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Sustainable Practices, Sustainable Markets? Institutional innovations in agri-food systems

Allison Loconto,¹ Anne Sophie Poisot² and Pilar Santacoloma³

Abstract

This text investigates how sustainable practices interact and co-evolve with sustainable marketing initiatives. The research is based on an international survey of fifteen case studies of institutional innovations in linking sustainable agricultural practices with markets. We explore how farmers and organisations are moving toward more sustainable practices through the collective mobilisation of participants, technologies, resources, and capacity building. Each of the cases illustrates a unique approach to creating linkages to markets, such as the use of *international standards, direct and institutional marketing techniques, and culinary education*. We find trends in the linkages between the socio-technical controversies that spurred the innovation and the form of the institutional innovation. Initial results point to the importance of charismatic leadership, constructing a common vision for sustainable agriculture, and building collective commitments among actors, as is common in social movements. While the focus of many market arrangements is on building local networks, we find the influence of international value chains in each case. This suggests that both community and international dynamics influence the development of institutional innovations in developing countries.

Key-words: sustainability, markets, standard, multi-stakeholder, institutional innovation, agri-food system

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1 Introduction

There is growing public consensus that agricultural production systems must develop within a model of sustainable intensification (Conway, 2012; FAO, 2011). However, how to intensify sustainably remains open to debate and there remain concerns about the feasibility of some proposed solutions to also meet societal grand challenges such as 'food security for all' (cf. Elzen et al., 2011; Garnett et al., 2013; Levin et al., 2012). For this reason, the sustainable intensification of agriculture provides a political space for making iterative improvements, or incremental innovations, to current agri-food systems (Busch, 2012; Grin et al., 2010).

Traditionally, agri-food system innovation has focused on developing and advocating the adoption and diffusion of productivity-enhancing technology, underpinned by improved research and development, but without much attention paid to system components beyond the technology (Lyson & Welsh, 1993). Advances in theories of innovation and socio-technical change recognise the importance of institutions (including markets) and techno-economic networks in the adoption and diffusion of innovation (Callon, 1991; Grin, Rotmans, & Schot, 2010; Smith, Stirling, & Berkhout, 2005). Studies of grassroots and social innovations are beginning to illustrate the importance of organisational and spatial arrangements, identities, collective mobilisations, knowledge and practices in innovation (Moulaert, 2013; Smith & Seyfang, 2013). If we take this broader view of agri-food system innovation, we find evidence of smallholders who are able to link with other food system actors to innovate beyond technology, to become organized for accessing new market opportunities, to expand into processing activities and to increase their power in market negotiations (HLPE, 2012). Put simply, innovations for sustainable agriculture are necessarily both technological and institutional (Struik, Klerkx, van Huis, & Röling, 2014).

Multi-stakeholder sustainability standards and their accompanying systems of certification have been referred to as: "one of the most innovative and startling institutional designs of the past 50 years" (Cashore, Auld, & Newsom, 2004, p. 4). Often emerging from alternative agri-food networks (Allen, Fitz Simmons, Goodman, & Warner, 2003; Bowen & Mutersbaugh, 2014; Goodman, 2004; Goodman, DuPuis, & Goodman, 2012), sustainability standards have become increasingly institutionalised through growing collaboration and recognition among a variety of actors and existing institutions (Loconto & Fueilleux, 2014). Recent experimentation in these systems push the boundaries of the traditional roles of institutional and market intermediaries who are taking on a wider range of roles in linking farmers with markets for their produce (cf. Vorley, 2013). These intermediaries are part of local infrastructural and institutional environments and include a range of organisations that provide support to producers to learn sustainable techniques and market sustainably produced products and services. For example, within organic agriculture systems, an emerging approach is the participatory guarantee system (PGS), whereby the oversight systems

are created by producers, researchers and consumers who collectively ensure that the sustainable practices are adopted (FAO, 2013; IFOAM, 2008). In other contexts, well-established farmer-supported marketing cooperatives are taking on new roles in supporting the adoption of more sustainable practices and technologies. We also see instances where public research and extension organisations are beginning to incorporate marketing aspects in the farmer field school (FFS) methodology and private traders are also beginning to invest upstream in their value chains to provide infrastructural and organisational support for small-scale producers. This study focuses on these types of innovations by asking: *How do institutional innovations in sustainable agriculture occur?*

This paper attempts to provide an answer to this question based on an international survey of fifteen case studies of institutional innovations that link sustainable agricultural practices with markets. We define institutional innovations as novel changes in the arrangements among actors (including organizations), schemas, norms, regulations and material objects (including technologies). In this paper, we are focusing specifically on innovations in the commercialisation of sustainably farmed products. We find that farmers and organisations are moving toward more sustainable practices through the collective mobilisation of technologies, resources, and capacity building. Each of the cases illustrates a unique approach to creating linkages to markets, such as the use of international standards, farm stalls, traditional markets, school canteens, and cooking schools among other techniques. We find trends in the linkages between the socio-technical controversies that spurred the innovation and the form of the institutional innovation. Initial results point to the importance of charismatic leadership and a common vision for sustainable agriculture, as is common in social movements, but also to the building of collective commitments among other actors. While the focus of most market arrangements is on building local networks, we find the influence of international value chains in each case. This suggests that both community and international dynamics influence the development of institutional innovations.

This paper proceeds as follows. We describe the conceptual framework based on the collective action model of institutional innovation (Hargrave & Van De Ven, 2006) that provides an analytical approach to the tensions identified in studies of alternative agri-food networks and socio-technical change. We then present the case study method. The cases are then analysed according to the framing contests, the construction of the networks, the enactment of institutional arrangements, and the collective action processes, which are core processes in institutional innovations. Conclusions are drawn about how sustainable practices are being linked to markets in developing countries in innovative ways.

2 Institutional Innovations and sustainable agri-food systems

In order to understand institutional innovations, it is important to establish why institutions are important for both constraining and facilitating transitions to sustainable agri-food systems. Generally, we follow North's (1991) definition of institutions as "humanly devised constraints that structure political, economic and social interactions" (p. 97). However, much has been written on institutions, particularly in theories of social movements and technology innovation management (see: Van de Ven & Hargrave, 2004), that qualifies this generic definition with a more pliable version where an institution is an arrangement that consists of actors, schemas, norms, regulations and material objects that enable action for individuals and organisations. Cleaver (2002) argues that institutional contexts are better understood as 'bricolage', which is a multiplicity of formal and informal institutions (conventions) that sometimes conflict or converge depending on the context. In this sense, institutions can be seen as outcomes of agreements and concerted action that arise from interaction among the actors who can make a difference (Röling et al., 2012, p. 3).

Röling et al. (2012) suggest that the challenge is "to empirically study and analyse the scope for change" in institutions (p. 4). This is particularly important, Röling and colleagues argue, because of the "complex, messy, multi-level situations and relational configurations in which actors with diverse interests interact" in the context of smallholder innovation in developing countries. Classical and new institutional theory typically explain institutional change as a linear, evolutionary trajectory either toward a robust state or toward its imminent collapse (Cleaver, 2002). Yet, envisioning institutional change and innovation as a multi-dimensional, relational and dialectical process, including more actors than the state alone, provides a number of different possible entry points and trajectories for 'purposeful change' where learning, adaptation and experimentation are possible (Jiggins, 2012).

Van de Ven and Hargrave (Hargrave & Van De Ven, 2006; Van de Ven & Hargrave, 2004) and Geels and colleagues (Frank W. Geels, 2002; Frank W Geels, 2010; Grin et al., 2010; Schot & Geels, 2008) focus on interpretations of Giddens's (1984) structuration theory as a way to enable an analysis of institutional change/innovation as contextually and historically contingent processes. Through the refinement of a multi-level perspective (MLP) heuristic, socio-technical systems are characterised by co-evolving relationships between actors and resources (e.g., supply and demand for innovations) and rules that co-ordinate their activities (Frank W. Geels, 2004). Diversity is considered to be present in these systems and resides in niches that offer alternatives and possible solutions to crises in the existing socio-technical regimes, which are comprised of rules,

routines, and technological artefacts, and are influenced by landscape level pressures. One such pressure is the need for sustainable solutions to agricultural problems.

Within agri-food systems, scholars have focused on the emergence of novelties as 'seeds of transitions' (Wiskerke & Van der Ploeg, 2004). That is, those ideas that modify or break with existing norms of the dominant agricultural socio-technical system. These can be focused on aspects of situated research activities, field practices or market organisation in situations of change that are governed by sustainable goals (Barbier, 2008). In all respects they are attempts to realign network actors towards existing public or private norms. Brunori et al. (2011) argue that alternative agri-food networks (AAFNs) are examples of niches, as they have stabilised beyond novelties through the creation of organizing visions and alternative techno-economic networks of food production, consumption and distribution. These are contingent relational activities where actors within AAFNs are interdependent on social actors within and outside the niche they are carving (Lamine, 2011). Some AAFNs, such as organic and fair trade, have adopted standards as a fundamental technology around which they organise diverse actors in a common vision of sustainability.

The assumption is that socio-technical change is a long process, not manifesting before 20-25 years. In the study of transitions there is thus a need for a methodology that can capture 'transitions in the making' (Elzen, Geels, Leeuwis, & van Mierlo, 2011). That is the controversy, negotiations and path forging and breaking that necessarily occurs when transitioning between novelties, niches, regimes and even landscapes; particularly when considering multi-stakeholder issues like sustainability where transitions are instigated by regime outsiders as a way to influence normative orientations. Some scholars have argued that this can be found by rethinking transitions as realignments in networks following the tradition of actor-network theory (Genus & Coles, 2008). By focusing on the actors and strategic realignments, institutional innovation can be seen as a process of designing and re-designing the problem conceptualisation and the mechanisms to mobilise and guide collective action.

It is from the perspective of collective action that we find the analytical framework that we adopt in this paper. In their review of the social movements, innovation systems and socio-technical change literature, Van de Ven and Hargrave (2004) identified four models of institutional change: institutional design, institutional adaptation, institutional diffusion and collective action. Each of these forms of change focuses on a different generative mechanism to explain change and can be seen as a progression over time of how academics have advanced our thinking about social change. Based primarily in the social movements literature, the collective action model is proposed as a way to understand how new institutions – or institutional innovations – emerge and develop through the political behaviours of multiple actors (Hargrave & Van De Ven, 2006). These actors play different roles in an organisational field or network that emerges to support the development

of a social movement or a technical innovation. The actors are characterised as being 'distributed, partisan and embedded' in both technological and institutional trajectories (Garud, Jain, & Kumaraswamy, 2002). In other words, different actors play key roles and no one actor controls any pathway (distributed), actors participate based on their own interests and solutions emerge through partisan mutual adjustment (partisan) and actors become dependent on the paths they create and they learn as the process unfolds (embedded).

Hargrave and Van de Ven's (2006) approach takes 'problem formation' as an entry point for analysis, and examines how actors engage four dynamics of institutional change: 1) framing contests, 2) construction of networks, 3) enactment of institutional arrangements and 4) collective action processes. The framing contests initiated in the first dynamic are carried through the others in order to mobilize actors and inspire frame transformations, which are necessary for system-wide innovation). While this approach recognises the power and interests of a variety of actors (institutional entrepreneurs and other stakeholders), Hargrave and Van de Ven (2006) insist that we cannot eliminate the limiting factors that existing institutions play in institutional change, particularly in terms of the form and pace of change (i.e., path dependency). Nonetheless, analysing institutional innovations according these four dynamic processes will provide us with an account of how institutional innovations in sustainable agriculture emerged from interactions among interdependent partisan agents. From the analysis of the fifteen different cases of innovations that focus on changing not only the technologies of production, but also the institutions and networks that bring products to markets, we can begin to draw conclusions about the diversity of possibilities for transitioning to sustainable intensification.

3 Methods

Producing more with less by increasing efficiency and improving ecosystem services is the core concept of the Food and Agriculture Organization of the United Nation's (FAO) new paradigm for sustainable intensification, synthesised in the book "Save and Grow" (FAO, 2011). FAO's new paradigm is built upon lessons learned from the Green Revolution, taking into account its benefits and drawbacks. In 2013-2014 FAO conducted a survey of institutional innovations in order to recognise trends and the potential for markets in developing countries to contribute to the adoption of sustainable practices. Following a case study method of qualitative research (Maxwell, 2005), the authors launched a call for case study proposals on institutional innovations that link sustainable practices with markets for sustainable products. Proposals were evaluated according to the following selection criteria:

- Relevance of the case to the request for proposals (describing an existing initiative, including sustainable practices, and including a link between sustainable practices and markets)

- Quality of the proposal
- Time that the innovative approach has been in use (more than two years)
- Author's institutional affiliation, with preference given to those directly linked to the implementers of the innovative approach

We received 87 proposals, of which 42 were considered relevant for the study. We then evaluated these based on 10 criteria that ranged from geographical priority to quality and innovativeness. This allowed us to prioritize those studies written by the innovators themselves, those that have been in successful operation for more than five years – which provided data for looking at the institutionalization process, and exciting new approaches.

Fifteen detailed case studies were finally selected from innovative approaches (public, private and/or civil society) designed to link sustainable agriculture practices with markets for sustainable products in developing countries. We sought geographic balance in our selection and in the end we arrived at four cases from Latin America and the Caribbean (Bolivia, Colombia, Ecuador, Trinidad and Tobago), six cases from Africa (Bénin, Namibia, Nigeria, Uganda (2), Tanzania), and five cases from Asia and the Pacific (India, Indonesia, Iran, Philippines, Thailand). The authors were primarily the implementing organisations (10), southern researchers with implementing partners (4), an implementing donor organisation (1) and a northern researcher with the implementing organisation (1).

Since the focus of the study is on understanding how institutions are changing in order to facilitate the linkages between sustainable agricultural practices and markets for their products, we categorised the cases according to the sustainable practices and the institutional innovations for linking farmers to markets. The cases span a variety of sustainable agriculture technologies, specifically: organic agriculture (10), integrated pest management (IPM, 2), and integrated production systems (IPS, 3). The bias towards organic agriculture in our case studies is a selection bias that comes from the distribution of the call for case studies, which was distributed through the organised organic networks as well as the sustainability standards and academic networks.⁴ However, the percentage of studies focusing on organic (69%) reflects the distribution of sustainable agriculture practices found in the first round of submissions (46%) and the short-list (62%) of selected case studies. Nonetheless, we do recognise that certified organic represents only 0.87% of total agricultural land (Willer & Lernoud, 2014) and thus is still very much a niche in the agricultural landscape. The institutional innovations examined in the study include participatory guarantee systems (PGS, 5), multi-stakeholder innovation platforms (IP, 6), and embedded networks (EN, 3).

⁴ We announced the call through the following listservs: FAO departmental lists, ISEAL IMPACTS, IFOAM (PGS list), INRA (UMR-SADAPT, UR-SenS), CIRAD, EGFAR, Altersyal, Rural Finance Learning Centre, ISA RC40 (Research Committee on Agriculture), Food for the Cities, Prodarnet network, FFS Global Review, E-forum 2, POET Com, East Africa Organic Movement Organizations

The case development process was iterative where the authors developed a structured outline with guiding analytical questions for the case studies. The first drafts received detailed comments by the authors and follow-up consisted of either field visits (for eight of the cases), where the first author conducted interviews with the case study authors and the other institutional actors who were identified in each case, or by video conference with the authors. In the seven cases where field visits were not possible, local peer reviewers who were knowledgeable about the case and its context were identified to review the cases.

4 Sustainable practices and markets

In this section, we present the analysis of our 15 case studies according to the four processes of institutional innovation: 1) framing contests, 2) construction of networks, 3) enactment of institutional arrangements and 4) collective action processes. We draw upon insights from actor-network theory, as it is developed within the sociology of innovation, to explain how these processes work. This analysis enables us to draw out the common elements of the institutional innovation process across the diversity of our cases. Annex 1 presents a summary table with the coding of each of the cases.

4.1 Sustainable Practices and Markets: framing contests

Framing processes call attention to the creation and manipulation of the meanings and issues at stake in the innovation process, as well as how a technology or a set of sustainable agriculture technologies is positioned within the dominant socio-technical regime. Frames have a role in both internal identity building and, externally, in establishing a world view that marks the innovation as a solution to an identified problem and something different from conventional approaches. Internally, frames make events and practices meaningful for the actors (Benford & Snow, 2000), but they necessarily draw upon discourses and repertoires already circulating in society in order to establish themselves as different and innovative (cf. Swidler, 1995; Tarrow, 1993). According to the sociology of innovation, the framing of a controversial situation is an attempt by the actors to identify a problem and make it calculable (Callon, 1998). Actors do this by limiting the number of overflows (i.e., what the frame fails to explain) and can focus on not only proposed solutions to problems, but also to the means used to reach desired ends (Rukanova, Henriksen, Raesfeld, Stijn, & Tan, 2007). In our cases, we identify a number of frames that are used to establish innovators as different from the conventional regime – thus solutions to the problems of unsustainable agriculture – and frames that are used to establish the means to achieve their desired ends.

In our cases we can distinguish between definitional framing (DF), which establishes the core identity for the actors, the objective (O) of the innovation, the solution (S) to the problem and the mechanism (M) through which to achieve it. We have identified four core ways of framing sustainable intensification as a solution: organic, commodity sustainability, community IPM and moral economy. We find that in the ten cases that use organic agriculture as their definitional frame there are contestations over what this means and the actors engage actively in definitional framing. We can divide our cases geographically and we find that the Latin American cases insist on a notion of agro-ecology, which includes a concept of food sovereignty and the promotion of a local economy. In the Bolivian case, it is defined as having the following dimensions: "1) technological or productive, 2) social/cultural, 3) environmental, 4) economic and 5) political". In contrast, organic is used to refer to a weaker form of agro-ecology that is focused on the export markets and international organic standards. These debates were also present in Africa and Asia but these innovators did not mind identifying themselves as organic as opposed to agro-ecological. In the case of India, this is because the national "standards for organic production are geared towards specificities in India e.g. use of Ayurveda and Unani medicine systems in agriculture." Nonetheless, in these cases we found that the actors were not focused only on local markets but were also integrated into export-oriented value chains.

The three cases of commodity sustainability focused on creating cohesion within a specific sub-sector of the agricultural landscape: cocoa in Indonesia, tea in Tanzania, and agro-forestry in Trinidad. The justifications for these framings draw upon sectoral development and are attempts to shift the entire industry towards the innovative approach. There are also two additional definitional frames found in the cases. In Thailand, the Dharma Temple Garden frames its response to unsustainable agriculture in terms of the construction of a moral economy founded in Buddhist principles. In Iran actors are connected around the promotion of a specific agricultural technology – integrated pest management – which helps them to create a group identity based on shared experiences with the FFS methodology.

These definitional frames are accompanied by objectives or goals for a transition to a sustainable future. We can characterise these frames in terms of how actors explained the goals of their activities. The most prominent theme relates to health and safety, specifically in terms of safe food, consumer health and nutrition, and producer/worker health and safety. In India and Iran, there are nation-wide concerns over the excessive use of pesticides in conventional agriculture. Therefore the concept of 'safe food' carries a lot of traction with consumers who are looking for food that poses minimal risks to their health. In Bolivia, Ecuador and Uganda safety was expressed in terms of 'safe food' but also in terms of the safety of the farmers who must handle synthetic inputs. In these three countries, concerns for farmers' health were linked with consumer interest in nutrition. Here, consumers seek organic food also because the organic farmers are growing difficult to find varieties of fruits and vegetables that are known to have nutritional benefits. In

Namibia, consumer health and nutrition was the key frame employed for an elite consumer base concerned about their local environment and animal welfare.

Livelihood promotion emerged as the second most salient objective of these initiatives. We saw a split between an individualistic notion of farmer livelihoods on the one hand (Tanzania and Indonesia) and community livelihoods on the other (Thailand, Trinidad and the Philippines). The Tanzanian and Indonesian cases are those where you have a strong presence of international standards and donors who are promoting sustainable agricultural practices in top-down, diffusion of innovation style projects – albeit with innovative techniques. Therefore, we believe that the focus on individual farmers emerges from this broader context. In the case of the community livelihoods, each of these is a community-initiated project that is focused primarily on a community-based market development. The case of the Songhai Centre in Benin is also focused on building local communities in the form of ‘green rural villages’, but they have a more ambitious plan for integrated rural development that is based in communities but linked into national, regional and international market networks. Finally, the Bolivian and Colombian cases have the objective of food sovereignty for producers. Food sovereignty is part of the public debate in both countries. It is enshrined in the Bolivian constitution and thus the innovation works to provide a means to achieve official policy. In Colombia, food sovereignty is hotly contested where official policy does not take it into account and thus the innovation plays an oppositional role by promoting it.

Each of the cases offers a different solution to the problem of sustainable agriculture. We can characterise the solutions more broadly into the categories of knowledge (youth training in Benin and Nigeria, FFS in Iran, and farmer-driven experimentation in Indonesia); market outlets (local economies in Bolivia, Ecuador, Namibia, Trinidad and Uganda and value chain management in Uganda and Tanzania); and access to biological resources (native seeds in Colombia and India, yield increases in India, and farmer-control over genetic resources in the Philippines). These solutions are delivered through three types of mechanisms: multi-stakeholder innovation platforms (IP), participatory guarantee systems (PGS) and embedded networks (EN).

An IP is “a multi-actor configuration deliberately set up to facilitate and undertake various activities around identified agricultural innovation challenges and opportunities, at different levels in agricultural systems (e.g. village, country, sector or value chain)” (Kilelu, Klerkx, & Leeuwis, 2013, p. 66). There is no set configuration for an IP, it can be centralised or decentralised and focus on research and/or development activities. We see examples of this in our case studies. The Songhai Centre in Benin is a centralised model focused on research, training and development. It is composed of primary (an integrated production model of agriculture, aquaculture, livestock-raising, and biogas production), secondary (processing and packaging) and tertiary (food, marketing, information technology and transport services) production activities. This centre is

linked to a network of satellite centres and alumni farmers who sell their products to the Songhai centres and promote learning exchanges. The Partisipasi Inovasi Petani (PIP) Project in Indonesia illustrates a hub-and-spoke model of innovation that provides a business-oriented farm extension outreach system where Cocoa Development Clinics (or CDCs) are the hubs and Cocoa Village Clinics (CVCs) are the spokes. The CDCs are centres for training, technology demonstration, developing regionally appropriate techniques and testing improved planting material. The CVCs are economically independent village enterprises that sell farm inputs, and provide agronomic advice based on their own demonstration plots.

The Community Based-Farming Scheme in Nigeria is another example of a centralised model whereby the University of Abeokuta has introduced organic agriculture curricula, student farms, community field visits and an organic kiosk to sell its produce. In Tanzania, we see national level government agencies collaborate with the tea research institute, private companies and NGOs to develop new technologies, exchange knowledge, provide financing and extension support to smallholder farmers for Rainforest Alliance certified production practices, which are sold locally to the tea processors who export the product. In Uganda, the Kangulumira Area Cooperative Enterprise (KACE) serves as a centralised IP for technology upgrading, knowledge exchanges and training in organic practices, access to finance and other development training for groups of farmers. Finally, the IPM Group in Iran is an example of a loose network IP. Here the network began in project-sponsored FFS but continued these FFS by creating a network of alumni and carrying on their own training of trainers. Now the IPM group also serves as a means to link its member farmers with markets by mobilizing other networks through exchange visits and renting farm stands.

PGS are networks created within local communities and consist of farmers, experts, public sector officials, food service agents, and consumers. "They certify producers based on active participation of stakeholders and are built on a foundation of trust, social networks and knowledge exchange."⁵ The role of this type of network is to create a local system of production and consumption whereby multiple stakeholders experiment with sustainable agriculture technologies (Rosegrant et al., 2014), but also collectively ensure that the techniques are adopted by setting standards and verifying their compliance (i.e., the governance arrangements) (IFOAM, 2008). PGS therefore both ensure the diffusion of the innovation and are the means through which the innovation process is governed. PGS emerged as experiments in organic agriculture in the 1970s in the US, Japan and Brazil, but are now found in 26 countries around the world. In developing countries they arose in response to protests against the dominant paradigm of standard-setting by corporate and Northern NGO actors who use third-party certification systems that were seen as too costly for

⁵ Official IFOAM PGS Definition, accessed 15 February 2014, <http://www.ifoam.org/en/value-chain/participatory-guarantee-systems-pgs>

many small-scale producers and not applicable to local agro-ecological and socio-technical conditions. PGS serve to provide a direct guarantee, through the formation of a market, for sustainably produced food and agriculture products. We have case studies of six PGS that are implementing organic agriculture in Bolivia, Colombia, India, Namibia, Philippines and Uganda. We can classify these into publicly promoted and recognised PGS (Bolivia and Philippines) and private sector PGS (Colombia, India, Namibia and Uganda).

EN refers to those innovations that are tied to the specific agro-ecosystems and socio-cultural contexts of their origin (Bair, 2008). In Ecuador, La Canasta Utopía is a community supported agriculture model whereby the core interactions are market-based, but support wider community mobilisation around healthy food and rural development. The markets and rural-urban exchanges take place in close proximity to the locus of action and they focus on ensuring rural food sovereignty. In Thailand, the Dharma Garden Temple is highly embedded in its community as it serves as the community religious centre and relies upon community volunteers for much of its training and outreach. The creation of a local radio station as a means to spread its message helps to embed the EN further into the community. Finally, the Brasso Seco Paria Community case demonstrates how an agro-tourism effort builds on existing community structures to introduce new technologies and markets that are necessarily located in their unique agro-ecosystem.

We find that each of these frames responds to debates that are circulating in national and international debates over sustainable agriculture. There are no fixed sets of problem frames, objectives, solutions and methods. In fact, each case has combined these in a different way, which provides evidence for the extremely contextual nature of these innovations. Nonetheless, we do find trends in the linkages between the socio-technical controversies that spurred the innovation and the form of the institutional innovation. In the PGS cases we see a reaction to controversies around food sovereignty and external expert control over practices. In the EN cases we see responses based on a moral economy that attempt to re-embed market transactions in to the community. In the IP cases, we see collaborative efforts to respond to crises related to agricultural technologies, particularly pesticide intensive farming, by encouraging collaborative learning.

4.2 Sustainable Practices and Markets: the construction of the networks

The construction of networks is fundamental to the extension of political, knowledge-based and market institutions. It is through the construction of networks that actors are able to transform the problems that they have framed into actionable solutions by mobilising actors, isolating themselves from conventional industries, and freeing themselves from some of the institutional

constraints that constrict their growth (Hargrave & Van De Ven, 2006). Network construction can be explained as a process of translation that includes the processes of problematisation, 'intéressement', enrolment and entanglement of actors into the network, and mobilisation (Callon, 1986). In an innovation process, the construction of the network must include actors internal and external to the group in order to achieve both political and technical goals and be considered legitimate (Loconto & Fouilleux, 2014). Therefore both vertical and horizontal mobilisations should be considered (Rukanova et al., 2007). These interactions can be collaborative or competitive and are not necessarily centrally planned, but more programmatically constructed where all of the actors concerned change their activities and ideas as a result of the interaction. In our cases we see examples of both vertical and horizontal network construction.

We see horizontal network construction occurring as a way to build cohesiveness within the group. This means that actors are enrolled and entangled as part of the core group of actors promoting the innovation. In all cases producers are the core group of actors, but what differentiates these innovations from conventional farmer groups or cooperatives is how producers are engaging with researchers, government officials, private companies, community members and consumers. In these horizontal relationships we see both market-based relationships and collective commitments between non-market actors. We see the emergence of a number of new hybrid actors, where responsibilities for different activities in the network emerge. The hybrid actors that we identify are *consumer-citizens*, *farmer-experts*, *producer-auditors*, *producer-consumers*, and *producer-marketer*. These hybrids represent a way for actors to take on multiple roles and identities in their networks. Producer-consumers are found in Bolivia, Colombia, Ecuador, Iran and Uganda where there is a primary focus on producing crops first for the farmers' own consumption and then for the local market. Farmer-experts, producer-auditors and producer-marketers are all ways to describe the changes in the roles of farmers in the Bolivian, Iranian, Indian, Namibian and Philippine networks. We see clearly the role of learning and knowledge exchange as producers take on more responsibilities beyond food production. Finally, there is an element of responsabilisation occurring in the Bolivian, Colombian, Ecuadorian, Namibian networks where we see consumer-citizens (cf. Spaargaren, 2011) who join the horizontal networks not only to consume organic food, but to also promote the social and political mission of the network.

Vertical network construction is used to create external alliances that ensure access to markets and/or provide a competitive pressure for improvement. In 12 of the 15 cases, we see a clear role for a charismatic leader (Zald & Ash, 1966) in both mobilizing within the innovative group and by creating linkages with donors, NGOs, government officials and long value chains. In these relationships, knowledge and financial resources are exchanged between external and internal network actors. The leaders in these cases cover a range of types as we see a charismatic leader, based on a moral authority, in the case of Benin and in Thailand; and an organisation as a leader, based on market authority, in the case of Tanzania and Namibia. In Ecuador, Indonesia, and

Trinidad, where we don't see a clear role for a charismatic leader, we find that these cases are small in size (and locally embedded in the cases of Ecuador and Trinidad) and the actors have not yet expressed clear intentions to expand their activities beyond their current geographically limited scope.

The focus on network construction highlights the importance of charismatic leadership and hybrid-actors as important for building collective commitments among actors. While the focus of many market arrangements is on building local networks, we find the influence of international actors in each case. This suggests that both community and international dynamics influence the development of institutional innovations in developing countries.

4.3 Sustainable Practices and Markets: the enactment of institutional arrangements

Institutional arrangements are those institutional and industrial infrastructures that provide political and market opportunities for the products produced through sustainable practices (Fligstein, 2001; McAdam, McCarthy, & Zald, 1996). Van de Ven and colleagues (Hargrave & Van De Ven, 2006; Van de Ven & Garud, 1993) identify institutional regulations (IR) (e.g., laws, standards, agencies, associations, scientific/technical communities), resource endowments (RE) (e.g., knowledge, finance, insurance, training), consumer demand (CD) (e.g., creation of environmentally-socially-health-conscious consumers) and proprietary activities (PA) (e.g., quality products). These institutions are important because in order to have a market for sustainably produced products there must be ways to establish prices, inform customers and suppliers and to provide distribution arrangements. We find all of this occurring in our cases.

The ways in which prices are fixed follow one of three approaches in our cases. First, there are national level mechanisms which establish a price premium for organic or 'safe' food. These mechanisms dictate a set price or percentage above the market price (e.g., Philippines and Iran). Second, some arrangements set up their own private price negotiation between the producers and consumers in their network. This is the case in Ecuador where producers and consumers negotiate a fair price each season. This is based on the wholesale market prices and the prices are usually favourable to producers as the prices they receive are always higher than those from the wholesale markets. Finally, some arrangements do not specifically negotiate a price, but rely upon private contracts or the market prices to negotiate prices based on the quality of their products (e.g., Benin, Namibia, Uganda and Tanzania). In these cases, a price premium for sustainable products is not assumed and often is not received. In Benin, producers explained that they adopt this mechanism because they are making cost savings. In Uganda and Tanzania the cost savings were not as apparent.

We find differences in how customers and suppliers are informed across the cases. Direct interaction between producers and consumers through traditional or speciality markets are the preferred ways of communicating quality. However, we also find innovative ways of improving consumer awareness through product labelling that explains the health benefits of the product (Benin), Facebook updates (Uganda) and exchange visits in all cases. Large-scale consumer awareness campaigns are also occurring in all of the countries, but these are usually carried out by actors in the vertical networks (ministries, national organic movements, NGOs) and not directly by the innovators.

Distribution arrangements range from direct markets, through cooperative sales, long and short value chains to public procurement. In most cases, distribution arrangements pose challenges as it is in these instances where the existing institutions constrict behaviour. For example, the formalisation of informal networks (through tax registration and establishing formal enterprises) is necessary for accessing more formal markets such as export, public procurement and even having a market stall in the mainstream markets. In Tanzania, one of the innovative aspects of this case is how the different public and private organisations have mutually adjusted their practices in order to ensure timely distribution of certified products. This has worked as an incentive for the adoption of practices by farmers as consistency of logistical networks enables better planning of harvesting practices.

Finally, we found that the existence of a national policy or standard was not present in all of the cases. Instead, there seems to be a mix between national, regional and international standards that the farmers are using as a guide for their sustainable agriculture practices. There are no clear trends in the cases. For example, the EN cases comply with locally defined standards, but in Trinidad and Thailand we also see the farmers applying international standards for organic agriculture. Indeed, while well institutionalised cases, like Bolivia and the Philippines have national organic standards, those cases that are in the developmental phase of innovation (Tanzania and Benin) do not have any legislation related to the standards that they are applying. The status of these institutional arrangements is important for evaluating the outcomes of these collective action processes.

4.4 Sustainable Practices and Markets: the collective action processes

Hargrave and Van de Ven (2006) refer to collective action processes as the contested political process through which innovations emerge. These processes include the ways in which the solutions are framed, how the network of actors is engaged and the political and market

opportunities that exist at a particular moment in time. Following from the information provided in the last three sections, we can consider the progress of collective action according to three phases: emergence, developmental and implementation (or convergence). We can thus discuss whether or not these innovations are currently considered legitimate solutions to the problem of unsustainable agricultural practices.

Building on the language from innovation studies, we characterise the current status of nine of the institutional innovations in our survey as being in an 'era of incremental change' (Anderson & Tushman, 1990) or in the developmental phase. Based on a timeline from their official creation, the innovations have been in existence for about 10-15 years. Their forms and governance structures have converged over time towards more formalised organisations with delegation of rights and responsibilities assigned to professional staff (in most cases). They have markets, mostly on the local level which they are consistently supplying. There are projects in all countries to gain public recognition of their sustainable practices, which have been achieved through the mobilisation of networks. Private recognition, in terms of consumers and market actors, is also developing alongside the public recognition and is actually the driving force for pursuing political solutions that can facilitate access to market outlets.

The Indonesian, Namibian, and Nigerian cases are still in the phase of emergence as the sustainable agriculture practices are in the process of being introduced, the network linkages are weak, and the political project driven by the innovators does not have strong support from the public sector. On the other hand, we see Benin, Bolivia and Tanzania as entering into the implementation phase. In Benin, the model has been in existence for over 20 years. The agricultural methods are well established with a strong training curriculum. The model has been replicated outside of the country and Songhai just received a political commitment from the Ministry of Education to establish Songhai centres in each district of the country. In Bolivia, there is continued investment by public and civic actors over the past 20 years in the promotion of organic. Ten years ago a new national agency was created to provide training and support for the development of PGS; and to manage the institutional linkages with the food safety authority. Bio-fairs have become a mainstay in a number of urban centres and activities are ongoing to link PGS producers with school feeding programs in rural areas. The government has also made commitments to finance municipal level organic extension officers. In Tanzania the agricultural methods have only been taught over the past five years, but the institutional actors have been collaborating together for almost 20 years. Moreover, we see changes in national regulations and mandates for both public and private actors through the collaboration around sustainable agriculture practices. The current policy of the government agencies is to ensure that all smallholder tea farmers in the country will be practicing sustainable agriculture over the next five years. This is supported by the private sector and farmers, as sustainable products have become a *de facto* mandatory market requirement.

5 Conclusion

As Hounkonnou et al. (2012) argue “institutions cannot be transferred like technologies” (p. 81), change must occur from within the existing institutions in order to create new ones. Therefore, it is important to survey existing cases of where we see actors have already begun to invest in alternatives that have started to make changes in practices towards sustainable intensification. In our cases, sustainable intensification has taken many forms. For example, even within the organic cases, the practices that are considered to be sustainable and their institutional arrangements are varied. When international standards are used, the innovation lies in the mutation of ‘control’ mechanisms into ‘learning’ mechanisms. This allows for greater inclusion of local actors, but these innovations are not yet accepted in international markets. In many cases, there is reliance upon technological innovations ascribed to capital-intensive production systems, which illustrates that many of these examples are indeed incremental innovations within the sustainable intensification paradigm. This preliminary analysis of the case studies remains descriptive, but provides an overview of existing institutional arrangements that are effectively implementing sustainable agriculture practices, standards, and incentives.

The introduction of new ways of linking sustainable agricultural practices with markets, through new institutional arrangements, is neither necessarily robust nor enduring. These arrangements are likely to evolve over time as they receive more support and interest by additional stakeholders and existing institutional actors. What these innovations do emphasise, however, is that their emergence and development has been a result of a number of diverse institutional opportunities that have allowed *ad hoc* actors to invest in new organisational forms. As Cleaver (2002) argues, single purpose institutions are not favoured through institutional bricolage, which is a notion of institutional change that recognises both the structural constraints of institutions and actors’ agency in changing them (though not a rational/instrumentalist agency). Indeed, we see this in our cases since while in their framing process each innovation may make claim to a key driver as the motivation for their innovation, the institutional development of the innovation has brought in complementary and contingent processes and functions that enable the innovation to persist over time. In this way, we have been able to explain how institutional innovations emerge from interactions and framing contests among partisan actors. By merging social movement theories with the sociology of innovation, we believe that we have been better able to capture the diversity of dynamics existing in our cases, but also to find similarities across the cases. This framework enabled us to ascertain a stage of collective action, which provides insights into questions of the legitimacy of these innovations in terms of resolving problems of un-sustainable agriculture. These insights are important for discussions of socio-technical transitions as they can shed light on the dynamics involved in moving these innovations from niche levels into wide-spread applicability

and regime shifts (cf. Grin et al., 2010), which are clearly areas for further research on the institutionalization of these types of innovations.

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6 References

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7 Annex 1

Country	Title	Framing Contexts	Network Construction	Institutional Arrangement	Collective Action
Benin	The Songhai Model of integrated production	DF: Organic O: Rural development S: Youth training M: IP	Vertical: Ministry of Education Donors (South-South, North-South) Leadership Horizontal: Alumni network Hotels	IR: Scaling-up strategy RE: Youth training CD: Labelling strategy PA: Quality products and services	Implementation
Bolivia	The Ecological Fairs of La Paz, Cochabamba and Tarija	DF: Agroecology O: Food sovereignty, Health (nutrition/safety) S: Local economy M: PGS	Vertical: Donors (FAO, Spain) Leadership Horizontal: Producer-Auditor Producer-Consumer Consumer-citizen School canteens Municipal officials	IR: National Organic Law & PGS standard RE: Capacity building CD: Local fairs PA: Quality products	Implementation
Colombia	The Familia de la Tierra PGS	DF: Agroecology O: Food sovereignty S: Native seeds M: PGS	Vertical: Restaurants Cooking school Peasant movement Leadership Horizontal: Consumer-citizen Producer-consumer University District-level public institutions	IR: Organic Policy Proposal, National Association RE: University seed research CD: Gourmet Consumers PA: Quality products	Developmental
Ecuador	Reinforcing the Local Systems of Healthy Food of Sierra Centro	DF: Agroecology O: Health (nutrition/safety) S: Fair trade (local economy) M: EN	Vertical: National NGOs Horizontal: Consumer-citizen Producer-consumer	IR: Food sovereignty law, Nation Association RE: Field visits CD: Community supported agriculture PA: Quality products	Developmental

India	PGS and the small holder markets: Idea of Trust and Short Market Chains	DF: Organic O: Health (safe food) S: Native seeds, Yields M: PGS	Vertical: Donors (FAO, IFOAM) Long value chains Leadership Horizontal: NGOs Farmer groups Producer-Auditor	IR: National Organic Law, Public PGS standard, Private PGS standard RE: Field visits CD: Short and long value chains PA: Quality products	Developmental
Indonesia	Partisipasi Inovasi Petani (PIP) Project: A participatory model for promoting farmer-driven innovation	DF: Commodity Sustainability O: Farmer livelihoods S: Farmer-driven experimentation M: IP	Vertical: Donors (Mars, Inc.) Long value chains University Horizontal: Input providers Farmer groups	IR: Scientific/technical community, GAP standards RE: Farmer experiments CD: long value chain PA: Quality products	Emergence
Iran	The role of CBOs in sustainable production and marketing of agricultural products	DF: Community IPM O: Health (safe food) S: Farmer Field Schools M: IP	Vertical: Donors (FAO) Leadership Horizontal: Producer-consumer Farmer-expert	IR: Development policy RE: farmer field schools CD: consumer information PA: Quality products	Developmental
Namibia	The Namibian Organic Association's Participatory Guarantee System	DF: Organic O: Health (nutrition/safety) S: Local economy M: PGS	Vertical: Allan Savory Institute National Organic Movement National NGOs Supermarkets Leadership Horizontal: Consumer-citizens Producer-marketer	IR: National Policy for Climate Change; National Rangeland Management Policy RE: National Organic Movement CD: local markets PA: Quality products	Emergence
Nigeria	Impact Assessment of the Community Based-Farming Scheme in Enhancing Sustainable Agriculture in Nigeria	DF: Organic O: Sustainable farming S: Youth training M: IP	Vertical: Donors Universities Leadership Horizontal: Community engagement Student training	IR: International Organic standards RE: Student farms CD: Organic kiosk PA: Quality products and services	Emergence

Philippines	The Innovative Institutional Approach: QPGS	DF: Organic O: Community livelihood S: Farmer control over genetic/bio-resources M: PGS	Vertical: Provincial government CSOs University Leadership Horizontal: Producer-marketer Producer-auditors	IR: National Organic Act, Private PGS standard RE: University linkage CD: local markets PA: Quality products	Developmental
Tanzania	Sustainable Agricultural Practices by Smallholders Tea Farmers	DF: Commodity Sustainability O: Health (safety) Farmer livelihoods S: value chain management M: IP	Vertical: Donors Government agencies SAGCOT Leadership Horizontal: Farmer-Processor linkages	IR: Rainforest Alliance standard, government agencies RE: extension CD: Market requirement PA: Quality products	Implementation
Thailand	Moral Rice Program: Dharma Garden Temple	DF: Moral economy O: Community livelihood S: Local economy M: EN	Vertical: IFOAM Long value chains Leadership Horizontal: Community members	IR: International and local standards RE: Volunteer, training CD: Radio PA: Quality products and services	Developmental
Trinidad	The Brasso Seco Paria Community Make Agrotourism Their Business	DF: Commodity Sustainability O: Community livelihood S: Local economy M: EN	Vertical: Donors (IICA) Horizontal: Community members Sister projects	IR: International standard RE: community association CD: Tourism PA: Quality products and services	Developmental
Uganda	Facilitating social networks through FreshVeggies PGS	DF: Organic O: Health (nutrition/safety) S: Local economy M: PGS	Vertical: Supermarkets National NGOs Donors (UN, Sida) Leadership Horizontal : Producer-consumer Farmer groups SACCO	IR: Regional Org Standard & PGS standard RE: National Organic Movement CD: Facebook PA: Quality products and services	Developmental
Uganda	The role of cooperatives in linking sustainable agricultural practices with market	DF: Organic O: Farmer livelihoods S: Value chain management M: IP	Vertical: Exporter National NGOs University Leadership Horizontal: Farmer groups	IR: Regional Organic standard, IMO certification RE: University linkages CD: long value chain PA: Quality products	Developmental