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Emergence and Development of Transformative Capacities for the Sustainability of the Agri-Food System: The Process in Valdivia, Chile

Nancy Sarabia * and Jordi Peris *

INGENIO [CSIC-Universitat Politècnica de València], Institute of Innovation and Knowledge Management, Polytechnic City of Innovation, Universitat Politècnica de València, 46022 Valencia, Spain

* Correspondence: nansamon@doctor.upv.es (N.S.); jperisb@dpi.upv.es (J.P.)

Abstract: Local agri-food disruptive innovations are becoming increasingly crucial for the transformation of agri-food regimes towards sustainability. This study incorporates a systemic approach to explore the relevance of various capacities available at the city region level to prepare, initiate, and lead a change in the sustainability trajectory of local agri-food systems. It explores the city of Valdivia, Chile, which has a large movement of sustainable cooperatives and diverse disruptive private and public agri-food initiatives that are challenging the deep free-market economic and social model with an agro-exporting, competitive, and centralist focus. Through the systemic approach of sustainability transition studies, themes of emergence and development of local agri-food transition processes are being developed, and the findings are linked to studies of social movements and the social and solidarity economy.

Keywords: sustainability transitions; social movements; agri-food transitions; agroecology transitions; city region agri-food; agri-food policy framework



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1. Introduction

The agri-food system is considered one of the most important forces of change towards a new sustainability paradigm because it is a complex and multidimensional socio-ecological system of great magnitude [1–3]. Despite evidence of the unsustainability of the agri-food regime, it resists change pressures because it is designed to preserve itself [4]. However, from the territories, there is work on learning by doing disruptive sustainable agri-food initiatives in various sectors—public, private, social organizations, and academia—that are working to transition to a socially, economically, and culturally fairer agri-food model that is also positive for the environment. The city of Valdivia, located in Southern Chile, is no exception, with a high degree of experimentation and disruptive sustainable agri-food initiatives and communities of practice, in areas related to agroecology, food sovereignty, cooperative, free seeds, circular economy, responsible consumption, fair trade, ecotechnology, permaculture, and regenerative practices that are challenging the Chilean agri-food regime, which is part of a deep economic and social model of free market and privatization of social rights, such as water rights, with agri-food policies with a manifest agro-export, competitive, and centralist focus [5].

This food business model is considered exemplary for economic growth by some stakeholders; however, it has the limited potential to benefit up to 16% of national forestry and agricultural enterprises [6] (p. 89). It is a model that has created inequalities and disincentivized small-scale food production, which must compete with low-priced imported products. This competition leads to the migration of producers to other salaried activities, a decrease in local consumption production, and an increased dependence on imported food, leaving the population vulnerable to international market instabilities, both in terms of prices and access to nutritious food [7,8]. Additionally, it contributes to changes in diet

and health, a high carbon footprint, negative impacts on biodiversity, and soil degradation, and, over the last decade, has highlighted the socio-ecological limits of water use, and increasing territorial conflicts [9–11]. According to previous studies [12], among the five types of existing plant-based food systems in Chile, the agroecological and small-scale organic systems have the potential to foster a transition towards sustainability.

Research on agri-food policies aimed at sustainability indicates a shift towards a systemic commitment to the food system, greater recognition of scale complexity, and an increasing focus on the relational aspects of urban food governance and policy-making dynamics [13]. The importance of place, municipalism as an active entity directly related to citizens, and the study of the agri-food system from an urban perspective as a driver of change are also highlighted [13,14]. However, it remains unclear what entry points or capacities are needed to achieve a truly transformative change in the agri-food system [15]. There is an urgent need to explore and explain the transformative capacity that embodies a systemic vision, along with a theoretical framework that better describes the factors affecting the emergence and growth of social innovations [16,17]. Studies on sustainability transitions in this area have gained relevance and have developed different approaches and heuristic frameworks that El Bilali analyzes [18], demonstrating the need to integrate and adapt them to the agri-food system.

The objective of the study is to analyze with a systemic, multiscale, city region place-based approach, the various capacities available to prepare, initiate, and direct a trajectory change towards the sustainability of the agri-food system of Valdivia, a case with a high presence of sustainable cooperatives within grassroots social innovation, confronting an agri-food regime at one of the most open economies in Latin America [6]. The aim is to understand the determining factors that influence the progression of transition capacities, as well as the broader sustainability transition processes of coevolution among the different socio-ecological dimensions that contribute to research and management of territorial actors from various contexts, in their work to drive the agri-food transition to sustainability. For this purpose, the operational framework of transition capacities by Wolfram [19] was chosen. Although grounded on sustainability transitions theoretical foundations with a clear northern hemisphere tradition [20], this operational framework of transition capacities integrates different approaches to sustainability transitions and contributions from a wide range of research areas, from which it draws various factors grouped into 10 components that describe the forms of agency and interaction (governance, leadership, communities of practice), development processes (system awareness, foresight and vision of change, experimentation and diverse solutions, integration of innovation and regulatory frameworks, reflection and learning) and relational dimensions (work at different human and political-administrative scales), components that are themselves, orientations to drive the capacities of transition to sustainability. The application of the operational framework of capacities to analyze a local agri-food system has previously been applied in Valencia, Spain [21], proving its usefulness. Through this second case study, the transition capacities framework is applied for the first time in a city region of Chile, demonstrating its adaptability to various local contexts of the global north and south. Additionally, findings related to the preconditions for capacity development and accelerators for agri-food transition are confirmed and complemented. Concrete tools are provided for both the assessment of local agri-food systems and for guiding regional agri-food policies with a vision of sustainability. On a theoretical level, coincidences and theoretical complementarities have been found between transition capacities, social movement studies, and social and solidarity economies.

Following this introduction, section two presents the theoretical framework used, based on studies of sustainability transitions and linked to the methodology derived from Wolfram's transformative capacities framework [19]. The section explains what the framework entails and how it was used. In section three, the case study of Valdivia as a city region is contextualized, including a brief historical analysis of the development process of current sustainability-related policies in the territory. Section four shows the

analysis of Valdivia's ten transformative agri-food capacities. In section five, the discussion focuses on the role of sustainable cooperatives, social movements, policies, and macro policies in sustainability transitions, and how these dynamics and facilitators have also been evidenced with different focuses from other theoretical studies, such as social and solidarity economies and social movements. The section also addresses the significant barrier in the territory under study for the agri-food transition, which relates to the systemic thinking of the agri-food system. Finally, the main theoretical and practical findings are concluded.

2. Theoretical and Methodological Framework

Cities play a pivotal role in driving urban sustainability transitions and innovation, attracting increased attention from the global academic sustainability transitions community [4,22–24]. Urban sustainability transitions are conceptualized as place-based endeavors, involving profound and enduring transformations that impact diverse dimensions, including technologies, markets, user practices, policies, governing institutions, and cultural discourses [25–27]. Given this perspective, the role of the local governments is crucial to facilitate governance processes contributing to these long-term transitions across all stages [28–30].

However, there is a growing academic consensus that recognizes the agri-food system as a complex socio-ecological system that extends beyond urban settings, encompassing nature and rural environments. In that sense, Davies [31] emphasizes the intersection of food systems with urban food consumption and sustainability, which includes considering how urban food strategies can support rural agriculture and the ecosystems they depend on. El Bilali's [20] work focuses on the sustainability of food systems and the transition towards more sustainable, resilient agriculture highlighting the need for a holistic approach that incorporates both the production and consumption aspects of food systems. Wolfram's [19] research on urban transformations towards sustainability includes the spatial dimensions of urban–regional interactions. He addresses how sustainable urban development must consider the ecological and socio-economic flows between cities and their regions, which includes managing resources such as water, energy, and food within an integrated regional framework that acknowledges the urban impact on rural landscapes and vice versa. Finally, Sarabia [21] states that *“the analysis of the agri-food system highlights the paradox of labelling transition capacities as urban, which perpetuates the invisibility of rural areas. Rural areas establish the natural, economic and social bases of food production, and provide a territorial idiosyncrasy”*.

As place-based processes, the varying cultural and geographical contexts are assumed to necessitate distinct transition pathways [29]. Consequently, there is a need for new governance approaches that not only develop novel ways of doing and organizing but also challenge embedded modes of thinking capable of managing ambitious, open-ended, and uncertain processes [28]. Furthermore, it has been clearly emphasized that transitions are not top-down governed processes. Instead, new urban transformative capacities and innovative experimentation, as well as increased participation and co-creation of initiatives such as multi-stakeholder governance initiatives involving a diverse range of actors based on bottom-up approaches, are considered crucial [19,23,32–34].

2.1. Urban Transformative Capacity

Within the field of urban sustainability transitions, there are different theoretical proposals that address the notion of urban transformative capacity. Hölscher [35] developed a conceptual framework of capacities for transformative climate governance that distinguishes between four different types of capacities of the climate governance system: stewarding, unlocking, transformative, and orchestrating. Pahl-Wostl [36] relies on social learning theories to identify the factors that increase the transformative capacity of a governance system, such as the existence of polycentric structures with flexible coordination or the balance between top-down and bottom-up processes. Wolfram [19] develops a holistic

and integrated framework describing the forms of agency and interaction, the processes, and the relational dimensions involved in the transformative capacity of a city.

It is precisely because of its integrated conception that this paper draws on Wolframe's conception of urban transformative capacity. It is defined "*as the collective ability of the stakeholders involved in urban development to conceive of, prepare for, initiate and perform path-deviant change towards sustainability within and across multiple complex systems that constitute the cities they relate to*" [19] (p. 126). According to the theoretical formulation of the proposal, the concept can be structured in 10 interrelated components that are the following ones, as shown in Figure 1:

- (1) Inclusive and multiform urban governance: diversified, flexible, and robust governance structures with wide participation and active inclusion of stakeholders from all sectors in a diversity of governance modes and actor networks with sustained and effective intermediary organizations and individuals among sectors and domains.
- (2) Transformative leadership: polycentric and socially embedded leadership arising not only from political elites but also from other spheres of society. A kind of leadership that enhances the role of different agents of change and includes the transfer between discourses (across sectors, domains, and scales) and the articulation of new visions and discourses to leverage collective energies and enable social learning.
- (3) Empowered communities of practice: communities of practices built on the shared experience of urban places and or joint concerns. They require association, coalition forming, access to resources, and conditions of autonomy.
- (4) Systemic awareness: awareness and understanding among stakeholders of the system dynamics, path dependencies, and obdurances that undermine urban sustainability.
- (5) Urban sustainability foresight: a collective vision of radical departure from the current path should be created, including alternative scenarios based on system thinking. Transformational knowledge must be developed through transdisciplinary co-production.
- (6) Diverse community-based experimentation with disruptive innovation: practical experimentation of path-deviant initiatives in the urban setting is crucial to developing transformative knowledge and social learning.
- (7) Innovation embedding and coupling: the extent to which barriers to innovation practices are removed and their embeddedness in routines, organizations, plans, and legal frameworks is enhanced.
- (8) Reflexivity and social learning: reflexivity and learning must include all actors of change to enable positive feedback loops. This involves the application of reflective assessment methods, the creation of formal and informal reflexivity formats that critically question progress, and to systematically manage transformational knowledge.
- (9) Working across human agency levels: capacity development needs to occur at different agency levels simultaneously, addressing individuals, households, groups, organizations, networks as well as society at large.

Working across political-administrative levels and geographical scales: cross-scale and multi-level implications should be incorporated into the understanding of all the components of the framework. Interactions among scales and administrative boundaries must be considered.

In this interaction between the different dimensions and scales, research needs: (1) to emphasize the interdependencies between urban centers and their wider regional and rural contexts, particularly in terms of environmental, social, and economic interactions [21,31], and (2) to be particularly attentive to the specificities of each city region as it is crucial to bear in mind the context-specific factors shaping sustainability transitions [26,37] and the role of the different urban and place-based factors shaping urban transformative capacity [14].



Figure 1. Components of the urban transformative capacity. Source: Own elaboration based on Wolfram, 2016 [19].

2.2. Methodological Approach

In view of the objectives of the research, the methodological approach is based on the interpretative paradigm [38,39] in which the objective is to collect and understand the interpretations that the different actors elaborate on the research topic. This qualitative approach is in line with most of the research on urban transitions to sustainability [40].

Our approach also incorporates a transdisciplinary perspective [41] in which city actors (institutions, organizations, businesses, and social movements. . .) are not considered as objects of study, but as research subjects whose contributions are academically contrasted. In this way, researchers take on the role of intermediaries or facilitators of spaces and processes of co-production of knowledge. The importance of transdisciplinary approaches in the collective production of knowledge and learning in sustainability transition processes has been widely emphasized [42]. To this end, research methods included semi-structured interviews with key informants and experts, as well as secondary data analysis of policy, strategy, and planning documents and specific research articles. Specifically, 18 semi-structured interviews were carried out including members of academia, private companies, social organizations, and public administration (see Table A2 for details and coding of interviewees from E1 to E18). Additionally, a space for interdisciplinary co-production of knowledge was created in the form of a transdisciplinary workshop for the exchange of knowledge among key stakeholders from the cities of Valencia (Spain) and Valdivia (Chile) for the transition to sustainable agri-food systems. In it, there was a sharing of insights on how various challenges of sustainable food are being addressed in their territories. To promote systemic analysis, design thinking tools were used in a virtual space for reflection and collective collaboration based on the principles of systemic innovation. The workshop focused on the identification of key challenges, the discussion of how they are being addressed, and the analysis of the emerging forms of collaboration. To guarantee the validity and reliability of findings, all the information was appropriately coded and

contrasted through a triangulation of techniques and sources of information, as well as through the feedback received by the participants in the transdisciplinary workshop.

3. Context of Valdivia

Valdivia is the capital city of the Los Ríos Region in Southern Chile. It is characterized as a tourist and university city, where rivers converge with their wetlands, and it has beaches towards the coast, bordering the Pacific Ocean. The city region is known for its high rainfall, which provides green landscapes with 908,531 hectares of native forest and Valdivian rainforest and a surface of 21,512 hectares of protected areas [43]. A total of “50% of the region is forest, meaning it is a natural ecosystem that is more or less intervened” (E14). According to the latest demographic information [44], Valdivia has 166,080 inhabitants, its projection for 2024 is 182,026 inhabitants, and for the region, it is 412,786 inhabitants [45] with a population density of 22.2 inhabitants per km². The city/municipality has 6.8% rurality, and the region has 28.3%. A total of 45% of this rural population is characterized as peasant family agriculture, where agriculture provides at least 25% of the family’s economic income [46].

“It is a strength to have people who are making their life and their life project in the countryside; it is a heritage that we still do not know how to look at properly” (E18).

“In the Los Ríos Region, there was a lot of agriculture; legumes, cereals, vegetables were formerly cultivated, and it has been lost and a bit of the perception from the people in the countryside is that they were displaced by products coming from the north, much cheaper and they have no chance of selling their product at a reasonable price” (E14).

In the region, there are 16,529 silvoagricultural operations with a total of 697,124 hectares used [43], the largest percentage of which is covered by forest plantations with 248,281 hectares followed by meadows for livestock, annual crops, and fruit trees, the latter covering an area of 2703 hectares. The most exploited fruit is the blueberry with zero percent destined for the domestic market, followed by hazelnut, cranberry, and raspberry, among others. The dairy industry, beer production, and honey also stand out. Fishing and aquaculture also have a prominent role in the area, with 11,987.7 tons of marine resources landed during February 2024 [47]. *“In terms of agroecological capacity, the soils, the productive surface is more than enough if we wanted to sustain the population we have today and energetically also, but we are not using it, we are not developing that capacity” (E14).*

Historical Context and Sustainability Integration into Policy

The city of Valdivia has a history of defending its territory through environmental conflicts that have shaped an empowered community with a vision of sustainability. In 2013, social organizations, NGOs, academics, and citizens won a 9-year legal battle against a formidable multinational forestry company that was polluting the Río Cruces Wetland with disastrous consequences. From this empowered social movement, new narratives around sustainability emerged, balancing economic, social, and ecological aspects and relating to the agri-food system, such as agroecology, responsible consumption, food sovereignty, free seeds, buen vivir (good living), social and solidarity economy, cooperatives, fair trade, circular and regenerative economy. These narratives have generated disruptive initiatives to the conventional agri-food model and promote and lead processes of agri-food transition to sustainability in the city region.

However, at the level of the established agri-food regime, policies, legal frameworks, prevailing perspectives, dietary habits, technologies, etc., there is a marked centralization in top-down policy-making and decision-making. The predominant agri-food system in Valdivia is part of a broader Chilean political and economic model of the free market, focused on the production of large-scale monoculture food crops with a high degree of intensification, productive efficiency, and industrialization, aimed at the agro-export market [5]. On the other hand, the shortages, rise in food prices, and increased food insecurity resulting from the Pandemic, the war in Ukraine, and the national “Social

Outbreak” crisis have highlighted the instability of globalized agri-food systems. Therefore, in 2023, the National Strategy for Food Sovereignty and Security was participatively raised, integrating the promotion of sustainability and short marketing chains, marking an interesting declaration of intent against the agro-export regime. In the policies of the city region, there are two windows of opportunity for the demands of the sustainability social movements to flow toward the regime. The first window of opportunity was created through the formation of the new region in 2007, which opened a process of drafting new policies for the region that captured all the conjunctural spirit of social movements for participation and environmental protection, resulting in the first Regional Development Strategy (2009–2019) where sustainability is the transversal axis. A second window of opportunity is the change in local government in 2021, which embraces the demands of environmental collectives supporting the formation of a governance process around the management and protection of wetlands. This governance process was promoted from the adherence of the Rio Cruces Wetland as a Ramsar Site in 1981, for the conservation and sustainable use of wetlands, however, governance was not implemented until the change in government in 2021.

Below, Table 1 summarizes the timeline of key events involving the Valdivia community in a vision of sustainability that influences the agri-food system:

Table 1. Key events in Valdivia’s political process regarding sustainability.

Year	Event	Details
2004	Environmental catastrophe at Río Cruces Wetland	Defense of the river and wetlands against contamination from a multinational forestry company’s effluents.
	Movement “Action for the Swans”	Empowered social organizations, NGOs, academia, and citizens develop a collective vision of sustainability with emerging sustainable agri-food narratives and initiatives.
2007	Formation of the New Region of Los Ríos with Valdivia as the regional capital (window of opportunity)	The Regional Development Strategy (2009–2019) is raised participatively with a sustainable vision.
2013	Court ruling in favor of social organizations	Marks a milestone and empowers social organizations. The Humedal Community is formed, convening 63 organizations.
2019	National socio-political and economic crisis “Social Outbreak”	Drives changes in local governments, questions the model, and begins food shortages, reinforcing and increasing sustainable agri-food initiatives.
2020	COVID-19 Pandemic	Increases food shortages, weakens the organization process of the social outbreak, and reinforces narratives of food sovereignty in national policies.
	Urban Wetlands Law	Management from the grassroots of legal frameworks for the protection of wetlands.
2021	Changes in local governments (window of opportunity)	Environmental demands of social movements are considered along with the governance proposal of the Ramsar Convention (1981) for the sustainable use of wetlands.
2022	Municipal ordinance for the protection of Valdivia’s wetlands	Governance processes are raised, and support is given to the Urban Wetlands Law.
2024	Nomination of Valdivia as a Wetland City (in application)	Management to enhance the value of what is protected with international recognition.

This timeline illustrates how Valdivia has experienced a series of significant events that have shaped its commitment to environmental protection and sustainability. These events

show a strong community response and policy adaptation in response to environmental challenges and social movements, leading to enhanced legislative protections and initiatives promoting sustainability and food.

4. Analysis

4.1. Inclusive and Multiform Urban Governance

Participation in the region has been assessed as high and different forms of stakeholder networks have been identified (see Table 2). The elaboration of forestry and livestock policy and the promotion of production have been highlighted as formal spaces for inclusive participation, although they are occasional spaces and participation is only consultative, not binding. In other formal and informal spaces of participation around agrifood, participation is not inclusive. *“There are governance spaces, but not where we all come together”* (E13). Centralized top-down governance systems predominate in decision-making, although on the other hand, important trust links have been achieved in decentralized networks. Hybrid and sectoral intermediaries were identified, highlighting cooperatives, public institutions, universities, unions, and the private sector articulating and bridging different sectors. However, with the exception of the public sector, the other intermediaries do not have a stable financial and organizational structure for this function, so this role is limited in time. There is a lack of a systemic vision of agri-food, the actors in the system are not articulated for advocacy and decision-making, and governance efforts do not involve all parties. Therefore, it can be concluded that participation is high, but in non-inclusive forms of governance, with the presence of intermediaries and effective agri-food governance with a medium to weak development.

Table 2. Modes and networks of formal and informal governance around the agri-food system in Valdivia.

	Participation Spaces for Advocacy/Decision Making	Inclusiveness/Participation	Referenced by
1	Development of Public Policies of the Regional Government, Forestry and Livestock Policy and Productive Development Policy	Producers, businesses, social organisations, public institutions and academia	E8, E14, E18
2	Regional Strategy FIA (Fundación para la Innovación Agraria)	Companies and public institutions	E8
3	Máfil Collaborative Innovation Centre	Producers, companies, academia and public institutions	E18, E8, E7, E17, E14
4	Responsible Consumption Cooperative La Manzana	Producers and consumers	E8, E18, E17
5	Evaluation of INDAP's (Instituto de Desarrollo Agropecuario) Regional Strategy through the Area Agency Committee (CADA).	Producers and public institution	E8
6	Rural Women's Bureau	Women peasants and public institutions	E8, E10
7	AVA Los Ríos, Food with Added Value	Companies, public institutions and academia	E2, E5
8	Productive Development Committee in the Region	Public institutions and notable citizens	E16
9	Semilla Austral Cooperative	Producers and partners	E7, E10
10	Territorial Councils	Citizenship, academia, business, public institutions, social organisations, etc.	E13, E3, E7, E6, E8, E12, E11, E17, E14
11	Federation of Cooperatives for Well Living	Companies and social organisations	E8, E11, E13
12	Calahuala Cooperative	Producers and public institutions	Transdisciplinary Workshop

4.2. Transformative Leadership

Different kinds of leadership are recognized in different sectors. The cooperatives stand out in the resolution of territorial problems with a vision of sustainability, coordinating themselves with grassroots social organizations and local institutions. *“I believe that cooperatives are powerful in this sense, with several working on agri-food issues”* (E8). The institutions generate spaces for public-private meetings and specific projects aligned with sustainability. *“From the Regional Government there is this Centre for Collaborative Innovation that has been a meeting point for companies that work with agro-ecological logic”* (E14). There are also private companies with environmental responsibility that promote sustainability and articulate with academia and institutions. *“The private sector, such as La Manzana, are the promoters and have remained over time, every year they are involved in some project to help farmers and provide good food”* (E10). The academy was also identified as a political advocacy leadership, generating spaces for reflection with academics who inspire sustainable and agroecological vision, however, these are a minority within the institution. *“In 2017 at the academic level they won a Corfo project ‘Nodo de intensificación de la agroecología en la Región de los Ríos’ in which they developed the transition of small vegetable producers towards an agroecological practice... they were able to hold a seminar in the Cecs tent which was called ‘Responsible consumption and agroecological production’”* (E3). There were also conflicting opinions regarding the imbalance between the university’s potential to lead this shift to sustainability and its actual agency. In general, it was stated that such leadership exists, but it is short-lived, lacking the synergy of social integration and social capital creation that operates in networked governance. Environmental NGOs present in the territory were highlighted as leaders in the vision of sustainability (E9, E12), they have translated this knowledge to the institution at different scales. However, there is an apparent disconnection between the ecosystem services provided by the environment and their intrinsic relationship with the socio-ecological agro-food system. This disconnect is also seen in the community and political leadership. Local political and media leadership is promoted by the mayor (E4, E9, E12), who promotes sustainability by supporting governance spaces for the protection of wetlands and a municipal ordinance that enforces the new national law on urban wetlands, which was developed from the territory. In summary, there is leadership with a sustainable vision in all sectors of the agri-food system, but with little scope for impact both at the level of cohesion and for translating the vision into policy institutional, being evaluated with medium development.

4.3. Empowered Communities of Practice

There are several empowered and autonomous communities of practice in Valdivia with a territorial identity, based on territorial and local issues (see Table 3). Most of them are born out of the defense of the territory (E9, E11, E14, E15). The environmental conflicts of the Rio Cruces Nature Sanctuary, Rio San Pedro, the socio-economic crisis of the Social Outbreak, and, contradictorily, the pandemic (which on the one hand promoted initiatives and on the other disarticulated the social movement that had grown out of the social outbreak), stand out as catalysts for communities of practice and disruptive initiatives. A percentage of these communities of practice disappear over time, others become dependent on government support or competitive funds, and others achieve self-management with sporadic public support, mainly in the form of cooperatives with a vision of sustainability, which includes participation and horizontality in their functioning. Meeting social needs is a cornerstone of both capacity building and sustainability. This reflects an ethical dimension (intra- and intergenerational equity), as well as the recognition of human agency as the key to balancing long-term ecosystem health and economic well-being. This component was assessed as medium to high development.

Table 3. Communities of practice of the agri-food system identified in the city region of Valdivia.

	Communities of Practice	Area	Referenced by
1	Responsible Consumption Cooperative La Manzana	Agro-ecological basket and sustainable education	E1, E3, E4, E5, E6, E7, E9, E10, E11, E12, E13, E14, E15, E16, E17, E18
2	Wetland Community	Participation, social innovation and sustainability	E8, E9
3	Trade Association of Organic Farmers Los Ríos	Guild of organic producers	E7, E8, E18, E10, E13
4	Cooperative Valdivia sin Basura—Cletacompostera	Sustainable waste management, community gardens, education	E3, E7, E8, E12, E17, E18
5	CAREP Ecological Restoration and Permaculture Learning Cooperative	Ecotechnology and sustainable education	E7, E8, E9, E11, E13
6	Worker Cooperative Semilla Austral	Free seeds, agroecological and cultural education	E3, E6, E7, E8, E10, E11, E12, E16
7	Calahuala Cooperative	Education and sustainable land-use planning	E8, E12
8	People’s Supply Network	Community-based sourcing based on food sovereignty and agroecology	E3, E7, E11, E12, E13, E15, E16
9	Mapuche Vegetable Garden Network	Agroecology and food sovereignty	E13
10	Cocinamar—inline fishing	Sustainable fishing	E6, E8
11	Cooperative of Agro-ecological Producers of Paillaco	Agroecology and education	E16
12	Paimuri	Agroecology and food sovereignty	E7, E8
13	Trade Association of Rural Youth of Los Ríos	Agroecology (non-exclusive)	E8
14	Mapuche tourism cooperative in the Panguipulli area	Local and sustainable tourism local gastronomy	E18
15	Lafkenche Community	Traditional and sustainable fishing and shellfish harvesting	E18
16	Mely Lawen Mapuche Cooperative	Sustainable and regenerative gastronomy and tourism	r.r.s.s
17	NGO Huerta Herbolaria	Community gardens, education in agro-ecology and medicinal plants	r.r.s.s.

4.4. Systemic Awareness

There are spaces for the establishment of baselines and identification of gaps (see Table 4). However, they are not addressed as agri-food systems (E7, E8, E18), but rather as agricultural sector (productive), entrepreneurs (processed and/or value-added food), and tourism. What comes closest to a systemic vision is the approach as an agri-food value chain. The latter is the case of the governance process carried out by the Collaborative Innovation Centre, which brings together various sectors of sustainable agri-food including academia, producers, technological actors, and public services. Another work in this sense of value chain is the one carried out by the Responsible Consumption Cooperative La Manzana through its research project together with FIA (Fundación para la Innovación Agraria) that addressed the demand for local, sustainable and socially responsible food. However, the analyses do not aim to move from a description of the state to an explanation of the territorial agri-food system and ultimately to the anticipation of the dynamics of (non) change (barriers/drivers) that would allow influencing the agri-food transition. There is also a lack of management that allows for transfers between different forms of sectoral and systemic knowledge. “The lines of diagnosis are also made in academia and institutionally, but

then it remains in papers and in an office, it is not open knowledge" (E12). However, a space that was also named and that systematized and opened up knowledge of these diagnoses were the territorial councils, spaces for inclusive self-convened participation, conjunctural to the social explosion and new constitution, through the Social Unity (organization of organizations) (E3). Although governance structures, institutions, and stakeholder conflicts are not subject to dedicated analysis, interviewees clearly identify areas of reluctance and are in favor of change in their specific areas. At the level of disruptive initiatives that generate decentralized governance spaces, "There is no strategy behind it. It is a day-by-day building, with the capacities and resources we have and with our sense of smell, instinct and intuition, rather than as a rational analysis" (E14). This component has been assessed with medium to weak development, mainly due to the lack of systemic vision.

Table 4. Baseline survey spaces with information on the agri-food system named by the interviewees.

	Institution/Organization	Document/Work	Referenced by
1	Regional Government	Regional Development Strategy, Regional Policy for Forestry and Livestock Development and Regional Policy for Productive Development	E1, E3, E4, E5, E6, E7, E9, E10, E11, E12, E13, E14, E15, E16, E17, E18
2	Collaborative Innovation Centre	Value chain in the framework of inclusive governance related to sustainable agri-food	E18
3	Responsible Consumption Cooperative La Manzana	Study on 'Characterising the responsible consumption market in Los Ríos, including the demand for local food, and the associated production and intermediation as a starting point for innovations in the local agri-food value chain'.	
4	Territorial Councils	Raising local territorial demands including, economies for living well and food sovereignty, proposals for a new constitution.	E3
5	Ministry of Agriculture	Characterisation of the National Organic Products Chain	E7
6	Federation of Cooperatives for Well Living	Information is shared and discussions are held on free seeds and food sovereignty	E11
7	Wetland Community	With a broader focus than agri-food, a baseline was drawn up in relation to the local needs of the 63 organisations that are part of the community in the framework of the judgement won around the protection of wetlands and the development of a sustainable action plan	E9

4.5. Urban Sustainability Foresight

There are future prospective spaces with diverse participation. The gathering of information and prospective to prepare the Regional Development Strategy was highlighted. Another foresight space was carried out by the La Manzana Responsible Consumption Cooperative, which has 120 members, to generate its action plan through Dragon Dreaming (Australian Aboriginal foresight methodology). The territorial councils and their prospective work to prepare proposals for the new national constitution were also named, along with prospective work within the alternative academic world and students and in organizations such as the Federation of Cooperatives for Buen Vivir.

There is also a vision of radical change in the agri-food sector of a conglomerate of organizations and a group of society, practically the same pro-environmental social fabric and social and solidarity economies. "(Valdivia) is a city that has a totally open vision. People look, think and do differently. I'm not telling you everything, but there is a trend and that trend marks a path" (E17). In the territory, there is a vision of sustainability, due to its history of environmental struggle. This vision transcends the political level and the new local administration, with a media discourse of sustainability with limited institutional programs in the agri-food system in accordance with that trend (see C6). Such as, for example, the

support and management of a successful local community garden project, the creation of the municipal unit to support cooperatives to improve their capacities; and it was the first municipality to promote the Ecomarket, whose mission is to reduce food waste and supply food to low-income families. A program at the regional public level is the Collaborative Innovation Center, which promotes public–private territorial articulation with a sustainable agri-food vision. The Regional Government also promoted a program that lasted 5 years of “Agroecological and organic production for small and medium-sized producers in the Los Ríos Region”, which included 180 producers and 30 advisors. There is also financial support through government competitive funds to improve the capabilities and infrastructure of cooperatives (communities of practice and companies with other cooperative logic). The viability problems of the new sustainable agri-food vision require clarification that has not been made and on the other hand, there is no negotiation between the actors of the system and the decision-makers to create policies, plans, and projects that can be put into practice with shared responsibilities. Consequently, it can be stated that there is no collective vision of agri-food sustainability and the need for radical change around agri-food (E7, E18). At the level of small businesses, the focus is sales as a means and end (E5), there is no vision of change, nor is sustainability fully understood, nor is there systemic thinking. There is a collective sense that an important group of the population wants to consume agroecologically, to carry out recycling, however, the structural and access capacities are not found for these actions to be developed massively [48] (E3).

In that sense, this component has been evaluated with medium development, since the vision of radical change belongs to a smaller group of the agri-food system and, therefore, is not collective. However, there is a co-production of knowledge to forecast the agri-food future that includes sustainability with greater or lesser importance and diverse interpretations of the concept.

4.6. Diverse Community-Based Experimentation with Disruptive Innovation

Practical experimentation offers a crucial mechanism to develop transformative knowledge and catalyze social learning [19]. There is diverse experimentation by place-based communities of practice that have a vision of sustainability that balances the economic, social, and ecological. A total of 61 sustainable agri-food initiatives were identified (see complementary information), experiments in urban and rural environments, some as social organizations, NGOs, institutions, academia, the private sector, and other hybrids between private–social organizations. Its narratives are the circular economy, permaculture, agroecology, responsible consumption, food sovereignty, the regenerative, social, and solidarity economy, and free seeds.

“There really is a lot of agroecological movement here, many organizations that are on different fronts of agroecology, economically, in consumer education, we in agrobiodiversity, in seeds. . .there is a critical mass and people doing things and organizations with experience, years. . .” (E13). The most recognized initiatives were cooperatives that operate with democratic principles of member participation, are autonomous, and promote sustainability, such as responsible consumption, through a store and baskets of local and agroecological products (Cooperativa La Manzana), waste management (Cooperativa Valdivia Sin Basura), propagation and rescue of traditional and agroecological seeds (Cooperativa Semilla Austral), ecotechnology and permaculture (Cooperative CAREP), all generate education projects and are socially committed to the territory and the environment. These function as private companies and as a social organization. There are also private companies in bio inputs for agriculture such as Liquén Austral and four regenerative livestock companies, bio-intensive organic producers, on a human scale, were identified. These companies also stand out for their work in education and coordination with institutions. In social organizations itself, the most named was the Organic Farmers’ Guild Association, with a certain degree of state dependence, but groups of Mapuche women farmers and sustainable fishermen in the region were also named with these principles. At an institutional level, the Collaborative Innovation Center stood out as a space that brings

together regional initiatives with principles of agri-food sustainability. The Popular Supply Network is a group of people/families who organize to buy local products together and with principles of food sovereignty. Initiatives were identified that are indirectly linked to the agri-food system and educating in sustainability, for example, in non-timber resources, biodiversity, organic waste management, and cooperatives in rural tourism that address local culture and gastronomy.

Two small markets were identified for agroecological and local farmers, however, they are not very active, compared to the free fairs, large itinerant markets that are located on the street and that through resellers bring an abundant and varied supply of vegetables and fruits that are produced throughout the country and imported. However, the construction of a large local fruit and vegetable market “Mercado Estación” is in process. Although their offer will be 100% local and they have a minimal application of agrochemicals, agroecological producers could have an important space. In this sense, the existence of disruptive initiatives has been evaluated with high development.

4.7. Innovation Embedding and Coupling

There are resources for sustainable and agroecological agri-food innovation, but proportionally they are marginal, compared to the resources deployed for the conventional, agro-industrial, and export vision. For the entrepreneurial ecosystem, there is support in financing, to generate a product and a business plan (E4), but there is no projection of sustainability, which is still not well understood in this sector, which continues to be governed by the search of hopefully export markets and focuses on advertising its added value (not eco), its main goal is to increase economic profits. The performance evaluation metrics in the institutionality do not reflect this intentionality of change, of transition, and sustainability is not promoted. However, most disruptive initiatives have been supported by state projects and several recognize the key nature of this support in their development. *“There are resources, I don’t know if for the issue of agroecology, but for the circular economy and for organizations, to form a trade association or to create a cooperative”* (E4). Furthermore, financial support is short-term (often executed annually), which limits the continuity and impact of a transition process.

“The structure of the economy is not proposed to change, but rather to introduce small improvements to obvious problems, such as climate change or the energy crisis, but without transforming the structure” (E14). *“There is a conservative institutional barrier, a centralized and complex structure, which when presenting social innovation asks better for technological innovation, there is distrust from the people to the politicians and from the politicians to the people”* (E9). There is little regulatory framework built with this sustainable vision, the existing one is not promoted or is not adaptable, since it does not leave room for interpretation according to specific contexts, for example, the agroecological within the organic, making its visibility difficult as it is outside of the law. It is the same case with free seeds (seed caretakers), bio inputs, and purifying wetlands. *“Since the new generates rupture, dialogue and the ability to resolve conflicts when thinking differently is also a capacity to develop”* (E12). *“Consumer cooperatives are also not well understood as a legal entity, before a notary or internal tax system”* (E14). *“And finally they prevent cooperatives from developing their full potential because it is different from a large company”* (E11). Existing regulations do not allow broader resource flows to be used for transformative action (financial, human, technical, or organizational). Consequently, this component has been evaluated as weak development.

4.8. Reflexivity and Social Learning

One of the spaces that marked a milestone of reflection and social learning were the Territorial Councils that were born at the same time as the social outbreak, spaces of inclusive participation and self-convened nature with rotating spokespersons and addressing diverse topics such as *“older adults, the environment, that of the book, of art, of workers, of*

universities, of science, of peasants and for 'buen vivir'. . . a summary of town council meetings was systematized, but the pandemic caused this to disperse" (C3).

It was identified that the university carries out an important task of systematization, but with technicalities that prevent it from being open access. In social organizations, meeting minutes play an important role and so does the exchange of experiences. *"The exchanges of experiences leave a lot of learning, La Manzana Cooperative shares its learning with other initiatives that request it, but it is not open knowledge, we are not enough with systematization, although there is evaluation and replanning" (E14, E15).*

In the public sector, there is a lack of management indicators and monitoring of planning instruments and programs that evaluate the impact of the projects that are financed. *"The indicators in the evaluation reports do not indicate whether there was learning, they only report activities and participation" (E18).* Furthermore, existing evaluation bodies do not involve all parties involved. On the other hand, the continuity of interesting projects is affected by changes in government. *"We have made progress with the Transparency Law in terms of social control, but it still needs to be more sophisticated, so that we can also accustom our local political class to the fact that things have to work like this moving forward" (E9).* Thus, various forms of reflection and feedback are manifested, however, there is consensus that systematization, evaluation, and monitoring are weak. This component is evaluated as medium to weak.

4.9. Working across Human Agency Levels

At the individual, family, neighborhood, and network level, there is work in agri-food sustainability, but it is just at the niche level and associated with knowledge (E2, E3, E4, E18) or high human capital. There are people or families from this niches group who choose to buy local food together, through the Popular Supply Network or through baskets of agroecological and local products at Cooperativa La Manzana, which has a small store open to the public. There are two other options of local agroecological producers that offer baskets with home delivery, and in supermarkets, there are small spaces where you can access organic or local products. The social outbreak caused some initiatives to be consolidated and agri-food awareness to expand. The pandemic also had an impact on urban gardens, increasing work at the individual, family, and neighborhood levels. However, both events also generated an economic crisis that impacted an increase in food prices, which added to the low income of most of the population, and further decreased family access to sustainable products (at least that are produced in their own gardens), which in terms of prices are less competitive than ultra-processed, fast food or imported foods produced in conventional agriculture on a larger scale. *"There is a collective awareness, even in the most humble neighborhoods, of climate change, and that water will be scarce, however, they eat chicken and French fries and choose the cheapest in supermarkets" (E9).* In relation to the management of organic waste, work is seen at the individual, neighborhood and city levels, through cooperatives and private initiatives. The Collaborative Innovation Center brings together agroecological and sustainable actors at the regional level. The Organic Farmers Network has meetings at the territorial and national levels. At a territorial, national, and international level, there is a network of agroecological seed caretakers. *"There is more work than 10 years ago, but very little" (E13).* In short, there are examples of work at the individual, family, neighborhood, network, regional, national, and also international levels, however, in low quantity, which is why this accelerator is evaluated with a medium level of development.

4.10. Working across Political–Administrative Levels and Geographical Scales

There is disarticulation at the political–administrative scale and the geographical scale, both horizontally and vertically. The local administration does not have competences in the agri-food field, although it does have powers in the public purchase of food from the municipality itself and manages some agri-food sustainability projects (see C6). At the regional government level, articulation is generated to create regional policies and also through the Collaborative Innovation Center, integrating the various public and private

actors, however, they are limited works (see C6), and then, each public institution functions independently, they obey to centralist logics that are generated in the national capital. *“The articulation occurs, but it is very limited and punctual, everything is very centralized, at the regional level people have more interaction, but not between institutions”* (E4).

On a vertical scale, there is a new national government program on Transition to Sustainable Agriculture of the Agricultural Development Institute (INDAP), this is articulated at different administrative political scales in the different territories of the country and at a horizontal level with another public institution, the Research Institute Agricultural Companies (INIA), for its execution. This is focused on a total of 1002 farmers out of the 56,000 with whom INDAP works, to whom it provides advice and financial support. Although there is much to do, this program marks a milestone, since both INDAP and INIA, and in general in the government sphere, are institutions that are traditionally characterized by working around conventional agriculture, since the focus of the national agri-food system is intensive production, industrialization and export. Another project at the national level, which was gradually launched 5 years ago and which operates under top-down centralist logic, with work at different scales, is the School Feeding Program, which through the coordination of INDAP and JUNAE (National Board of School Aid and Scholarships) sets percentages (2.5–5%) of local purchases of fruits and vegetables for the concessionaire companies that supply school cafeterias. Finally, there is the first-party or participatory organic certification program of the state’s Agricultural and Livestock Service (SAG), which generates networks of organic farmers at different levels, under unified registration and inspection criteria at the national level. This component was evaluated as weak because the efforts and interactions between institutions on a vertical and horizontal scale related to agri-food sustainability are very specific.

5. Discussion: Barriers, Enablers and Dynamics

5.1. The Role of Sustainable Cooperatives

Energy and agri-food consumption cooperatives have been studied in Valencia, Spain from the perspectives of sociotechnical transitions and strategic management, where these practices constitute niches [49,50]. From the capabilities of transition, we can add that sustainable cooperatives (there are various types of cooperatives in the territory, but not all are sustainable. Some are closer to the industrial model, while others are smaller in scale but neglect environmental impacts or one of the three pillars of sustainability) in this case study address various key transformative components: (1) disruptive initiatives and experimentation, (2) communities of practice, (3) intermediaries and decentralized governance, (4) transformative leadership, also contributing to (5) foresight of urban sustainability and (6) learning and reflection. Although leadership with influence on a larger scale and effective and inclusive governance still need to be developed, the components addressed by sustainable cooperatives are key forms of (collective) agency that mutually reinforce the development of transition capacity.

Sustainable cooperatives are communities of practice (C3) and disruptive initiatives (C6), acting as hybrids between social organization and private enterprise, where economic activity combines profitability and social change [51] and balances social, environmental, and economic aspects. *“To observe the biocentric way of viewing the economy and social relations, questioning the type of business model, which does not align well with the type of sustainable development. . . with the aim of pointing towards an economy of multiple economies, as from Karl Polanyi’s concept of the retributive state economy, the community economy, and obviously utility for the company that could coexist with other economies”* (E11). Education is a requirement for generating individual agency capacity, with training in values, rights, social change, and leadership being critical [19,52]. In the same line of agency capacity, cooperatives conduct self-training schools in social and solidarity economy, extractivism, and sustainability in neighborhoods and grassroots social organizations, service work, and addressing local needs, a characteristic that defines communities of practice. Both the communities of practice in the operational framework of transition capacities and sustainable cooperatives

adhere to the visions of the social and solidarity economies (SSE). SSE is a broad and plural theoretical concept that covers various economic models and approaches based on social goals, socially inspired work organizations, and fundamental shared values such as self-management, resource redistribution, reciprocity, and solidarity practices [53,54]. One of the most mentioned barriers to transition by interviewees (E3, E4, E9, E11, E12, E13) refers to individualism and distrust as a cultural form present in Chile and as a consequence of the promotion of the hegemonic model based on competition. *“In many professional/university careers they are competitive and from the bases, they teach you to compete and not to collaborate”* (E12). *“Because here there is an ingredient that perhaps helps you solve different dilemmas, we live in a state of distrust. The state does not trust the people and the people do not trust the state”* (E9). Sustainable cooperatives play a key role in articulating the community with the institutionality and convening various sectors for events or projects, for example, the agroecological legume project managed by the Responsible Consumption Cooperative La Manzana, which convenes the Austral University, University of Chile, the Association of Organic Producers, the Association of Young Rural Entrepreneurs, Collaborative Innovation Center, local producers, aiming to rescue the local production of local legumes, as an economic alternative for producers, a crop resilient to water scarcity and climate change and in the face of high legume imports in Chile. This role is called intermediaries (C1) in the framework of transition capacities, who move and articulate between different sectors and are fundamental in the processes of network participation and governance. Additionally, they develop spaces for multifaceted decentralized governance (C1), within the same cooperatives with their members, one of them has 120 members among which there are professionals from different sectors, and another of the sustainable cooperatives has spaces for participation and representation at the national level and through the Federation of Cooperatives for “Buen Vivir” (“Buen Vivir” is an ancestral indigenous territorial paradigm that consists of a way of living that is respectful and in balance with the environment, based on community and collective work), which gathers cooperatives with a sustainable vision of the territory. They also perform functions to lead (C2) systemic change for agri-food sustainability, through their role as intermediaries; education in neighborhoods, health centers, and municipal schools as in their own educational centers where they practice agroecology and permaculture; organization of meetings and participatory spaces for organization, foresight, reflection, dissemination, and education around sustainable agri-food; through research projects, communication, ecotechnology, and productive agroecological promotion; agroecological sales space; alternatives for the recycling of organic products, among other disruptive agri-food initiatives (see Table A1 and C6). However, their work is focused on the territorial scale, weak at the moment of political influence and feeding local problems at a larger scale. Sustainable cooperatives promote a very clear message that a sustainable economic model with ethical values of territorial-social responsibility can be generated.

In terms of practical implications, sustainable cooperatives fulfill various roles as change agents and work on at least six transformative capacities out of the ten analyzed within the study framework. Additionally, they are identified as a solution for social innovation, going beyond addressing social needs by proposing improved public–private economic and social structures based on trust and associativity. This contrasts with the barriers and challenges of human and economic competitiveness, individualism, and distrust that have been prioritized and developed based on the current socio-economic model.

In terms of theoretical implication, studies of social and solidarity economies and social movements find direct affinity with studies of sustainability transitions, highlighting the social, economic, and political components of social transformations toward sustainability. They complement each other, generating synergies in knowledge production and understanding of urban sustainability processes.

5.2. Social Movements, Grassroots Innovation, and Agri-Food Transition to Sustainability

According to Sarabia [21], social movements are identified as a foundation for the development of sustainable agri-food transition capacities and are turning points in accelerating transition processes. In the territory of Valdivia, this finding was confirmed as the social movement for the defense of the territory established a basis for the development of transition capacities by creating: awareness of sustainability and new agri-food narratives with a vision of radical change (C5) such as agroecology, food sovereignty, responsible consumption, fair trade, regenerative circular economy; it also promoted the generation of reflexivity spaces (C8), capacities that were reinforced with the subsequent national social movement known as the Social Outbreak. From these social movements, mainly at the territorial level, new communities of practice and disruptive agri-food initiatives with a sustainable vision (C3, C6) are also developed, creating niches. However, the community and citizen objective that convenes the territorial environmental movement is the protection of urban wetlands threatened by the activity of the forestry industry, with the development of the mentioned agri-food transition capacities being part of an emergency and co-evolution process [4,55] interconnected by sustainability as an umbrella. This is part of the combined effect of spiraling forces that reinforce themselves in transitions, as mentioned by Rotmans [56]. The environmental social movement also had synergy with the regionalist movement, which achieved its goal of forming the New Region of Los Ríos and politically and administratively placed Valdivia as its capital city. This event brought a window of opportunity for the sustainability vision to flow from social movements into the new regional development policy. The objective of protecting urban wetlands, being supported by a civic movement and a network of actors with specialized intermediaries, developed more transition capacities related to the integration and coupling of the vision into policies, through a governance space around wetlands (C1) and regulatory frameworks such as the Wetlands Law and a Municipal Ordinance around wetlands (C7). These advances are related to the perseverance and agency capacity of the network of actors involved in the environmental social movement, with the role of intermediaries (C1) recognized in the transition capacity framework, who articulate between different sectors (private, public, academic, social), different action domains and scales. Intermediaries are also part of the transformative leadership (C2) effectively creating a shared discourse around the protection of wetlands and the environment, performed by NGOs, which have specialization in environmental issues and citizen participation, along with an organizational structure with a stable financial base to fulfill this function. NGOs worked together with the wetland community, and 63 local social organizations organized, generating transformative leadership (C2) and a process of social innovation or grassroots innovation [55,57].

In Table 5, key historical territorial events that directly influence the collective territorial sustainability vision, the development of agri-food narratives and initiatives, along with the process of coupling the environmental and sustainable vision into policies and legal frameworks, are summarized.

From the theory of social movements, Merti i Puig [58] describes that with tools of public policy, the political impact of social movements was classified into four areas, which we see materialized in the Valdivia case study and which we can match to some transition capacities: (1) the “symbolic”, with changes in value systems, opinions, social and individual attitudes and behaviors, and the formation of new collective identities. This can be equated to transition capacities of communities of practice (C3) and vision of radical changes (C5); (2) the “interactive”, with the ability to bring forth new political actors or generate changes in the structure of political representation and in the systems of alliances. This area can be equated to intermediaries, participation networks (C1), and leadership (C2); (3) the “institutional”, with the enabling of new administrative procedures and the creation of new stable negotiation spaces and mechanisms with authorities, which can be equated to the component of effective multifaceted governance (C1); and (4) the “substantive”, pushing the change in certain ongoing government policies obtaining individual, civil, and social rights, and ultimately creating new opportunities for mobilization, an area that we could

equate with the component of coupling innovation to policies (C7). Some researchers with different focuses have expressed theoretical links between social movements and sustainability transition studies [59,60]. Social movements are considered in transition studies as part of social innovation [21,55,57,61–64]. It is necessary to connect social movements and their emancipatory objective to shape new norms and rules and establish new institutional paths [63]. This aspect is key when evaluating the transition capacities of the agri-food system of Valdivia and comparing them with the progress of transformative capacities in the protection of wetlands. The capacities of effective governance (C1) and coupling of innovation to policies (C7) make a difference. The advancement and deployment of these capacities C1 and C7 can also be observed in the study of Sarabia [21] in which the defense of the territory of social movements was associated with the Mediterranean orchard and therefore governance and legal frameworks are associated with the agri-food system. In terms of practical implications for agri-food transitions, the support of a civic movement and the availability of specialized intermediaries with structural and financial bases within the network of actors, enable the development of governance capacities and alignment with new transformative political frameworks.

Table 5. Historical events and socio-political processes of sustainable vision in Valdivia.

Events	Valdivia Transition Process
Territory Defense Conflict	Defense of the river and wetlands against pollution from a multinational forestry company. Collective awareness for the environment and sustainability.
Territorial Social Movement	“Action for the Swans” movement, creation of networks among various actors, empowered social organizations. Emergence of narratives around sustainable food.
“Regionalists” Movement	Synergy between movements and achieved the long-awaited appointment of the New Region, opening a window of opportunity to incorporate the sustainable vision into new regional policy.
National Social Movement	Favors change in local government. Generates critical reflection on the system and social change. Reinforces and gives rise to disruptive territorial agri-food initiatives.
Emergence of Legal Frameworks	Urban Wetlands Protection Law. A legal initiative that arises from grassroots, bottom-up.
Changes from conservative to progressive local governments	New local government in favor of sustainability narratives. Window of opportunity for capacities to flow with the sustainable vision.
International Convention, framework for sustainable governance actions	Ramsar Site since 1981. Provides notions of governance, for the conservation and sustainable use of wetlands.
New local policies around the vision	Municipal ordinance that favors the application of the Wetlands Law and the establishment of a local governance process around wetlands.
Management to enhance the value of protected areas with international recognition	Nomination of Valdivia as a Wetland City (in application).

5.3. Global Macro Policies and Local Policy as a Window of Opportunity

Transition studies also refer to the multi-level perspective in which a transition occurs at different levels, influencing each other. In addition to the regime (meso-level) and niches (micro-level), it considers the landscape, which relates to material and immaterial elements at the macro level, where the global influence of macro policies on socio-technical regimes is found. Brysk [65] in his study of the success of indigenous social movements in Latin America describes the relationship with international actors who defended these issues globally as key, as well as an important relationship between self-determination, territorial identity, and indigenous cultural survival. In exploring the case of Valdivia, we can also observe this relationship with international actors in the environmental field, in addition to territorial identity and self-determination. Valdivia's signing of the international Ramsar Convention, which provides notions of governance for the conservation and sustainable use of wetlands, was important in the process of fighting for territorial defense. However, 30 years after signing the Ramsar Convention, with the change in local government, a window of opportunity opened to support the wetland governance process proposed by the international agreement. Another political management of enhancing the value of protected areas with international recognition is through the recent nomination of Valdivia as a wetland city to the Ramsar Convention. This has also been noted by Sarabia [21], where macro policies have influenced the development of transition capacities in agri-food, as long as there is a base of agri-food social movements sensitive to the issues and a political window of opportunity that allows adherence to sustainable food macro policies and to carry out the governance process proposed by the international agreement. In the agri-food system of Valdivia, this formal international association with the local government is not observed, nor is there an agri-food social movement with civic participation that has emotionally and communicatively involved the citizenry, as in the case of wetland defense. Regarding the agri-food policies of Valdivia, these show significant centralization (top-down) in decision-making. *"Because when I talk about the centralist state, I don't only mean the governing state, but also that we have a centralist chip here (shows head) we come formatted, from childhood we are taught to be centralists, to look at Santiago (the country's capital)"* (E9). This hinders political influence from the grassroots. Additionally, there are no incentives for the coordinated work of public institutions that work in different aspects of the agri-food sector, so instances of joint work are occasional, without continuity, and are at the expense of the particular goals of each institution and contingency. Although the pro-environmental movement is closely linked to the vision of sustainable food in Valdivia, this relationship between environmental sustainability and the agri-food system is scarcely recognized in the collective vision, coinciding with the low coupling of these agri-food sustainability narratives to local policies.

In terms of practical implications, the alignment of sustainable macro policies with local government supports territorial sustainability transition processes. However, this is enabled by a committed local government that is in tune with an empowered social movement.

5.4. Systemic Thinking. What Does the Environment and the Conservation of Wetlands Have to Do with the Agri-Food System?

Wetlands provide ecosystem services such as drinking and irrigation water to nearby agricultural communities, and the gathering of medicinal plants, and they offer potential use for rice production, which is not exploited in Valdivia. Other highlighted ecosystem services include landscape beauty, biodiversity of flora and fauna, recreational services, their capacity to absorb high precipitation, which is key in preventing flooding in urban areas, and their carbon capture services that mitigate climate change. Adjacent to the wetlands are farming communities that, when applying agrochemicals to the soil, are carried by rain through leaching to rivers and wetlands, impacting the development and balance of the flora and fauna of the wetland ecosystem and the water basin. *"When conventional agricultural systems are made with a series of agrochemical inputs, they have a*

negative impact not only on the territory where they are applied but also on adjacent territories and associated with downstream water basins. . . we have to understand that conservation islands are not enough” (E6). The agri-food system interacts directly with the Valdivian forest and its water sources; these natural systems have been intervened by deforestation not only for exotic monoculture forest plantations but also to generate pastures for livestock and for the implementation of agricultural systems at different scales and with different types of soil treatment. “This boundary between natural vegetation and the productive realm is not a line like with a wall, but rather a gradient that allows flows, processes. . . the idea is that it is a conservation area where production is carried out” (E6).

Ericksen [66] highlighted the importance of analyzing the interactions of the food system with global environmental change and evaluating the main social outcomes in food security. However, following this study, there is an important development of systemic thinking and the inclusion of the environment in sustainable agri-food systems [67,68] developing the definition of the agri-food system as a complex socio-ecological system [1–3,69]. The agri-food system is responsible for one-third of greenhouse gases in global warming [11]. Climate change, in turn, causes major impacts on the agri-food system, exacerbating droughts, and floods, and decreasing biodiversity, among other ecosystem imbalances, which directly impact food production and natural ecological systems, with the environment, climate, and food system being intimately related. Moreover, it is important to remember that the agri-food system consumes 70% of the world’s freshwater resources in Chile [70]. From agroecology and the indigenous worldview, this intimate relationship between agriculture and ecology respecting biodiversity and the balance between the environment and food system was already observed, manifesting this interaction at different ecosystemic levels that also include human social relations and organizations (politics) as part of an integral system. *“Talking about food is talking about territory, landscape, culture, environment, education, it’s talking about gender, social justice, climate change. . . it’s a network of actors and activities. . . the agri-food system is one of the greatest forces of change” [71].*

In terms of practical implications, developing a systemic vision of the agri-food system is key in Valdivia. Policies are sectoral to agriculture and the close relationship between climate, environment, and agri-food is not integrated into the collective environmental consciousness. This is a barrier to the necessary civic support to drive the coevolution of new capacities in the agri-food system.

6. Conclusions

The transformative capacities framework used in the study allows for the multiscalar and systemic vision required by the agri-food system, highlighting in the case of Valdivia that this systemic and socio-ecological perspective of agri-food is underdeveloped. This is crucial for the effective governance and coevolution of capacity flows from the territorial environmentalist social movement.

Sustainable cooperatives in Valdivia fulfill various roles as change agents and work on at least six of the ten transformative capacities analyzed within the study framework. Additionally, they are identified as a social innovation solution, going beyond addressing social needs and presenting themselves as another economically disruptive initiative. They improve public–private social structures based on trust and associativity that counteract competitiveness, individualism, and distrust, which are barriers to developing transformative capacities as consequences of the hegemonic economic and cultural model.

The alignment of the local government with sustainable macro policies supports the processes of territorial sustainability transition. However, this is enabled by a committed local government in tune with an empowered social movement.

Theoretically, studies of social and solidarity economies and social movements correlate with studies of sustainability transitions, highlighting the social, economic, and political components of transformations towards sustainability. They complement and generate synergies in the knowledge of transformative capacities. Compared to other previous studies using Wolfram’s framework, according to Castán-Broto [29], capacities associated

with socio-ecological systems are particularly weak. We see that Valdivia, through its wetlands, and Valencia, through its agri-food system [21], differ from this generality, with ongoing formal governance systems and associated legal frameworks. However, there is a consensus that most capacities are in an incipient development stage. In the case of Bongstrom [72] in Sweden, we find common results with the agri-food case in Valdivia, highlighting that disruptive initiatives have limited potential due to poor governance articulation and multi-level connections. From the experience in Valencia protecting the huerta [21] and Valdivia protecting the wetlands, it is highlighted that the support of an empowered civic movement with the issues and solutions, along with a network of actors including specialized intermediaries with a structural and financial base, allows for the development of effective governance capacities and the alignment with new political frameworks, involving work at different scales.

Concerning the limitations of the study, it is necessary to mention that although the capacities framework used provides a snapshot of the moment, we approached the case study with a historical perspective that allowed us to integrate time into the capacity development processes of the territory. Additionally, we did not address relevant topics of the agri-food system such as the right to healthy and sustainable food, gender focus, or issues of nutrition, health, and non-human agency [73]. However, some of these topics are directly or tangentially addressed through the work of local disruptive initiatives. On the other hand, we conducted an observation and analysis of existing transformative capacities. As a recommendation for future studies, the framework could be used as an action-research framework to study transformative capacities by working on them intentionally in practice.

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Appendix A

Table A1. Disruptive agri-food initiatives of the city region of Valdivia.

n	Agri-Food Disruptive Initiatives	Sector	Key Informants	Area
1	Huerteras	Private company	E3, E8	Urban agroecological gardens
2	Cisne Negro	Social and cultural organization	E3, E8	Agroecology and food sovereignty
3	Gata Gorda	Private company	E8	Sustainable food
4	Carnes Manada	Private company	E2, E5, E17, E18	Regenerative livestock farming
5	Ayelén	Private company	E2, E18	Healthy eating (not exclusively organic)
6	Liquén Austral	Private company	E4, E12, E13, E14, E17, E18	Organic bioinputs
7	Centro de Innovación Colaborativa CIC	Public administration	E7, E12, E14, E17, E18	Sustainable governance

Table A1. Cont.

n	Agri-Food Disruptive Initiatives	Sector	Key Informants	Area
8	Mercado Campesino -Terminal de Buses	Public administration	E2, E3, E8, E16	Agroecological market
9	Escuela Agroecológica de Paillaco	Public administration	E8, E16, E13	Agroecological education
10	Cooperativa de Consumo Responsable La Manzana	Social organization-private	E1, E3, E4, E5, E6, E7, E9, E10, E11, E12, E13, E14, E15, E16, E17, E18	Agroecological basket and sustainable education
11	Asociación Gremial de Agricultores Orgánicos Los Ríos	Social organization	E7, E8, E18, E10, E13	Organic producers guild
12	Cooperativa Valdivia sin Basura	Social organization	E3, E7, E8, E12, E17, E18	Sustainable waste management, community gardens
13	Cooperativa de Aprendizaje Restauración Ecológica y Permacultura CAREP	Social organization-private	E7, E8, E9, E11, E13	Ecotechnology and sustainable education
14	Cooperativa de Trabajo Semilla Austral	Social organization—private	E3, E6, E7, E8, E10, E11, E12, E16	Seeds and agroecological education
15	Cooperativa Calahuala	Social organization—private	E8, E12	Education and sustainable estate planning
16	Red de Abastecimiento Popular	Social organization	E3, E7, E11, E12, E13, E15, E16	Food sovereignty
17	Huerto los Chilcos	Private company	E4, E6, E13	Agroecology and biointensive production
18	Huevos co-có	Private company	E6	Regenerative egg production
19	Ecogranel	Company	E5, E8	Sustainable bulk sales
20	Quitralco	Company	E6	Regenerative livestock farming
21	Cerro Azul	Company	E6	Regenerative livestock farming
22	Red de Huertas Mapuches	Social organization	E13	Agroecological production and food sovereignty
23	CEAM—UACH	Academia	E13	Sustainable education
24	Semillas Sara Gueregat de Semillas Máfil	Private company	Taller de intercambio VLD-VLC	Education and sustainable production
25	El Jardín de la Oli	Company	Taller de intercambio VLD-VLC	Education and sustainable production
26	Cocinamar—pesca en línea—pesca sustentable	Company and social organization	E6, E8	sustainable fishing
27	Ferias de las Otras Economías—Encuentro Consumo Responsable	Social organization	E8, E11, E13	Agroecology and social and solidarity economy education
28	Festival Fungifest (Amanita)	Social organization	E8	Sustainable education
29	Feria del Trueque	Social organization	E8, E9	Sustainable education
30	Festival de las Plantas	Social organization	E8	Sustainable education
31	Flor de Suelo	Company	r.r.s.s	Organic bioinputs
32	Circula Sustentable	Company	E8	Sustainable waste management
33	Slow Food Paillaco-Los Ríos	Social organization	E10	Sustainable education
34	Cooperativa de Productores Agroecológicos de Paillaco	Social organization and company	E16	Agroecological production
35	GrünKompost	Company	E4, E7	Sustainable waste management

Table A1. Cont.

n	Agri-Food Disruptive Initiatives	Sector	Key Informants	Area
36	Paimuru	Social organization	E7, E8	Agroecology and food sovereignty
37	Acomuri	Social organization	E5	Food and tourism
38	Valvox	Company	E6	Organic bioinputs
39	Agricultores, mujeres, mapuches agroecológicos de Paillaco	Social organization	E7, E10	Agroecology
40	Cletacompostera	Company	E7	Organic waste management
41	Bioxiplas	Company	E7	Sustainable materials and garments
42	Huerta Herbolaria	Social organization, NGO	r.r.s.s	Sustainable education and agroecological community gardens
43	Plangen	Company	E12, E17	Nursery and organic basket
44	Conare	Company	E3	Recycling plant
45	Asociación Gremial de Jóvenes Rurales de Los Ríos	Social organization	E8	Agro-ecological production (non-exclusive)
46	Ecomercado	Public administration	r.r.s.s	Agri-food waste and the right to food
47	Feria Costumbrista Punucapa	Social organization and private	E8	Local and sustainable gastronomy and tourism
48	Mercado campesino—Teja Market	Social organization and private	E3, E8, E16	Local and agroecological products
49	AVA Los Ríos	Public administration	E2, E5, E18	Value-added foods (not exclusively sustainable)
50	Tienda Mundo Rural	Public administration	E1, E8, E16	Store of local and rural products (not exclusively sustainable)
51	Centro Humedales Río Cruces	Public administration	E9, E12	Education Sustainable.
52	Comunidad Humedal	Social organization	E8, E9	Participation, social innovation, and sustainability
53	Compras públicas JUNAEB comedor escolar	Public administration	E16	15% local purchases for school canteens (non-organic only)
54	Cooperativa de turismo mapuche en la zona de Panguipulli	Social organization	E18	Local and sustainable tourism (local gastronomy)
55	Comunidad Lafkenche	Social organization	E18	Traditional and sustainable fishing and shellfish gathering
56	La Huella	Company	E7	Restaurant of local products
57	Curso de Agricultura Sustentable UACH	Academia	E4, E13	Subject within the professional training at UACH
58	GESOP (Gestión Social Organizacional para Producción)	Public administration	E17	Organizational management program (not exclusively sustainable)
59	Huerto Las Juntas	Company	r.r.s.s	Agroecological and biointensive production
60	Lácteos Manquelaif	Company	r.r.s.s	Regenerative production

Table A1. Cont.

n	Agri-Food Disruptive Initiatives	Sector	Key Informants	Area
60	Lácteos Manquelaif	Company	r.r.s.s	Regenerative production
61	Cooperativa Mapuche Mely Lawen	Social organization and company	r.r.s.s	Sustainable and regenerative gastronomy and tourism
62	ONG Suelo Fértil	Social organization	r.r.s.s	Education in agroecology and organic waste
63	Cultiva Funaltun	Social organization	r.r.s.s	Experimental garden of UACH campus
64	Cooperativa de Trabajo Conciencia y Desarrollo CoyDe	Social organization	E11	Education for sustainability
65	Alvatros Consultores	Private	r.r.s.s	Farm consultancy agro-ecological transition
66	Huerto Comunitario Collico	Social organization	E11	Agroecological and food sovereignty

Table A2. List of interviewees. (All the interviewees have explicitly provided their approval to collect the information for the research).

	Affiliation	Sector
E1	Universidad Austral de Chile	Academia
E2	Universidad Austral de Chile	Academia
E3	Universidad Austral de Chile	Academia
E4	Universidad Austral de Chile	Academia
E5	Ayelén	Private company
E6	Carnes Manada	Private company
E7	Liquen Austral	Private company
E8	Cooperativa de Consumo Responsable La Manzana	Private company and social organization
E9	Organización Asociación Comunidad Humedal	Social organization
E10	Asociación Gremial Orgánicos Los Ríos	Social organization
E11	Cooperativa de Reciclaje Valdivia sin basura	Private company and social organization
E12	Cooperativa de Aprendizaje Restauración Ecológica y Permacultura CAREP	Private company and social organization
E13	Cooperativa Semilla Austral	Private company and social organization
E14	Cooperativa Calahuala	Private company and social organization
E15	Cooperativa de Consumo Responsable La Manzana	Private company and social organization
E16	Ilustre Municipalidad de Valdivia	Public administration
E17	Instituto de Investigaciones Agropecuarias	Public administration
E18	Gobierno Regional de Los Ríos	Public administration

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