

RESEARCH ARTICLE

# Analyzing institutional changes in community-based management: a case study of a participatory guarantee system for organic labeling in Brazil

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## Abstract

The literature on collective action has poorly addressed processes of incremental institutional changes within organizations. This paper helps fill this gap by shedding light on how the community-based management of an organic label has changed following its formal recognition as a ‘participatory guarantee system’ (PGS). Ostrom and Basurto’s (2011) analytical tool is useful to describe the changes in collective rules to address collective action problems that take place in standard-setting and labeling activities. Using original data collected from the Ecovida Agroecology Network – the oldest and largest PGS in Brazil –, we study the multi-scale changes in governance rules from the 1970s until today. We pay particular attention to the links between the institutional consolidation of PGS, its recognition by public authorities, and its adaptation to legal rules. We detail analytical operators indicating whether the introduction of the PGS rules at the national level was bottom-up or top-down. Our findings emphasize how local communities have been able to both adapt their governance system in response to the official arrangements concerning organic regulations, and influence national public arenas where these arrangements are defined. This form of co-management has been accompanied by a significant increase in the number of PGS-certified farmers.

**Key words:** Brazil; collective action; institutional dynamics; organic label; participatory guarantee systems

## 1. Introduction

While the literature on collective action has occupied much of the social sciences for the last two decades, little work has analyzed the gradual and incremental institutional changes in these forms of governance. This is all the more surprising given that among the institutional currents in economics, historical institutionalism has, over the same period, turned its attention from radical ruptures to gradual changes (Mahoney and Thelen, 2010).

To help fill this research gap, this article explores progressive institutional changes in community-based organizations encountered in the management of the organic labeling in Brazil. These organizations implement a ‘participatory guarantee system’ (PGS) that refers to evaluation by peers (producers) to check compliance with a voluntary quality standard. Unlike in most parts of the world, in Brazil since 2009, this participatory system has been officially recognized as certification of farms according to the public standard of organic agriculture, and hence grants the official organic label. This recognition has generated institutional changes within and outside organizations at both the local and national levels. Based on a case study of organizations that have been managing organic agriculture for over 30 years, we question how these communities have evolved over time in the face of changing

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governmental regulatory frameworks. Our hypothesis is that the singular structure created for self-management governance of PGS in Brazil has changed in accordance with a subtly negotiated institutional balance between locally established social conventions and nationally and legally imposed laws and norms.

To tackle our research question, we drew on the institutional analysis and development (IAD) framework proposed by Ostrom and her colleagues (Ostrom, 2005; Ostrom *et al.*, 1994). While first developed in the case of collective action for self-governing of shared natural resources, IAD also seems effective to deal with the institutional analysis of a wider range of collective action dilemmas (Harris, 2018; Ostrom, 2005; Ostrom and Hess, 2007; Williams and Hall, 2015), when individuals share willingness to resolve the dilemma with the same desired ends and are characterized by low power asymmetry (Levine, 2019). In our case study, the community-based organizations are characterized by collaborative and horizontal decision-making processes and by the fact that their members are themselves users of the standard and beneficiaries of the added-value of the collectively managed organic label. Yet, standard-setting activities – as a driver of harmonization – necessarily imply collective action for *ex-ante* coordination (the requirements of the standard) and *ex-post* to insure that the adoption and implementation of the practices respect that standard (enforcement) (Mazé, 2017). Not only do users face the challenge of institutional design, control, and enforcement of access rules to avoid free riding (Mazé, 2017; Simcoe, 2014), the design must be adaptable to evolve in a changing global environmental context, while maintaining the purpose of the standard.

To describe how the local governance system is structured for managing the standard in self-governing organizations, this article specifically draws on the operational rule typology (Ostrom and Crawford, 2005), considering the rules in use in the arena where the action and the decision-making take place. We then apply Ostrom and Basurto's (2011) analytical tool to scrutinize changes in rules in a real-life case study, which few empirical works have done since their paper was published in 2011 (Baur and Binder, 2013; Futemma *et al.*, 2015; van Karnenbeek and Janssen-Jansen, 2018; Ostrom, 2014). Our aim is to understand the institutional basis of the governance system through the linguistic statements (deontic) that compose it at each period that correspond to a different institutional configuration of the system. The grammatical syntax serves as a basis for collecting, presenting, and analyzing data to code institutional rules, in a way that gives substantive meaning to the study of change in institutions.

We collected original data on the PGS from Ecovida Agroecology Network, the oldest PGS in Brazil. We analyzed changes in institutional arrangements at multiple levels from the 1970s until today. When analyzing the multi-scale institutional changes, we pay particular attention to the links between the institutional consolidation of PGS, its recognition by public authorities, and its adaptation to the rules enacted by the latter.

Our findings reveal that local communities have been able both to adapt their governance system in response to the official arrangements concerning organic regulation and to influence the national public arenas where these arrangements have been defined. However, the situation has deteriorated, in recent years, thereby creating uncertainties about the direction of future institutional changes and the ability of local actors to maintain control over the PGS.

Although the detailed history of the organic movement in Brazil has been analyzed by other scholars (Niederle *et al.*, 2020; Passos Medaets *et al.*, 2020; Petersen *et al.*, 2012) this is the first in-depth investigation of the incremental institutionalization of the PGS in Brazil. In this way, we also contribute to the academic literature on the analysis of institutional change in collective action. What if more, standard-setting activities are a relevant research area to understand interdependences between legal regulation and institutional rules of collective action at different scales (Mazé, 2017).

The rest of the paper is organized as follows. First, we present the case study of the institutionalization of organic agriculture in Brazil. Second, we describe the different approaches and tools in the IAD framework we used to analyze institutional changes, and, third, the methods we used to collect and analyze the data. Fourth, we present the results of the analysis of changes in the governance system with the focus on changes in the operational rules that directly affect the standard management. Finally, we discuss the context that allowed the PGS governance system to adapt in response to political changes and identify possible pathways for further research.

## 2. The process of institutionalization of organic agriculture in Brazil

Organic agriculture has been among the most popular food labels for many years now (Manning *et al.*, 2012) and is one of the fastest growing sectors of world agriculture. Brazil is no exception: the organic sector accounts for 1.1 million hectares, or 1.7% of total cultivated land, and 26,000 certified organic farmers (MAPA, 2022).

The Brazilian organic movement dates back to the 1970s, when social movements emerged to oppose the effects of agricultural modernization, mainly social exclusion and environmental degradation (Baptista Da Costa *et al.*, 2017). At that time, scattered small groups of family farmers were producing organic food with no inter-coordination. In the 1980s, many non-governmental organizations (NGOs) grouping agronomists and technicians specialized in organic practices began to give credibility to the organic concept and its methods.

At the beginning of the 1990s, organic production initiatives multiplied and there was a sharp rise in revenues in the sector. Sales of organic products abroad, in supermarkets, and on local markets prompted the Brazilian Ministry of Agriculture to regulate the sector. The growing institutional pressure on organic regulation was also a response to Brazil joining the World Trade Organization and private companies' interest in selling organic food on international markets, for which audited certification was required. As a result, in 1999, the National Committee of Organic Agriculture (responsible of technical specifications for organic standard), published a normative instruction to regulate the use of the term 'organic', for which third-party certification became mandatory. Private accredited certification bodies regulate the right of access to and use of the label according to their own inspection scheme, agreed upon by the owner of the standard. According to the ISO 17065 standard, this third-party certification is presumed to be effective because of the independence between the owner of the standard, the controlled user and the private certification body.<sup>1</sup>

During the discussion of this normative instruction, scattered local organic organizations started to interact to create the Ecovida Agroecology Network and oppose certification. The cost of a private audit (both bureaucratic and financial) was expected to prevent smallholders from accessing the emerging market. When it was no longer an option, Ecovida reoriented its action to persuading the Ministry of Agriculture to recognize participatory certification. With this aim in view, Ecovida not only articulated a political coalition of social movements to put pressure on the policymakers, but also began to develop and disseminate its own PGS among local communities as an alternative to third-party certification. Participatory certification represents a real paradigm shift: it relies on peer review, as well as regular exchanges to improve practices, and social control as driving forces to guarantee the promises of the standard.

Although the Law of Organics was published in 2003 with no reference to participatory certification, a major change in the Brazilian political field began in the same year with the election of the president Lula da Silva, whose political coalition embraced the social movements that supported agroecology. Consequently, in 2007, after 4 years of intense discussion that opposed the organizations supporting PGS and the private certification bodies, the National Commission for Organic Production published a decree authorizing participatory certification. It took another 2 years before the 2009 Normative Instruction established that PGSs should be structured as a Participatory Conformity Assessment Body (PCAB) officially registered with the Ministry of Agriculture. In 2010, PGSs rapidly spread throughout Brazil and even became dominant in the South Region where participatory certification was already socially accepted and was widely used in farmers' markets and local organic shops. Moreover, during this period, the Food Acquisition Program, which was created in 2003 but whose most influential period was 2008–2012, and the School Meal Program, which was reorganized in 2009 to favor family farmers, especially organic farmers, had a profound impact on boosting PGSs. Likewise, as supermarkets were unable to respond to the increasing demand only using organic

<sup>1</sup>However, third-party certification is increasingly the subject of criticism (conflict of interest, cost, etc.) that is tackled in other studies (Fouilleux and Loconto, 2017; Reynolds 2004).

products with third-party certification, they have gradually included PGS-certified products into their store shelves.

In January 2022, out of 26,622 Brazilian organic farmers registered with the Ministry of Agriculture, 8,841 were PGS-certified, *versus* 12,739 farmers with third-party certification (the others correspond to farmers in Social Control Organizations who sell organic products directly to consumers with no certification). But, when we consider the three southern states of Rio Grande do Sul, Santa Catarina, and Paraná, which corresponds to the Ecovida area of action, 6,130 registered organic farmers are PGS certified (94% of them are members of Ecovida) and only 3,029 are third-party certified (MAPA, 2022).

### 3. Analyzing institutional changes in collective action

#### 3.1 Standard setting and labeling activities as a collective action issue

While most academic literature examines the issue of sustainability standards in response to information asymmetries<sup>2</sup> and market failures (Balineau and Dufeu, 2010; Jahn *et al.*, 2005) or in relation to the structuring of global value chains (Reinecke *et al.*, 2012), few studies have considered standard-setting activities as issues of coordination and governance (Lemeilleur and Sermage, 2020; Mazé, 2017; Simcoe, 2014, 2012).

Simcoe (2014) adapted Ostrom's framework for analyzing collective self-governance of shared natural resources to tackle the problem of creating standards for technical interoperability in managing shared technology platforms. According to him, independent actors benefit from shared resources and confront similar problems of institutional design, overcoming free riding in the supply of public goods, monitoring and enforcing access rules, and crafting credible commitments (Simcoe, 2014). Following this proposal, Mazé (2017) investigated how the rising coalitions of private actors to support standard-setting activities in the agricultural sector differ in their capability for *ex-ante* organization of the standard-setting process and for the *ex-post* dissemination and adoption of the selected standard. Here again, she argues that the resulting collective action problem in some way resembles what is encountered in the self-management of natural resources, with the need for rules of access and exclusion.

Organic standardization and labeling therefore necessarily imply collective action for *ex-ante* coordination to choose organic practices required into the standard, and *ex-post* to make sure the adoption and implementation of organic practices meet the requirements of the standard. Thus, by adopting the organic standard and label, independent actors can benefit from an economic advantage (added value or market access) when they affix the organic label – i.e. the organic logo and name – on the products they sell (at least as long as knowledge of organic production practices is relevant, the values remain desirable, and the information on the product label remains credible). Equal access to the label without predefined limits, combined with the risk of degradation through inappropriate use and free riding, leads these actors to design an institutional framework to exclude illegitimate users and manage the appropriation and distribution of the label.

#### 3.2 Rules and institutional grammar

Ostrom *et al.* (1994) crafted the IAD framework to understand the institutional structure at multiple levels and to evaluate the results of interactions between actors in terms of 'good institutional performance'. This approach is based on the use and articulation of a set of concepts designed to capture a complex reality (Figure 1).

Within this framework, Ostrom and Crawford (2005) distinguish seven types of 'rules' that structure action situations: boundary, position, choice, aggregation, information, payoff, and scope rules (Table 1).

<sup>2</sup>The information asymmetry in market transactions is particularly strong for so-called credence goods, whose quality is impossible for the consumer to evaluate, either before or after purchase (Darby and Karni, 1973).

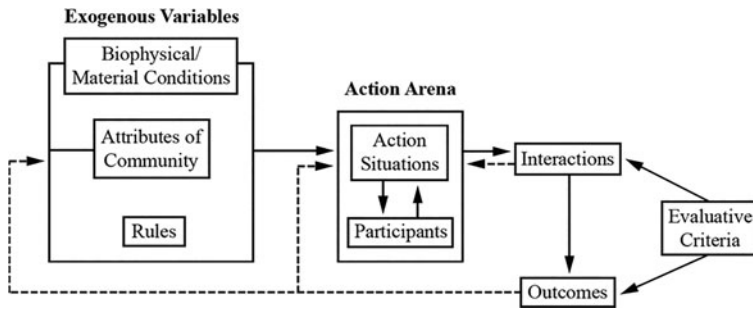


Figure 1. IAD framework (Ostrom, 2005 adapted from Ostrom *et al.*, 1994).

Table 1. Definition of rules (adapted from Ostrom and Crawford, 2005)

Typology of rules	Definition
Position rules	Specify a set of positions that are filled by participants.
Boundary rules	Affect how individuals are assigned to or leave positions.
Choice rules	Affect the assignment of particular action sets to positions.
Aggregation rules	Specify if a decision by a single participant or by multiple participants is needed prior to an action at a node in a decision process
Information rules	Affect the level of information available in a situation concerning actions and the link between actions and outcome linkages.
Payoff rules	Assign external rewards or sanctions to specific actions that have been taken.
Scope rules	Affect which outcomes must, must not, or may be affected within a domain.

For the analysis, only rules-in-use, whether written or not, are relevant, not rules-in-form that exist in written form but that nobody follows (Crawford and Ostrom, 2005). As defined by Crawford and Ostrom (1995: 583) an ‘institutional statement refers to the shared linguistic constraint or opportunity that prescribes, permits, or advises actions or outcomes for actors (both individual and corporate)’. Crawford and Ostrom provide a grammatical syntax with concrete directions for coding institutional statements as strategies, norms, and rules. Strategies are plans developed by individuals in a given situation to achieve specific results through specific actions. Norms are prescriptions for actions or outcomes without short-term gain, acquired within the community with which the individual frequently interacts. Rules are prescriptions that resemble norms, but that involve a sanction when prohibited actions are committed and observed. According to the institutional grammar, norms and rules involve the syntax component of deontic reasoning. The deontic is the prescriptive operator of an institutional statement that describes what ideally is permitted, obligatory, or forbidden (Crawford and Ostrom, 2005). The deontic is identified by words like may, should or must (should not; must not) or their synonyms.

Many if not all systems are inherently cross-scale (Adger *et al.*, 2005), implying that the construction of the rules is nested at several levels with different temporalities for each level.

Kiser and Ostrom (2000) distinguished three levels. The first level corresponds to *operational rules* that structure daily interactions between participants. The second level corresponds to *collective rules* where individuals interact to establish operational rules. The third level corresponds to the *constitutional rules* where the institution defines the rules of collective choices, namely, who is eligible to participate in collective decisions and how decisions are taken at the collective-choice level. Therefore, the IAD framework links the local level with higher levels of decision making.

### 3.3 Institutional changes

Systems are not only cross-scale but dynamic (Cash *et al.*, 2006). Indeed, institutions are difficult to design and take many years to craft. In addition, events may arise and stimulate changes to the use of rules. Ostrom and Basurto (2011) developed a tool to track changes in institutions. From a simple set of rules at the initial stages, institutions develop a more complex arrangement at the more advanced ones. Based on the rule typology and deontic components, institutional configurations can be documented for a given action situation at time zero, after which selected rules and norms can be tracked in subsequent periods. In a changing system, mechanisms for change in rule configurations within an action situation can be the result of many self-conscious processes (e.g. imitation of rules) or unconscious processes (e.g. trial-and-error) (Ostrom, 2014). While some rule configurations fit local needs better than others, not all locally governed systems will eventually find effective rule configurations. Rule configurations may be far from optimal, but it is nevertheless not easy to move away from these configurations. Indeed, certain rule dynamics can create self-reinforcing mechanisms and path dependencies if the leaders of these systems are somehow advantaged by these rules, and they may resist any effort to change (North, 2005).

Although Ostrom and Basurto's tool published in 2011 is particularly appropriate for analyzing institutional changes, very little empirical work has applied it to real-life case studies. Baur and Binder (2013) used it to study the impact of industrialization-related socioeconomic changes on pastoralist communities in the Swiss Alps. Futemma *et al.* (2015) applied it to study land management by Afro-Brazilian communities accessing different public policies. Finally, Van Karnenbeek and Janssen-Jansen (2018) used the tool to study changes in rules governing urban land use. These three studies highlight the value of the IAD method (1) to identify the reactions of a local community to strong socio-economic changes, (2) to analyze cases where incremental and gradual changes predominate, and (3) to identify how public policies and programs impact locally self-governed institutional structures.

## 4. Data collection and analysis

### 4.1 The PGS case study

The Ecovida Agroecology Network was created by farmers, consumers, and members of different NGOs in 1998. Ecovida is the oldest PGS in Brazil and existed prior to the law. Ecovida's success and ability to influence public policies made it a key actor in designing organic certification regulation. Based on the 2009 official regulation, the network registered its PCAB in 2010. This formal body is responsible for managing certification and is part of a more comprehensive set of practices organized by Ecovida, including farmer training by NGOs, and the articulation of marketing chains via associations and cooperatives.

Ecovida covers the three southern states of Brazil: Santa Catarina, Paraná, and Rio Grande do Sul (Figure 2), and is active in nearly 400 municipalities. Today, the network consists of 32 regional groups in the three states, each of which includes 40–50 local groups, each including from 3 to 25 farm families. In all, Ecovida includes more than 5,000 family farms. In addition, 40 support entities (technical advisory NGOs, associations and cooperatives, etc.) and eight consumer cooperatives are linked to local or regional groups.

### 4.2 Data collection

Our aim was to understand the institutional basis of Ecovida PGS through the linguistic statements (deontic) that compose it at each period that characterized the different institutional configurations of the system. According to Crawford and Ostrom (1995), such work requires qualitative research methods, including in-depth interviews or archival retrieval. We triangulated document analysis, semi-structured interviews, and participatory observations.

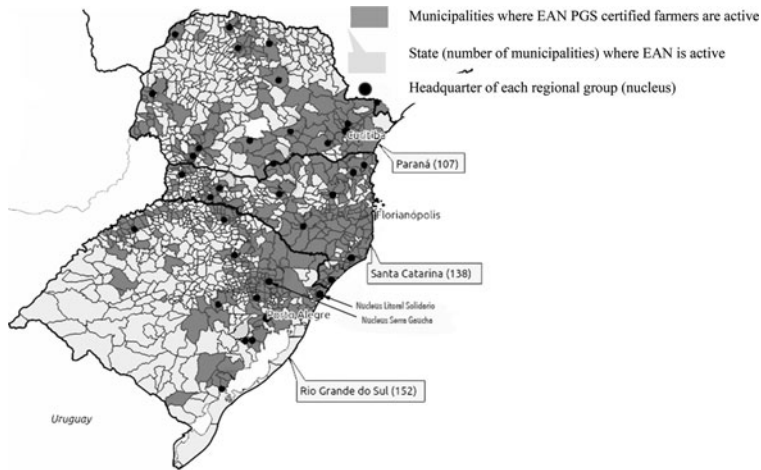


Figure 2. Municipalities where Ecovida Agroecology Network (EAN) is active in Brazil (source: authors).

We analyzed major documents including the Law of Organics no. 10.831/2003, its regulation by Decree no. 6.323/2007, and the publication of Normative Instruction 19/2009, which provides information on the functioning of the different control mechanisms, including PGS. We also checked all infra-legal rules created by Ecovida itself to orientate farmers' practices. The secondary data were checked and compared with different actors' interpretations in semi-structured interviews carried out from September to December 2018 with two policymakers, representatives of four social movements, 14 extension technicians, and 15 PGS-certified farmers belonging to five recent and former local groups of the two oldest regional groups of Ecovida (Serra Gaúcha and Litoral Solidario). The interviews were recorded and transcribed to help us clarify and cross check findings.

While the rules formally prescribed by a national government are easily identifiable, we also needed to understand the processes by which rules change at the community level. As argued by Ostrom and Basurto (2011: 318), 'we frequently do not know which rules are accepted by individuals in their everyday interactions. Thus, the rules affecting much of our behavior are relatively invisible, which challenges our ability to identify and measure them'. The work listed above was thus supplemented by participatory observations at two intragroup compliance inspections, a key PGS assembly, and a meeting of the Commission of Organic Production in the state of Rio Grande do Sul, where two oldest regional groups of Ecovida are located (Figure 2). Participatory observations gave us an in-depth understanding of the institutional arrangements and settings and made it possible to distinguish rules-in-use from rules that might exist in form but not in practice. We confirmed our findings in three interviews with farmers. Finally, a report on our results was sent to all the stakeholders we interviewed to confirm and complete data collection.

#### 4.3 Data analysis

We analyze changes in the operational rules in two action situations, namely a labeling campaign where the organic label is attributed (or not) to a farm, and the improvement of technical specifications following regular knowledge exchanges and a collective decision. In our analysis, we focus on the four types of rules that have undergone notable changes in the different institutional configurations: position, choice, aggregation, and information rules. Boundary rules (proximity and membership requirement), scope rules (production concerned), and payoff rules (fees and gradual sanction) have undergone little change. To analyze institutional statements, we drew on the deontic component to describe how rules are configured and to compare such a structure at a hypothetical time zero, and at subsequent time periods to explain institutional change (Ostrom and Basurto, 2011).

As suggested by Crawford and Ostrom (1995: 586) ‘for some research questions, it may be useful to divide rules into those made within governmental arenas and those made outside of government arenas. The syntax in no way prevents this distinction’. To this end, we differentiate between deontic operators, by adding an asterisk, to distinguish governance rules developed by Ecovida itself at the constitutional level from governance rules that are the responsibility of public regulators at the same level. For the governance rules, we also added a symbol to explain the origin of the change: upward arrows to signify bottom-up change – rules emanating from the Ecovida community – and downward arrows to signify top-down change – rules emanating from public authorities.

The periods are coded for changes in rules as follows: when no rules or norms exist, we use the code 0; when a norm exists and should be complied with, we use the code ‘should’ (S); when a rule may be complied with, we use the code ‘permitted’ (P); when the rule must be complied with and enforced, we use the code ‘required’ (R); when the rules are prohibited, we use the code ‘forbidden’ (F).<sup>3</sup>

## 5. The incremental institutionalization of the PGS for organic agriculture in Brazil

When analyzing the history of the management of the organic standard and label in Brazil, we distinguish three distinct periods in which we identified changes in the operational rules that directly structure the situations of action (Tables 2 and 3). Each period is determined by a rule configuration. Rule configuration T1 corresponds to the period from 1970 to 1999, prior to the official creation of Ecovida, when the groups were geographically scattered. T2 corresponds to the period from 1999 to 2009, when Ecovida was officially created with the formalization of a number of rules within the network. Lastly, T3 corresponds to the period from 2009 to 2018, when the publication of 2009 Normative Instruction introduced the exigence of formally registered PCABs.

### 5.1 The 1970 to 1999 period: organic agriculture and peer review relying on norms

In the 1970s, the first social and political movements emerged in opposition to the dominant productivist agricultural model and to promote environmentally friendly practices. These movements designed sets of organic farming practices to preserve the soil’s natural fertility, water and air quality, biodiversity, and healthy food. Nonetheless, prior to Ecovida, no formal rules were in use among these scattered group entities. In the absence of normative prescriptions, the reputation of organic agriculture and hence the economic value it generates can be jeopardized if some producers ‘overuse’ or ‘misuse’ the term ‘organic’ when they sell their products but do not apply truly organic practices. In this context, some NGOs first attempted to develop a simple set of norms: they wrote the first specifications for organic principles and implemented a peer review system where neighboring farmers helped each other and went to inspect each other’s farms to confirm their organic conformity (P1: S). In addition to farm inspections by peers, a system of consumer-reviewer inspections was organized by Coolmeia, a small cooperative created in 1978 that was responsible for establishing the first Brazilian organic farmers market in Porto Alegre in 1989. The presence of consumers during the inspection (P2: S) was intended to guarantee the integrity of the inspection, to improve knowledge flow and to promote social ties and cooperation for the well-being of the community. Coolmeia’s experiment led other local associations to do the same and became later a reference for the PGS Ecovida. During this period, the use of the term ‘organic’ was only regulated by communities (C1: S)<sup>4</sup> and the maintenance and improvement of the technical specifications was mainly achieved by the NGO’s agronomists.

The first row in Table 2 represents this rule configuration at time one (T1). This simple norm-based system could have survived for many years if the national and international demand for organic

<sup>3</sup>For example, when PGS-certified producers are forbidden to use the term ‘organic’, this is coded as a ‘forbidden’ (F) rule.

<sup>4</sup>In our case study, choice rules guided the farmers’ appropriation of the organic label.



**Table 2.** Rule or norm configuration inventory in the Ecovida PGS

Periods	Position rules				Choice rules		Aggregation rules					Information rules			
	P1	P2	P3	P4	C1	C2	A1	A2	A3	A4	A5	I1	I2	I3	I4
T1 (1970–1999)	S	S	0	0	S	0	0	0	0	0	0	0	0	0	0
T2 (1999–2009)	R	P	R	R	F*↓	S	R	R	R	P*↓	0	R	R	R	0
T3 (2009–2018)	R*↑	F*↓	R*↑	R*↑	R*↓	R*↓	R*↑	R*↑	R*↑	P*↓	R*↓	R*↑	R	R*↑	R*↓

Note: 0, no rule; P, permitted; S, should; F, forbidden; R\*, required by the law.

**Table 3.** Rules identified in our field study

Position rules
P1 <i>Peer-reviewer</i> for on-farm inspection
P2 <i>Consumer-reviewer</i> for on-farm inspection
P3 <i>General member</i> with obligation to participate
P4 <i>Ethics committee member</i> for cross check inspection
Choice rules
C1 <i>Use of the term organic agriculture</i> for a 1-year period with formal certification
C2 <i>Use of Ecovida associative brand</i> according to Ecovida rules
Aggregation rules
A1 <i>Local group consensus</i> following the report of the formal social control
A2 <i>Ethics committee consensus</i> following the report of the cross check
A3 <i>General assembly vote</i> to change rules and revise internal document
A4 <i>Ecovida representatives' advice</i> to the National Commission for Organic Production to change technical specification of organic production
A5 <i>Appeal Council collective decision making</i> to resolve disputes
Information rules
I1 <i>Self-declaration</i> by the farm manager that describes the farm
I2 <i>Archiving of farm inspection reports</i> : archived for each farm each year
I3 <i>Recoding in the regional group minutes</i> gathering information concerning local groups
I4 <i>Updating the National Registry of Organic Producers online</i> on the Ministry of Agriculture website

products had not awakened major economic interest in the sector and if, at the same time, the shift to public ownership of the term 'organic' had not created new collective decision-making arenas.

### 5.2 From 1999 to 2009: adopting Ecovida constitutional rules within new collective-choice arenas

In 1999, following growing institutional pressure to prevent false labeling on the Brazilian market and to allow exporters to access international markets, the first regulation on organic production was adopted, and third-party certification became mandatory. So, unless producers were also third-party certified at their own expense – which some were, especially those who exported some of their production – producers involved in associative movements were no longer allowed to use the term organic to describe their products (C1: S to F\*).

Then, Ecovida started to formalize its rules to allow a growing but evolving community to take ownership of the system, to legitimize its credibility and to guarantee the processes developed by its members. A governance model with three nested levels was developed:

- (1) Local groups comprising approximately 10 certified producers based on proximity. The proximity of the members makes it possible to meet regularly, build social trust and promote knowledge exchange.
- (2) Regional groups (nuclei) with an ethics committee, in which each local group has two representatives. Each regional group meets every 1 or 2 months to make decisions regarding new entrants and the allocation of the Ecovida label.
- (3) The national federation of regional groups, in which each regional group has three to four representatives. Federal regional group plenaries and the general assembly of all Ecovida members make decisions on the functioning of the PGS.

The formalization of Ecovida made participation a requirement for any general member (P3: R) – without specifying the degree of active participation required –, in connection with the new formally defined positions. First, at the local group level, to achieve *formal social control*, each household had to take turns in a peer-reviewer position according to a predetermined schedule (P1: S to R). Second, at the regional level, positions were created for members of the ethics committee – two representatives of each local group – to conduct *cross check inspections* (P4: R). These inspections – still based on peer review by three members of the ethics committee – checked the local groups were being run correctly

and the compliance of the farms selected for inspection (at least the square root of the number of farmers in a local group, but in practice, each farm was inspected by the ethics committee at approximately 4-year intervals). At that time, consumer-reviewer inspections continued to complement the farm peer-review system, but with no formalization of this rule. However, the participation of consumers, which was time-consuming for PGS managers to organize, tended to disappear with the structuring of the network (P2: S to P).

New information and aggregation rules were also created. Any farmer who wanted to join Ecovida had to fill out a nine-page form describing his/her farm (farm management plan) (I1: R). The internal inspections carried out within the local groups ended with a written report (I2: R) and a collective consensus opinion on the conformity of each farm (A1: R). This was followed by cross inspections by the ethics committee, which, in light of the different reports, gave its consensus agreement on the awarding of the label to each farm (A2: R). In Ecovida, the local group is the first guarantor, as it calls for improvements or corrective measures. When non-conformity occurs repeatedly within a given group, the entire group loses the organic certificate, which represents a strong social sanction. In practice, this has never happened because, in the few cases where the problem arose, the group decided to exclude the non-compliant producer to avoid the penalty. The minutes recorded all the information from the local groups (who had the right to use the label, who was excluded, any non-conformities identified or requests for improvement) and were freely accessible (I3: R). This significantly improved the level of internal transparency and established the credibility of this alternative certification system. The federal plenary sessions and the general assembly defined constitutional rules, mainly position rules and aggregation rules. Organic specifications were formalized in 2004 in a single document detailing specifications for plant and animal production and processing, which was adopted by all the members in the general assembly (A3: R). Lastly, even though Ecovida was not officially recognized as a mode of certification during this period, representatives of Ecovida were invited to participate and give their opinion in monthly meetings of local Organic Production Commissions, the local entities of the National Commission for Organic Production, responsible for arbitrating the standard governing organic production. No formal rule obliged the Ministry of Agriculture to take the suggestions made by the civil society into consideration. The process of co-construction relied more on a tacit and consensual agreement that meant PGS members were able to participate in the construction of an organic regulation (A4: P\*). The receptiveness of the public authorities to social participation helped foster circulation and renewal of organic knowledge as amendments to the legislation, and the amendments were regularly and easily made through this public consultation. The goal was to define an official standard that is as close as possible local farmers' real conditions.

As the use of the term 'organic' became prohibited except in the case of third-party certification during this period, the association created the collective brand name *Ecovida* (C2: S), to indicate the equitable production process, create economic value, and enable access to some wet markets and fairs.

The Ecovida rules defined by the federal organization at the constitutional level applied to all regional and local groups of the organization. Nevertheless, the lower levels still had some autonomy in designing additional rules at each level. For instance, some rules such as the predetermined schedule for inspections or committee meetings was designed and altered collectively by local groups, and the list of fines to be paid for most violations of operational rules, such as under-provision of collective work or failure to participate, was defined each year by the local group.

The second row in [Table 2](#) lists this rule configuration at time two (T2) when some rules were designed and monitored in collective-choice arenas.

### 5.3 From 2009 to 2018: legal recognition of PGS in Brazil and new constitutional rules for the system

The election of President Lula da Silva was a turning point in support for social movements promoting agroecology. After almost a decade of discussions and improvements of the participatory methodology, in 2009, the federal government finally published a Normative Instruction (IN no 19/2009) defining the operation required for organic quality control by PGS, thereby allowing it to operate at

the same level as the third-party certification with respect to market access. The legislation lays down that the PGS shall be managed by an accredited PCAB, the formal status that Ecovida took in 2010. This process was facilitated since this network was the main model for the construction of the regulations (Niederle *et al.*, 2020).

The PCAB is audited and accredited each year by the Ministry of Agriculture for the renewal of certification. The PCAB can lose its accreditation if its members repeatedly violate the rules governing organic agriculture requirements. While cheating is further regulated at the local and regional levels by the groups and nuclei, an annual random check of farms by public auditors can also result in the withdrawal of a non-compliant farmer's certificate. According to the law, PGS-certified producers can use the organic label for a period of 1 year after which the verification process must be repeated to renew the right of access to the resource (C1: F\* to R\*). The mention of the name of the PGS is also mandatory (C2: S to R\*).

To be accredited by the Ministry of Agriculture, each PCAB must detail their minimum member participation prerequisite (P3: R\*). However, the requirements concerning participation are very flexible: in the legal text, participation is defined as 'the active presence of the PGS members in the actions led by the PGS'. In Ecovida, each local group and regional group must hold a minimum of three meetings per year. Families must attend a minimum of 60% of local group meetings and the group must attend a minimum of 60% of regional group meetings. The official rules require also an Inspection Commission for intergroup *cross check inspections* and states that it is possible to either inspect all farms in the group annually, or annual inspections based on sampling (where the number of farms visited per year cannot be less than the square root of the number of farms in the group). In both cases, an annual inspection is carried out by the Internal Verification Commission, i.e. the group itself. In most Ecovida groups, this rule simply ratified their existing practices (P1: R to R\*; A1: R to R\*). However, according to the law, consumer-reviewer inspections are no longer allowed as part of the formal inspection procedure (P2: P to F\*). The law also required the creation of an Assessment Commission in charge of approving or rejecting requests for organic certification. Instead of a single Assessment Commission for all the regional groups, Ecovida maintains its decentralized system based on the regional ethics committees already in place (A2: R to R\*). The law states that the Assessment Commission must be composed of representatives of members of the PGS (P4: R to R\*) but does not define the type of representatives or on what basis they should be chosen. Ecovida also allows flexible modes of operation: local groups appoint or elect two representatives to the ethics committee; some regional groups require rotating positions while others do not. In the case of farmer compliance, ethics committees must forward the documents to the technical staff of the PCAB general office at federal level, who register the certified farmers with the Ministry of Agriculture. If non-conformity is detected, the report suggests the farmer undertake changes in production practices – which is prohibited in the case of third-party certification. Moreover, when they meet for Assessment Commission meetings, regional leaders still discuss other subjects than certification, such as the implementation of public policies, technical assistance programs, and marketing strategies. To sum up, after the recognition of its PCAB, Ecovida had to adapt and incorporate the new nomenclatures created by the law, but this had no significant effect on its dynamics or on existing practices.

Among the new rules required by public regulation, the Brazilian law provides for an Appeal Council and standardizes the appeal procedure. A producer has 30 days to appeal to the PCAB Appeal Council if he/she disagrees with sanctions or corrective actions. The council is the only entity that is competent to manage disputes (A5: R\*) as a last resort if no agreement can be reached in the various PGS dialog arenas. Here again, the composition of the Appeal Council is not laid down by law, and to avoid creating a new decision-making body, Ecovida chose to have it composed of the members of the existing ethics Committee.

Regarding the information rules, the law refers to the principle of transparency according to which 'all documents and conformity decisions are recorded in the minutes and communicated to the ministries'. This has major implications for the amount of work required of the PGS: farmers must complete a 25-page document (I1: R to R\*) and upload it on an internal online platform; minutes are

consulted once a year by competent authorities (I3: R to R\*), PCAB must register information concerning all certified farmers (location, contact information, organic certification status (active, suspended, excluded)) on the Ministry of Agriculture's online platform (I4: R\*), and then publish the organic conformity certificates. While increasing transparency, these requirements also increase red tape thereby creating difficulties for some Ecovida farmers.

As was the case in the previous period, the internal PGS procedures can be revised on a regular basis by the General Assembly to be sure they are adapted to local conditions (A3: R to R\*). However, each modification must be sent to the Ministry of Agriculture for validation, which adds a new layer of decision making to the choice of rules for the PGS. Concerning organic specifications, because the official technical standard was co-constructed with by key members of Ecovida and public authorities, it did not drastically differ from the Ecovida standard. In 2009, Ecovida General Assembly had to adopt official technical standards that were more detailed but remain close to those previously defined by Ecovida.

The last row in Table 2 shows how this rule was configured at time three (T3) when governmental rules framed the PGS. However, to the extent that the procedures are documented and remain equally restrictive, or more restrictive, than the law, the latter offers considerable flexibility in the way the system is managed.<sup>5</sup>

## 6. Challenges to governing community-based management of organic agriculture

As long as the organic movement was only associative in Brazil, guaranteeing organic practices was a matter for the civil society organizations that were the precursors of these practices. Although at first glance, this system might appear to be open access, with no rules or control over organic labeling, in practice, it involved collective management by local communities with a simple norm-based system: social control by peers and consumer reviews to attest to the conformity of farms based on previously agreed norms. Regular exchange of knowledge during farm inspections and committee meetings enabled the maintenance, improvement, and renewal of the organic standard. At that time, information rules were extremely informal.

In 1999, the shift from a community ownership system to a public ownership system – based on the idea that public authorities are better able to protect the label against fraud, while delegating a significant part of the monitoring activities to third-party certification – had major consequences for the internal governance of organic communities. In Ecovida, operational and constitutional rules to regulate the use of the associative label were progressively crafted at that time, undeniably corresponding to the formal emergence of the PGS. We have shown that public recognition of participatory certification, which followed 10 years later, in 2009, had little impact on the earlier structure, except that the rules became constitutional requirements laid down by a public authority. The construction of public constitutional rules consistent with existing Ecovida rules was only possible because the local Organic Production Commissions guaranteed participation of social movements, thereby limiting any attempt by policymakers to impose stricter controls.

This route of institutionalization has prevented notable disruption of Ecovida governance systems and, as a result, avoided the exclusion of a large number of pre-existing label users and founders of the movement. Instead, the registration of Ecovida PGS as a PCAB in 2010 has boosted the number of certifications over time. While in 2009, Ecovida had 24 regional groups comprised of 200 local groups, 8 years later, 32 regional groups comprised of 500 operational local groups. In addition, three more PGS were registered as PCABs in the state of Rio Grande do Sul between 2014 and 2016 (Dorville *et al.*, 2021). These figures emphasize the fact that PGS respond to a real societal demand.

According to Bowles *et al.* (1998), worker-owned organizations are able to achieve higher levels of productivity than centralized public governance or private firms. The main reason is that worker-

<sup>5</sup>While Ecovida transferred the responsibility for defining rules and procedures to its regional group and local groups, local differences are not visible in our table.

owners as residual claimants on the income of the firm have an interest in the effort levels of the other workers, thereby providing a motive for mutual monitoring. A parallel can be drawn with organic farmers, who although independent, interdependently benefit from the added value of the collectively managed organic label. Thus, in this farmer-owned system, individuals have a stake in the effort levels of other organic farmers. Ostrom (1998) argued that many studies provide empirical evidence in support of Bowles and Gintis' general thesis. It is repeatedly reported in the literature that community members who have sufficient autonomy to design their own rules for governing and managing their resource, tend to achieve better outcomes than when experts or external authorities design the rules in their stead (Ostrom, 2010). Indeed, in community-owned systems, members have access to better information about other members' past behavior, the quality and the quantity of their work, capacity, and needs (Bowles and Gintis, 2002). They can monitor each other's conformance at low cost since members interact face-to-face in a variety of daily activities. Community-based management also reduces transaction costs since community norms such as ethical values, reciprocity, and keeping promises, enable individuals to solve some coordination failures, and in the case of nonconformance, local sanctions within a community can be less expensive to implement – and even more coercive because of the community's strong moral effect – than a formal punishment (Ostrom, 1998). Ostrom (1998) added that community members also transmit these shared norms of behavior at low cost and may teach skills such as 'how to craft rules that change the incentives of participants while keeping monitoring and sanctioning costs low' (p. 119).

Articulation between the different levels of a large system, on the other hand, may have high coordination costs. Therefore, the choice of polycentric governance as implemented in organic regulation in Brazil – in which multiple centers of semi-autonomous decision making interact to make and enforce rules – drastically reduces these transaction costs thanks to better information transmission, a closer match between policies and the context, and enhanced capacity for deliberation, learning, and adaptive management (Carlisle and Gruby, 2019; Marshall, 2009). Moreover, the Brazilian organic regulatory system can also be likened to a co-management system – defined as 'shared responsibility between institutions of the State and of local resource users' (Adger *et al.*, 2005) that results from extensive deliberation and negotiation (Carlsson and Berkes, 2005). Co-management is a process rather than a fixed state (Carlsson and Berkes, 2005), a process in which rules seek to establish minimum parameters that cover the diversity of local contexts and maintain the high capacity of each organization to adapt procedures to its own reality.

While our data do not allow us to conclude that PGSs are more efficient than purely public or private governance, in line with certain authors (see Sarker, 2013; Sarker *et al.*, 2015), the Brazilian posture (i.e. recognition of the rights of local users to design and monitor their own rules, polycentric governance for large systems, and co-management) provides evidence supporting that the institutional route adopted so far favors the sustainability of PGS. Nonetheless, successful management is precarious as increasing administrative requirements are tending to replace relationships based on trust, and the current political situation appears to be challenging for autonomous movements, as technical assistance for and public policies on organic farming are being disarticulated and gradually abandoned (Sabourin *et al.*, 2020). Leaders of the organic farming movement denounce both the dismantling of multi-stakeholder arenas for policy governance, and the arrival of agribusiness agents in local and national Commissions for Organic Production that favor the techno-commercial vision which characterizes third-party certification. According to some of the leaders we interviewed, the PGS has not yet been challenged because its disappearance would profoundly disrupt the organic market, thereby affecting even large-scale retailers.

### Concluding remarks

Participatory certification represents a real paradigm shift compared to third-party certification because, contrary to the latter, it believes that proximity, regular exchanges to improve practices and social control guarantee the effectiveness of compliance with the standard. Ecovida governance

of the PGS was indeed originally designed to avoid opportunistic use of the organic label. Nonetheless, our empirical study emphasizes the need for the community to formalize its rules over time in the face of a growing and changing community of participants, in response to the hegemonic third-party certification requirements, and to reinforce the legitimacy of the PGS in the process of institutionalizing organic agriculture.

Based on the now widely accepted idea that rules crafted by users match local contexts better than those prescribed by public agencies (Bastakoti and Shivakoti, 2012; Carlsson and Sandström, 2008), at the time, the Brazilian government adopted rules for the recognition of PGS that were as close as possible to those that existed previously within the community. In addition, PGSs still have a considerable degree of autonomy in terms of formulating rules and devising their own institutional arrangements – probably more than is the case in third-party certification.

This paper illustrates how grammatical syntax can serve as a basis for collecting, presenting, and analyzing data to code institutional changes, in a way that gives substantive meaning to the study of change in institutions. It shows that it is still difficult to describe, analyze, and dissect all these interlocking levels of rules, in agreement with Ostrom's work on the analysis of institutions as complex adaptive systems. Nonetheless, the use of the Ostrom and Basurto's tool in the form of a table summarizing changes in rule configurations is very eloquent from this point of view. It provides a visual understanding of these changes and how the government has partially taken over the definition of the set of rules at the collective-choice level. However, we were obliged to refine the operators to be able to indicate from which institutional level the constitutional rules emerged (Ecovida or law) and on what basis they were introduced (bottom-up or top-down). This allowed us to provide additional information to explain why the link between the different levels of rules (mainly bottom-up) has been relatively well established in Brazil, thereby making the system sustainable.

To conclude, our case study advances our understanding of how to analyze rules and changes thereto, and helps define how the strategic position and behavior of the public authorities can enhance user autonomy and self-governance. Future studies that address the dynamics of institutional rules should focus on investigating the evolving role of public authorities and not take it for granted (Carlsson and Sandström, 2008), how deadlocks emerge and how such situations can be unblocked, and on the link between changes in the governance system and the subsequent motivations of the individuals involved.

Moreover, even though it was not our intention to go deeper into the dialog with other institutional theories and schools, our findings, which 'bring the public authorities back' into the analysis of the collective action, also bring Ostrom's model closer to historical neo-institutionalism. A more careful analysis of institutional change in collective action and self-governing organizations could be a first step toward greater theoretical cross-fertilization.

## References

- Adger, N., N. W. Arnell and E. L. Tompkins (2005), 'Successful Adaptation to Climate Change Across Scales', *Global Environmental Change*, **15**(2): 77–86. doi:10.1016/j.gloenvcha.2004.12.005.
- Balineau, G. and I. Dufeu (2010), 'Are Fair Trade Goods Credence Goods? A New Proposal, with French Illustrations', *Journal of Business Ethics*, **92**(S2): 331–345. doi:10.1007/s10551-010-0577-z.
- Baptista Da Costa, M., M. Souza, V. Muller Junior, J. Comin and P. E. Lovato (2017), 'Agroecology Development in Brazil Between 1970 and 2015', *Agroecology and Sustainable Food Systems*, **41**(3–4): 276–295. doi:10.1080/21683565.2017.1285382.
- Bastakoti, R. C. and G. P. Shivakoti (2012), 'Rules and Collective Action : An Institutional Analysis of the Performance of Irrigation Systems in Nepal', *Journal of Institutional Economics*, **8**(2): 225–246. doi:10.1017/S1744137411000452.
- Baur, I. and C. R. Binder (2013), 'Adapting to Socioeconomic Developments by Changing Rules in the Governance of Common Property Pastures in the Swiss Alps', *Ecology and Society*, **18**(4): 60. doi:10.5751/ES-05689-180460.
- Bowles, S. and H. Gintis (2002), 'Social Capital and Community Governance', *The Economic Journal*, **112**(483): 419–436. doi:10.1111/1468-0297.00077.
- Bowles, S., H. Gintis and H. Brighouse (1998), *Recasting Egalitarianism: New Rules for Communities, States and Markets*, London: Verso.

- Carlisle, K. and R. Gruby (2019), 'Polycentric Systems of Governance: A Theoretical Model for the Commons', *Policy Studies Journal*, **47**(4): 927–952. doi:10.1111/psj.12212.
- Carlsson, L. and A. Sandström (2008), 'Network Governance of the Commons', *International Journal of the Commons*, **2**(1): 33–54. doi:10.18352/ijc.20.
- Carlsson, L. and F. Berkes (2005), 'Co-management: Concepts and Methodological Implications', *Journal of Environmental Management*, **75**(1): 65–76. doi:10.1016/j.jenvman.2004.11.008.
- Cash, D. W., W. N. Adger, F. Berkes, P. Garden, L. Lebel, P. Olsson, L. Pritchard and O. Young (2006), 'Scale and Cross-Scale Dynamics: Governance and Information in a Multilevel World', *Ecology and Society*, **11**(2). <https://www.jstor.org/stable/26265993>.
- Crawford, S. and E. Ostrom (1995), 'A Grammar of Institutions', *The American Political Science Review*, **89**(3): 582–600. <http://www.seep.ceu.hu/alpsa/readings/grammar.pdf>.
- Crawford, S. and E. Ostrom (2005), 'A Grammar of Institutions', in E. Ostrom (ed), *Understanding Institutional Diversity*, Princeton: Princeton University Press, pp. 137–173.
- Darby, M. and E. Karni (1973), 'Free Competition and the Optimal Amount of Fraud', *The Journal of Law and Economics*, **16**(1): 67–88. doi:10.1086/466756.
- Dorville, C., S. Lemeilleur, P. Niederle and H. Ilbert (2021), Legally recognized commons and institutional diversity: The case of participatory guarantee system to certify organic agriculture in Brazil. *Working Paper CIRAD, MOISA*.
- 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): 1–14. doi:10.1007/s10460-016-9686-3.
- Futemma, C., L. C. Munari and C. Adams (2015), 'The Afro-Brazilian Collective Land: Analyzing Institutional Changes in the Past Two Hundred Years', *Latin American Research Review*, **50**(4): 26–48. doi:10.1353/lar.2015.0059.
- Harris, C. (2018), 'Institutional Solutions to Free-Riding in Peer-to-Peer Networks: A Case Study of Online Pirate Communities', *Journal of Institutional Economics*, **14**(5): 901–924. doi:10.1017/S1744137417000650.
- Jahn, G., M. Schramm and A. Spiller (2005), 'The Reliability of Certification: Quality Labels as a Consumer Policy Tool', *Journal of Consumer Policy*, **28**(1): 53–73. doi:10.1007/s10603-004-7298-6.
- Kiser, L. L. and E. Ostrom (2000), 'The Three Worlds of Action: A Metatheoretical Synthesis of Institutional Approaches', in M. D. McGinnis (ed), *Polycentric Games and Institutions: Readings From the Workshop in Political Theory and Policy Analysis*, Ann Arbor, MI: University of Michigan Press, pp. 56–88.
- Lemeilleur, S. and J. Sermage (2020), 'Building a Knowledge Commons: Evidence from the Participatory Guarantee System for an Agroecology Label in Morocco', *International Journal of the Commons*, **14**(1): 465–480. doi:10.5334/ijc.1020.
- Levine, P. (2019), 'What Should We Do?': The Bloomington School and the Citizen's Core Question. Published in Herzberg, Roberta Q., Peter J. Boettke, and Paul Dragos Aligica, eds. *Ostrom's Tensions: Examining the Political Economy and Public Policy of Elinor C. Ostrom* (Arlington, VA: Mercatus Center at George Mason University, 2019). doi:10.2139/ssrn.3765730.
- Mahoney, J. and K. Thelen (2010), *Explaining Institutional Change: Ambiguity, Agency and Power*, Cambridge: Cambridge University Press.
- Manning, S, F Boons, O Von Hagen and J Reinecke (2012), 'National contexts matter : The co-evolution of sustainability standards in global value chains', *Ecological Economics*, **83**: 197–209.
- MAPA. (2022). *Organicos*. Ministério da Agricultura, Pecuária e Abastecimento. <https://www.gov.br/agricultura/pt-br/assuntos/sustentabilidade/organicos/organicos>.
- Marshall, G. R. (2009), 'Polycentricity, Reciprocity, and Farmer Adoption of Conservation Practices Under Community-based Governance', *Ecological Economics*, **68**(5): 1507–1520. doi:10.1016/j.ecolecon.2008.10.008.
- Mazé, A. (2017), 'Standard-setting Activities and New Institutional Economics', *Journal of Institutional Economics*, **13**(3): 599–621. doi:10.1017/S174413741600045X.
- 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. doi:10.1016/j.jrurstud.2020.06.011.
- North, D. C. (2005), *Understanding the Process of Economic Change*, Princeton: Princeton University Press.
- Ostrom, E. (1998), 'Norms and Efficiency', *Recasting Egalitarianism*, London: Verso, pp. 113–120.
- Ostrom, E. (2005), *Understanding Institutional Diversity*, Princeton: Princeton University Press.
- Ostrom, E. (2010), 'Beyond Markets and States: Polycentric Governance of complex Economic Systems', *The American Economic Review*, **100**(3): 641–672. doi:10.1257/aer.100.3.641.
- Ostrom, E. (2014), 'Do Institutions for Collective Action Evolve?', *Journal of Bioeconomics*, **16**(3): 3–30.
- Ostrom, E. and C. Hess (2007), *Understanding Knowledge as a Commons: From Theory to Practice*, Cambridge: MIT Press Ltd.
- Ostrom, E., R. Gardner and J. Walker (1994), *Rules, Games, and Common-pool Resources*, Ann Arbor: University of Michigan Press.
- Ostrom, E. and S. Crawford (2005), 'Classifying Rules', in E. Ostrom (ed), *Understanding Institutional Diversity*, Princeton: Princeton University Press, pp. 186–215.
- Ostrom, E and X Basurto (2011), 'Crafting analytical tools to study institutional change', *Journal of Institutional Economics*, **7**(3): 317–343.



- Passos Medaets, J. P., A. Fornazier and K. M. Thomé (2020), 'Transition to Sustainability in Agrifood Systems: Insights from Brazilian Trajectories', *Journal of Rural Studies*, **76**: 1–11. doi:10.1016/j.jrurstud.2020.03.004.
- Petersen, P., E. M. Mussoi and F. Dalsoglio (2012), 'Institutionalization of the Agroecological Approach in Brazil: Advances and Challenges', *Agroecology and Sustainable Food Systems*, **37**(1): 103–114. doi:10.1080/10440046.2012.735632.
- Raynolds, L. T. (2004), 'The Globalization of Organic Agro-FOOD Networks', *World Development*, **32**(5): 725–743. doi:10.1016/j.worlddev.2003.11.008.
- Reinecke, J., S. Manning and O. von Hagen (2012), 'The Emergence of a Standards Market: Multiplicity of Sustainability Standards in the Global Coffee Industry', *Organization Studies*, **33**(5–6): 791–814. doi:10.1177/0170840612443629.
- Sabourin, E., C. Grisa, P. Niederle, S. Pereira Leite, C. Milhorange, A. Damasceno Ferreira, S. Sauer and J. M. Andriquetto-Filho (2020), 'Le Démantèlement des Politiques Publiques Rurales et Environnementales au Brésil', *Cahiers Agricultures*, **29**. doi:10.1051/cagri/2020029.
- Sarker, A. (2013), 'The Role of State-reinforced Self-governance in Averting the Tragedy of the Irrigation Commons in Japan: State-reinforced Self-governance', *Public Administration*, **91**(3): 727–743. doi:10.1111/padm.12011.
- Sarker, A., T. Ikeda, T. Abe and K. Inoue (2015), 'Design Principles for Managing Coastal Fisheries Commons in Present-day Japan', *Ecological Economics*, **117**: 32–38. doi:10.1016/j.ecolecon.2015.06.019.
- Simcoe, T. (2012), 'Standard Setting Committees: Consensus Governance for Shared Technology Platforms', *American Economic Review*, **102**(1): 305–336. doi:10.1257/aer.102.1.305.
- Simcoe, T. (2014), 'Governing the Anticommons: Institutional Design for Standard-setting Organizations', *Innovation Policy and the Economy*, **14**(1): 99–128. doi:10.1086/674022.
- van Karnenbeek, L. and L. Janssen-Jansen (2018), 'Playing by the Rules? Analysing Incremental Urban Developments', *Land Use Policy*, **72**: 402–409. doi:10.1016/j.landusepol.2017.12.021.
- Williams, M. R. and J. C. Hall (2015), 'Hackerspaces: A Case Study in the Creation and Management of a Common Pool Resource', *Journal of Institutional Economics*, **11**(4): 769–781. doi:10.1017/S1744137415000016.