classical mathematical tool, to solve complex problems such as the estimation of the minimum cost of a diet, subject to multiple nutritional and acceptability constraints.

Several diet optimization studies have attempted to find a tradeoff in the model parameters to design nutritionally adequate, culturally acceptable, and economically affordable diets.

Respect the cultural dimension of a sustainable diet, properly characterizing the population, food habits is key, and all model parameters need to be carefully justified and adapted to the study objectives when designing the model and when interpreting it results.

In this sense a Lineal Program model was develop in order to set up the minimum prices of a diet taking into consideration nutritional recommendations and using different related constraints:

1. Fulfilling both GAPA and Lancet diets intakes recommendations: the different food groups where taking combing GAPA recommendations and Lancet using it maximum limits for food groups where in Argentina are extremely representative at cultural level, specifically regarding meat intakes.
2. Including at the same time variability of foods and acceptability constraints: for this the INDEC (2020) was taken into consideration limiting with a maximum intake the items with less acceptability and with a minimum on the ones that have a high level of acceptability.
3. Considering previous works recommendations (Brito, 2019) for the Argentinian context and in order to be aligned with ongoing researches on the field; the nutrients identified were: as essentials: proteins, fiber, calcium, iron, zinc, potassium and vitamins A, C and B9 and the critical: sugars, sodium, saturated fatty acids and starches.

4. Minimum requirements for each essential nutrient and maximum recommended intakes of critical ones where establish from the European Food Safety Authority (EFSA) Dietary reference values (DRVs) for healthy populations.

6.2.3 Organic and Agroecological Short and Alternative Value Chains

Organic and agroecological characteristics at general level and contextualized in the Argentinian reality have already been discussed in chapter 2 and alternatives value chains has been partially approached in chapter 3 but it is important to further introduce some specific concepts relevant to better express the methodological approach implemented on the identification of the actors involved in the research.

The literature related to short and alternative chains presents a broad development and touches different dimensions and fields of research (Luo et al., 2018). The two characteristics present in most of the works are based on the proximity between the producer and the consumer, both through geographical proximity and through organizational proximity. (Aubry and Kebir, 2013; Boschma, 2005).

There are currently no internationally agreed criteria or univocal definitions that determine the margins of when a channel can be defined short, in this sense the local reality.

On the one hand, geographical proximity is limited to the distance between producers and consumers, this distance presents different ranges at the bibliographic level and can be measured through distances in km (Blake et al., 2010; Rose et al. 2008) or at an administrative level as municipalities, provinces or macro-regions (Schönhart et al. 2008). The phenomenon of consumption at km 0 highly developed in Europe, for some countries represents a structural difficulty in relation, on the one hand, to the availability of nearby food and, on the other hand, as in the case of the City of Buenos Aires, to a productive regionalization of national order where certain types of food are mainly produced

in certain territories with greater biological, climatic and structural historical development conditions.

Regarding organizational proximity, the main elements found in the bibliography refer, on the one hand, to the level of economic and financial interaction of the different actors in the chain (Boschma, 2005). It includes from one side the number and characteristics of eventual intermediaries that participate in the process and from the other the “social” or “political” approach of bonding and sharing from information, to participatory price setting or co-financing practices between producers and consumers, in some cases called co-producers.

In Argentina short value chains are mainly related in most of the cases to the organizational aspects and less related with the distances where usually this kind of are defined as alternative value chains and. In many cases are directly related with the social and solidarity economy (Anello et al, 2020).

Van der Ploeget al. (2012), refer to these markets as “nested markets”, that is, new governance structures in decentralized networks, which establish their resilience capacity against the hegemonic agri-food system

6.2.4 Empirical Strategy

During the months of January to March of 2020 (summer period) more than 60 varieties of organic and agro-ecological products of different food groups were identified from a representative base of short-chain distribution systems with the participation of different structures and actors that included a total of 200 delivery points distributed throughout the territory of the City of Buenos Aires.

For Vegetables and fruits 10 distribution experiences outside the traditional channels of large distribution were chosen based on the distribution of stational products organized from food baskets of between 5 and 8 kilos, some of the including other food groups that were integrated with small dedicated shops, on line sales and small group retailers.

Which could be defined in 3 different categories:

1-Producer groups / unions that jointly organize the distribution through their organization:

These groups produce in an Agroecological way and in the 3 cases included belongs to the social and solidarity economy and implement at different levels practices that have been addressed in chapter 2.

In the case of the Union of Land Workers (UTT) it gathers around 10,000 peasant families and producers from 15 provinces. Their declared reason for being is to defend these families, to fight for their access to land and for the conditions of production and life.

Their Marketing strategy is based on the creation of own and agroecological greengrocers, the presence on local fairs and the network organization for food baskets distribution.

This last mechanisms was the first form of sale that the union used and the most representative. It is organized through neighborhood nodes on its different forms Social Organizations, Neighborhood Organizations and Institutions (municipalities, universities, foundations, Cooperatives) and invidious or families that receives at least 10 food baskets every week.

There are more than 200 nodes of Solidarity Consumers throughout the Greater Buenos Aires, La Plata and the Autonomous City of Buenos Aires to which the food baskets arrives on certain days and times.

The same methodology is implemented by Territorial Market that is constituted as a second level group with the participation of different organizations, groups of producers and cooperatives from all over the country. It was promoted from its origins by the University of Quilmes, as we have seen in the second chapter of this thesis, many universities had very active roles in the generation of this type of initiative at the national level.

It is built in open and participatory assemblies where producers, consumers, managers of nodes and logistics and solidarity intermediaries discuses about the heterogeneity of the bag, typical of resulting from crops that respect the cycles of nature; agroecology; the collaboration in the promotion of food sovereignty and all together define the cost of the food baskets and the distribution of it amount the participants.

The same mechanisms of socialization and decision making are shared by the Bolson Soberano Initiative which integrates different family farming mainly integrated in the association of producers called 1610 with members in this case mainly allocated in Florencio Varela Municipality in Buenos Aires Province. They are based 40 kilometers form the city of Buenos Aires, becoming the shorter possible distance for food supply not considering urban agriculture inside the city.

Most horticultural production from the three presented groups and the rest that will be detailed afterwards are coming from the peri-urban edges of the Metropolitan Area of Buenos Aires which contributes to the provision of fresh food for the entire population. Barsky (2010) considers peri-urban agricultural production to be essential to maintain a local agriculture that guarantees the variety of foods and their nutritional value.

The "Sovereign food basket" initiative was strongly supported by the Unversity of Buenos Aires Agricultural and Agrarian Faculty (FAUBA) which institutionalized it relationship as an extension initiative in 2016 with a resolution of the Board of Directors 3304/16 authorizing to use the property in order to market the food baskets and directly collaborating at different levels from different spaces, mainly through the Food Sovereignty Open Course (CALISA) which is actively supporting the organization and promotion of the Participatory Guarantee System related to the initiative.

It is important to consider that the three experiences included in this group include different producers that are in agroecological transition meaning that are not implementing full agroecological practices yet. Until now all the producers that are participating should be at least in this process and most of them counts like

UTT with technical specific divisions that are directly supporting producers on that way.
The three organizations are taking part of the interinstitutional "National System of Participatory Certification" (CNCP) described in chapter 2.

This first group described include the three most representative initiatives from agroecological production of social and solidarity economy and movements which active political campaigns like the "verdurazo", implemented by UTT and that consist in distributing free or at extremely low cost fruits and vegetables in specific targeted places and moments have created strong visibility, and others like open debates at neighborhoods levels, are part of the strong increase of the agroecological presence on families kitchens and in public debates and social media.

Through their commercial channels they support different other production like eggs, flour, pasta, rise, and others in this case were not included on the research because they are mainly coming from the social solidarity movements but not necessarily involved agroecological practices of process nor PGS.

2- Small businesses that offer products from different producers or producer groups

These enterprises that have grown widely in the last 6 years are small private initiatives most of the burnt in buying groups or dedicated small shops that considering the increasement of the organic and agroecological products.

They buy from single producers, family farmers, associations and cooperatives like the first introduced, and centrals of distribution like paralelo organico the only medium retailer up to now from organic products based on the central market.

The grown of this initiatives is facilitated by social networks which is the central element of this group.

The 6 initiatives that were taken: 6 centred on the food baskets: el click orgánico, la comunidad organica, no cualquier verdura, el brote organico, como siempre

orgánico, tierra orgánica and one, Fernanda, with non-fresh products, counts at least with 40.000 followers each on main social networks (Instagram and facebook) where they advertise and organize their weekly food baskets and related products sales.

Advertising include mainly 3 aspects: (i) the varieties and in some cases the origin, both in terms of place of production, characteristics of producers and whether are certified or not, (ii) nutritional characteristics of the single products and health recommendations (iii) recipes with included items from the food baskets and other related organic and agroecological foods available.

With the exception of como siempre organic which certified as an organic distributor guaranteeing through certification that all their products are organic, the guarantee of the other cases are completely delegated to the enterprises, only one of them el click organize visits to the producers with consumers, in most of the cases the possibility of consumer participation is limited to making inquiries in the respective platforms.

In the case of Fernanda, who deliver non fresh foods organic certified products are detailed and as we've seen in the first chapter agroecological offered ones doesn't include PGS experiences.

These initiatives in any instance supported and facilitated from a complementary perspective the awareness and the diffusion of organic and agroecological principles and its relation with health and food habits.

The orders that are completely organized online, are delivered on different spaces mainly in the so called "dieteticas" that have gone an strong expansion from 2000s and that are small shops of healthy foods that recently include most of the non-fresh organic products present on the markets.

Different products present in this shops where included in the research such as: organic products like MOO meet introduced in the forth chapter, honey, what, pasta, rice and some agroecological that have long term tradition in the country like las Chozas dairy farm which from more than 20 years implement biodynamic practices until now not certified, and COECO chicken and eggs.

3- Independent producers who complement their offer with products from other producers and organic certified shops.

There are 2 cases of certified organic horticultural producers that mainly incorporate organic fruits from other producers in the country to complement their offers: La Anunciación and Tallo Verde this two producers from the peri urban area of Buenos Aires are among the starters of delivering organic and agroecological product from the 90s in collaboration with the Rincon orgánico initiative described in the 2 chapter.

The different products as well as baskets are all exclusively certified under the organic regulations and its distribution is directed both to final consumers or at healthy stores like seen in the previous group.

Included in this group is a small biomarket specialized only in organic agriculture who directly buys from producers and a medium enterprise of organic bakeries, Hausbrot that has been introduced

6.3 Results

In order to carry out the different analyses, 2 types of households were considered as reference:

One made up of the base of the GAPA reference model, that is, by a middle-aged woman with low physical activity; and the other a household with four members: a 35-year-old man, a 31-year-old woman, a 6-year-old son, and an 8-year-old daughter. In this sense, in the first case, an equivalent of 0.77 units has been taken as a reference, and in the second 3.09 consumer units or equivalent adults.

Table 6.3 shows the results obtained for the first case, where the dietary recommendations, both from GAPA and Lancet, are mostly present.

Some recommended products could not be included since they were not available when researching identified requirements. Peanut is among them, and

it is recommended by the Lancet and which, as seen in the Pampa Orgánica case study chapter, will be available for local markets in the 2023 season.

Another food that has not been taken into account is fish, given the fact that in the city of Buenos Aires, up to now, there are no fishery products in the market that follow organic certification processes, or that have specific characteristics of sustainable traditional fishing.
As can be seen, very few processed products have been included, given that when defining the diet, the priority was to address a majority of fresh products for homemade preparations.

Table 6.3 Woman Identified diet

Vegetables			Friuts			Bread, rice, pasta and flours			Food Optional consumption	
Carrot	860		Banana	2000		Semi-wholemeal bread with seeds	1.500		Sugar	200
Courgettes	1.100		Apple	2750		Pasta	750		Daily	7
Onions	300		Pear	1800		Rice	500			
Varieties of salads leaves	1.100		Grape	2200		Integral rice	500		Honey	200
Avocado	280		Peach	260		**Total**	3.250		Daily	7
Radish	1.100		**Total**	9010		Daily	276			
Anco squash	1.100		Daily	295					Blueberry Jam	100
Eggplant	1.580					Milk and Cheese			Daily	3
Tomato	800		Legumes			Pategras Cheese	910			
Cherry tomato	400		Chickpea flour	200		Skin milk	7.600		Salt	50
Lettuce	900		dried peas	400		Whole milk	1.400		Daily	2
Cucumber	1.000		dried lentils	400		Total	10.910			
Fennel	1.100		dried beans	650		Daily	358		Cookies	1.600
Total	12.210		dried Chickpea	540					Daily	52
Daily	400		**Total**	2190		Eggs	500 (10u)			
			Daily	72		Daily	16			
Starchy foods										
Potato	1.000		Meat			Oil				
Sweet potato	1.000		Asado (beef)	650		Sunflower Oi	550			
Total	2.000		Matambre (beef)	650		Olive oil	360			
Daily	66		Bife ancho (beef)	390		Daily	30			
			Chicken	1170						
Tofu	200		Total	2860		Pecan nuts	300			
Daily	7		Daily	96		Daily	10			

This diet, which had a total cost of $8,028, guarantees the minimum requirements for each essential nutrient without exceeding the maximum recommended critical intakes, as shown in Table 6.4:

Table 6.4 Women's diet Nutritional Values and Cost

	Calories	Carbohydrates	Starch	Total Fat	Saturated Fat	Sodium	Sugars	Protein	Fiber	Calcium	Iron	Zinc	Vitamin A	Vitamin C	Potassium	Vitamin B9
model	66.413,60	36.146,60	4.497,78	20.130,00	565,71	50.301,00	2.322,40	10.031,40	1.062,63	30.404,00	412,40	348,14	23.473,00	3.242,40	119.329,59	12.116,00
daily	2.177,5	1.185,1	147,5	660,0	18,5	1.649,2	76,1	328,9	34,8	996,9	13,5	11,4	769,6	106,3	3.912,4	397,2
Carbohydrate	55,0%		Protein/Calories	15,0%		Total Fat/Calories	30,0%		COST	8.028						

For the same period, that is, March 2020, the Basic Food Basket in the City of Buenos Aires for a mononuclear family made up of a middle-aged female member was $5,372. This means that the healthy option with organic and agroecological food from short and alternative value chains costs 66% more than the first one.

As described in table 6.5, which includes only those items present in both baskets, the price difference between organic and conventional foods was notably higher for flour and baked goods, whereas the prices of organic products tripled the conventional ones; meat, eggs, and oil were close to double whereas in the case of vegetables and fruits, the difference was not so wide, only 4.7% and 13% respectively.

Table 6.5 Price difference between Model diet - CBA

	Weight	Organic and Agroecological	IPC-CABA	Difference in %
Vegetables				
carrot	860	49,02	81,67	
courgettes	1.100	49,5	55,56	
anco squash	1.100	52,8	41,14	
tomato	800	112	64,80	
lettuce	900	108	111,60	
Total	4.760	371,32	354,78	4,7
Friuts				
Banana	2.000	160	186,00	
Apple	2.700	291,6	210,60	
Total	4.700	451,6	396,60	13,9
Starchy foods, flours, rice, pasta and bread				
potato	1.000	65	43,34	
sweet potato	1.000	90	41,43	
semi-wholemeal bread	1.500	529,5	123,00	
pasta	750	202,5	75,00	
rice	500	59,5	33,40	
Total	4.750	946,5	316,17	199,4
Legumes				
dried lentils	400	53,2	59,20	
Total	400	53,2	59,2	10,1
Meat, Egg and Tofu				
Asado (beef)	650	383,5	204,75	
Chicken	1.200	384	142,08	
Eggs	500	176,5	84,17	
Total	2.350	944	431,00	119,0
Milk and Cheese				
Pategras Cheese	910	483,21	524,16	
Milk	9.000	900	445,86	
Total	9.910	1383,21	970,02	42,6
Oil				
Sunflower Oi	930	184,14	91,14	
Total	930	184,14	91,14	102,0
Food Optional consumption				
sugar	300	44,7	17,10	
Salt	50	12,4	38,11	
Blueberry Jam	500	176	103,01	
Cookies	220	54,56	48,40	
		287,66	206,62	39,2
Total Cost		4621,63	2825,52	63,6

In total, among these items, modeled foods would be costing 63% more than the conventional ones. This could indicate that the price difference between both diets would not be represented by the difference in the variety and quantity of the food groups, but rather by the higher cost of organic and agroecological products of short and alternative value chains compared to the ones from the consumer price index of the City of Buenos Aires. (IPCBA, 2020)

Taking the second case, that is, a family of 4 members (table 6.6), the variety of foods included increased, generating a wide variety of foods that could make up a wide range of different dishes, always satisfying, as shown in table 5.5, the nutritional needs for the entire family group for $28,857.

Table 6.6: Family Identified diet

Vegetables:			Friuts			Bread, rice, pasta and flours			Food Optional consumption	
Carrot	3.200		Grapefriut	2.300		Semi-wholemeal bread with seeds	5.980		Sugar	1.050
Courgettes	3.450		Banana	6.600		White wheat flour	2.400		Daily	34
Cabbage	2.750		Apple	8.400		wholemeal flour	2.400		Daily by member	9
Green onion	250		Pear	8.300		Oat flour	500			
Various salad tyoes and rocket	3.450		Grape	5.000		Pasta	2.500		Honey	750
Kale	250		Peach	2.000		Integral rice	2.000		Daily	25
Radish	2.150		Melon	2.400		Corn flour (Polenta)	2.400		Daily by member	6
Anco squash	3.100		Total	35.000		Total	18.180			
Eggplant	5.050		Daily	1.148		Daily	596		Blueberry Jam	1.000
Chard	2.700		Daily by member	287		Daily by member	149		Daily	33
Tomato	2.200								Daily by member	8
Cherry tomato	1.400		Legumes			Milk and Cheese				
Lettuce	2.200		dried peas	1.200		Cheese (Pategras)	3.200		Salt	200
Cucumber	2.600		dried lentils	1.200		Skim milk	40.400		Daily	7
Onion	2.000		dried beans	2.400		Whole milk	0		Daily by member	2
Maiz	2.000		dried Chickpea	1.200		Total	41.660			
Beetroot	1.800		Total	6.000		Daily	1.366		Cookies	3.500
Bell pepper	350		Daily	197		Daily by member	341		Daily	115
Green beans	500		Daily by member	49					Daily by member	29
Fennel	1.200					Oil				
Garlic	600		Meat			Sunflower Oi	3.850		Butter	400
Artichokes	2.750		Asado (beef)	1.300		Daily	126		Daily	13
Total	45.950		Matambre (beef)	1.300		Daily by member	32		Daily by member	3
Daily	1.507		Bife ancho (beef)	1.050						
Daily by member	377		Minced (beef)	950		Pecan Nuts	600			
			Vacio (beef)	1.300		Daily	20			
Starchy foods			Chicken	4.090		Daily by member	5			
Potato	6.640		Total	9.990						
Cassava	3.000		Daily	328		Tofu	800			
Sweet potato	3.300		Daily by member	82		Daily	26			
Total	12.940					Daily by member	7			
Daily	424		Eggs	2.000						
Daily by member	106		Daily	66						
			Daily by member	16						

In this case, in March 2020, the Basic Food Basket for a family of 4 with 2 adults and two children in the City of Buenos Aires, amounted to $21,279, which means that the diet elaborated by the model presented would be 73% higher.

Table 6.7 Family diet Nutritional Values and Cost

	Calories	Carbohydrates	Starch	Total Fat	Saturated Fat	Sodium	Sugars	Protein	Fiber	Calcium	Iron	Zinc	Vitamin A	Vitamin C	Potassium	Vitamin B9
model	248.723,38	136.797,86	18.300,00	74.617,01	2.267,16	183.000,00	7.320,00	37.308,51	4.078,19	122.000,00	1.710,01	1.393,95	93.940,00	13.176,00	465.050,12	48.800,00
daily	8.154,9	4.485,2	600,0	2.446,5	74,3	6.000,0	240,0	1.223,2	133,7	4.000,0	56,1	45,7	3.080,0	432,0	15.247,5	1.600,0
daily by member	2.038,7	1.121,3	150,0	611,6	18,6	1.500,0	60,0	305,8	33,4	1.000,0	14,0	11,4	770,0	108,0	3.811,9	400,0
Carbohydrates/Calories	55,0%		Protein/Calories	15,0%	Total Fat/Calories	30,0%		COST	28.857,40							

In order to analyze the accessibility that the population of the City of Buenos Aires has to this diet, for the different income groups, income registered in March 2020 was taken as a reference, as shown in table 6.8.

The food expense % in relation to incomes (not including alcoholic beverages) was taken as a reference, according to the latest statistics available for the years 2017/2018.

Table 6.8 Incomes, Food Expenditures and quantities of Families and people

Period	March 2020		2017/2018	March 2020	1st semester 2020	
	Incomes					
	Minimun	Maximun	Food Expendures %	Total Food Expendures	Families	People
Total					**100**	**100**
In a situation of poverty					**21,6**	**28,2**
In a situation of indigence	0	21.279			8,7	11,7
In a situation of poverty not indigent	21.280	41.640			13,0	16,5
Not poor					**78,4**	**71,8**
In a vulnerable situation	41.641	52.093	25,4	10.577	9,5	9,4
Fragile middle sector	52.094	65.116	25,4	13.232	8,8	8,4
Middle Sector - "Middle Class"	65.117	208.372	21,1	13.740	49,1	45,2
Well-off sectors	208.372	more	15,7	32.714	10,9	8,9

Analyzing the data derived from the pooling of these 2 factors, we can see that only part of the middle sector, the one with the highest income, and the well-off sectors could economically access this proposed diet in full mode. Especially, if we take the average amount attributed to this group at 21.1%, an income of $136,763 would be needed.

Discussion:

As we have already seen, there is a strong inconsistency between the food model proposed in the CBA and the recommendations of both GAPA and Lancet-EAT. Starting from the cost of an unhealthy diet to make up the National Index of indigence and from there that of poverty is to lay the methodological bases of the measurements on a highly unstable floor.

Seeing the results obtained according to the income groups, we can see that 3 different groups could be identified: A first group in a situation of poverty could not, in any way, access the proposed diet. A second group in a situation of economic vulnerability, or the lower segment of the middle class, could eventually have access to products with fewer price differences, that is vegetables, fruits, legumes, and some optional foods such as honey, sugar, or cookies. But it would be extremely difficult for them to access products such as flour, bread, meat, and dairy products. Finally, a small group represented by the upper middle class and the well-off sectors could eventually choose a whole diet based on the proposed model.

Linking exclusively the accessibility of this type of diet through an income analysis would be highly restrictive and would fall within a narrow line of neo-classical market analysis limitations, as seen already in Chapter 3.

Different alternatives for upscaling accessibility to this model of diet can be elaborated. As we saw in chapter 2, in the section referring to the interventions carried out by the National Government in Addressing SDG Goal 2, we can identify 2 important lines: the one supporting consumption was represented by the food card and canteens aid; and the other addressing programs for family and small-scale production.

In the first case, the food card, up to now, has not included any type of food group restrictions or production modality, and as can be seen in different impact studies (Unicef) it has not served to change the eating habits that lead to high numbers of malnutrition.

In this sense, a gradual incentive toward the consumption of the foods included in the proposed model by these public policies, coupled with a parallel incentive pack to production, facilitated by the second line in question, could contribute to a considerable increase in the consumption from the most vulnerable population groups.

Clearly, these processes require higher efficiency and effectiveness of the organic and agroecological production processes throughout the value chain. Different options identified in previous chapters referring to the Pampa Organica Norte case can be taken into account.
Social and solidarity economy could add to these options as a way to complement and diversify the access channels for groups ranging between the vulnerable and middle classes.

These processes could lead to a decrease in the cost of these products, and in turn could include a greater number of people in healthier diets.

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7. General Discussion

As a starting point for the discussion, it is important to emphasize the fact that from different visions, perspectives and knowledge it is becoming more and more evident that a change in the food system is increasingly necessary if environmental and social sustainability is really to be achieved.

In this sense, the SDGs would be both global and local attempts to direct the objectives to that end.

However, as we have seen, there are subtle differences between objectives, targets and indicators that, in certain aspects, can be substantial and even contradictory (such as the paradigmatic indicator concerning the intake of animal protein included in the Argentine adaptation of point 2.3).

Argentina, like many other countries, depends economically on agricultural exports that are centered on an unsustainable food system model, based on industrial monoculture practices for animal feed, and the production of high-calorie, low-nutrient refined foods with an extreme imbalance between capacities consumption between populations and countries (UN 2020). This model generates concentrated wealth without effectively providing solutions to nutritional challenges at the global level, and at the same time shows a local malnutrition level close to 70% of the population, a clear example of a malfunction of the system itself.

In this sense, a neo endogenous development privileges local systems with high levels of productivity and global distribution, as is the case of the value chain linked to organic milk in the Pampas Region. This in turn, allows the subsistence of traditional local systems regarding mixed agricultural and livestock systems, and also the preservation of local knowledge, both in production and in transformation. All these, constitute essential elements when it comes to visualizing options for enhancing quality through the typicity of the territory and the sustainability of agricultural practices.

Another kind of wealth is created and introduced by the experience of local know-how that the PO group is carrying out in conjunction with other stakeholders. It is broadly identified in the present work either in the value chain, such as small and medium-sized dairy farms, mills, etc., as well as in scientific institutions, public institutions, research centers, producer groups and movements.

On the other hand, as presented in chapter 5, different initiatives from civil society are generating experiences that, from the social and solidarity economy perspectives, contribute with practices, knowledge and to the strengthening of value chains based on the principles of health, justice and environmental sustainability.

Finally, some public policies concerning SDG actions will be described in chapter 2. Different public attempts can be glimpsed in these directions. Political interventionism could surely expand and articulate with those presented in the case studies that will follow in order to generate greater and more sustainable impacts on the system.

As De Molina et al (2019) sustain, these experiences should not be seen as a sum of actions or as a radical intervention aimed at the sudden fall or destruction of the productive model that sustains the food model, but rather as actions that generate cracks in the system toward a gradual "agroecological metamorphosis", which is neither a one-way-track nor does it present a single recipe for application. However, as discussed earlier, local activation and global transitional staggering are often obstructed by unforeseen hostile situations, or even suffer unexpected setbacks before moving on.

In this sense, Organic Agriculture and Agroecology should evolve from its challenges to "conventionalize", (Darnhofer et al., 2010; Herren et al., 2015) "co-optation¨ (Wetzel et al 2018) to establishing common understandings, metrics, and open alliances in terms of territorial development both at public, private and

civil society levels, and truly upscale the metamorphosis toward a strong Sustainable Food System.

8. Conclusions

This thesis targeted the in-depth exploration of the relationships between the processes concerning the SDGs and the experiences and opportunities represented by organic and agroecological production with territorial development approaches especially as in the case of the Argentine Republic.

Despite the amount of literature dealing with SGD, organic agriculture, and rural and territorial development; this work attempts to relate and analyze these concepts from a new perspective. Firstly, by understanding the global historical processes and the relationships with those of Argentina, and at the same time, seeking to articulate them with processes such as the Bio-districts, which are currently being explored both theoretically and methodologically in different latitudes.

In this sense, the second part of this work, is an attempt to link and articulate different methodologies. This integration has facilitated the expansion of knowledge and also generated practices close to research, particularly in the case concerning the development in the Pampas region. Such actions have opened up possibilities for scaling up the research at the national level, and in turn served to interact with different ongoing processes at the international level.

In particular, the analysis of sustainability of agroecological practices represented by the application of TAPE has been found very useful to expand access to information while promoting common reflection of the participating group in relation to the different elements that constitute the agroecological basis and that are in direct harmony with the different dimensions of the SDG.

In turn, the participatory analysis of the value chain facilitated an innovative model of thinking the productive process of the region, the combined operational simplicity with the validity and relevance of the data obtained, and the ease of communication and interaction between them.

The Stakeholder Analysis, carried out also in a participatory way, proved to be very useful when establishing categories and going deeper into the relationship processes with different institutions based on a participatory construction of the indicators reflected in the influence interest matrix.

In the analysis of the stages, and the possible and available activation pathways of both LAFS and Biodistricts, these three methodological processes have been extremely useful.

Despite the fact that access to healthy, sustainable food is now popular and fashionable, both at local and international levels; in terms of the case presented dealing with the analysis of the accessibility to healthy, sustainable diets in CABA, until now, no research in the country has addressed the issue using mathematical linear programming for the identification of the cheapest diets in terms of basic nutritional needs.

On the other hand, up to now, there are no articulations between the national guiding rules (GAPA) and the most recent, representative ones at global level, which include the environmental aspect which is key for the joint analysis of food systems.

The relationship between both elements, that is, the mathematical programming methodology based on food guidelines and recommendations, was applied specifically to the short and alternative chains present in a given context, the City of Buenos Aires, and based on organic and agroecological productions.

This process has resulted in attributing the minimum, but fair price to a specific basic food basket: nutritionally healthy, from organic and agroecological alternative value chains.

Finally, the processes analyzed in the secondary source research (documentary) included in the first part of this work, and the specific methodologies applied in the second part to the case studies, are in a position to be implemented, confronted, re-elaborated and re-implemented in different local contexts, national and/or international, and at different scales. The applicability of this process, it is hoped, may eventually contribute to feeding the agroecological metamorphosis from the vital spaces of science-action activities.

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