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What might an “agro-ecological” food system look like?

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Abstract

Through its international and regional symposia, FAO has recognized the important role of agroecological production systems in the development of sustainable food systems. However, there is little understanding of how agro-ecologically produced crops become marketable products that are recognized by consumers for their agroecological qualities. In 2015, FAO and the Institut National de la Recherche Agronomique (INRA) conducted a qualitative survey with producers, consumers and intermediaries from 12 countries (Benin, Bolivia, Brazil, Chile, China, Colombia, Ecuador, France, Kazakhstan, Mozambique, Namibia and Uganda) to gain insights into this question. Through this study, we identified a typology of markets that are based on different levels of interaction between actors in a food system, the inclusiveness of the business model, the number of times the product changes hands, the fairness of prices, the means of quality communication and the identification of quality attributes themselves. In this paper, we present the results of this study by explaining these typologies of “agroecological” markets in developing countries.

Introduction

The FAO symposium on Agroecology in 2014 highlighted the importance of agro-ecological practices in the development of sustainable food systems, particularly for its contributions to the sustainability of family and traditional farming systems. Specifically, one of the conclusions was that “the ecological foundation and food system focus of agroecology provides an action-oriented approach for simultaneously developing alternative food systems, while transforming the current industrial model” (FAO, 2015a). If we are interested in pursuing this possible future model for sustainable food systems, we must be able to identify in practice what an “agro-ecological” food system might look like. Providing insights into this question is the purpose of this paper.

The first task is to provide a definition for an “agro-ecological food system”, which does not appear in the literature and is only emerging in practices around the world. The most well-known food system for agroecologically produced crops is referred to as organic agriculture (FAO, 1999). Organic agriculture has become a relatively stable term that is increasingly recognized around the world, with both positive and negative connotations (Freyer and Bingen, 2014). What began as a number of isolated experiments in the 1920s is found today in 110 countries where there are active or draft organic regulations and at least 121 private organic standards (UNCTAD/FAO/IFOAM, 2012). These standards, and the certification and labelling systems that have been developed to enforce them (Fouilleux and Loconto, 2016), have contributed to the creation of national, regional and global markets for organic products. For instance, the State of Sustainability Initiative (SSI) estimates that there is a total production value of USD 50.3 billion across a range of standards for sustainable commodities in agriculture, forestry and fisheries (Potts *et al.*,

2014). The value of the global market for certified organic products alone reached USD 80 billion in 2014 (Willer and Lernoud, 2016), but this number captures only those products in consumer markets that are officially recognized as organic through public and private systems of standards, certifications, accreditations and labels.

Significant critiques of a dilution of agroecological principles as they have been interpreted in public organic standards and large-scale commercial organic farming (Darnhofer *et al.*, 2010; Gibbon, 2008; Jaffee and Howard, 2009) demonstrate that if we are to examine markets for products that come from production following agroecological principles, we cannot limit ourselves to only those markets that trade “organic” products. Moreover, organic third-party certification is not the only way to value the products and services from agro-ecological production. Moreover, it is probably not the method that is most adapted to agro-ecological food systems that rely upon small-scale production (FAO, 2014a). The value of agroecological products can be determined through a range of activities, particularly through the creation of a diversity of market channels through which produce can move from producers to consumers. Specifically, we need to look at the diversity of markets that are being built from the bottom up in order to capture the variety of ways through which agroecology is becoming commercialized in line with, or separately from, organic.

This line of research fills an important data gap in our understanding of transitions to agroecology-based food systems as there are currently not enough systematic studies on the role of markets in facilitating the creation of sustainable food systems within developing countries. In order to understand the extent to which food systems can become sustainable, and how markets can become beneficial to small-scale producers and family farmers and can promote food security, we must first know what the different food systems look like. The purpose of this paper is therefore to summarize the main results of the exploratory study undertaken by the Institut National de la Recherche Agronomique (INRA) and FAO to examine how those products that come from agroecological cultivation are being valued in markets.

Study methodology

We relied upon perception data to gather information about how different actors in the food systems that we observed were actively constructing these systems through processes of identifying agroecological practices and assigning a value to the products of those practices. Since an “agroecological food system” was not a term that is commonly used in practice, and thus was not a model that could be tested, we adopted an inductive methodology that explored how markets are created. This study used a case study method (Yin, 1984) in order to collect systematic evidence from multiple case studies. This approach permitted a meta-analysis of the opportunities and challenges of creating agroecology-based food systems across a range of diverse cases. These types of data enabled the following research question to be asked: *are there markets for “agroecological” products and what forms do they take.*

To answer this question we investigated the relationships between markets and agro-ecology by selecting six¹ agroecological case studies that had the most developed market data in a previous study (FAO, 2016) and by adding six(6)² new case studies of “agroecology-based food systems” that are purposively used to expand the diversity of situations (production systems, market practices, geographic distribution) and to develop an understanding of the sustainability of these systems (based on cultural, economic, environmental and social elements).

We conducted key informant interviews with producers (average n=7 per case), consumers (average n=7 per case) and intermediaries (average n=5 per case) in each initiative (n=221, 78 percent completed, an

¹ The first six case studies are from: Bénin, Bolivia, Colombia, Ecuador, Uganda and Namibia

² The additional six case studies are from: Brazil, Chile, China, France, Kazakhstan, and Mozambique.

average of 18 per case) were conducted by the authors, or by local enumerators who were familiar with the initiatives, using a structured questionnaire with closed and open ended responses. In eight cases, focus groups (Morgan, 1997) were used to facilitate discussions among consumers and farmers. The average age of interviewees was 46 years of age and 64 percent of respondents were female. On average, the respondents were of middle income compared with others in their community, but there was a rather higher level of education (university level) among the producers, intermediaries and consumers. On average, 54 percent of the daily food intake for those people who were interviewed consisted of agroecological products that come from within their initiatives.

The data were analysed using a mix of quantitative and qualitative methods (Creswell, 1994). We produced descriptive and inferential statistics (using Excel® and SPSS® software) to analyze the closed response questions to market channels, business models, prices and perceptions of sustainability. On the open ended responses, lexical analysis (using IRaMuTeQ software) was used for the analysis of similarity, co-occurrence of words and it was also used to present the results in a visual form of word cloud (Reinert, 1983). The lexical analysis allowed us to analyse the relationships between the words in the respondents' descriptions of agroecology, quality and strategies. This allowed the authors to identify key trends in how markets are forming for "agroecological products". We triangulated these forms of data with actor-network maps for each initiative, based on the value chain actor categorization used in previous FAO work (FAO, 2014b, 2016). This analytical method allowed us to create market typologies based on the role of intermediaries in facilitating flows of resources and values (finance, knowledge/information, commercial transactions, culture/values, control/surveillance, political authority) within each initiative.

Results

We consider the creation of markets through the following five entry points (i.e. market channels, business models, product value, perception of sustainability of the system and possibilities for scaling-up). We summarize here the results from the study according to these five aspects of market construction.

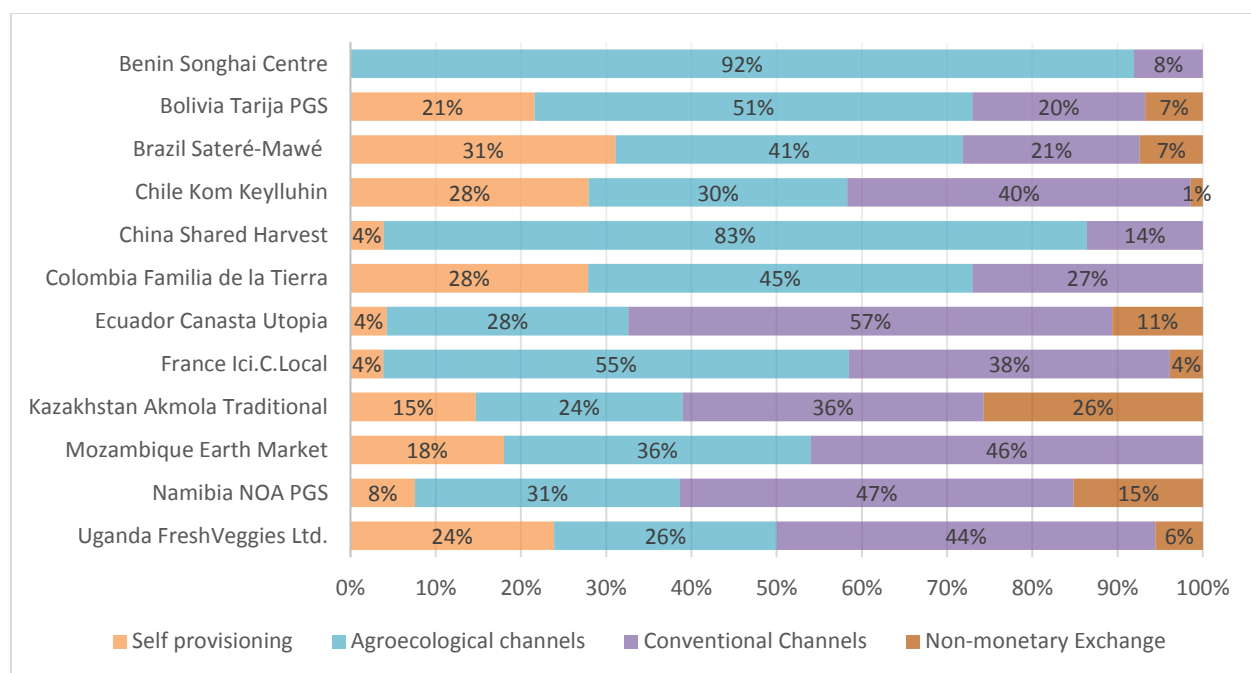
Diversifying markets as a key strategy

Market channels can refer both to how farmers source the inputs they need to grow food sustainably and how they then sell the excess food that they produce. These channels do not necessarily have to be "market" exchanges in the classic sense of exchanging goods for money, but can also refer to other provisioning systems such as sharing or gift economies. Therefore, we take a holistic notion of market channels to try to capture the diversity of ways that products circulate within agroecological farming systems. Specifically, we solicited information about volumes and sales of products that pass through each channel. We asked about the prioritization of specific channels and the perceived benefits that each provide to consumers, intermediaries and producers.

Input market channels were primarily three: own production, local farmers and local supplier shops. The dominance of procuring inputs locally was justified by the cost reductions in the production process and the reliability of purchasing from trusted local actors.

We were able to identify that about 45 percent of the produce that is farmed agro-ecologically is being exchanged through channels that could be called agroecological (Figure 1). We use this term because respondents reported that this produce was either labelled or communicated to buyers as having 'agroecological' qualities.

Figure 1 : Where does the agroecologically produced food go?

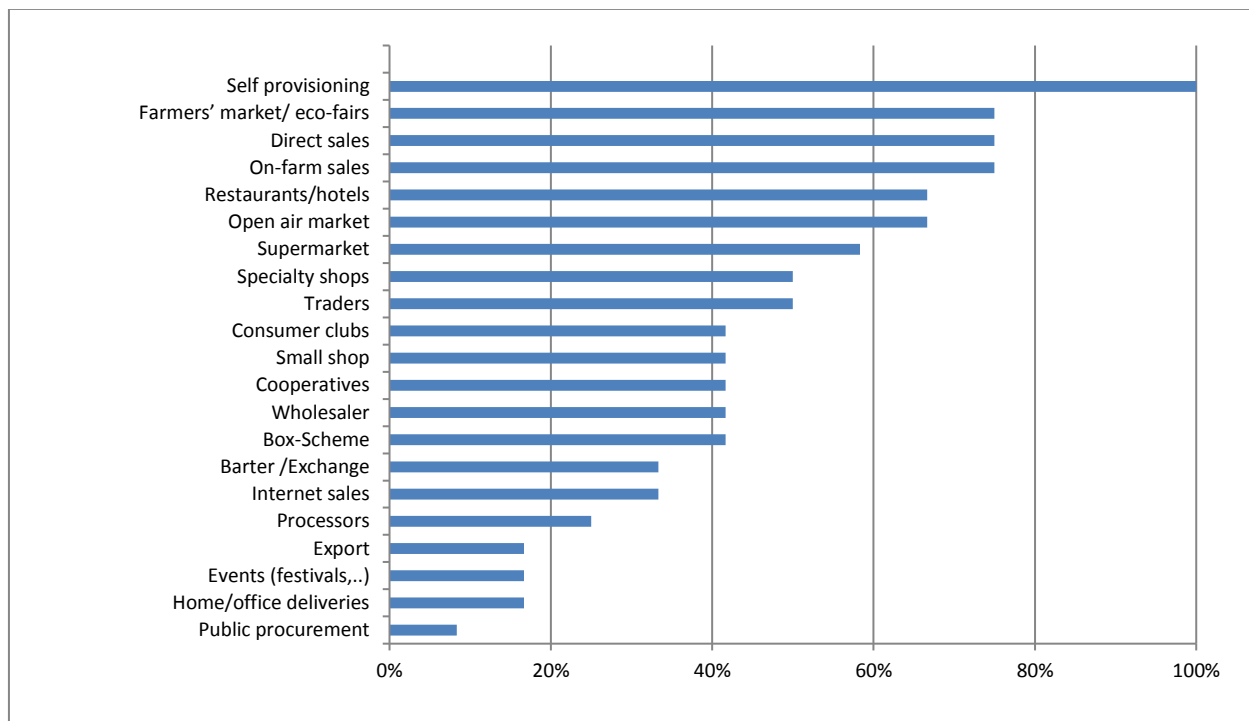


Source: FAO (forthcoming 2017).

From Figure 1, we see that the Songhai Centre in Benin is the most advanced, with 92 percent of their products being sold through Songhai's own agroecological channels. The Akmola Traditional Presidium in Kazakhstan has the smallest proportion of their sales passing through agroecological channels (24 percent), but they also make use of non-monetary exchanges and self-provisioning which also provide channels for preserving the agroecological identity of their food. Self-provisioning remains a very important component of farmers' marketing strategies (about 15 percent), which ensures that the farmers themselves are the very first consumers of agroecological food. The Ecuador initiative sells the largest proportion of its products through conventional channels (57 percent) because of an arrangement that was negotiated between the producer cooperative, two consumer cooperatives and the wholesale market. In this arrangement the initiative was able to purchase and sell products for their box scheme using the wholesale market service, but at a renegotiated price that was considered fair for both producers and consumers. This negotiated price takes into consideration the higher value and costs of agroecological production, so even though the products move through conventional channels, there is some acknowledgement of the agroecological production practices that are used.

For products, we found an amazing amount of diversity. We identified 20 different market channels in addition to informal barter/exchange and the self-consumption of products by the farmers across the cases. On average, there were 8.3 channels per case and the farmers in all of the initiatives also consumed a portion of what they grew. The most important market channels were: Direct sales and on-farm sales, Farmers' markets & Ecofairs, Open air markets and restaurants/hotels (Figure 2).

Figure 2 : Diversity of market channels for 'agroecological' products: How do they create markets?



Source: FAO (*orthcoming 2017*)

The biggest challenges to accessing markets reported by producers and intermediaries were logistics and lack of consumer awareness both about where to find agroecological products and about why agroecological products should be consumed (specifically in terms of what the agroecological qualities were). The logistics concerns were linked to inconsistencies in production and challenges in product placing, often due to poor transport conditions and a lack of adequate post-harvest and processing infrastructure close to the areas of production. In terms of consumer awareness, most of the initiatives reported that intermediaries and consumers lacked information about agro-ecological products and production practices and were highly influenced by untrustworthy or incorrect information about the safety and price of agroecological products, mostly linked with labelled organic products.

Community-based business models

To understand how the organizational arrangements provide opportunities to construct different forms of markets, we focused on the types of business models set up by each initiative. We found that all initiatives had the community embeddedness as one of the principal objectives. This means that each food system initiative fitted its objectives to the specific needs of the community and the socio-cultural context was taken into account in the development of the initiatives' way of operating. The organizational forms most common across the cases were those that included producers, intermediaries and consumers directly in the governance of the initiative. Most initiatives were inclusive of anyone who wanted to join; only a few had the specific objective of including marginalized people. Finally, financial independence was a goal of all of the initiatives, but only 46 percent of the cases have reached financial autonomy of the entirety of their operations. On this point, it is important to note that the commercial side of operations is generally covered through product sales, but the extra services that are provided by the key intermediaries are often funded through public, research or donor funds.

The value chains are rather short (with an average of two to three links), even in export markets where direct contact with importers was common and despite the geographic distance. Oral agreements were the most common form of engagement between actors and, on average, there are between four and five different actors working together in network formations (nonhierarchical relationships and each operating within their own organizational structure) and agroecological products change hands about two times in these networks. Based on these criteria, we can classify the supply chains across the 12 initiatives as being "short food supply chains" (Chiffolleau, 2012; Chiffolleau and Prevost, 2012; Goodman, *et al.*, 2012; Renting, *et al.*, 2003).

Valuing products

We ascertained how quality is determined and how price is calculated and negotiated between the different actors. We wanted to understand how producers, consumers and intermediaries perceive the value of the products and how they allocate a monetary measure (or not) to that value. We adopted a broad definition of quality that can include organoleptic, credence (including social and cultural) or nutritional attributes of the products. These aspects are not always captured in the price of a product and may be valued through alternative channels. Therefore, we gathered information about how quality and price are communicated between producers and consumers, which can take place in common spaces such as during monthly fairs, through advertising via the Internet or cell phones, captured by brand recognition or in a collective label, or by word of mouth through traders or other intermediaries. As a result, qualitative and price data were collected. Unfortunately, it was not possible to collect reliable price data for all of the products in all of the cases. Therefore, we focused on understanding the perception of the fairness of the prices that were received by producers and intermediaries and also paid by consumers and intermediaries.

The most common responses for the desired qualities for agroecological products were related to rather typical organoleptic and visual quality attributes: taste, freshness, good quality, size and appearance. We also see cleanliness and organic are important attributes. Packing was also mentioned. Ecological and agroecological as a clearly defined quality are less prevalent.

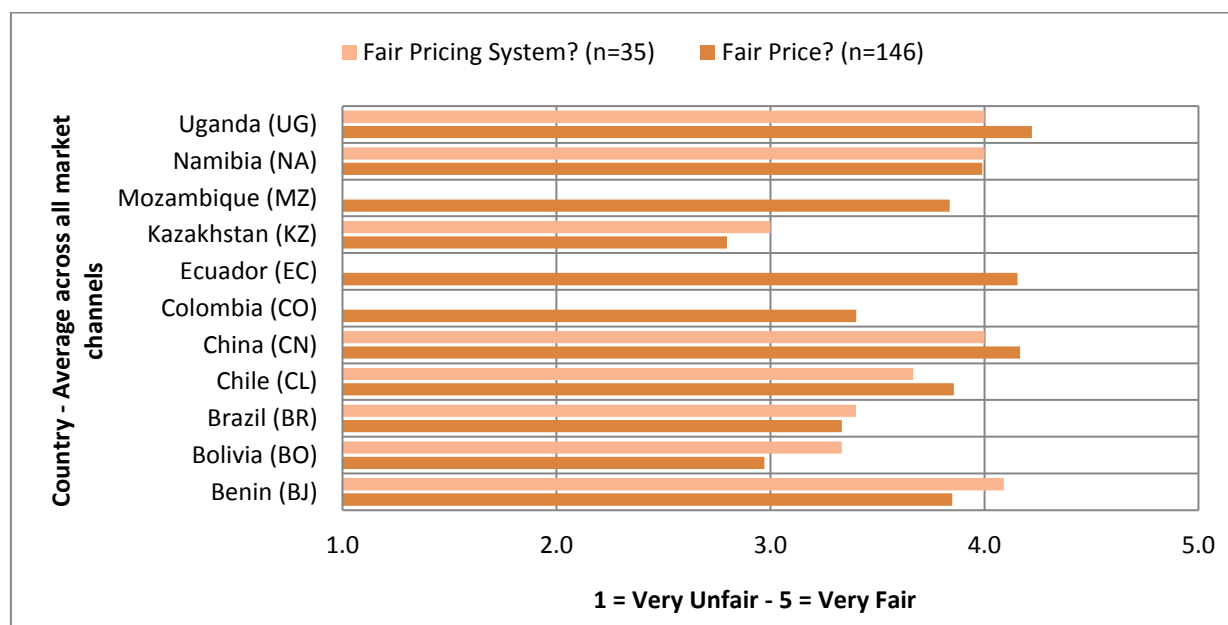
We found that knowledge about the agroecological qualities through direct contact between trusted actors (producers, consumers and intermediaries) can, in some cases, override the dominant preferences for classic quality attributes. This is because the communication of "agroecological value" is done mostly through direct communication and contact between consumers and producers. For example, in Ecuador consumers visit the farms to learn about production practices and to meet the farmers. In Chile, restaurants prepare traditional food with agroecological products purchased directly from farmers and explain these qualities directly to consumers.

However, branding and labeling are also very important for a number of cases. For example, in Benin, the Internet is used to advertise their products as being high quality, natural and organic – which they link to their own brand and is also communicated through on package labels. In France, a different kind of label is used at the community market whereby colours differentiate the distance travelled by the products – thus allowing consumers to choose to support shorter or longer value chains.

Overall, the prices were considered to be fair by all actors in the system (Figure 3). The actors in Kazakhstan and Bolivia felt that their prices were the least fair, but in both cases they felt that the system for setting prices was fair. When we looked at whether or not the consumers are paying more for agroecological products and whether or not they are willing to pay more, we see that Bolivia is not paying a higher price for their products, but they are willing to pay more, which means that the consumers do not think that they are paying as much as they should for agroecological products (which is in line with their feeling about the fairness of the price, which we can interpret to mean that it is not fair because it is not high enough). On the other hand, Kazakhstan is not paying a higher price, but the consumers feel that they should be

paying less. This also reflects the unfairness of their prices from the last table, but in this case the unfairness comes from prices that are too high.

Figure 3 : How fair are agroecological food prices?



Source: FAO (forthcoming 2017).

Overall, the consumers that were interviewed in these case studies seem to be insensitive to price (except for Kazakhstan and Uganda) – or at least they placed a lower priority on the price of the product when determining quality. This finding is in line with the literature which suggests that ethical consumers are less price-sensitive than others (Arnot *et al.*, 2006). Often, this is tied to their relatively higher socio-economic status. However, our interviewees declared themselves to be mostly of middle income compared with the average incomes where they live; which offers an interesting avenue for future research.

Sustainability of market networks

As a way to understand the sustainability of “agroecological food systems”, we started with understanding how those actors who are involved in the initiative perceive the sustainability of what they are doing. We adapted the self-assessment developed by the Laboratory of the Social and Solidarity Economy. This assessment holds the normative assumption that a sustainable food system is based on four principles : (i) the creation of social ties (trust, solidarity and reciprocity) and cooperation; (ii) equity in financial exchanges and efficiency in operations; (iii) a participatory approach to decision-making; and (iv) a ‘learning-by-doing’ logic where interactions between participants creates greater common understanding and identity (LABO ESS, 2015).

From this perspective, we have characterized the initiatives under review as what van der Ploeg and colleagues (Hebinck, Schneider and van der Ploeg, 2014; van der Ploeg, Jingzhong and Schneider, 2012) have identified as “nested” markets, which are those markets that are formed within existing dominant markets as a response to a variety of market failures. They are the result of social struggles and mobilize the specificities of place and networks to create spaces where quality products receiving premium prices can be exchanged.

Table 1: Nested Market Networks for Agroecology

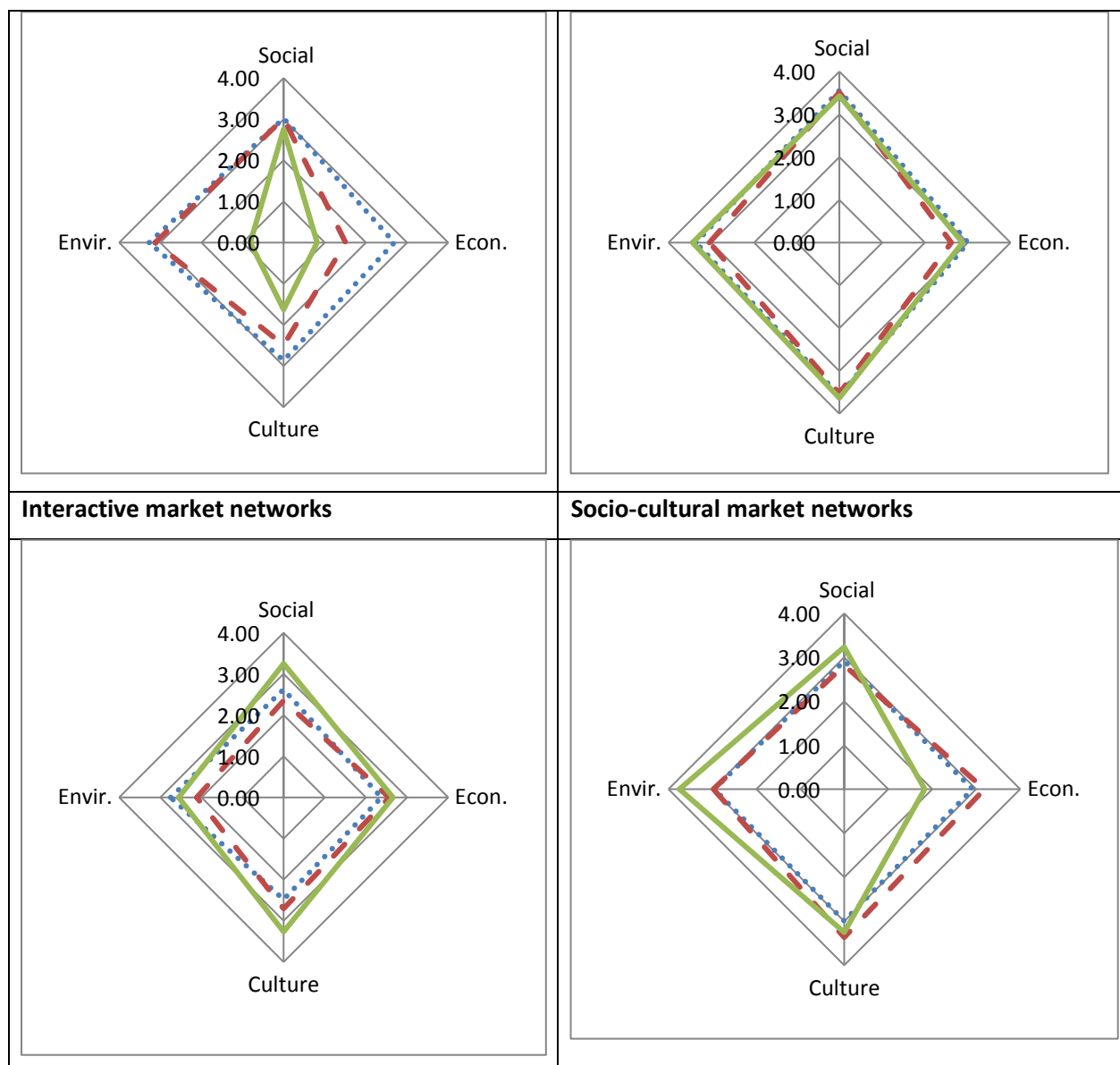
DIVERSITY OF INTERMEDIARY MARKET MAKING ACTIVITIES		
PARTICIPATION IN MARKET EXCHANGES		
	LOW	HIGH
	HIGH	LOW
	Information-rich market networks <ul style="list-style-type: none"> The main intermediary function is to share information between market actors (quality control system), but no market exchange Product specialization Direct sales as the core site of interaction and value creation Examples : Bolivia, Kazakhstan, Namibia	Diversified market networks <ul style="list-style-type: none"> Multi functional intermediary provide services that add value among market actors (some trading) but do not run the consumer market Product specialization and innovation Traders as the core site of interaction and value creation Examples : Uganda, Brazil, Colombia
	Interactive market networks <ul style="list-style-type: none"> The main intermediary function is to facilitate the market exchange Product diversification Farmers' market as the core site of interaction and value creation Examples: Ecuador, France, Mozambique	Socio-cultural market networks <ul style="list-style-type: none"> Multi functional (market, knowledge, education, services, etc.) intermediaries who own/run their own markets Product diversification On-farm shops as the core site of interaction and value creation Examples : Benin, Chile, China

Source: FAO(forthcoming 2017).

Then we examined the different roles of the dominant intermediary (that actor who was the most influential in building the local network that supported the market). We found that we could identify differences in the nested markets based on the extent of the diversity of this actor's roles in supporting the network that was built to support market exchanges and the level of their participation in the market transactions (Table 1). For example, in Ecuador, we found that the intermediary (Canasta Utopia) provided only a market-making service in its network – that of organizing the box-scheme, which is the core market exchange of the network. Here an interactive market network was created to facilitate the exchange of products that could be identified as agroecological. However, in China, we found that the intermediary (Shared Harvest) directly organized the market exchanges, but also organized the production, training services, a restaurant and educational and research programmes. In this market network, socio-cultural exchanges were also part of the value of the market.

Figure 4: Perceptions of the sustainability of the different nested market networks

..... Intermediaries — — — Producers — — — Consumers	
Information-rich market networks	Diversified market networks



Source: FAO (forthcoming 2017).

When we look at the perceptions of sustainability from intermediaries, producers and consumers according to these different typologies – we see that, generally, there is coherence between the responses (Figure 4), except for the information-rich markets, where the consumers are much less positive about the environmental, economic and cultural sustainability of this type of network. This is very interesting because it is the only network where the intermediaries do not have a direct role in the marketing of products – which is an important point for future research on the role of intermediaries within transitions to sustainable food systems.

Scaling up

There is a temporal aspect to sustainability, which means that a system must be able to persist over time. One of the questions often asked is how does an “agroecological food system” emerge and evolve over time? Another question relates to what kinds of support structures are required in order to transition existing food systems towards “agroecological food systems”? These questions refer to the scaling up (or

out) of “agroecological food systems” via horizontal or vertical expansion (see Callon, 1998; Hermans, *et al.*, 2013).

Each case demonstrated different changes in their operations over time and there are clearly opportunities for changing the scale of their operations in the future. We can summarize the proposals in two ways: the first is through a scaling-up approach and the second is what has been referred to in the literature as scaling out. *Scaling up* was referred to as the changing of the scale of influence of the initiative – often in terms of vertically expanding the reach of the core intermediary. For example: the case from Namibia proposes a model of mediated growth and diversification of markets. One producer claimed:

We should not be focusing on superspar [local supermarket], but focusing on the other markets ...have to be careful that we don't grow grow grow (and follow the trend in the economic world) so that our quality and our human relations go down.

Scaling out is a term that has been used more recently in farming systems research and refers to a horizontal expansion of a technology or idea, rather than a vertical size increase. In Uganda, the scaling up strategy is on growth in local clusters around the country that can then be connected through logistics systems. An intermediary explained that

Since we have four different geographical locations ..., through the steering committee of directors, we should support the clusters to grow to that tune (up to 800 members). (...) This structure represents replication of a business idea to other regions without compromising the autonomy of producers to own their operations.

In general, the most common opportunity for scaling up is increasing local, regional and national recognition of the initiatives. Increased visibility is helping to share these experiences beyond the borders of their communities. Diversification of markets, in terms of both new sales outlets and new products, is actively being pursued. The type of support that is needed is fairly common across all cases: there is a need for financial support. There is an interest in specific certification schemes for agroecological products as a means to differentiate these; access to agroecological technologies and training in these practices are still needed. Political support through the recognition of agroecology and its existing markets is important for scaling up – particularly in Bolivia, Colombia and Mozambique. Finally, there is a need for internal commitments by members to continue their participation in the initiative and local-level collaboration between private and public actors is fundamental to changing the scale of these initiatives.

Conclusions

We do find evidence that the concept of an “agroecological product” is emerging, but the term “agroecology” is not an evident quality attribute sought in markets. This product is traded in short food supply chains at fair prices within initiatives that are mostly sustainable with respect to economic, environmental, cultural and social concerns. Producers and intermediaries perceive the initiatives to be more economically sustainable than consumers do, and intermediaries see the greatest potential for the environmental sustainability of these networks.

These markets are dynamic and the actors are strategic in how they are positioning their products and how they are creating a value for them in their markets. All initiatives use some form of informal or formal control and those who use on-product labels are mostly using adaptations of participatory guarantee systems to ensure the use of agroecological practices. The more inclusive initiatives are building on existing social networks, but are also expanding, as we found significant response rates related to the role of the initiative as creating a social space for collaboration among actors who traditionally do not socialize. This points to relative network stability for the majority of the cases, even though financial autonomy is not

fully achieved. There is significant potential for changing the scale of these initiatives, both in individual size and in their collective reach based on a declared, but untapped consumer demand.

Gliessman (in FAO, 2015b) argues that there are five levels of passage in a stepwise transition towards sustainable food systems. The first three focus on the farm level with changes that must be made progressively towards more ecological agricultural practices – i.e. creating eco-efficiencies in industrial/conventional practices (level 1); substitute industrial/conventional inputs and practices (level 2); redesign the agroecosystem so that it functions on the basis of a new set of ecological processes (level 3) – while the last two deal with food system changes at local and national levels (level 4) and at a global scale (level 5). Specifically, level four of a transition to a sustainable food system is the re-establishment of a more direct connection between those who grow the food and those who consume it. We see evidence of this emerging in 12 different countries. Specifically, we have found evidence of an important role for consumers who are directly influencing the way products are marketed and a correspondingly increased responsibility being taken by producers to develop their own marketing strategies. The construction of nested market networks illustrate that products are not the only goods being valued in these spaces, but cultural traditions, ideas, visions, and knowledge are also being exchanged. Community embeddedness is a core element of these markets, which is reinforced by the valuing of direct contact, interpersonal trust and the proximity of actors within the networks. These exploratory results point to a need to take the lessons learned from this research and develop broader surveys that can collect systematic and comparable data across a variety of agro-ecological, socio-cultural, geo-political and economic food systems.

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