



(Un)intended lock-in: Chile's organic agriculture law and the possibility of transformation towards more sustainable food systems

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Abstract

Food systems transformations require coherent policies and improved understandings of the drivers and institutional dynamics that shape (un)sustainable food systems outcomes. In this paper, we introduce the Chilean National Organic Agriculture Law as a case of a policy process seeking to institutionalize a recognized pathway towards more sustainable food systems. Drawing from institutional theory we make visible multiple, and at times competing, logics (i.e., values, assumptions and practices) of different actors implicated in organic agriculture in Chile. More specifically, our findings identify five main institutional transformative logics underpinning the interests and actions of organic actors. However, we find that the Law was not motivated by these logics and did not advance them. Rather, the Law was designed to support a market niche targeted to elite consumers and to reinforce agricultural exports. As a result, the Law constrains rather than enables the practice of organic agriculture and access to organic food by consumers, especially at the domestic level. We note that attention to institutional logics in the analysis of food systems, and specifically food system transformation, is relevant to more comprehensive assessments of the transformational potential of food systems policies. We conclude that there is a need to further consider and make visible the way in which different drivers (i.e., laws) are constituted through and by diverse, and often competing, institutional logics.

Keywords Food systems transformation · Public policy · Food systems drivers · Institutional logics · Organic agriculture · Conventionalization

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Abbreviations

CAEL	Centro Agroecológico Longaví (Agroecological Center Longaví)
CET-BioBio	Centro de Educación y Tecnología (Center of Education and Technology)
CNAO	Comisión Nacional de Agricultura Orgánica (National Commission of Organic Agriculture)
INIA	Instituto de Investigación Agropecuaria (Institute for Agricultural and Livestock Research)
INDAP	Instituto de Desarrollo Agropecuario (Institute for Agricultural and Livestock Development)
OAEs	Organizaciones de Agricultores Ecológicos (Ecological Farmers Organizations)
ODEPA	Oficina de Estudios y Políticas Agrarias (Office of Studies and Agrarian Policies)
PGS	Participatory Guarantee Systems
PRODESAL	Programa de Desarrollo de Acción Local (Program for Local Action Development)

SOCLA-Chile	Sociedad Científica Latinoamericana de Agroecología-Chile (Latin American Scientific Society for Agroecology)
SAG	Servicio Agrícola y Ganadero (Agriculture and Livestock Service)

Introduction

There is a global consensus around the need for sustainable food system transformations (HLPE 2020; Webb et al. 2020). Food system transformations imply a change of mental modes, social practices, and the development of new values, alongside a destabilization of the assumptions, models, methods, and practices of current mainstream food systems (Duncan et al. 2022). *Sustainable food system transformations* are marked by a normative component based on sustainability values (Béné 2022). Such sustainable transformations demand coherent policies and legal frameworks. However, the literature on food systems suggests many policies and laws targeting sustainable food systems come to undermine their transformative potential (Béné et al. 2019a; Baker et al. 2021; Slater et al. 2022), for example, through competing proposals for transformation pathways (Lajoie-O'Malley et al. 2020; Zurek et al. 2021). Organic agriculture has been put forward as one pathway for balancing multiple sustainable development goals (Reganold and Wachter 2016; Eyhorn et al. 2019) with proven environmental (Céspedes-Leon et al. 2017; Seufert and Ramankutty 2017) and social benefits (MacRae et al. 2007; Prihtanti et al. 2014).

Because 'policy matters', we need 'to take seriously the sort of politics and policies required to enable organic agriculture to be what is imagined' (Guthman 2005, p. 313; Tomlinson 2008) and advance our understanding of whether existing public policies favour sustainable transformations, or whether they act as disincentives (Arcuri 2015; Bendjebbar and Fouilleux 2022). Towards this end, this paper responds to calls to unpack and further understand the underlying forces, trends and processes that drive food system change to formulate more effective sustainable food system policy (Fanzo et al. 2020; HLPE 2020; Duncan et al. 2022). We do this by examining the diverse logics relating to the Organic Agriculture Law of Chile to understand what these logics are, how these logics relate to institutional logics underpinning the motivations of different organic agriculture field actors and how the difference between the two relate to the effects of the Law in terms of hindering or supporting sustainable food systems transformation.

Here it is important to note that organic agriculture is not a monolithic category: it includes a range of practices from multifunctional, small-scale, biodiverse farms to globally standardised and business-oriented industries targeting export with reliance on input substitution-based methods

(Darnhofer et al. 2010; Migliorini and Wezel 2017; Poméon et al. 2018; Niederle et al. 2020). In this paper, we define organic agriculture as a farming approach based on processes that preserve biodiversity and sustainably use natural resources, such as: appropriate soil tillage and conservation techniques; crop rotation with leguminous; intercropping and functional biodiversity, for example, for pest management (Migliorini and Wezel 2017; Eyhorn et al. 2019). Furthermore, we understand organic agriculture to be based on food values of health, ecology, fairness and care (De Wit and Verhoog 2007), for instance, striving for fairness in producer–consumer relationships (Darnhofer et al. 2019). Despite relevant critiques and concerns, organic agriculture has been developed as an alternative form of food production with ambitions to change mainstream food systems (Tovey 1997; Michelsen 2001a; Niederle et al. 2020).

Starting in the early nineties, organic agriculture began to receive policy support at the national and global level (Michelsen 2001b; Demiryürek et al. 2008; Dabbert et al. 2014; Nikol and Jansen 2021). This can be considered a significant contribution towards advancing a transition pathway given that policy has been identified as a critical driver for steering sustainable food systems (iPES Food 2015; Candel and Pereira 2017; HLPE 2020). For instance, Denmark and Brazil have been cited as positive examples of successful organic public policies (Lynggaard 2001; UNCTAD 2008; Lamine et al. 2021), partly for contributing to expanding organic food consumption through market development instruments (UNCTAD 2008).

Nevertheless, organic policies can have adverse impacts that undermine organic agriculture's transformative potential by restricting its transformative values and political aspects (Tovey 1997; Kaltoft 2001; Guthman 2005; Tomlinson 2008; Arcuri 2015; Bendjebbar and Fouilleux 2022).

Across diverse contexts, studies have shown how organic public policies have reflected a move away from movements' politics towards a focus on commercial values (Haedicke 2016; Fouilleux and Loconto 2017; Lehtimäki and Virtanen 2020; Nikol and Jansen 2021). Previous studies from the Global South and North have shown that a main motivation for governments to support organic policies has been the development of export organic agriculture as means of economic growth (Campbell and Liepins 2001; Demiryürek et al. 2008; Gao et al. 2017; Darnhofer et al. 2019; Nikol and Jansen 2021). Consequently, many national and international organic policy debates have been reduced to the institutionalization and harmonization of national certification systems. One consequence of this has been a shift away from addressing issues such as securing the livelihoods of resource-poor farmers and domestic food security (Haedicke 2016; Fouilleux and Loconto 2017; Bendjebbar and Fouilleux 2022). Further, farmers who do opt for organic production face the high costs and bureaucratic requirements associated with

certification (Veldstra et al. 2014). This leads organic farmers to rely on premium prices (Klonsky and Greene 2005). As a result, the dominant way that organic agriculture has been enacted in policy (Constance et al. 2008; Tomlinson 2008) risks that organic agriculture becomes a niche-market with premium prices, available by choice to predominantly middle-upper class consumers (Adasme-Berríos et al. 2015; FIA 2017; Nikol and Jansen 2021).

In this paper, we interrogate these politics and tensions through an analysis of the Chilean National System for the Certification of Organic Agricultural Products (from now on, *The Law*¹). We have selected the case because, first, as noted above, organic agriculture has been acknowledged as a promising transformative pathway (Eyhorn et al. 2019), but it is not without critique. Second, the case provides an example of a public policy process to institutionalize organic agricultural at the national level as a potentially transformative food system pathway (Lehtimäki and Virtanen 2020; Bendjebbar and Fouilleux 2022). This has been little studied in the context of Latin America. Furthermore, while there is research about organic agriculture in Chile (Millaleo et al. 2006; Céspedes-Leon et al. 2017), this has not received much attention from the social sciences (Cid-Aguayo 2011) and food system transformation perspectives. Third, Chile has been identified as a predominantly export-orientated organic agriculture country (Hruschka et al. 2021). Thus, the case provides insights about current trends in the rapidly internationalizing organic global policy debate (Schwindenhammer 2017) and the impact of policy on the capacity of organic agriculture to advance food system transformation, particularly in the context of countries from the Global South.

To support our analysis we use concepts of 'organizational fields' and 'institutional logics' from institutional theory. Institutional theory has been widely used to examine how processes of institutionalization unfold, analyzing the (de)institutionalization of mainstream economic and social dynamics and the power of transformative institutions; including within organic agriculture policy-making processes at the global level (Fouilleux and Loconto 2017; Schwindenhammer 2017) and national contexts (Michelsen 2001b; Legun 2011; Lehtimäki and Virtanen 2020; Bendjebbar and Fouilleux 2022). Some previous studies on organic agriculture have used 'organizational fields' to examine

the actions and interactions of different actors in either the reproduction or transformation of institutional arrangements (Lynggaard 2001; Michelsen 2001b; Haedicke 2016; Schwindenhammer 2017).

The concept of 'institutional logics' allows us to examine different actors' positions within organizational fields (Reay and Hinings 2009; Osei-Amponsah et al. 2018) in relation to multiple understandings of the purpose of organic agriculture (Haedicke 2016). We opt for an institutional logics approach to more finely grasp actors' values and actions, and their implications for sustainable food systems, though we acknowledge other approaches (e.g., political economy, discourse analysis) could have also been useful to examine the underlying politics in the formal institutionalization of a sustainable food system pathway (iPES Food 2015; Clapp et al. 2018; Béné et al. 2019b; Maughan et al. 2020; Béné 2022).

In the next section, we explain our theoretical framework. Thereafter, we explain our data gathering and analysis methods. We then present our findings, and we discuss these findings in relation to other studies. Finally, we provide our conclusions. Our analysis of the implementation of the organic Law in Chile highlights the need to further consider and make visible the way in which different drivers (i.e., laws) are constituted through and by diverse and often competing institutional logics. We argue that attention to institutional logics in the analysis of food systems and specifically food system transformation is key to more comprehensive assessments in the transformational potential of food.

Theoretical framework

In this paper we apply institutional theory concepts of 'organizational fields' and 'institutional logics' to analyze the implications of the Chilean Organic Agriculture Law for sustainable food systems. Here, we explain these concepts and how they were applied.

Organizational fields and institutional logics

Institutional theory is concerned with advancing knowledge about the stability (i.e., reproduction) and change (i.e., disruption) of institutions (Barley and Tolbert 1997). By institutions, we understand all of the 'rules of the game' that structure (e.g., enable, constrain) human interaction and activity (North 1990, p. 3). Institutions can be formal or informal, overt or implicit (Darnhofer 2015). Informal institutions are cultural and social norms (e.g., value systems). Formal institutions are explicit rules (e.g., constitutions, laws, property rights) designed and enforced, for instance, by governments (Conti et al. 2021). In this work, we focus on a formal institution.

¹ We use the term 'The Law' as is the common name used by people in Chile to refer to the country's 'National System for the Certification of Organic Agricultural Products'. This System is constituted by three interrelated components: (i) The Law N° 20.089, which describes the System's scope of action, procedures and sanctions; (ii) Supreme Decree N°2 about technical norms regulating organic food production and manufacture; (iii) Supreme Decree N°3 about technical norms that regulate the System's functioning.

We understand organizational fields as ‘those organizations that in the aggregate, constitute a recognized area of institutional life: key suppliers, resource and product consumers, regulatory agencies, and other organizations that produce similar services or products’ (DiMaggio and Powell 1983). The classical organizational field approach assumes that field-level dynamics lead to similar structures as field actors pursue ‘a common meaning system’ (DiMaggio and Powell 1983). Recent studies have demonstrated that organizational fields do not only emerge around organizations with similar orientations but usually around agents with competing interests and values (Schwindenhammer 2017).

‘Institutional logics’ (in short, logics) help us to capture the multiple visions, interests, normative understandings and practices within an organizational field (Haedicke 2016). Here we follow earlier definitions of ‘institutional logics’ as the ‘socially constructed, historical [observable] patterns of cultural symbols and material practices, assumptions, values and rules by which individuals produce and reproduce their material subsistence, organize time and space, and provide meaning to their daily activity and social reality’ (Thornton et al. 2012). In other words, logics are ‘frames of reference’ that guide actors’ practices; for instance, helping them to give their actions comprehensible and legitimate meanings, make sense of their world, construct their actions and identities, steer attention towards specific problems and solutions, define goals, set the rules of the game, allocate power and status. Logics are simultaneously embodied through both symbolic representations (e.g., language) and concretely experienced through material practices (Thornton et al. 2012). Institutional logics differ from other approaches (e.g., discourse analysis, policy framing) in that it also allows to examine actors’ practices in consideration of food systems transformations.

The ‘institutional logics’ approach promotes the idea of ‘embedded agency’: institutions and institutional logics both shape and are shaped by individuals and organizations (Thornton et al. 2012; Osei-Amponsah et al. 2018). Logics shape and influence (e.g., enable, constrain) the cognition (e.g., belief systems) and behavior (e.g., practices) of individuals and organizations (Thornton et al. 2012). However, they are not simply passively adopted: actors draw from, construct and enact logics according to their values, needs or goals (Haedicke 2016). Actors also have the capacity to (re)shape and resist prevailing institutional logics, and introduce alternate logics through new practices (Hayes and Rajão 2011). Hence, logics are not static or deterministic within organizational fields; they are instantiated, enacted, (re)shaped, and challenged by actors in organizational fields (Thornton et al. 2012; Berg Johansen and Boch Waldorff 2015).

Organizational fields can thus also be understood as the practical space where different actors display and play-out

their respective logics. In organizational fields multiple logics often co-exist. The relations between different actors’ logics can be complementary, contradictory, competitive, conflicting and/or resistant. Contradictory or competing logics can make organizational fields arenas of political struggle (Hayes and Rajão 2011). For example, institutional logics has been applied in previous food system studies as an heuristic to show actors’ negotiations about local food systems’ meaning and structure (Mars and Schau 2017), or how value-based conflicts about food safety consumption affects non-compliance practices of formal food safety rule (Mercado et al. 2018). Within sustainability transition studies, institutional logics has proven a valuable approach to study the confrontation between actors seeking and resisting change (Smink et al. 2015).

Application of the analytical concepts

We consider the Chilean mainstream food system as highly institutionalized—both formally and informally—and the Chilean Organic Agriculture Law as a process of formally institutionalizing a potentially transformative food system pathway in public policy. We see the organic sector as an organizational field as it is composed of varied organizational field actors (e.g., suppliers, consumers, regulatory agencies) with its own recognizable institutions—to which all field actors are subject whether they agree or not with them.

Previous organic agriculture studies have applied institutional logics as a fine-grained approach for mapping and examining the relations between different actor’s understandings and practices within the organic field (Haedicke 2016). Other food studies have applied it as a framework to structure and compare different actor’s food safety logics and their implications for food safety regulation (Mercado et al. 2018). We apply institutional logics as an heuristic to identify and characterize the values, assumptions, and practices informing an interest in organic production by Chilean field actors. We then look at the logics embedded in, and advanced by, the Law. We compare the logics of field actors and the Law to analyze what interests and values were advanced by institutionalization, and what logics within the organic field are not captured by the Law. We reflect on these dynamics to consider how this form of institutionalization shapes the possibility of food system transformation.

Methods

Case study context

Since the mid 1970’s, Chilean agricultural policies have focused on configuring a food export industry as a means

of economic development (Sarabia and Peris 2021). Small-scale farmers policies have been oriented towards 'reconverting' traditional agriculture into productive farms based on green revolution practices (Cid 2014; Martínez et al. 2017) and integrating farmers into export or domestic industrial value chains (Kay 2002; Cid and Latta 2015). Today, Chile's mainstream horticultural food system presents a dual structure (Ríos and Torres 2014)—with combinations therein (Echeverría et al. 2012; Berdegué and López 2017)—among a fruit export and vegetable domestic sectors. The latter is mainly represented by smallholders. In Chile, exports exceed imports by far (Jensen 2021). The supply from small-scale farmers compensates for the lack of exportable products at the domestic level (Boza et al. 2019), where wholesalers and supermarkets commercialize almost 100% of total volume, and are the dominant players in value chains where farmers have weak bargaining power (Boitano 2011; Gaitán-Cremaschi et al. 2020).

Chilean agricultural policies have been widely recognized as successful (Murray 1999; Melo et al. 2021) partly for positioning the country as a world class fruit supplier (EU and CONICYT 2007) and consolidating a relevant sector for the country's economy (ODEPA 2019a). However, this success has been challenged due to Chile's mainstream food systems intensive use of natural resources (Melo et al. 2021) and exiguous interest in sustainability (Muñoz-Saez and Renwick 2022). Impacts include biodiversity loss due to extensive monocropping (Torres et al. 2015) and food safety problems associated to pesticides use in horticultural production (Corral et al. 2017; Zúñiga-Venegas et al. 2021; Coria and Elgueta 2022).

Interest in organic agriculture and its organization has grown with the expansion of intensive farming. In the eighties, NGOs promoted organic agriculture through rural development programs (UNCTAD 2008). In the nineties, the first organization of small-medium scale organic domestic farmers emerged (Tierra Viva, 1992—until today) and exports by larger organic farmers or companies started (UNCTAD 2008; Cid-Aguayo 2011). Since 2005, a National Commission for Organic Agriculture (*Comisión Nacional de Agricultura Orgánica*—CNAO) has been operating, with participation from different agencies of the Ministry of Agriculture and private sector actors, for the latter to articulate their needs to public for support in organic agriculture (Hruschka et al. 2021).

In 2006, The National System for the Certification of Organic Agricultural Products (The Law) was approved in congress and has since then been implemented. It has been identified as Chile's most comprehensive policy in terms of food system sustainability for its explicit goal towards promoting food systems managed under agroecological farm principles (Martínez et al. 2017). In our findings we further explain the architecture of this Law. Yet, it is of note

that while numerous promising alternative vegetable food systems based on some forms of organic agriculture exist today in Chile, these remain disempowered (Rossing et al. 2020). Chile has been identified as a predominantly export-orientated organic agriculture country (Hruschka et al. 2021; ODEPA 2021) with an underdeveloped domestic market. Around 95% of certified organic hectares (less than 1% of cultivated land) are destined to exports, there are few domestic market sites and low levels of consumption (Adasme-Berríos et al. 2015; von Meyer-Höfer et al. 2015; FIA 2017; Gaitán-Cremaschi et al. 2020). Obstacles to domestic organic market development include a lack of information for consumers and difficulties distributing a wide range of products through different permanent channels (UNCTAD 2008; Gaitán-Cremaschi et al. 2020).

Data gathering

Because logics are historically contingent patterns that can change over time (Thornton et al. 2012), our analysis focuses on contemporary logics within the organic agriculture field as identified at the time of data gathering. Yet, our analysis deals with the period from the Law policy-making until ongoing events and dynamics as articulated by research participants. We consider that a retrospective analysis of the policy-making process is important for a thorough understanding about current logics, from where and why they have developed.

Qualitative data was gathered between August 2018 and March 2020 in Chile using a combination of methods including secondary data review (including, ODEPA 2011, 2019b, 2021; SAG 2019), purposive semi-structured interviews (54 in total), and observation.

We first conducted interviews with field actors as identified in our secondary data review. Through snowball sampling (Miles and Huberman 1994), these first interviews allowed us to identify other relevant field actors. Interviewees involved a diversity of field actors including domestic farmers from OAEs (*Organizaciones de Agricultores Ecológicos*—Ecological Farmers Organizations), domestic farmers-markets developers, export farmers, extensionists, representatives from certifying companies, scientists and NGOs, and public sector servants from different Ministry of Agriculture agencies (Appendix).

Interviews were intended to capture different field actors' organic agriculture values, beliefs, motivations and practices (i.e., logics). Actors—from public, private, NGOs and SOCLA-Chile (*Sociedad Científica Latinoamericana de Agroecología*-Chile) scientists—that participated in law-making were asked to reconstruct the process and asked about what led to its creation. They were also asked about cooperation, contestation and negotiation and the issues on which these dynamics were centered. Further, they were

asked to evaluate the Law: whether it has supported organic agriculture and made changes to the mainstream food system; whether it has negative aspects or effects; and, whether it could be improved. In general, interviewees were asked about the main problems they perceive within mainstream food systems and how these problems can be addressed through organic agriculture, and where appropriate, they were asked to describe their own organic practices. All interviews were transcribed (in Spanish), coded and analyzed using Atlas.ti. To allow interviewees to speak freely, they were guaranteed full anonymity, as also stipulated in the informed consent form most interviewees signed. To avoid traceability, which is quite easy in the small network of organic agriculture actors in Chile, we also refrain therefore from referring to the organizations or sectors interviewees belong to.

To reveal actors' practices, interviews were complemented with observation in interviewees working space (farms, farmers-markets, NGOs demonstrative farms) and in CNAO (5 meetings in total). The latter also allowed us to understand ongoing political issues around organic agriculture in Chile and the Law's implementation (Wooten and Hoffman 2016).

Data analysis

Like other institutional logics studies (Reay and Hinings 2009; Osei-Amponsah et al. 2018), and in acknowledgement that different methods exist (Reay and Jones 2016), here we have used an interpretivist analysis to identify institutional logics. This means that patterns associated with logics are informed by the literature on organic production but emerge from inductive data analysis and interpretation. Empirical data was analyzed through a combination of deductive and inductive coding. Data was first analyzed through deductive codes derived from the application of logics constructs, such as values, assumptions (or beliefs), and practices. At the same time we remained open to other codes; for instance: goals, visions, motivations, barriers, complementarities or contestations. Subsequently, coded text excerpts were revised by the main author to identify and categorize patterns from which, out of interpretative inductive analysis, main field logics were derived; each of them with an implicit or explicit belief system (e.g., values, assumptions) and associated practices (see Table 1 and 2). By 'pattern' we mean a set of symbols and beliefs expressed in discourse (verbal, written), (in)formal norms observable in behavior and activity (i.e., practices) that are recognizable and associated with an institutional logic or logics (Reay and Jones 2016). Further analysis of identified logics allowed us to examine their relations (e.g., synergies, competition, and contradictions) and what these imply for the possibility of sustainable food systems.

Findings were presented by the main author in three group discussions for feedback and verification. One with thirty farmers from different OAEs, another with two officers from the Ministry of Agriculture, and one with five members of the SOCLA-Chile scientific group. In our Findings we illustrate each logic through the empirical gathered data, including quotes from interviewees (Reay and Jones 2016).

Findings

In what follows, we first describe organic agriculture logics displayed by field actors. Then, we describe the relations between these logics. Second, we describe the logics incorporated in and supported by the Law. We thereafter analyze the effects of the Law and its logics in relation to field actors' logics and to sustainable food systems.

Different field actor's organic agriculture logics

We identify five organic agriculture logics as commonly displayed by different actors working for organic agriculture including national NGOs, both domestic and export farmers, certification companies, researchers, and public officers sympathetic with organic agriculture. These logics are: a human health logic, environmental logic, two market logics (export and domestic), a control logic, and a rural development logic.

Human health logic

The human health logic contains values of human health protection, and the provision of nutritious and secure food. For example, a health logic might be expressed by concern that food intake does not generate health risks or exposure to dangerous substances for those working on agriculture (Interview 3, 5, 6, 7, 8, 9, 15, 16, 30, 31, 33, 41, 43, 48, 51, 52, 53). The health logic in organics operates under the assumption that there are risks associated to high use of pesticides in Chile's horticultural food systems, specially at the domestic level. While Chilean conventional exports comply with safety standards for pesticides residues— as required by importer countries or international standards (e.g., ISO 65)—, at the local level the application of these chemicals remain risky for people's health (Muñoz-Quezada et al. 2012; Corral et al. 2017; González 2019). As indicated by a farmer from an OAE,

“the spirit that this thing should have is that the production of food is to nourish the population, even if it is for export, not to make people sick” (Interview 8)

Table 1 Institutional logics enacted by different organic agriculture field actors

Different field actors' organic agriculture logics	
Human health logic	
Values	Protection of consumers and agricultural workers; provision of secure food
Assumptions	Health risks associated to high use of pesticides in Chile's food systems
Practices	Ecological practices provide healthy food free of pesticides
Environmental logic	
Values	Nature protection, environmental stewardship
Assumptions	Varied environmental impacts of Chile's mainstream food systems
Practices	Ecological practices confront harmful industrialized food landscapes through food production practices that harmoniously coexist with nature
Market logic	
Values	Justice. Against asymmetric power relations in food distribution
Assumptions	Place-based markets with minimum intermediaries may allow farmers to receive higher and fair prices, while reducing costs in food transport
Practices	Export field actors embedded in global food distribution; though some have supported domestic market development Domestic farmers organizations create farmers-markets where they set their own rules, prices, and sell directly to consumers. NGOs support local actors in developing place-based markets
Control logic	
Values	Trust, transparency, credibility. Encourage farmers learning in organic agriculture practices
Assumptions	Mainstream farmers or food processors may claim their produce as organic; either because: - Farmers lack knowledge about organic farming practices - Opportunism driven by premium prices
Practices	When the Law was discussed, already: - Out of self-motivation, some domestic farmers organizations inspected each other's organic practices - Export farmers have always (before and after the Law) being subject to private companies certification, as required by foreigner markets
Rural development logic	
Values	Contribute to poverty alleviation and improving livelihoods in rural areas
Assumptions	Implementing ecological practices may allow farmers to reduce their production costs, work under safe conditions, enhance their living place
Practices	NGOs working on knowledge activities for small-scale farmers to implement ecological practices

Environmental logic

The environmental logic values nature protection and environmental stewardship. Those orienting to the environmental logic recognize the impacts that the mainstream agriculture practices have on the environment, such as the historical effects of monocultures on soil erosion, native deforestation and biodiversity loss (Interview 1, 26, 33, 42). Also, high pesticide use and related environmental pollution are recognized (Interview 2, 4, 5, 6, 8, 33, 40, 42, 45, 51, 52, 53). Under an environmental logic, organic practices oppose mainstream practices aimed at maximizing agricultural production through artificial inputs or the clearing of native flora for extensive monocropping. Instead, organic agriculture practices relate to principles of ecology (Interview 1, 2, 24, 26, 27, 30, 33, 36, 40, 45) or holism (Interview 34). Ecological practices entail working with and encouraging agri-ecological systems relations (Interview 26, 33) for food production to achieve adequate levels of production based on farm-derived and local resources; such as recycling on-farm

nutrients, managing diseases and pests through the health of soils and enhanced biodiversity. Based on these ecological practices, organic agriculture is proposed to confront harmful industrialized food landscapes through food production that harmoniously coexists with natural ecosystems.

Market logic: export and domestic

There is a market logic wherein we distinguish both an export and a domestic market sub-logics. The former is held primarily by export field actors such as certifying companies, private extensionists and export farmers. According to interviewees and as observed by previous studies (Cid-Aguayo 2011), many of these export field actors are driven by the environmental and human health logics, rather than for business (Interview 1, 34, 40, 41, 43), and have also been supporting the domestic market logic, either as organic domestic consumers (Interview 40, 41), as farmers that both export and supply the domestic market (Interview 31, 40, Observation in

Table 2 Institutional logics enacted by the Chilean organic agriculture Law

Institutional logics incorporated and supported by the Chilean System for the Certification of organic agriculture products (The Law)

Provokers of the Law: Export and business logics

Export logic

Values	Positioning Chile within global organic food trade market to support the country's economic development
Assumptions	Chile's geographical conditions (e.g., counter-season in relation to north hemisphere; isolation that protects from foreigners pests and diseases) provide the country with comparative advantages for agricultural exports (FIA 2017)
Practices	To ensure Chilean organic exports in as much countries as possible, organic practices definition based on foreigner organic agriculture Laws Ministry of Agriculture agencies actions focused on consolidating export markets; for example: - Providing monetary support to farmers or industries for the opening of foreigner organic markets - Raising statistics about organic export markets, and signing equivalence agreements with the EU, Brazil, Switzerland, Australia (currently in process with US, South-Korea, Japan) - There are no statistics about organic agriculture at the domestic level, nor any other public sector actions targeted to support the domestic organic market

Business logic

Values	Profitability
Assumptions	Organic products can access better prices than mainstream ones due to certain consumers' willingness to pay more for them
Practices	Ministry of Agriculture agencies actions focused on consolidating profitable markets; though, no public actions have been taken to support the organic domestic market as compared to the export one

Control and Environmental logics: Induced and shaped by the export and business logics

Control logic

Values	<ul style="list-style-type: none"> - Promote values of credibility, transparency, legitimacy, trust - Against values of fraud and opportunism - Protect organic farmers from unfair competition from mainstream farmers claiming their produce as organic
Assumptions	<ul style="list-style-type: none"> - Mainstream farmers or food processors may claim their produce as organic; because: - Farmers can lack knowledge about organic practices - Opportunism driven by organic premium prices - Thus, need to protect the proper use of the terms organic, biological or ecological agriculture
Practices	<ul style="list-style-type: none"> - All farmers and food processors willing to sell products as organic (or as ecological or biological) must follow the Law's certification process; otherwise they should be sanctioned by SAG (the Ministry of Agriculture agency responsible for safeguarding) the Law's correct implementation - For farmers, this include every year: to elaborate a production plan (e.g., how many hectares they will plant, what crops, their yields); fill-in records of all their practices through the growing season - Farmers' effective implementation of organic practices are inspected by both SAG and certification bodies (either private certification companies or an OAEs) - Certification bodies inspect farmers at least once a year; this includes farm site observation, gathering and uploading into SAG's organic website farmers' fill-in records - SAG inspects every year both farmers and certification bodies; provides accreditation to certification bodies; approves or denies inputs in organic agriculture farming or food manufacturing - Unfulfillment to the Law by farmers, food manufacturers, or certification bodies are sanctioned by SAG (e.g., including monetary fines or suspension from the system) - SAG dispenses to organic farmers or food processors a one year certificate for them to be able to prove they do organic practices, as well as the official national organic seal to label their produced. The seal is aimed for consumers to identify organic products

Table 2 (continued)

Environmental logic	
Values	Organic products officially defined in the Law as ‘ <i>those coming from holistic</i> ’ agricultural systems which are those that ‘ <i>encourage and improve the health of agroecosystems and, in particular, biodiversity, biological cycles and soil’s biological activity</i> ’ (Law 20.089 Article 2, SAG 2019)
Assumptions	Organic farming practices may encourage and improve the health of agroecosystems; in particular, biodiversity, biological cycles and soil’s biological activity
Practices	- The Law defines compulsory, allowed and forbidden practices in organic farming and food manufacturing, and - Regulates a tripartite certification system to ensure that farmers and food manufacturers effectively implement or avoid the practices defined in the Law

According to the goals that triggered the Law’s creation, we identify the export and business logics as drivers of the Law, which induce the control and environmental logics: necessary to ensure Chilean organic exports in profitable niche markets. It can be said that the control and environmental logics are at the service of the logics driving the Law

farmers-markets), or through support for the development of domestic farmers-markets (Interview 6, 31, 40).

The domestic market logic relates to values of justice in response to mainstream domestic market actors’ relations and dynamics. These relations are shaped by a highly concentrated supermarket and wholesale sector, which disempowers farmers who cannot negotiate fair prices and conditions (Interview 6, 7, 30, 32, 31, 40, 41, 48, 53). The following quote illustrates the farmer-supermarket dynamics:

[Supermarkets] asphyxiate farmers until they don’t have more air, because they ask them incredible conditions, reducing their prices until farmers say “no, you know, I can’t breathe anymore”, and when farmers are above to decide to die, supermarkets tell them “oh, I led you breath now” [interviewee inhales profoundly], and then they squeeze them again, until the poor farmers ... (Interview 41)

Farmers and NGOs enacting the domestic market logic criticize the Ministry of Agriculture’s policies aimed at connecting medium and small-scale farmers to large retailers and export market. These policies are motivated by the assumption that these markets may provide higher revenues to farmers, contributing to higher incomes and rural development, as confirmed by public servants (Interview 21, 22). Organic domestic farmers maintain that their interest has almost never been to supply supermarkets or to export, mainly because they do not align with the skills of producers and volume capability (e.g., number of hectares) (Interview 5, 6, 8, 30, 31, 53). These farmers advocate for place-based markets that allow them to set fair prices, reduce costs in food transport, sell directly to consumers and build relations of trust with them (Interview 5, 6, 8, 10, 31, 32, 51, 53). They advocate for minimal intermediaries only when necessary, so to avoid farmers receiving a too small share of the final price. In practice, some farmers’ organizations have

created their own farmers-markets where they set their own rules, prices, and sell directly to consumers. Some NGOs have supported local actors (e.g., municipalities, farmers) in developing or accessing local, place-based markets (Interview 1).

Control logic

Within the market logic we distinguish a control logic that was already practiced by different field actor groups when the Law was discussed. This logic differs in practice in the domestic and export markets. Out of self-motivation, members of some domestic farmers organizations inspected each other’s organic practices. These kinds of processes are often part of what is referred to as participatory guarantee systems (PGS). The peer inspections were implemented to avoid potential cheating on organic practices, encourage consumer’s trust, and to share knowledge among members (Interview 5, 6, 8, 9, 10, 31). In the export context, when the Law was discussed, foreigner certification companies already came to Chile to audit and certify farmers.

The underlying values that underpin the control logic are trust, transparency, and credibility. The control logic operates under the assumption that farmers may sell conventional products as organic, either because they lack knowledge about organic practices (Interview 2, 5, 6, 9, 50) or to get higher prices (Interview 5, 6, 15, 40, 53) and this would undermine those values.

Rural development logic

A rural-development logic is shared by diverse actors from the field including domestic farmers, some export farmers and public officers. It has been developed in practice mainly by NGOs like CAEL (*Centro Agroecológico Longaví*) and CET-BioBio (*Centro de Educación y Tecnología-BioBio*). In this logic, organic agriculture (at times agroecology) is

a means to achieve broader goals related to rural poverty alleviation and the improvement of small-scale farmer's livelihoods. The assumption is that farmers may improve their earnings and quality of life by implementing ecological farm practices; not because they may sell organic products at higher prices, but by disrupting their dependence on farm external inputs (Interview 1, 18, 26, 31, 30, 33, 36, 40, 42, 45, 51), providing them with secure working conditions, protecting and enhancing their living-place, and, if applied at the landscape-scale, improving their overall surrounding physical environment (Interview 1, 18, 26, 33). This logic contests the Ministry of Agriculture's policies, which some interviewees identify as responsible for disrupting (indigenous) farmers ecological practices from the past, making them dependent on inputs like pesticides, fertilizers, and seeds and the corporations that develop and sell them (Interview 1, 5, 10, 26, 30, 31, 51, 53).

Food systems transformative relations amongst field actor's organic agriculture logics

From the above, we see that all logics—perhaps, with exception of the export market and control logics—share a transformative agenda for organic agriculture. Organic agriculture emerges as both a criticism and solution to the problems of mainstream food systems. To varying degrees, all actors display the environmental, human health and rural development logics; reflecting what could be considered organic agriculture's core values.

Each of these logics aim to disrupt one or several mainstream food system institutions. Yet, these logics are not exclusive from but coalesce into each other with respect of mainstream institutions to be transformed, and sustainable food system transformation overall. For instance, implementing ecological practices may allow farmers to reduce their production costs, work under safe conditions, enhance their living place, and supply citizens with secure food. Thus, the environmental logic is expected to support both the rural development and human health logics. The human health and domestic market logics are expected to reinforce each other in the need to improve current pesticide standards and the delivery of secure food to citizens. The domestic market and rural development logics may target big corporations' (e.g., agri-chemical companies, wholesale markets) power concentration in the mainstream food system. The domestic market sub-logic thus also is expected to support the environmental and human health logics. More direct farmer-consumer relations may improve effectiveness in pesticides traceability. The control logic may not be considered as transformative on its own, it may support other transformative logics by, for instance, contributing to assure that organic practices have effectively been implemented, encouraging farmers learning in organic practices

(environmental and rural development logics), or strengthening trust in organic markets (market logic). While each of these logics respectively challenge mainstream food system institutions, together they create synergies for the construction of sustainable food systems.

Institutional logics of the Law

The Law has incorporated four logics: a market export logic, a control logic, an environmental logic, and a business logic. It can be noticed that the Law only aligns to three of the logics identified within the organic organizational field (export, control, environmental) while a new logic emerged through the Law (business). In Table 2 we provide a characterization of the logics enacted by the Law and we explain them in this section.

Market export logic

We distinguish the export market logic according to one of the main goals that provoked its creation, as well as what has been the focus of different government actions since its implementation (Table 2). Many interviewees—including public and private actors (e.g., export and domestic farmers, certification companies)—suggested that what triggered the need for a Law were changes in EU's organic regulation (Interview 12, 14, 15, 40, 41, 42, 43, 44, 45, 53). These changes compelled countries wanting to export organic products to have a legal, national organic agriculture system with state involvement to safeguard its correct implementation (Interview 12, 15, 14, 42). Specifically, the EU requires a tripartite standards governance system that links standard-setting, certification, and accreditation activities, which are inseparable from the market for certified organic products (Fouilleux and Loconto 2017).

To ensure Chilean organic exports could access as many markets as possible and advance equivalence agreements (Interview 12, 13, 34, 54), the definition of organic practices has been based on reviewing and adapting (Interview 2, 12, 40, 41, 42, 43, 54) foreign standards, or even adopting a "copy paste" approach (Interview 2, 12, 42). The most stringent interpretation of foreign standards has been included in the Chilean system (Interviews 2, 12, 34, 40, 41). As mentioned by different interviewees as an example, the EU's organic agriculture guidelines forbid fertilization with natural saltpeter (an abundant mineral in Chile) and the US organic policy still allows it. In order to ensure the entrance of its organic products in both EU and US, Chile opted to forbid saltpeter. The same pattern applies to all standards from the many diverse countries to which Chile exports organic agricultural products; Chile complies with the standard that will allow it to enter another country's markets as

organic. In line with Chile's export agricultural policies (Sarabia and Peris 2021), organic agriculture appeared as an opportunity for Chilean agricultural exports. As a result, the market export logic of organic agriculture has been central to public sector support and attention (Interview 12, 40, 41, 42, 43, 54).

Control logic

As required by the EU, the Law sets the rules for a tripartite mechanism of organic farmers and certification body practices (Table 2). The Law acknowledges two certification bodies: certification companies and OAEs. To date, there are 23 OAEs distributed across the country (Eguillor 2022).

In OAEs, farmers organize themselves to inspect each other's practices and obtain organic certification, while also being inspected by SAG, to whom they pay only once in their lifetime for their subscription and accreditation. Through OAEs farmers are allowed to sell at the domestic level and export to Brazil, since both countries signed an equivalence agreement. The acknowledgement of OAEs in the Law resulted from action by domestic farmers against the organic export logic endorsed by the public sector. They contested that if approved, the Law would oblige them to go through a certification process they could not afford, and they questioned why they should follow policies imposed by foreigner countries whose markets they had no interest in accessing (Interview 4, 6, 8, 12, 40, 54).

The aim of the control logic is to protect the proper use of the term 'organic agriculture' and its equivalents—according to the Law: ecological, biological agriculture, or the 'combination of these terms', e.g., 'agro-ecology'. This has been adopted mainly to provide a guarantee to consumers (Interview 5, 7, 8, 9, 14, 15, 18) and to strengthen consumer's trust and perceptions of organic agriculture's legitimacy (Interview 5, 6, 8, 9, 14, 15). Nonetheless, from the above sub-section (about the Law's export market logic) we note that the main goal for the formal institutionalization of the control logic has been to support organic exports.

Environmental logic

The Law defines organic products and agriculture as "*those coming from holistic*" agricultural systems which "*encourage and improve the health of agroecosystems and, in particular, biodiversity, biological cycles and soil's biological activity*" (Law 20.089 Article 2, SAG 2019). The acknowledgement of organic agriculture by the Law as an holistic system resulted from the "*battle*" (Interview 34) of private field actors—including certifying companies and export and domestic farmers—against some public-sector actors willing to give prominence to input-substitution approaches, as

indicated by some interviewees that participated in the law-making process (Interview 34, 54). This resulted in a Law that not only defines forbidden and allowed practices, but also makes some practices compulsory; such as the recycling of nutrients through composting, rotations and enhancing biodiversity through cover crops. This was identified as important to diminish organic "*input-by-substitution*" approaches (Interviews 34).

Business logic

We distinguish this logic based on another goal that triggered the Law's creation, as well as the way the public sector has been supporting organic agriculture. As indicated by an organic private extensionist who participated in the law-making process, "*what drove this [the Law's creation] was the spirit of conquering niche markets*" (Interview 34). Here, we note a business logic which conceives organic agriculture as a "*market niche*" (Interview 11, 14, 19, 20, 22) where products can access "*premium prices*" (Interview 34, 41, 43). For instance, a public extensionist engaged in supporting domestic organic farmers groups signaled to do so in an attempt "*to help farmers to add [economic] value to their production*" (Interview 11). Compared to mainstream production, organic agriculture may provide higher economic returns to farmers due to premium prices, under the assumption that organic products have certain qualities (e.g., without pesticides, environmentally sound) appreciated by certain consumers willing or able to pay more for them.

Effects of the Law and its logics on food systems transformation

Some interviewees recognized ways that the Law contributed to organic agriculture. Some indicated that it has contributed to the reputation and access of Chilean organic agriculture in foreign markets (Interview 34, 41, 54). At the national level, it has contributed structure and order to the organic field through a common understanding about organic farming practices (Interview 2, 5, 6, 8, 9, 15, 54). Other interviewees perceive that the existence of a public organic agriculture law has legitimized organic agriculture as a viable form of agriculture in contrast to past and present prejudices that view it as "*hippy farming*", unproductive or non-profitable (Interview 1, 34, 54). Others celebrate the acknowledgment of OAEs for farmers that otherwise cannot afford certification (Interview 1, 2, 9, 12, 14, 15).

Besides the above mentioned, interviewees did not identify other contributions from the Law, and described some key shortcomings. Most organic actors contest the lack of support for both domestic and export-oriented organic farmers and for the focus on export markets to the neglect of domestic market development (Table 2). There remains a

need for policies aimed at domestic market development (e.g., public purchases, access to physical space in every district for organic farmers-markets, informing the population about organic food human health benefits alongside health risks associated to mainstream food consumption) (Observation CNAO). Moreover, besides allowing farmers some control over what can be called organic, the Law does not include any other actions that would help expand the practice of organic agriculture to more farmers and consumers. There also remains a policy need to support learning in organic practices, as well as in organizational skills to create and maintain OAEs. There is currently no provision for organic projects with exclusive public funding or bonus scores in public tenders in a way that would acknowledge organic agriculture's social and environmental benefits in comparison to mainstream production. Today, organic agriculture actors seeking public funding compete equally with mainstream producers (Interview 24). We further explain these findings in the following sub-sections.

Problems of the control and business logics for organic agriculture to be practiced by more farmers and consumers

Despite the growth in terms of hectares under organic management since the Law's implementation, the number of hectares destined for export has stagnated in the last years (Interview 12; Observation CNAO). Interviewees explained that this is because organic agriculture for exports is constrained to crops that can access premium prices (i.e., apples, blueberries, wines, wild collection) (Interview 12, 34, 41, 43). As one public officer explained:

...We have noticed that a barrier for more farmers making organic agriculture is that Chilean export fruit price is too good. So, fruit exporters are not interested in switching into organic (Interview 12)

This was echoed by a certifying company interviewee who said:

If an agricultural product has an excellent value in the conventional market, it is not interesting for farmers to make the effort to convert their produce into organic. But, if what they produce suffers a lowering in its price because it is too massive, it is very interesting for people to say, "how can I have again an interesting price?", "converting into organic". That is a classic situation that we see. When a product is very well paid, nobody asks "how can I convert my production into organic?". Even an entrepreneur with conviction made the exercise and told me, "for earning one cent more, making the whole effort is not convenient to

me". But, when do they come back? When they realize they won't earn one cent but 30% more if selling organic (Interview 41)

These quotes illustrate that at the export level the main or only incentive for farmers to transition to organic agriculture is to access premium prices (i.e., business logic) that pay off the extra investment of certification. Even farmers with conviction may not switch to organic if they will not receive the economic incentive because farmers face additional work when practicing organic compared to mainstream agriculture (DeLind 2000). In our case, additional work and costs mainly relate to certification, which affects domestic farmers more than export ones. As confirmed by previous studies, export farmers or industries pay personnel to make the certification, whereas OAEs must deal with certification tasks and costs by themselves (Hruschka et al. 2021). Despite OAEs pay to SAG only once for their registration, every year thereafter they must incur in extra-costs (e.g., gas for moving between members' fields, some organizations pay members doing the inspections for their time) that seem to be overlooked by public officers.

Our findings point to interdependence between the control—enforced by law—and business logics. On the one hand, the control logic reinforces the business logic, as it is unlikely most farmers will assume certification extra work and costs if they are unable to access premium prices. On the other hand, the chance to access premium prices may create the incentive for farmers, food manufacturers and commercialization spots to act opportunistically and cut corners or even fraudulently label produce as organic, thus, the need of a control system. The control and business logics interdependence in theory has positive aspects, but in practice can be problematic.

Control strengthens the field's legitimacy and may encourage farmers' learning (Interview 1, 2, 5, 6, 9, 34). Economic incentives also seem an effective incentive to encourage more farmers to implement organic agriculture, reducing ecological impacts. Thus, the business logic supports the environmental logic, and perhaps the rural development logic in aligning to efforts to raise the income of farmers. Yet, these logics only operate if farmers access premium prices, which at the export sector is limited to few crops, and at the domestic level to a few wealthy districts and supermarkets. In supermarkets, retailing organics can reproduce unfair conditions for farmers, contradicting their motivations for market fairness through organic agriculture (as indicated above, in field actors organic agriculture (market) logics). Furthermore, raising farmer's income through premium prices represents a deviation from the rural development logic as described by organic field actors, aimed at improving farmer livelihoods by reducing production costs

through ecological practices. The control-business logic's interdependence undermines the rural development logic when raising—rather than lowering—farmer's costs through certification processes, particularly at the domestic level where they are less likely to receive economic compensation for this extra investment.

The business logic—reinforced by the control logic—is problematic in so far as has contributed to shape organic agriculture as a market-niche and sustainable or healthy lifestyle *option* targeted to medium-upper class environmentally concerned citizens (McDonnell and Yáñez 2008; FIA 2017). It contrasts with the human health logic: to ensure secure food to the broader population, denoting a market-incentive-based policy making the market rather than a sense of public sector obligation the main driver of food systems sustainability outcomes. Furthermore, at the domestic level, prices are a major barrier for more citizens to consume organic produce (Interview 15, 18); being 25% to 100% higher than mainstream products (FIA 2017). Supermarkets supply organic products due to marketing studies indicating that organic products attract citizens with high purchasing power (Interview 41), and most distribution points are gourmet shops located in wealthy districts (FIA 2017, Interview 41). “*Today organic is completely stigmatized, and it is very difficult to get rid of the elite stigma*” (Interview 5). The benefits of legitimacy and no longer seeing organics as a ‘hippy’ form of production has been displaced by an assumption that organics is inaccessible. As pointed out by SAG, export and domestic farmers interviewees there is a need to change the business logic towards making organic food equal in prices or even cheaper than mainstream ones (Interview 5, 15, 18, 30, 31, 40).

The Law's logics are largely reproducing the mainstream food system

Some interviewees agree that organic for export is an advancement towards more sustainable food systems through the switch to nonpolluting substances (Interview 1, 26). However, some domestic farmers, public officers (Interview 24, 26, 27, 33, 30) and export field actors (Interviews 40, 41, 43) criticize organic production oriented for export because it enables large extensions of organic mono-cropping with little biodiversity; poor labor conditions (Interview 16, 26, 40, 33); or concentrations in water rights among large producers, marginalizing small-scale farmers (Interviews 26, 33). Different interviewees also criticize that organic for exports has been the sole focus of public policy. The following quotes illustrate how issues raised by the domestic market, rural development, and human health logics have remained unchallenged by the Law:

When the Law was discussed, some groups contested that, ethically why should we produce clean products to feed the Europeans that pay more. Why not produce at a local scale, for the local market, for healthy nutrition for the local population, etc. (Interview 54)

The [monetary] support from PROCHILE [a Ministry of Agriculture Agency] constrained our actions because funding was aimed only for activities related to exports. That produced that we could not freely deliver resources nor time to other activities, for instance, for peasants family agriculture (Interview 40)

Furthermore, the Law is counterproductive to the human health, rural development, and domestic market logics, and fails to meaningfully or extensively enact an environmental logic. It has institutionalized a system that sanctions organic farmers, more-so than conventional ones. Conventional farmers are inspected—and eventually fined—by public agencies (SAG, Ministry of health), but these control mechanisms are proven to be weak and ineffective (Interview 6, 12; González 2019; Zúñiga-Venegas et al. 2021). Organic actors point out to the paradox that farmers implementing environmentally sound practices are more controlled and must acquire more additional certification costs than conventional ones. Something some of them consider unfair (Interview 4, 7, 10, 41) and others frame as “*the world up-side down*” (Interview 5, 6, 9, 33). This indicates that while a whole public sector effort (including the government, parliament) has been mobilized to set-up an organic law, this has been done in a way that does not disrupt mainstream food system institutions.

One example interviewees cited to illustrate the maintenance of mainstream production through the Law related to the regulation of spray drift. All organic farmers face chemical drift pollution from their conventional neighbors (Interview 5, 6, 40, 41, 43, 54). There is no article in the Law protecting them from it, so that organic farmers assume drift costs and consequences. In setting stringent control to organic than mainstream farmers, the Law doesn't create the conditions for fair competition between organic and mainstream agriculture. As indicated by a public servant:

there is almost no control over conventional agriculture. If you can arrive to the market with produced with not allowed residues, for me that is grave. And, it is also like organic agriculture cannot compete against an agriculture that it is allowed to do everything and has no limits (Interview 24)

Organic agriculture's incapacity to compete with mainstream agriculture is accentuated by the fact that organic policy officers have been mandated to support organic agriculture without criticizing the mainstream food system. For

instance, they must avoid making claims about the health benefits of organic food (Interview 12, 14, 19, 21) despite food safety concerns domestically due to pesticide use (Muñoz-Quezada et al. 2012; Corral et al. 2017; González 2019) and this being a core aspect of an organic human health logic. These concerns are widespread: in a meeting of the National Commission of Horticulture, a policy officer suggested that they could not support a ‘5 a day’ movement advocating for citizens to consume five or more fruits a day, as such policy could imply human health risks due to high levels of pesticides at the domestic level (Observation National Commission of Horticulture). Yet, organic policy officers are unable to use these unsafe pesticide levels to advocate for organics to challenge mainstream production. This illustrates how the public sector faces barriers to acknowledging problems in dominant conventional food industries, and this is echoed in the Law: it is crafted to support only those logics that would fail to confront or challenge those industries.

Resistance to the Law by organic agriculture and agroecology fields actors

We found resistance to the Law among domestic field actors including farmers, some NGOs and market developers. Their resistance took two forms.

First, some domestic organic farmers or market-developers resist being compelled to follow certification as stipulated by the Law (Interview 10, 27, 30, 48, 53). Some would only seek certification in cases where there is a market that offers good conditions and prices, so they might at least recover their investment in certification. The issue is, on the one hand, that with the exception of wealthy districts, there is almost no premium price in the domestic market (Interview 5, 10, 44, 48, 53). On the other hand, these actors are not driven by a business logic, but by others (i.e., human health, environment, rural development, domestic market). They display the control logic, and believe control is needed, particularly in the absence of direct farmers-consumers relations. Yet, they consider that the effort required by the current certification system might not be necessary for the markets they participate in and pursue; these are place-based markets, where consumers and farmers know each other and control is based on trust, peer-review among farmers organizations (at the margins of SAG) and by making farms open-access to consumers. While they do not resist the Law certification process per se, they advocate for more reflexivity about the type of market relations appropriate for mandating a singular certification system, particularly in the context of alternative market relations where other forms of control could be more appropriate (Interview 6, 26, 30, 48, 53).

Second, some interviewees perceived that the Law has reduced organic agriculture to a checklist of environmental

farm practices aligned with business and export logics, and leaving issues like extensive organic monocropping with little biodiversity and related social issues unchallenged (Interview 1, 5, 6, 10, 27, 30, 33, 48, 53). This criticism was shared by public sector actors (Interview 15, 16), export field actors (certification companies, farmers) (Interview 34, 40, 42, 43), domestic farmers from both OAEs and those that resist current certification (Interview 5, 6, 10, 27, 30, 33, 48, 53). As a result, some actors do not identify anymore with organic agriculture but with other transformative pathways such as agroecology or regenerative agriculture (Interview 1, 27, 30, 33, 48, 53). In their view, agroecology does entail a political project that challenges power relations in the mainstream food system. Export organic field actors continue to advocate for organic agriculture but consider that there is a need for an ‘Organic 3.0’ agenda, as proposed by IFOAM (IFOAM 2017; Migliorini and Wezel 2017) (Interview 34, 40, 41, 43). Political challenges to business-as-usual are central to most organic field actors, and yet, they have not been reflected in the Law.

Discussion

In this paper we analysed the case of the Chilean Organic Agriculture Law using institutional fields and institutional logic to examine how policies and institutions can function as drivers or inhibitors of food system transformation. In what follows, we reflect on our main findings. First, we reflect on the implications of the case for policy intended for food system transformations. Second, we reflect on the utility of institutional logics as an analytical tool.

Our case shows the policy-making process and implementation of Chile’s organic agriculture law. While done with good intentions from the public sector—to indeed support organic agriculture’s development—the public sector has selected logics coherent with Chile’s mainstream food system policies, compatible with productivist export oriented industrial agriculture paradigms (Sarabia and Peris 2021). Transformative logics that imply changes within this mainstream food system have been excluded. This has happened by not formally institutionalizing confrontational logics in further policy actions, and limiting the Law to a strict mechanism of organic farm and food manufacturing practices. Exclusion has also happened by silencing the relations between organic transformative logics and the mainstream food system. For instance, public officers working in and sympathetic with organic agriculture are mandated to support organic, but only in manners that avoid criticism to the mainstream food system. This resonates with Tomlinson (2008), who explains how in the UK organic policies support the institutionalization of

organics, but in ways that avoid critique and any comparison between organic agriculture and the mainstream food system. Furthermore, and in line with previous studies, it indicates that despite organic's formal institutionalization, the intention has not been to transform the mainstream food system (Martínez et al. 2017). As a result, the Law has had the opposite effect: to contain organic agriculture and prevent transformation.

Our findings demonstrate how public policy can undermine the content of organic agriculture and its transformative potential when it excludes its social, political and normative values (or logics); contributing to its depoliticization. This is aligned with the findings of other organic agriculture scholars (Tovey 1997; Michelsen 2001b; Tomlinson 2008; Arcuri 2015; Lehtimäki and Virtanen 2020; Bendjebbar and Fouilleux 2022) and food systems transformation studies, beyond organic agriculture (Duncan and Claeys 2018; Schiller et al. 2019; Béné 2022). In Chile, depoliticization has resulted in the creation of an organic agriculture policy that, paradoxically, generates more obstacles for sustainable and beneficial food production than mainstream production partly due to controls that are more stringent for organic producers. For instance, the costs, bureaucratic requirements, burdensome record keeping is onerous for organic certification (Barrett et al. 2001; Guthman 2004; Veldstra et al. 2014). This has meant that in Chile organic agriculture is only possible for a few farmers with high levels of conviction or farmers who produce a crop that receives a premium price. Moreover, when the public sector prevents the circulation of information about problems with high pesticide use or the health benefits of organic production, it is less likely that citizens will be willing to pay more for organic food. Consequently, with the current Law organic agriculture cannot compete with the mainstream food system and keeps actors stuck in existing production and consumption patterns (Conti et al. 2021), being unable to drive the transformation the Chilean food system requires (Muñoz-Saez and Renwick 2022).

Implications of the case for policies intended for food system transformation

In view of our findings in relation to previous organic and food system transformation studies, our study has two implications for transformative policies that drive sustainable food systems.

First, transformative food system policies will be those that purposively aim to the sustainable transformation of mainstream food system. This requires a focus beyond policies supporting or formally institutionalizing transformative pathways, as seen in our case as well as in previous

organic agriculture and other transformative pathways studies (Michelsen 2001b; Mier y Terán Giménez Cacho et al. 2018; Nicholls and Altieri 2018; Schiller et al. 2019). Such policies are needed, but transformation also requires active work in disrupting mainstream food systems and engaging with them directly. Transformation requires policies that disrupt the values, practices, relations, assumptions (i.e., logics, institutional) driving unsustainable food systems outcomes, and contributing to mainstream system's lock-in (Kuokkanen et al. 2017; Béné 2022). Hence, policy mixes are required between policies aiming for the 'creation' of sustainable institutions and for 'destabilizing' (Kivimaa and Kern 2016; Rogge and Reichardt 2016) unsustainable ones (Eyhorn et al. 2019; Leeuwis et al. 2021; Bendjebbar and Fouilleux 2022).

Second, while the state is the only one able to institutionalize transformative food systems in public policies (Bendjebbar and Fouilleux 2022), committed non-public field actors can be critical in supporting and advancing transformative food policies (Campbell and Liepins 2001; Constance et al. 2008; Arcuri 2015; Haedicke 2016; Niederle et al. 2020). Committed actors to food system transformation are key in resisting the public sector's tendency to depoliticize food systems transformative pathways and policy debates. Their challenge is to develop organizational capacity to generate strong coalition discourses (Leeuwis et al. 2021) able to re-politicize sustainable food systems policy debates (Niederle et al. 2020) and to apply pressure to governments (Eyhorn et al. 2019). The challenge for the public sector is to balance the contradictions and trade-offs between supporting both mainstream and transformative food-systems, as well as to acknowledge transformation's inherent political dimension. Hence, it is necessary to meaningfully include committed social movements and private sector actors into the policy debate to contest mainstream food systems (Campbell and Liepins 2001; Arcuri 2015; Bendjebbar and Fouilleux 2022). It is necessary to foster a continuous and recursive policy making process of contestation, cooperation and negotiation among social movements, the private and public sector (Campbell and Liepins 2001) and make space for their competing logics.

Utility of institutional logics as an analytical tool

Institutional logics provides us with a useful approach to unpack and further analyze some of the underlying forces, trends and processes involved in food systems change and inertia, particularly related to the politics of formal institutionalization. Institutional logics allowed us to capture the understandings, motivations and actions tied to organic agriculture by different field actors, and to analyze how these related to those embedded in the Law. This helped us to

further analyze two things: First, how different logics may affect mainstream food system transformation or reproduction; Second, the power relations between different actors created through unequal representation of logics in the Law. For example, the public sector captured and locked-in a transformative pathway, making visible the way in which different drivers (i.e., laws) are constituted through and by diverse and often competing institutional logics that exist in unequal conditions of power.

A number of sustainable food systems frameworks have highlighted the importance of unpacking and further understanding the processes involved in food systems drivers, as ultimately these drive (un)sustainable food-systems outcomes (iPES Food 2015; HLPE 2020). Institutional logics is an approach that can aid and deepen these analyses, not only by offering a way to consider processes and drivers at play in the politics of formal institutionalization, but also by complementing other approaches (e.g., political economy, policy framing) by providing an analytical tool to make visible often contested and competing values, interests and practices in sustainable food systems politics and policymaking. We have shown how important it is to explore the logics that inform these drivers, for instance, to demystify the particular claims made by some actors (e.g., public sector) in relation to advancing transformative food system pathways (e.g., organic agriculture) by formal institutions. As in our case, it cannot be assumed that the existence of an organic agriculture Law—supposedly Chile’s most comprehensive policy in terms of food system sustainability (Martínez et al. 2017)—is putting us in the right direction towards sustainable food systems. Institutional logics can provide more comprehensive understanding and assessments in the transformational potential of food systems policies.

Conclusion: policies as drivers of sustainable food systems transformations

The urgent need for sustainable food systems transformations demands coherent policies and legal frameworks. However, the literature on food systems suggests many policies targeting sustainable food systems may undermine their transformative potential. Through the case study of the Chilean National System for the Certification of Organic Agricultural Products and the use of institutional theory concepts—namely: institutional fields and institutional logics—this paper examines the politics of a (supposedly) sustainable food system policy, and their implications for the role of policy as a driver of sustainable food systems transformation.

Our case shows an organic agriculture policy that ultimately serves to perpetuate the mainstream food system, inhibiting, even obstructing, food system transformation.

We find there is no a real intention towards food system transformation, with the public sector still committed to mainstream modes of food production and circulation (Duncan and Pascucci 2017). Despite being recommended as a potential sustainable food system transformation pathway and its increasing institutionalization in different national contexts in last decades, considerably less public financial support is put towards organic than to mainstream food systems worldwide (Vanloqueren and Baret 2009; Reganold and Wachter 2016). Furthermore, transforming mainstream food systems implies trade-offs for the public sector; including uncertainty (Duncan et al. 2022), and sunk costs from (past) investments in mainstream food systems chosen by governments (Kuokkanen et al. 2017; Conti et al. 2021). In addition, overtly acknowledging the benefits of organic agriculture in relation to the mainstream food system the public sector supports, implies making public serious political issues associated with high pesticides use in horticulture. To avoid these challenges, governments may formally institutionalize transformative pathways, but in ways that fail to challenge the mainstream system, keeping transformative food system pathways marginalized, at bay, or locked-out (Kuokkanen et al. 2017; Béné 2022).

Previous food system studies have identified different mechanisms to lock-in mainstream systems (Kuokkanen et al. 2017; Conti et al. 2021). One is through the depoliticization and neutralization of transformative pathways, as shown in our case and observed by previous food system organic agriculture studies. This can occur through selecting (‘cherry picking’ (Béné 2022)) these pathways’ aspects that are coherent with the mainstream food system policy agenda. Political aspects that imply a disruption of dominant mainstream systems are ignored or hidden. This has also been conceptualized as transformative pathway’s co-optation (Campbell 2001; Wezel et al. 2018) appropriation or capture (Pel 2016; Schiller et al. 2019) by actors that resist food systems transformations; including the public sector. Consequently, policies concerning transformative food system pathways are made under mainstream food systems logics contributing to their reproduction and incremental changes.

Transformations are inherently political, and can only be accomplished by understanding and addressing the power relations that underlie attempts at change (Scoones et al. 2015). As our research indicates, institutional logics are one way to further understand how transformation is motivated and mobilized, but ultimately placated and subsumed in the service of powerful economic interests.

Appendix

See Table 3.

Table 3 Different type of organic agriculture field actors interviewed

Organic agriculture field actors interviewed	
Private sector	Eighteen domestic farmers in total; among which: Ten are members from OAEs; these are farmers organizations officially acknowledged by the Law for farmers to obtain organic certification through group inspection among member farmers Ten participate in farmers-markets Three none-farmers domestic organic farmers-markets developers Organic export sector: four farmers, two private extensionists, and Two representatives from certifying companies
Public sector	Twelve representatives from different agencies from the Ministry of Agriculture: ODEPA— <i>Oficina de Estudios y Políticas Agrarias</i> ; responsible for statistics, agricultural policy making, and official coordinator of the <i>Comisión Nacional de Agricultura Orgánica</i> (CNAO—National Commission of Organic Agriculture) SAG— <i>Servicio Agrícola y Ganadero</i> ; responsible for the country's phytosanitary control and for implementing the Organic Law INDAP— <i>Instituto de Desarrollo Agropecuario</i> ; responsible for peasants and small-scale farmers development INIA— <i>Instituto de Investigación Agropecuaria</i> ; private institute with public sector support for agricultural and livestock research PRODESAL (<i>Programa de Desarrollo de Acción Local</i> —agreement between and co-financed by INDAP and the respective municipality to provide public extension to smallholder farmers)
NGOs and scientists (non-profit organizations)	Five interviewees representatives from national NGOs; including <i>Red por la Soberanía Alimentaria de la Sexta Región, Centro Agroecológico Longaví</i> (CAEL), CET-BioBio Eight academics and members of SOCLA-Chile (<i>Sociedad Científica Latinoamericana de Agroecología-Chile</i>)

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Declarations

Conflict of interest The authors have no financial nor any other conflict of interests to disclose. All individuals and organizations that participate in this study gave their informed consent.

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References

- Adasme-Berrios, C., M. Sánchez, R. Jara-Rojas, A. Engler, M. Rodríguez, and M. Mora. 2015. Who are the potential consumers of organic fruits and vegetables in central Chile? A CHAID approach. *Revista De La Facultad De Ciencias Agrarias Universidad Nacional De Cuyo* 47 (1): 193–208.
- Arcuri, A. 2015. The transformation of organic regulation: The ambiguous effects of publicization. *Regulation and Governance* 9: 144–159. <https://doi.org/10.1111/rego.12066>.
- Baker, P., J. Lacy-Nichols, O. Williams, and R. Labonté. 2021. The political economy of healthy and sustainable food systems: An introduction to a special issue. *International Journal of Health Policy and Management* 10 (12): 734–744. <https://doi.org/10.34172/ijhpm.2021.156>.
- Barley, S.R., and P.S. Tolbert. 1997. Institutionalization and structuration: Studying the links between action and institution. *Organization Studies* 18 (1): 93–117.
- Barrett, H.R., A.W. Browne, P.J.C. Harris, and K. Cadoret. 2001. Smallholder farmers and organic certification: Accessing the EU market from the developing world. *Biological Agriculture and Horticulture* 19 (2): 183–199. <https://doi.org/10.1080/01448765.2001.9754920>.
- Bendjebbar, P., and E. Fouilleux. 2022. Exploring national trajectories of organic agriculture in Africa. Comparing Benin and Uganda. *Journal of Rural Studies* 89: 110–121. <https://doi.org/10.1016/j.jrurstud.2021.11.012>.
- Béné, C. 2022. Why the Great Food Transformation may not happen—A deep-dive into our food systems' political economy, controversies and politics of evidence. *World Development* 154: 105881. <https://doi.org/10.1016/j.worlddev.2022.105881>.
- Béné, C., S.D. Prager, H.A.E. Achicanoy, P. Alvarez Toro, L. Lamotte, C. Bonilla Cedrez, and B.R. Mapes. 2019a. Understanding

- food systems drivers: A critical review of the literature. *Global Food Security* 23: 149–159. <https://doi.org/10.1016/j.gfs.2019.04.009>.
- Béné, C., P. Oosterveer, L. Lamotte, I.D. Brouwer, S. de Haan, S.D. Prager, E.F. Talsma, and C.K. Khoury. 2019b. When food systems meet sustainability—Current narratives and implications for actions. *World Development* 113: 116–130. <https://doi.org/10.1016/j.worlddev.2018.08.011>.
- Berdegúe, J.A., and D. López. 2017. Mediana agricultura y agricultura familiar en Chile hacia el año 2030. In *Agricultura Chilena. Reflexiones y desafíos al 2030*, 179–202. Santiago: ODEPA.
- Berg Johansen, C., and S. Boch Waldorff. 2015. What are institutional logics and where is the perspective taking us? *Academy of Management Annual Meeting Proceedings* 1: 14380. <https://doi.org/10.5465/ambpp.2015.14380abstract>.
- Boitano, L. 2011. *Análisis de la cadena de distribución en la comercialización de productos frescos en Chile: frutas y hortalizas*. Santiago: MSc Thesis, Departamento de Ingeniería Industrial, Universidad de Chile.
- Boza, S., J. Muñoz, and A. Núñez. 2019. Food policy in Chile. *Reference Module in Food Science*. <https://doi.org/10.1016/b978-0-08-100596-5.22617-6>.
- Campbell, D. 2001. Conviction seeking efficacy: Sustainable agriculture and the politics of co-optation. *Agriculture and Human Values* 18: 353–363. <https://doi.org/10.1023/A:1015210215751>.
- Campbell, H., and R. Liepins. 2001. Naming organics: Understanding organic standards in New Zealand as a discursive field. *Sociologia Ruralis* 41 (1): 21–39. <https://doi.org/10.1111/1467-9523.00168>.
- Candel, J.J.L., and L. Pereira. 2017. Towards integrated food policy: Main challenges and steps ahead. *Environmental Science and Policy* 73: 89–92. <https://doi.org/10.1016/j.envsci.2017.04.010>.
- Céspedes-Leon, C., M.G. Balzarini, R.J. Zoppolo, H.A. Zarza, E.M. Rodríguez, N.I. Granval, and I.A. Torrico. 2017. Successful organic production practices in the Southern Cone. *Sustainable Agriculture Research* 6 (3): 26–34. <https://doi.org/10.5539/sar.v6n3p26>.
- Cid, B. 2014. Movimientos agroecológico y neo campesino: Respuestas postmodernas a la clásica cuestión agraria. *Agroalimentaria* 20 (39): 65–78.
- Cid, B., and A. Latta. 2015. Agro-Ecology and food sovereignty movements in Chile: Sociospatial practices for alternative peasant futures. *Annals of the Association of American Geographers* 105 (2): 397–406. <https://doi.org/10.1080/00045608.2014.985626>.
- Cid-Aguayo, B. 2011. Between conventionalization and civic agriculture: Emerging trends in the Chilean agroecological movement. *Journal of Agriculture, Food Systems, and Community Development* 1 (3): 53–66. <https://doi.org/10.5304/jafscd.2011.013.010>.
- Clapp, J., P. Newell, and Z.W. Brent. 2018. The global political economy of climate change, agriculture and food systems. *Journal of Peasant Studies* 45 (1): 80–88. <https://doi.org/10.1080/03066150.2017.1381602>.
- Constance, D.H., J.Y. Choi, and H. Lyke-Ho-Gland. 2008. Conventionalization, bifurcation, and quality of life: Certified and non-certified organic farmers in Texas. *Southern Rural Sociology* 23 (1): 208–234.
- Conti, C., G. Zanello, and A. Hall. 2021. Why are agri-food systems resistant to new directions of change? A systematic review. *Global Food Security* 31: 100576. <https://doi.org/10.1016/j.gfs.2021.100576>.
- Coria, J., and S. Elgueta. 2022. Towards safer use of pesticides in Chile. *Environmental Science and Pollution Research* 29: 22785–22797. <https://doi.org/10.1007/s11356-022-18843-6>.
- Corral, S.A., V. de Angel, N. Salas, L. Zúñiga-Venegas, P.A. Gaspar, and F. Pancetti. 2017. Cognitive impairment in agricultural workers and nearby residents exposed to pesticides in the Coquimbo Region of Chile. *Neurotoxicology and Teratology* 62: 13–19. <https://doi.org/10.1016/j.ntt.2017.05.003>.
- Dabbert, S., C. Lippert, and A. Zorn. 2014. Introduction to the special section on organic certification systems: Policy issues and research topics. *Food Policy* 49: 425–428. <https://doi.org/10.1016/j.foodpol.2014.05.009>.
- Darnhofer, I. 2015. Socio-technical transitions in farming: key concepts. In *Transition pathways towards sustainability in agriculture: case studies from Europe*, ed. L.A. Sutherland, I. Darnhofer, G.A. Wilson, and L. Zagata, 17–31. Wallingford: CAB International.
- Darnhofer, I., T. Lindenthal, R. Bartel-Kratochvil, and W. Zollitsch. 2010. Conventionalisation of organic farming practices: From structural criteria towards an assessment based on organic principles. A Review. *Agronomy for Sustainable Development* 30 (1): 67–81. https://doi.org/10.1007/978-94-007-0394-0_18.
- Darnhofer, I., S. D'Amico, and E. Fouilleux. 2019. A relational perspective on the dynamics of the organic sector in Austria, Italy, and France. *Journal of Rural Studies* 68: 200–212. <https://doi.org/10.1016/j.jrurstud.2018.12.002>.
- De Wit, J., and H. Verhoog. 2007. Organic values and the conventionalization of organic agriculture. *NJAS Wageningen Journal of Life Sciences* 54 (4): 449–462. [https://doi.org/10.1016/S1573-5214\(07\)80015-7](https://doi.org/10.1016/S1573-5214(07)80015-7).
- DeLind, L.B. 2000. Transforming organic agriculture into industrial organic products: Reconsidering national organic standards. *Human Organization* 59 (2): 198–208. <https://doi.org/10.17730/humo.59.2.hm8263678687n536>.
- Demiryürek, K., C. Stopes, and A. Güzel. 2008. Organic agriculture: The case of Turkey. *Agriculture* 37 (4): 261–267. <https://doi.org/10.5367/000000008787167754>.
- DiMaggio, P.J., and W.W. Powell. 1983. The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields. *American Sociological Review* 48 (2): 147–160.
- Duncan, J., and P. Claeys. 2018. Politicizing food security governance through participation: Opportunities and opposition. *Food Security* 10: 1411–1424. <https://doi.org/10.1007/s12571-018-0852-x>.
- Duncan, J., and S. Pascucci. 2017. Mapping the organisational forms of alternative food networks: Implications for transition. *Sociologia Ruralis* 57 (3): 316–339. <https://doi.org/10.1111/soru.12167>.
- Duncan, J., F. DeClerck, A. Baldi, S. Treyer, J. Aschemann-Witzel, K. Cuhls, L. Ahrné, S. Bisoffi, S. Grando, L. Guobys, J. Kohl, H.O. Hansen, R.L. Hudson, H.J. Lutzeyer, V.H. Nielsen, B. Ruiz, E. Saggau, E. Valceschini, G. Siebielec, and G. Brunori. 2022. Democratic directionality for transformative food systems research. *Nature Food* 3: 183–186. <https://doi.org/10.1038/s43016-022-00479-x>.
- Echeverría, R., V. Moreira, J. Barrena, and M. Gopinath. 2012. A characterization of Chilean farmers based on their market-production orientation. *Ciencia e Investigación Agraria* 39 (2): 255–264. <https://doi.org/10.4067/s0718-16202012000200002>.
- Eguillor, P. 2022. Estudio de caracterización de la agricultura orgánica en Chile y la Unión Europea. https://www.eeas.europa.eu/node/422499_en?s=192. Accessed 31 May 2023.
- EU and CONICYT. 2007. The fruit sector in Chile: research capabilities and science & technology development areas. http://www.conicyt.cl/documentos/dri/ue/Frutic_Fruit_BD.pdf. Accessed 31 May 2023.
- Eyhorn, F., A. Muller, J.P. Reganold, E. Frison, H.R. Herren, L. Lutikholt, A. Mueller, J. Sanders, N. El-Hage Scialabba, V. Seufert, and P. Smith. 2019. Sustainability in global agriculture driven by organic farming. *Nature Sustainability* 2: 253–255. <https://doi.org/10.1038/s41893-019-0266-6>.
- Fanzo, J., L. Haddad, R. McLaren, Q. Marshall, C. Davis, A. Herforth, A. Jones, T. Beal, D. Tschirley, A. Bellows, L. Miachon, Y. Gu,

- M. Bloem, and A. Kapuria. 2020. The food systems dashboard is a new tool to inform better food policy. *Nature Food* 1: 243–246. <https://doi.org/10.1038/s43016-020-0077-y>.
- FIA. 2017. *Canales de comercialización alternativos para el desarrollo del mercado nacional de productos agrícolas orgánicos*. Chile: Santiago.
- Fouilleux, E., and A. Loconto. 2017. Voluntary standards, certification, and accreditation in the global organic agriculture field: A tripartite model of techno-politics. *Agriculture and Human Values* 34: 1–14. <https://doi.org/10.1007/s10460-016-9686-3>.
- Gaitán-Cremaschi, D., L. Klerkx, J. Duncan, J.H. Trienekens, C. Huenchuleo, S. Dogliotti, M.E. Contesse, F.J. Benitez-Altuna, and W.A.H. Rossing. 2020. Sustainability transition pathways through ecological intensification: an assessment of vegetable food systems in Chile. *International Journal of Agricultural Sustainability* 18 (2): 1–20. <https://doi.org/10.1080/14735903.2020.1722561>.
- Gao, H., H. Park, and A. Sakashita. 2017. Conventionalization of organic agriculture in China: a case study of Haobao organic agricultural company in Yunnan province. *Japanese Journal of Agricultural Economics* 19: 37–42. https://doi.org/10.18480/jjae.19.0_37.
- González, P. 2019. Efecto de los plaguicidas sobre la salud humana: Exposición e impactos. Asesoría Técnica Parlamentaria. Valparaíso, Chile. https://obtienearchivo.bcn.cl/obtienearchivo?id=repositorio/10221/26823/2/Efecto_de_los_plaguicidas_en_la_Salud.pdf. Accessed 5 June 2022.
- Guthman, J. 2004. Back to the land: The paradox of organic food standards. *Environment and Planning A* 36: 511–528. <https://doi.org/10.1068/a36104>.
- Guthman, J. 2005. *Agrarian dreams: The paradox of organic farming in California*. Berkeley: University of California Press.
- Haedicke, M. 2016. *Organizing organic: Conflict and compromise in an emerging market*. Standford: Standford University Press.
- Hayes, N., and R. Rajão. 2011. Competing institutional logics and sustainable development: The case of geographic information systems in Brazil's Amazon region. *Information Technology for Development* 17 (1): 4–23.
- HLPE. 2020. *Food security and nutrition: building a global narrative towards 2030*. Rome: HLPE.
- Hruschka, N., S. Kaufmann, and C.R. Vogl. 2021. The benefits and challenges of participating in participatory guarantee systems (PGS) initiatives following institutional formalization in Chile. *International Journal of Agricultural Sustainability* 20 (4): 393–407.
- IFOAM. 2017. Organic 3.0 for truly sustainable farming and consumption. A landmark document of the organic movement. IFOAM-International Federation of Organic Agriculture. <https://www.ifoam.bio/about-us/our-history-organic-30>. Accessed 15 Jan 2023.
- IPES Food. 2015. *The new science of sustainable food systems: overcoming barriers to food systems reform*. Brussels: IPES Food.
- Jensen, M. 2021. Transformación de los sistemas alimentarios en Chile. *Estudios Internacionales* 53 (199): 61–90. <https://doi.org/10.5354/0719-3769.2021.59273>.
- Kaltoft, P. 2001. Organic farming in late modernity: At the frontier of modernity or opposing modernity? *Sociologia Ruralis* 41 (1): 146–158. <https://doi.org/10.1111/1467-9523.00174>.
- Kay, C. 2002. Chile's neoliberal agrarian transformation and the peasantry. *Journal of Agrarian Change* 2 (4): 464–501. <https://doi.org/10.1111/1471-0366.00043>.
- Kivimaa, P., and F. Kern. 2016. Creative destruction or mere niche support? Innovation policy mixes for sustainability transitions. *Research Policy* 45: 205–217. <https://doi.org/10.1016/j.respol.2015.09.008>.
- Klonsky, K., and C. Greene. 2005. Widespread adoption of organic agriculture in the US: Are market-driven policies enough? In *Agricultural and Applied Economics Association Annual Meeting*. Providence, RI.
- Kuokkanen, A., M. Mikkilä, M. Kuisma, H. Kahiluoto, and L. Linnanen. 2017. The need for policy to address the food system lock-in: A case study of the Finnish context. *Journal of Cleaner Production* 140: 933–944. <https://doi.org/10.1016/j.jclepro.2016.06.171>.
- Lajoie-O'Malley, A., K. Bronson, S. van der Burg, and L. Klerkx. 2020. The future(s) of digital agriculture and sustainable food systems: An analysis of high-level policy documents. *Ecosystem Services* 45: 101183. <https://doi.org/10.1016/j.ecoser.2020.101183>.
- Lamine, C., C. Schmitt, J. Palm, F. Derbez, and P. Petersen. 2021. How policy instruments may favour an articulation between open ended and deterministic perspectives to support agroecological transitions? Insights from a franco-brazilian comparison. In *Agroecology transitions, between determinist and open-ended visions*, ed. C. Lamine, D. Magda, M. Rivera-Ferre, and T. Marsden, 129–151. Brussels: Peter Lang.
- Leeuwis, C., B.K. Boogaard, and K. Atta-Krah. 2021. How food systems change (or not): Governance implications for system transformation processes. *Food Security* 13: 761–780. <https://doi.org/10.1007/s12571-021-01178-4>.
- Legun, K. 2011. Cultivating institutions: Organic agriculture and integrative economic choice. *Society and Natural Resources* 24: 455–468. <https://doi.org/10.1080/08941920903002560>.
- Lehtimäki, T., and M.J. Virtanen. 2020. Shaping values and economics: Tensions and compromises in the institutionalization of organic agriculture in Finland (1991–2015). *Journal of Rural Studies* 80: 149–159. <https://doi.org/10.1016/j.jrurstud.2020.08.023>.
- Lynggaard, K.S.C. 2001. The farmer within an institutional environment. Comparing Danish and Belgian organic farming. *Sociologia Ruralis* 41 (1): 85–111. <https://doi.org/10.1111/1467-9523.00171>.
- MacRae, R.J., B. Frick, and R.C. Martin. 2007. Economic and social impacts of organic production systems. *Canadian Journal of Plant Science* 87: 1037–1044.
- Mars, M.M., and H.J. Schau. 2017. Institutional entrepreneurship and the negotiation and blending of multiple logics in the Southern Arizona local food system. *Agriculture and Human Values* 34: 407–422. <https://doi.org/10.1007/s10460-016-9722-3>.
- Martínez, H., M. Namdar-Irani, and C. Saa. 2017. Las políticas de fomento a la agroecología en Chile. In *Políticas públicas a favor de la agroecología en América Latina y El Caribe*, ed. E. Sabourin, J.F. Le Coq, C. Schmitt, M. Avila, M. M. Patrouilleau, and P. Niederle, 123–156. Porto Alegre: Red PP-AL, FAO.
- Maughan, C., C. Anderson, and M. Kneafsey. 2020. A five-point framework for reading for social justice: A case study of food policy discourse in the context of Brexit Britain. *Journal of Agriculture, Food Systems, and Community Development* 9 (3): 1–20. <https://doi.org/10.5304/jafscd.2020.093.024>.
- McDonnell, P. R., and M. A. Yáñez. 2008. *Alimentos orgánicos: ¿Qué es lo que busca el consumidor verde?* MSc Thesis, Departamento de Administración, Facultad de Economía y Negocios. Universidad de Chile. <https://repositorio.uchile.cl/handle/2250/108469>. Accessed 20 June 2022.
- Melo, O., N.B. Quiñones, and D. Acuña. 2021. Towards sustainable agriculture in Chile, reflections on the role of public policy. *International Journal of Agriculture and Natural Resources* 48 (3): 186–209. <https://doi.org/10.7764/ijanr.v48i3.2359>.
- Mercado, G., C.N. Hjørtsø, and B. Honig. 2018. Decoupling from international food safety standards: How small-scale indigenous farmers cope with conflicting institutions to ensure

- market participation. *Agriculture and Human Values* 35: 651–669. <https://doi.org/10.1007/s10460-018-9860-x>.
- Michelsen, J. 2001a. Recent development and political acceptance of organic farming in Europe. *Sociologia Ruralis* 41 (1): 3–20.
- Michelsen, J. 2001b. Organic farming in a regulatory perspective. The Danish case. *Sociologia Ruralis* 41 (1): 62–84.
- Mier y Teran Gimenez Cacho, M., O.F. Giraldo, M. Aldasoro, H. Morales, B.G. Ferguson, P. Rosset, A. Khadse, and C. Campos. 2018. Bringing agroecology to scale: key drivers and emblematic cases. *Agroecology and Sustainable Food Systems* 42 (6): 637–665. <https://doi.org/10.1080/21683565.2018.1443313>.
- Migliorini, P., and A. Wezel. 2017. Converging and diverging principles and practices of organic agriculture regulations and agroecology. A review. *Agronomy for Sustainable Development*. <https://doi.org/10.1007/s13593-017-0472-4>.
- Miles, M.B., and A.M. Huberman. 1994. *Qualitative data analysis. An expanded Sourcebook*, 2nd ed. Thousand Oaks: SAGE Publications Ltd.
- Millaleo, R., C. Montecinos, R. Rubio, A. Contreras, and F. Borie. 2006. Efecto de la adición de compost sobre propágulos micorrízicos arbusculares en un suelo volcánico del centro sur de Chile. *Revista De La Ciencia Del Suelo y Nutrición Vegetal* 6 (3): 26–39.
- Muñoz-Quezada, M.T., V. Iglesias, B. Lucero, K. Steenland, D.B. Barr, K. Levy, P. Barry Ryan, S. Alvarado, and C. Concha. 2012. Predictors of exposure to organophosphate pesticides in schoolchildren in the Province of Talca, Chile. *Environment International* 47: 28–36. <https://doi.org/10.1016/j.envint.2012.06.002>.
- Muñoz-Saez, A., and L.L.R. Renwick. 2022. Agricultural sustainability in Chile's proposed new constitution. *Nature*. <https://doi.org/10.1038/d41586-022-02320-8>.
- Murray, W.E. 1999. Local responses to global restructuring in the Chilean fruit complex. *European Review of Latin American and Caribbean Studies* 66: 19–38.
- Nicholls, C.I., and M.A. Altieri. 2018. Pathways for the amplification of agroecology. *Agroecology and Sustainable Food Systems* 42 (10): 1170–1193. <https://doi.org/10.1080/21683565.2018.1499578>.
- Niederle, P., A. Loconto, S. Lemeilleur, and C. Dorville. 2020. Social movements and institutional change in organic food markets: Evidence from participatory guarantee systems in Brazil and France. *Journal of Rural Studies* 78: 282–291. <https://doi.org/10.1016/j.jrurstud.2020.06.011>.
- Nikol, L.J., and K. Jansen. 2021. Rethinking conventionalisation: A view from organic agriculture in the Global South. *Journal of Rural Studies* 86: 420–429. <https://doi.org/10.1016/j.jrurstud.2021.07.001>.
- North, D.C. 1990. *Institutions, institutional change and economic performance. Individuals, institutions, and markets*. Cambridge: Cambridge University Press.
- ODEPA. 2011. Propuesta de plan estratégico para la agricultura orgánica Chilena 2010–2020. <https://www.odepa.gob.cl/publicaciones/documentos-e-informes/propuesta-de-plan-estrategico-para-la-agricultura-organica-chilena-2010-2020-enero-de-2011>. Accessed 5 June 2022.
- ODEPA. 2019a. Panorama de la agricultura chilena. <https://www.odepa.gob.cl/wp-content/uploads/2019a/09/panorama2019aFinal.pdf>. Accessed 5 June 2022.
- ODEPA. 2019b. Caracterización de la cadena nacional de productos orgánicos. <https://www.odepa.gob.cl/publicaciones/documentos-e-informes/informe-caracterizacion-de-la-cadena-nacional-de-productos-organicos>. Accessed 5 June 2022.
- ODEPA. 2021. Agricultura Orgánica: Información actualizada del sector. <https://bibliotecadigital.odepa.gob.cl/bitstream/handle/20500.12650/71235/ArtAgriculturaOrganica122021.pdf>. Accessed 20 May 2022.
- Osei-Amponsah, C., A. van Paassen, and L. Klerkx. 2018. Diagnosing institutional logics in partnerships and how they evolve through institutional bricolage: Insights from soybean and cassava value chains in Ghana. *NJAS Wageningen Journal of Life Sciences* 84: 13–26. <https://doi.org/10.1016/j.njas.2017.10.005>.
- Pel, B. 2016. Trojan horses in transitions: A dialectical perspective on innovation capture. *Journal of Environmental Policy and Planning* 18 (5): 673–691. <https://doi.org/10.1080/1523908X.2015.1090903>.
- Poméon, T., E. Fouilleux, S. Lemeilleur, and A. Loconto. 2018. Organic farming in France: an alternative project or conventionalisation? In *Ecology, capitalism and the new agricultural economy: the second Great Transformation*, ed. G. Allaire and B. Daviron, 207–226. London: Routledge.
- Prihtanti, T.M., S. Hardyastuti, S. Hartono, and S. Irham. 2014. Social-cultural functions of rice farming systems. *Asian Journal of Agriculture and Rural Development Journal* 4 (5): 341–351.
- Reay, T., and C.R. Hinings. 2009. Managing the rivalry of competing institutional logics. *Organization Studies* 30 (6): 629–652. <https://doi.org/10.1177/0170840609104803>.
- Reay, T., and C. Jones. 2016. Qualitatively capturing institutional logics. *Strategic Organization* 14 (4): 441–454. <https://doi.org/10.1177/1476127015589981>.
- Reganold, J.P., and J.M. Wachter. 2016. Organic agriculture in the twenty-first century. *Nature Plants* 2: 15221. <https://doi.org/10.1038/nplants.2015.221>.
- Ríos, S., and G. Torres. 2014. El sector agropecuario en la región de Los Lagos y el paradigma “Chile potencia alimentaria”: Desafíos para la política agraria nacional. *Mundo Agrario: Revista De Estudios Rurales* 15 (29): 1515–5994.
- Rogge, K.S., and K. Reichardt. 2016. Policy mixes for sustainability transitions: An extended concept and framework for analysis. *Research Policy* 45: 1620–1635. <https://doi.org/10.1016/j.respol.2016.04.004>.
- Rossing, W.A.H., A.G. Kormelinck, F. Alliaume, S. Dogliotti, J. Duncan, C. Huenchuleo, L. Klerkx, J. Trienekens, and D. Gaitán-Cremaschi. 2020. Transitioning to the safe and just space inside ‘the doughnut’ by means of agroecological niche food systems: Insights from Chile and Uruguay. *International Journal of Agriculture and Natural Resources* 47 (3): 295–311. <https://doi.org/10.7764/ijanr.v47i3.2258>.
- SAG. 2019. Sistema nacional de certificación de productos orgánicos agrícolas. Ley N° 20.089. https://www.sag.gob.cl/sites/default/files/sist_nac_cert_prod_organicos.pdf. Accessed 31 May 2023.
- Sarabia, N., and J. Peris. 2021. Socio-technical regimes to understand grassroots innovations and natural capital in Chile. In *Social innovation in Latin America: Maintaining and restoring social and natural capital*, ed. S. Calvo and A. Morales Pachón. London: Routledge.
- Schiller, K., W. Godek, L. Klerkx, and P.M. Poortvliet. 2019. Nicaragua's agroecological transition: Transformation or reconfiguration of the agri-food regime? *Agroecology and Sustainable Food Systems* 44 (5): 611–628. <https://doi.org/10.1080/21683565.2019.1667939>.
- Schwindenhammer, S. 2017. Global organic agriculture policy-making through standards as an organizational field: When institutional dynamics meet entrepreneurs. *Journal of European Public Policy* 24 (11): 1678–1697. <https://doi.org/10.1080/13501763.2017.1334086>.
- Scoones, I., P. Newell, and M. Leach. 2015. The politics of green transformations. In *The politics of green transformations*, ed. I. Scoones, M. Leach, and P. Newell, 1–25. London: Routledge.

- Seufert, V., and N. Ramankutty. 2017. Many shades of gray—the context-dependent performance of organic agriculture. *Science Advances* 3: e1602638. <https://doi.org/10.1126/sciadv.1602638>.
- Slater, S., P. Baker, and M. Lawrence. 2022. An analysis of the transformative potential of major food system report recommendations. *Global Food Security* 32: 100610. <https://doi.org/10.1016/j.gfs.2022.100610>.
- Smink, M., S.O. Negro, E. Niesten, and M.P. Hekkert. 2015. How mismatching institutional logics hinder niche-regime interaction and how boundary spanners intervene. *Technological Forecasting and Social Change* 100: 225–237. <https://doi.org/10.1016/j.techfore.2015.07.004>.
- Thornton, P.H., W. Ocasio, and M. Lounsbury. 2012. *The institutional logics perspective. A new approach to culture, structure, and process*. Oxford: Oxford University Press.
- Tomlinson, I. 2008. Re-thinking the transformation of organics: The role of the UK government in shaping British organic food and farming. *Sociologia Ruralis* 48 (2): 133–151. <https://doi.org/10.1111/j.1467-9523.2008.00457.x>.
- Torres, R., G. Azócar, J. Rojas, A. Montecinos, and P. Paredes. 2015. Vulnerability and resistance to neoliberal environmental changes: An assessment of agriculture and forestry in the Biobio region of Chile (1974–2014). *Geoforum* 60: 107–122. <https://doi.org/10.1016/j.geoforum.2014.12.013>.
- Tovey, H. 1997. Food, environmentalism and rural sociology: On the organic farming movement in Ireland. *Sociologia Ruralis* 37 (1): 21–37. <https://doi.org/10.1111/1467-9523.00034>.
- UNCTAD. 2008. *Best practices for organic policy: What developing country Governments can do to promote the organic agriculture sector*. New York and Geneva: UNCTAD.
- Vanloqueren, G., and P.V. Baret. 2009. How agricultural research systems shape a technological regime that develops genetic engineering but locks out agroecological innovations. *Research Policy* 38: 971–983. <https://doi.org/10.1016/j.respol.2009.02.008>.
- Veldstra, M.D., C.E. Alexander, and M.I. Marshall. 2014. To certify or not to certify? Separating the organic production and certification decisions. *Food Policy* 49 (2): 429–436. <https://doi.org/10.1016/j.foodpol.2014.05.010>.
- von Meyer-Höfer, M., E.O. Jaik, and S. Lakner. 2015. Organic food consumption in Chile. In *Understanding the agricultural sector in Latin America: Results from the Chilean German academic cooperation*, ed. A. Engler, J. Diaz, R. Valdes, S. von Cramon-Taubadel, and S. Lakner, 174–188. Talca: Ediciones Universidad de Talca.
- Webb, P., T.G. Benton, J. Beddington, D. Flynn, N.M. Kelly, and S.M. Thomas. 2020. The urgency of food system transformation is now irrefutable. *Nature Food*. <https://doi.org/10.1038/s43016-020-00161-0>.
- Wezel, A., M. Goris, J. Bruil, G.F. Félix, A. Peeters, P. Bárberi, S. Bellon, and P. Migliorini. 2018. Challenges and action points to amplify agroecology in Europe. *Sustainability* 10: 1598. <https://doi.org/10.3390/su10051598>.
- Wooten, M., and A.J. Hoffman. 2016. Organizational fields past, present and future. In *The SAGE handbook of organizational institutionalism*, ed. R. Greenwood, C. Oliver, K. Sahlin, and R. Suddaby, 130–148. London: SAGE Publications.
- Zúñiga-Venegas, L., C. Saracini, F. Pancetti, M.T. Muñoz-Quezada, B. Lucero, C. Foerster, and S. Cortés. 2021. Exposición a plaguicidas en Chile y salud poblacional: Urgencia para la toma de decisiones. *Gaceta Sanitaria* 35 (5): 480–487. <https://doi.org/10.1016/j.gaceta.2020.04.020>.
- Zurek, M., A. Hebinck, and O. Selomane. 2021. Looking across diverse food system futures: Implications for climate change and the environment. *Q Open* 1: 1–39. <https://doi.org/10.1093/qopen/qa001>.

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