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Participatory certifications for the sustainability transition of food systems in Costa Rica: barriers and opportunities for scaling out

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ABSTRACT

Participatory certifications for organic production are proliferating around the world, especially in India and Latin America. Costa Rica is one of the Latin American countries that recognizes Participatory Guarantee Systems (PGS) by law although, so far, only few such types of certifications exist in the country. PGS schemes for promoting organic agriculture can be especially important for the vegetable sector of Costa Rica given the historically large use of agrochemicals in conventional (fruits and vegetables) production and its environmental and public health consequences. In this article, we use transition theory and the Multi-Level Perspective to analyze PGS for organic vegetables as a niche with a potential for but facing barriers to scaling out. Our literature review, supported by field surveys and observations, revealed different social and institutional barriers characterizing the niche–regime interactions which foster, or at times hamper, the scalability of PGS. Examples from other countries like Brazil and Mexico helped shed light on potential future paths for PGS in Costa Rica. Our results suggest that current institutional recognition of PGS might support scaling out if a more flexible legislative framework is implemented and political and technical support provided to participatory certification initiatives is increased.

KEYWORDS

Participatory certifications; transition theory; barriers; scaling; alternative food systems

Introduction

The current (global) food system relies largely on a model of industrialized agriculture (Rosin, Stock, and Campbell 2012) which has heavy environmental and public health impacts (Altieri and Toledo 2011). As alternatives to this agricultural model, many initiatives call for and/or have promoted smaller-scale models of organic agricultural production (Rosin, Stock, and Campbell 2012; Sabourin et al. 2018). The certification and associated trade of organic food products have grown significantly in northern countries (Raynolds 2004) and, more recently, in the global south (Willer and Lernoud 2019) as a means to assure consumers that the products they buy have been produced with

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environmentally friendly and healthy production practices. During this growth, certification initiatives transitioned from voluntary schemes in which producers act as peers for each other (i.e., first-party certification) (Nelson et al. 2010) to a more complex scheme with a Third Party Certification (TPC). Under this scheme, a third party guarantees consumers on the compliance of organic producers with a pre-defined standard by verifying that producers follow the principles and Family of Standards (FoS) of the International Federation of Organic Agriculture Movements (IFOAM), of specific (national) legislations, or of other private sectors' standards (Nelson et al. 2010; Nigh and Gonzalez 2005; Sabourin et al. 2018). Despite the diffusion and wide acceptance of different TPCs worldwide, some scholars have questioned them for fundamentally maintaining the characteristics of conventional food trade at the global scale (Boza Martínez 2013; Sabourin et al. 2018) and perpetrating its injustice by imposing standards that, being costly, lengthy and not tailored to local contexts, tend to exclude small-scale farmers especially of developing countries (Fighting 2015; Nelson et al. 2010; Nigh and Gonzalez 2005).

As an alternative certification scheme, sustainable agriculture initiatives around the world have started to promote Participatory Guarantee Systems (PGS) (or participatory certifications) (Nelson et al. 2010; Torremocha 2011) defined by IFOAM – Organics International as “locally focused quality assurance systems that certify producers based on active participation of stakeholders and are built on a foundation of trust, social networks and knowledge exchange” (Participatory Guarantee Systems (PGS) 2019). A core feature of PGS mechanisms is their embeddedness in local contexts. As such, scholars argue that they are an alternative food network that triggers empowerment of small-scale producers and local communities and stimulates an alternative food supply chain and consumption by facilitating consumers' access to local products (Coscarello and Rodríguez-Labajos 2015; Gueguen et al. 2016; Torremocha 2011, 2012).

According to IFOAM – Organics International, Latin America is the region with the highest amount of operational PGS initiatives (Willer and Lernoud 2019) with Brazil and Mexico being the most studied by scholars (Boza Martínez 2013; Fonseca et al. 2008; Gueguen et al. 2016; Kaufmann and Vogl 2018; Nelson et al. 2010; Sacchi, Caputo, and Nayga 2015; Zanasi et al. 2009). Brazil is a pioneer country also for having formalized the recognition of PGS at a national level promoting its institutional acceptance and flexibility to adapt to local contexts for certification. Similarly, Mexico legally recognized PGS as a certification system for national organic production (Bara et al. 2018; Gueguen et al. 2016; Nelson et al. 2010; Suarez 2014).

Although several studies highlighted the positive outcomes and implications of PGS (Binder and Vogl 2018; Hirata et al. 2019; Home et al. 2017; Nelson et al. 2010; Sacchi 2019; Torremocha 2011, 2012; Zanasi et al. 2009),

few have focused on the shortcomings and the challenges that PGS face in Latin America (Bara et al. 2018; Binder and Vogl 2018; Gueguen et al. 2016; Kaufmann and Vogl 2018), such as uneven participation of stakeholders, internal organization issues, and social conflict among producers. Moreover, no such study has been done on Central America, a region among the largest users of agrochemicals (Galt 2008a) and where initial PGS experiences are being piloted to formalize their schemes in national legislations and to test their functioning at the local level. In this region, Costa Rica has pioneered the legal recognition of PGS through its Law for the Development, Promotion and Fostering of Organic Farming, 8591 (2007) and its Legislative Decree 35242 (2009). Although globally known as a “Green Republic” for its nature conservation efforts, its agriculture is highly dependent on pesticides which are used by 90% of its farms (Galt 2008b; Sabourin et al. 2018) and especially by its vegetable producers (Galt 2008a, 2008b), making the country one of the largest pesticide users in Latin America.

The heavy use of pesticides for vegetables’ production does not only affect the health quality of its export products but also the one for its domestic markets (Galt 2008b, 2006) as certified organic agriculture accounts for only 0,5% of total agricultural land in the country (Willer and Lernoud 2019) of which only about 1% is devoted to vegetables production (Camacho et al. 2015; Willer and Lernoud 2019). Furthermore, most of the Third Party Certified (TPC) organic agriculture in the country is for export, with national consumption accounting for about 30% of the organic production (Mag 2013; Raynolds 2004). According to the Ministry of Agriculture and Livestock (MAG), the country has only seven operational PGS, five of which focus on vegetables (the last one being registered on November 2020) (Mag 2019). In this context, PGS represents a recent innovation that can be seen as a niche with potential to be adopted at a larger scale and, so, contribute to reduce environmental impacts of vegetable production and increase healthiness of vegetable food items available in the domestic market. It is not clear, though, which barriers these experimental innovations are facing to achieve a larger adoption in local markets and what lessons can be drawn from these initial steps in PGS promotion.

Understanding what barriers prevent scaling out of Costa Rican PGS can be important also because at least 10% of farms in the country are not yet so highly dependent on agrochemicals and can, thus, potentially adopt more easily the sustainable production practices required to enter PGS certification.

Thus, by studying the potential barriers to scaling out of PGS, this contributes to the literature that aims to inform efforts to expand PGS as a tool for achieving a more sustainable food system. The concept of scaling out refers to an increase of the niche’s number and dimension, gaining recognition and institutional attention. The concept of barriers in this study refers to the issues

and difficulties faced by farmers and stakeholders in designing, building and/or implementing PGS initiatives as experienced by actors currently engaged in PGS initiatives or those potentially willing to engage and support them (31,35).

The paper begins by delineating the main research problem framing PGS as a niche innovation facing barriers to scaling out and providing support to a sustainable food system's transition. Then, the methods section introduces the steps to gather data combining literature analysis and field research to assess the barriers. In the results section, we use graphical aids to show the barriers to diffusion of PGS in Costa Rica, and then discuss our results against the findings of studies in Mexico and Brazil to highlight lessons to overcome these barriers to promote PGS schemes to contribute to sustainable food systems transitions in Latin America.

PGS as a niche in transition

The current experimental nature of PGS implementation in Costa Rica suggests it can be considered as an innovation niche that has potential to be scaled out especially in response to the increasing demand for environmental and healthy products. However, the possible expansion of these locally embedded initiatives would need to happen in a context where conventional agrochemical-intensive agriculture is supported by well-rooted dominant stakeholders and institutions. To analyze this dynamic interaction and barriers to expand adoption of niche innovation, we use the conceptual lens provided by the Multi-level Perspective (MLP) proposed by Transition theory. This allows us to look at the barriers that hamper PGS scaling out through the analysis of “the more or less organized processes of change” that accompanies the emergence of new technologies (Avelino and Wittmayer, 2016; Darnhofer 2014a; Elzen, Geels, and Green 2004; Geels 2002, 2019), but also more recently applied to the analysis of sustainability transitions in agriculture and food systems (Brunori, Rossi, and Malandrini 2011; Costa Rica: and Report 2011; Darnhofer 2014b; Dumont, Gasselin, and Baret 2020; Elzen, Geels, and Green 2004; Gaitán-Cremaschi et al. 2019; Geels 2011; Levidow 2015; Smith 2006; Spaargaren, Oosterveer, and Loeber 2012b).

The MLP suggests to look at the dynamics of societal change analyzing the interaction among three levels, namely the landscape, the regime, and the niches (Avelino and Wittmayer, 2016). The landscape consists of “heterogeneous, slow-changing factors, such as cultural and normative values, broad political coalitions, long-term economic development, accumulating environmental problems growth, emigration” as well as sudden shocks in the wider system. It is external to and not controllable by the other two levels and can put pressures on the other levels so to open opportunities for change and larger adoption of niche innovations (Avelino and Wittmayer, 2016). For instance, the current environmental degradation and health issues due to the

conventional vegetables food system increasingly acknowledged by media and consumers exert pressure on the conventional food regime by increasing the demand for healthier food products in the domestic market (El Bilali et al. 2019).

The regime comprises “a cluster of elements, including technology, regulations, user practices and markets, cultural meanings, maintenance networks and supply networks” (Avelino and Wittmayer, 2016). It includes different social groups that interact on multiple institutional dimensions, such as knowledge, regulations, culture, markets to thrive to stabilize the status quo (e.g. current conventional production and consumption) (Dumont, Gasselin, and Baret 2020). The third level is the niche (e.g., technological innovations and/or new ways of doing (Costa Rica: and Report 2011)) as a protected space where radical novelties and innovative social networks develop (Avelino and Wittmayer, 2016). This can be the case of alternative food networks or other hotspots of innovations within the food regime (Bui et al. 2016; Darnhofer 2014b; Geels and Schot 2007).

Interactions among niches, regimes, and landscape can develop through an extended period of time and shape trajectories that can alter or keep stabilizing the incumbent regime (Avelino and Wittmayer, 2016). Historical processes, internal and external events at landscape and regime level can create a window of opportunity for niches (Avelino and Wittmayer, 2016; Geels 2002) in the presence of which two broadly defined pathways might be possible. On the one hand, niches might be incorporated into the regime risking to lose their core, most radical, elements and undergo a process of mainstreaming (Spaargaren, Oosterveer, and Loeber 2012b). On the other hand, they might radically influence the dominant food system, for example, “by turning consumer-citizens into new consumer segments” (Darnhofer 2014b) and altering the current food production-consumption regime taking advantage of pressures and changes happening at the landscape level (e.g., increasing demand for healthier products) (Saldana 2016).

The process of change from the current regime (i.e., conventional food production-consumption) to a more sustainable one can face different types of barriers (e.g., related to resistance due to regime’ lock-ins; (Geels and Schot 2007)). Barriers can be related to internal struggles of the groups, as organizational issues and uneven participation from the members, or external factors, such as political or regulatory bottlenecks and narratives.

Methods

We used three methodological steps. **First**, we revised both academic papers and gray literature available online to characterize national trends of food and agricultural systems in Costa Rica, and the emergence of PGS innovations.

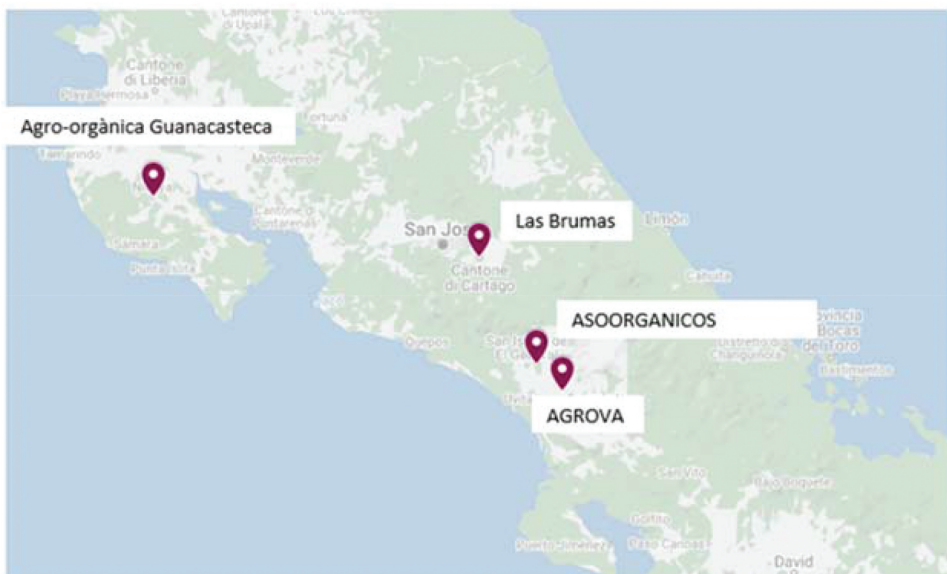


Figure 1. Participatory Guarantee Systems (PGS) initiatives focusing on vegetables production in Costa Rica: Asociación Agro-orgànica Guanacasteca, Asociación de Productores Organicos Las Brumas, Agroecológica del Valle and Asociación de Productores Organicos de la Región Brunca (Mag 2019). They will be referred to as Agro-orgànica Guanacasteca, Las Brumas, AGROVA and ASOORGANICOS respectively. Source: Google Maps.

In the **second step**, during November and December 2019 we ran interviews with key informants in Costa Rica and identified four PGS located in different part of the country (Figure 1) focusing on vegetables production (Mag 2019).

Field data collection method

For the second step, we used semi-structured interviews and participant and non-participant observations. Semi-structured interviews were used to maintain flexibility, adaptability, and openness on the gathered information (Bernard 2017). The interviews were held in Spanish with actors and organizations within and outside PGS initiatives for vegetables production and were of two types: formal or informal. The former were voice recorded and their duration ranged from 45 min to 3 h. The latter were non-recorded and shorter, lasting from 10 to 45 min. For the analysis of data, we kept anonymity and used codes identifying interviewees' roles with acronyms (i.e., PRO as producer, CONS as consumer, EXP as expert).

Externally to the PGS, we interviewed experts whose opinion and expertise in the agricultural, organic and/or PGS schemes helped shape the research and adapt the interviews to the Costa Rican context. We so embedded the research design with a better understanding of the national functioning of organic

agriculture, regulations, market coordination of PGS groups, education and training. These experts included experts from the MAG and Phytosanitary Service (SFE) including the Department of Organic Agriculture, that of Agro-environmental production, that of Extension Offices and the Auditing and Registration Unit for Organic Agriculture (ARAO). In order to include experts on PGS product distribution and vending we interviewed a representative of the *Feria Verde* food market as a key civil society actor. In addition, we also interviewed representatives of the academia (i.e., State Distance University – UNED), a Law student part of the Legislative Assembly and a member of the Certification Body Eco-LOGICA.

The interviews to actors within the PGS targeted the four selected cases to gather information about the PGS (e.g., number of people involved, date of formation, points of sale, and motivations) and focused on uncovering the barriers related to agency and structure. We interviewed the active members of PGS which were mainly producers and asked them to suggest contacts of consumers that were member of the PGS and whom we could interview. As shown in Table 1, we ended up with significantly more interviews to producers than consumers as producers suggested very limited number of consumers member of their PGS. This reflected the structure and functioning of these PGS in the country (Table 1) and prompted us, in addition to the limited number of consumers formally in the PGS, to search for, and interview, (informal) consumers of PGS products directly in the food markets, as they were not formally member of the PGS group.

Participant and non-participant observations complementing the interviews' data (Boeije 2010; Corbetta 2011) focused on noticing different aspects of producers' and consumers' interactions in organic markets, and of participants in the national meeting of the National Movement of Organic Agriculture (MAOCO) and in one PGS workshop (Table 1). Visits to markets highlighted the type of sale as well as the PGS products found there (if any)

Table 1. Composition of semi-structured interviews and non-participant observations.

Semi-structured interviews							
<i>Experts (EXP)</i>		<i>Producers (PR)</i>		<i>Consumers (CONS)</i>			
Formal	Informal	Formal	Informal	Formal	Informal	Formal	Informal
8	3	13	3	1		4	
Observations							
				Participant		Non-participant	
<i>Feria Verde de Aranjuez</i>						v	
<i>Feria Organica del Trueque</i>						v	
<i>Feria Organica de ASOORGANICOS</i>				v			
<i>Feria General del Agricultor</i>						v	
<i>Feria Azul</i>				v			
<i>Mercadito Azul</i>						v	
<i>Organic Agriculture Movement (MAOCO) meeting</i>				v			
<i>State Distance University (UNED) workshop at Guanacasteca</i>				v			

and helped understand the interactions between PGS producers and non-PGS consumers, such as whether the PGS groups were known among consumers attending the markets and if consumers purposefully bought the products there. The markets visits entailed either a participant or non-participant observation depending on the conditions in which they took place. Thus, observations were participant when the researcher's role was well known among producers and consumers, for example, when a market was visited with the assistance of a PGS member (as in the Feria Organica de ASOORGANICOS) (Corbetta 2011). On the contrary, non-participant observations were conducted when the researcher's role was covert, allowing for the observation of spontaneous behavior (Meirelles 2012). This occurred in the visit to the *Mercadito Azul* in Cartago city.

Finally, participant observations during the MAOCO meeting and the PGS workshop helped gain a deeper understanding of the barriers that participatory certifications and the national organic-sector face in Costa Rica. The MAOCO meeting was useful as many PGS actors were present at the meeting and expressed the needs of PGS and organic sector as a whole, while the workshop was useful to observe the interactions and the management of the PGS initiative. Interviews and observations gave an overview of the main actors and organizations in the Costa Rican PGS initiatives. Moreover, they helped categorize and refine the type of barriers for the PGS scaling out and the niche–regime interactions.

Data analysis

For the **third step**, we implemented a content analysis using ATLAS.ti 8 software package. A code, defined as “a word or short phrase that symbolically assigns a summative, salient, essence-capturing and/or evocative attribute” to the data (in our case, transcripts and field notes) helps identify patterns (Bryman 2012). We first coded general categories of barriers mentioned in relation to the internal PGS schemes' functioning or to the external context surrounding them (i.e., cultural and regulatory aspects). Then, we identified, within these general categories, sub-codes that identified more specific barriers. Coding was useful also to characterize niche–regime interactions that could either support or hinder PGS scaling out.

Functioning of PGS scheme in Costa Rica

The figure below illustrates the actors and their inter-relation to achieve the PGS certification (Figure 2).

As shown in Figure 2, PGS are affected by institutions, such as formal and informal norms, regulations, cultural attitudes, and narratives. Consumers and producers, bonded by a relationship of trust (showed in

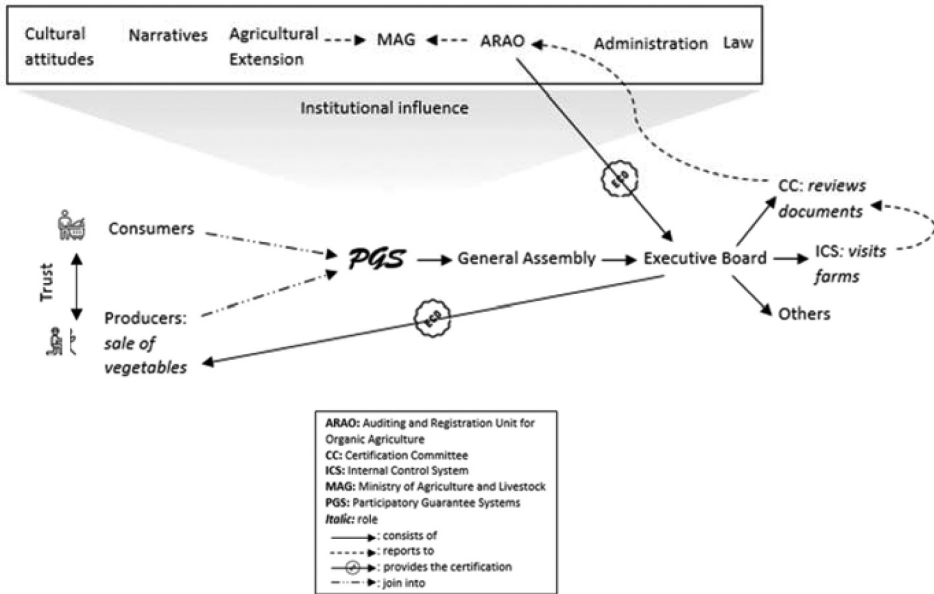


Figure 2. Functioning of a PGS in Costa Rica and representation of the supply chain from farm to fork.

the figure as a line with no arrow heads, highlighting the reciprocity of trust), are part of a PGS. They gather periodically in the General Assembly. Members of the Assembly are all the associates and an Executive Board. The Board consists of subgroups with different roles: most commonly secretary, treasurer, prosecutor, Internal Control System (ICS) and Certification Committee (CC). The ICS consists of at least two people and conducts farm visits and inspections. The CC revises the information provided by the ICS and sends it to the Auditing and Registration Unit for Organic Agriculture (ARAO). ARAO audits the PGS and provides the yearly organic certification to the group. Certified producers can then sell their organic vegetables in the national market. PGS initiatives consist of an Executive Board, which is ruled by a President, Vice-President, Secretary, Treasurer, Prosecutor and two certification bodies. Such certification bodies are the Internal Control System (ICS) and the Certification Committee (CC). Either one or both the ICS and the CC should include one, or more, consumer(s). The Prosecutor ensures that the group is complying with the national regulations as well as internal PGS ones. The sale of PGS products is most of the times independently conducted by farmers rather than by the PGS group as a whole. However, the field research highlighted some exceptions, such as the PGS ASOORGANICOS which purposefully created a Cooperative (COOPEORGANICOS) for the commercialization of the groups' products.

Results

The field research highlighted the existence of barriers that are internal or external to the functioning of PGS groups. Interviews and observations contributed to the delineation of such barriers as well as to the understanding of the type of niche–regime interactions, which help frame PGS as a niche in transition.

*Interviewees mentioned several **internal barriers** including diverging motivations for belonging to a PGS, issues of organization, lack of even participation and trust. An identified internal barrier to the development and growth of PGS is that the underlying **motivation** for being part of a PGS differs according to each member. This can be a barrier when PGS members dissent on the reason for engaging with the group and on how it should be managed. More specifically, some PGS members join the group because of the **lower financial costs** compared to third-party certification. Others, because they want to improve their sales by **accessing the national organic Market**, as evident in the quotation:*

We pay. And if I pay for self-consumption, this is everyone's choice. But . . . I mean, in my point of view, this does not make sense. Do you understand? Why does someone certify his/her farm? To access a Market. Why does someone adopt the participatory certification? To access a Market with a group that supports you and ensures that you are producing organically. Otherwise, what is the point? (PR02).

On the other hand, some members join a PGS to be part of a group, stressing the value of **social embeddedness** of PGS. Concepts and values like grassroots empowerment, food sovereignty, and trust emerged throughout interviews with several members (EXP04; PR13). More specifically, these PGS producers valued the possibility to have the freedom to certify themselves without the need of a TPC body, at least when selling on the national Market (EXP05).

Diverging motivations for joining a PGS sometimes also led to different opinions on how a group should be managed and how interaction with other PGS should be conducted. An outstanding issue that emerged regarding this concerned the fact that in several PGS groups there is some lack of coordination in sales. Most of the times, there is no common sale's channel; hence, producers individually sell their produce without coordinating with other group members (PR04). Among the four PGS interviewed, only ASOORGANICOS commonly manages the sales of products through a Cooperative that is in charge of the commercialization and additional processing of products. According to some interviewees, this lack of organization in sales is at time related to low organizational skills among producers, as they have different backgrounds and goals. Some make a living out of the vegetables sales (PR12), while others mostly destine the products toward self-consumption (PR07; PR08).

Moreover, the internal organization of a PGS is such that all organizational issues are in the hands of a few members that is felt by other associates as uneven participation in decision-making (EXP06) and a potential cause of lack of commitment of several members to the PGS (EXP06; PR08).

The lack of internal organization within a PGS is reflected on a larger scale also in the lack of coordination among PGS groups and with the Government as reflected by a producer:

It seems to me that the participatory certification associations should not have their own agenda. They should try to have the same agendas as the national movement (of organic agriculture). But they don't . . . (PR02).

These organizational issues are also related to the level of perceived participation and trust among the groups' members, with differences being noticed between producers and consumers. The **participation of producers** varied according to the role taken in the PGS and to the group's internal regulations. Members of the Board of Directors tend to have an active role within the associations, while the others are less committed. According to interviewees, this depends on the internal regulation of the associations. If some require all members to participate in every group meeting, as ASOORGANICOS (PR12), others mostly rely on the members of the Board of Directors, as in AGROVA and Las Brumas (PR08; PR12; PR04). The **participation of consumers** is more limited compared to that of producers. According to interviewees, this can be explained by a lack of organization in sales as most PGS groups do not have a common, shared, point of sale, and consumers do not feel committed to the group because they might perceive this certification scheme as irrelevant for consumers (EXP05; PR01). Additionally, some PGS groups are producers-led and engage with an as small as possible number of consumers just to comply with the PGS regulation requiring a minimum of one consumer to be part of the group (Law 8591, 2007).

These organizational and engagement issues affect the level of trust perceived among PGS members as well. In this case, some interviewed PGS groups raised questions over the reliability of the members of the same group. For example, one interviewee reported that he knew that some producers were acting as middlemen by selling products from uncertified non-PGS producers to charge higher prices using the PGS certification (PR08).

Interviewees also identified several *external barriers* mainly related to political and regulatory issues, cognitive constraints and lack of time. According to interviewees, in spite of the formal regulatory recognition of PGS schemes in a Law, they have received limited support. Although the Law 8591 (2007) advised the creation of a **Decree for PGS** and of a **governmental body to support the sector**, the Decree has not been created yet and nowadays both PGS and TPC producers follow the same technical requirements. Therefore, PGS producers comply with the requirements specified by a previous Decree (no 29782), which was issued before these systems even

gained legal recognition. Some interviewees complained about this situation of legal uncertainty (EXP04; EXP08; PR06). However, A MAG expert clarified that negotiations among the MAG, ARAO, and PGS groups are occurring so to pave the way to a potential new Decree for PGS (EXP04).

The **Organic Agriculture Department (DFPAO)** was created in 2018 with the mandate to promote and foster PGS schemes (EXP04). However, as a MAG expert recognized, there had been no governmental support for a long time (2007–2018) as the auditing body (ARAO) gave no technical training to PGS producers (EXP04; EXP08; PR02). In addition to this, an expert from the MAG argued that the difficult economic situation of the country limits the availability of resources to provide more institutional support (EXP05).

Multiple interviews highlighted that **ARAO** is at times hindering PGS implementation. An expert underpinned that in the past years this auditing body hampered the formation of PGS groups (EXP01). This can be partially explained by the lack of efficient regulation on PGS. For instance, the lack of definition of the concept of “locality” in the law caused legal uncertainty, as some PGS groups have members located far away from each other (PR01; PR10), while others have been rejected in the past specifically because of this (EXP05). Some interviewees perceived this also as a demonstration of lack of will from the Government to support PGS (PR02; PR06).

An additional barrier mentioned referred to the lack of support from **Agricultural Extension Agencies**. Technical and educational services provided by the regional Agencies of Agricultural Extension do not sufficiently support the establishment and growth of PGS. Some interviewees argued that not all employees of extension services are well prepared about organic agriculture, leading to a lack of technical support to several PGS members (EXP07; PR08). Nonetheless, MAG interviewees stressed that awareness is being raised among agricultural extension providers (EXP04; EXP07). Lack of support and training were partially fulfilled by other bodies and organizations like the National Institute of Apprenticeship (INA) and Universities.

Several producers raised the issue of the **value added tax (VAT)** applied to organic products. The Law 8591 (Article 28, 2007) asserts that certified organic products within the country should be exempted from paying any additional VAT. This is not occurring at the moment, leading to a greater paperwork load for producers as organic vegetables have different VAT (either 1% or 13%) (MAOCO; PR02). Overall, tiresome paperwork as well as slow administrative procedures (for instance, for obtaining incentives for producers) discourage producers from asking support from the Government (EXP04; EXP08; PR03; PR10).

In addition to these institutional barriers, cultural attitudes affect the perception of organic and PGS in the country as suggested by an interviewee: “*Due to the individualistic culture of Costa Rica, it is hard for this (PGS) to scale out as much as I wish it did* (EXP04).” Individualism and

preconceptions about organic as an elitist and expensive concept limits a further development of PGS. Moreover, other interviewees suggested that some **narratives**, as the one related to conventional agriculture, might be hindering the spread of organic and PGS initiatives in Costa Rica as many producers are perceived to carry on the ‘*chemical thinking*’ (PR12) narrative brought by the *Green Revolution*. More specifically, these interviewees argued that many producers are convinced that spraying chemicals and fertilizers is intrinsically entrenched in modern agriculture (EXP07; PR02; PR12). Although workshops and trainings for organic agriculture are given to producers, participation is scarce and, as suggested by some interviewees, general knowledge on PGS and organic certification is low among both producers and consumers (EXP06; EXP07; PR05; PR12).

Aside from the above mentioned barriers, another outstanding issue was the associated “price” of being involved in a PGS. The costs of being involved in a PGS are considerable if all factors are taken into account. Time was the primary concern, as much of it is spent in meetings, farm visits and paperwork (EXP05; PR06). And not all PGS members easily found time to dedicate to the group internal activities. A MAG expert argued, “*My conclusion is that they are worth the same* (EXP05).”

In the next figure (Figure 3), we provide a general overview of the barriers and opportunities for scaling out PGS under the current niche–regime interaction in Costa Rica.

According to interviewees, the combination of support to PGS (e.g., in form of training and incentives to adoption) and the current cultural shifts in the Costa Rican population demanding healthier and more sustainable food (i.e., representing current landscape pressures) might be important opportunities for scaling out PGS in the country. As suggested by interviewees, the MAG, its departments and extensions services and the Phytosanitary branch can play an important role in determining the level of support given for PGS scaling out. This implies that barriers are also determined by the capacities and resources that these actors are endowed with to exert this important role. For example, although the DFPAO was identified by interviewees as an actor supportive of PGS adoption (i.e., promoting symbiotic interaction with the PGS niche innovation) and is supposed, by law, to support the PGS sector in the country by providing incentives and training, its role is still limited due to its lack of experience and sufficient resources (EXP04; EXP05). Similarly, interviewees perceived that some agricultural extension agencies could play a critical role in promoting adoption and contribute to this (symbiotic interaction) role of the Ministry of Agriculture but significant limitations exist due to lack of resources and extension agents trained on the topic of organic agriculture and participatory certifications. On the contrary, ARAO is pictured by

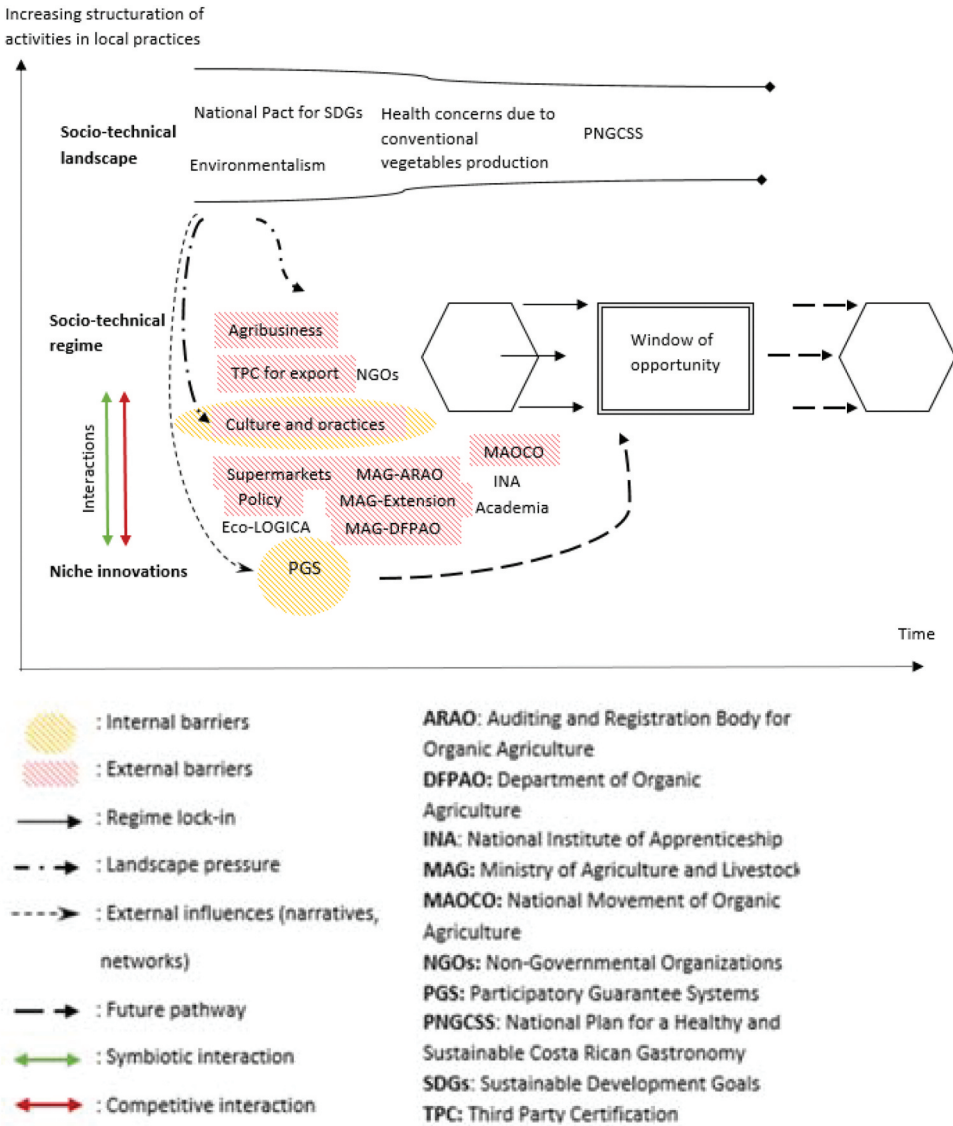


Figure 3. Barriers and opportunities for PGS niche scaling out under the lens of the multi-level perspective. (adapted from Geels & Schot, 2007) (Saldana 2016).

interviewees as an institution that fostered competitive niche–regime interactions by posing barriers to PGS scaling through excessive administrative requests and lack of political support.

Interviews and observations highlighted the role played by non-governmental organizations in supporting the PGS niche-innovation’s development. In this respect, the key supportive role of the National Institute of Apprenticeship (INA), the MAOCO and several NGOs were clearly emphasized during the interviews. More specifically, the INA was mentioned to play a pivotal role in fostering organic agriculture and helping the formation of

PGS (EXP02; EXP04; EXP07) alongside the MAOCO, which, although being perceived by some as a weak and sometimes fragmented movement (EXP08; PR02), plays a pivotal role in raising awareness on PGS' needs at a national level and through practical workshops and meetings. In addition to the INA and MAOCO, interviewees mentioned several other organizations that, from the international (e.g., International Cooperation Agency of Japan, and United Nations) to the national level (e.g., Universities, TPC agency such as Eco-LOGICA), actively support PGS by promoting technical and educational support and raising awareness among conventional vegetable producers selling in domestic markets.

Discussion

Niche–regime interactions open up opportunities for a PGS scaling out but also impose several barriers both related to agency and structure. Although Costa Rica was a pioneer in formalizing this innovation into a National Law 14 years ago, only seven PGS groups exist of which five focus on vegetables production (whose dominant conventional mode of production is still characterized by intensive use of chemical pesticides). Our analysis shed some light on the type of interactions between the PGS niche innovation and the incumbent regime in the vegetable food sector and, as we show in this section, complements analysis of similar PGS initiatives in other Latin American countries like Brazil and Mexico to help understand how to overcome barriers to scaling.

Actors involved in PGS niche innovations in Costa Rica engage with a variety of actors across scales and administrative functions, such as the MAG, the TPC agency Eco-LOGICA, Universities, the INA, some NGOs and the MAOCO. Some played a pivotal role in the institutional recognition of participatory certifications in the country such as the MAOCO and international NGOs in a process that started at the beginning of the 2000s until their legal recognition in 2007. The fact that similar networks of stakeholders supported PGS establishment and development in Brazil and Mexico suggest that similar initiatives can be started and implemented in other countries through a networked approach involving producers, NGOs, regional and national legislators and the civil society (Fonseca et al. 2008; Meirelles 2010; Mendonça 2014; Nelson et al. 2010). However, although the process of PGS institutional recognition in these countries seemed to follow a similar pattern, it did not lead to the same results when considering the implementation of the legislation and the support given to participatory certification groups.

In the case of Brazil, a frontrunner with PGS in Latin America, a flexible legislation for organic production and certification is in place (Cuéllar-Padilla and Ganuza-Fernandez 2018; Meirelles 2010; Mendonça 2014). Organic producers can certify through TPC or PGS. The latter can follow a formal or

informal certification system. PGS initiatives can get certified at a national level by fulfilling the administrative requirements prescribed by law and by obtaining the national organic seal. Alternatively, producers can avoid these procedures if they sell their products directly to the consumers; in this case, no seal is required; hence, it creates multiple possibilities for recognizing these systems at a national level without relying on TPC and thus widening the access to organic production and consumption (Meirelles 2010; Mendonça 2014). Horizontality and grassroots empowerment emerge with the adoption of these flexible and easily adaptable approaches (Mendonça 2014) allowing space to acknowledge the work of farmers while contributing to build their identity as organic producers (Meirelles 2010). Nonetheless, the literature and field research from these Latin American cases also suggest that the translation of PGS principles into national regulations might also present some barriers as shown by the similarities between the Mexican and Costa Rican cases. Bara et al. (2018) (Bara et al. 2018), based on the analysis of the Mexican case, purported that the translation of PGS principles into national regulations of Mexico can present at least three types of risks that might also be relevant for PGS scaling out in Costa Rica.

First, translating the certification schemes' principles of an intrinsically flexible and context-specific system into a more rigid national law leads to the risk of losing its core principles (Bara et al. 2018). This can be especially true for PGS schemes as, by their very definition, they are locally focused systems that build on trust and knowledge exchange in social networks of producers and consumers (Participatory Guarantee Systems (PGS) 2019). As Cuéllar-Padilla & Ganuza-Fernandez (2018) (Lopez Cifuentes, Cuellar Padilla, and Vogl 2018) argue, an official PGS recognition risks translating the pillars of these certification schemes (trust, knowledge exchange, participation, locality) into those of the conventional food system. This would undermine their very essence of giving "voice to consumers and producers to define food quality, that is, *of embedding* all the agro-food system in local communities" ((Lopez Cifuentes, Cuellar Padilla, and Vogl 2018), *italic* by author). In this sense, social networks, trust and knowledge exchange would be hampered by being translated into formal rules applied in any context, irrespective of differences in networks functioning and (e.g., cultural) characteristics. Moreover, governmental regulations on PGS created in Costa Rica are embedded in and are the expression of the institutional culture that created them (Lopez Cifuentes, Cuellar Padilla, and Vogl 2018) as shown by their specification of the technical and registration procedures for PGS which reflected and partly replicated the previous experience and knowledge of third-party certification (i.e., showing lock-ins). Therefore, institutional cultures and narratives can limit scaling out of PGS by imposing standards that are not flexible to adapt to local producers-consumers networks characteristics.

Second, formalizing regulations into a national law might run the risk of increasing administrative procedures required to access PGS certification. As outlined by Bara et al. (2018) (Bara et al. 2018), the Mexican regulatory framework added administrative burdens and complicated procedures for those wanting to engage with a PGS limiting especially those groups that largely relied on voluntary work for administrative tasks (Bara et al. 2018). This situation was clearly manifested by interviewees in the Costa Rican case highlighting the cumbersome and lengthy procedures required for PGS certification in Costa Rica.

Third, when legal and administrative requirements for PGS increase, the existence of technological and institutional support is crucial to ensure that producers and consumers willing to access this certification receive training and count on the needed resources (Bara et al. 2018). This was found to be lacking in the case of Mexico (Bara et al. 2018, 59). As for Costa Rica, the field research highlighted that PGS groups perceive a lack of political support, partly due to an ineffective implementation of the law.

Conclusion

The research explored the existence of barriers for a scaling out of PGS scheme in Costa Rica with the lens of the Multi-Level Perspective and Transition Theory. By comparing the case study of Costa Rica with those of Mexico and Brazil, we showed that for an institutional recognition (i.e., in a legal framework) to effectively support adoption and increase the number of PGS certified groups, social and institutional (internal and external) barriers need to be addressed. As a general remark, then, networks of diverse actors supportive of PGS initiatives can promote institutional anchoring in legal frameworks but also should promote training, incentives and a flexible approach in its implementation in order to take into account context-dependent limitations, preferences, and resources' needs.

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Author contributions

Conceptualization, Sara Anselmi and Raffaele Vignola; methodology, Sara Anselmi and Raffaele Vignola; validation, Raffaele Vignola; formal analysis, Sara Anselmi; investigation, Sara Anselmi; resources, Sara Anselmi and Raffaele Vignola; data curation, Sara Anselmi and Raffaele Vignola; writing—original draft preparation, Sara Anselmi; writing—review and editing, Raffaele Vignola; supervision, Raffaele Vignola.; project administration, Raffaele Vignola. All authors have read and agreed to the published version of the manuscript.

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