Comparing local and global supply chains of tomatoes: the case of Catalonia

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Keywords: Food supply chains, Tomatoes, Multidimensional performance indicators, Integrated Assessment

Introduction

In recent years, the study of alternative food networks is receiving increasing attention. During the last decades, the intensification of agriculture and the globalisation of food markets have dominated the discussion, in political and academic circles, about what the food system is and should be. Consequently, the global food supply chain model has been strongly promoted. Global food supply chains refer to the dominant model of food supply, where products are globally distributed in big and organized quantities. They entail intensive production, long distribution distances, where corporations attempt to minimize the cost of production in order to minimize prices and reach as much consumers as possible.

Despite the dominant position of global food systems, the so-called “alternative”, “quality” or “local” food networks have unexpectedly strengthened and proliferated (Whatmore et al, 2003). Alternative food networks refer to alternative modes of production, distribution and marketing (Murdoch & al., 2000). They promote organic farming, the use of traditional seed varieties and techniques and the use of local resources. Also, alternative food networks are characterized by face-to-face relations between producers and consumers, based on mutual trust and articulating new forms of political association and market governance. Products are distributed to individual or group consumers through direct selling schemes such as local markets, on-farm selling or basket schemes. The marketing of alternative food networks is done through agro-tourism, local festivals and rustic restaurants among others forms of promotion. All those practices can be encapsulated under the category of local food supply chain. Contrary, global food supply models are then seen as drivers of environmental perturbations and the crisis of rural areas (Muchnik 2006).

Different actors highlight the advantages and disadvantages of local and global food supply chains according to their interests and their position in the chain. However, when assessing the performance of a food supply chain one has to consider that different configurations of the chain entail different consequences over the situation of involved actors and on the environment, at different scales and under different dimensions.

This paper explores the performance of global and local food supply chains of tomatoes sold in Catalonia. The evaluation considers social, economic, environmental attributes, which are operationalized by a set of multidimensional indicators. Different indicators represent different

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actors concerns, which were identified by a literature review and in-depth interviews to key actors.

Context

Spain produces about 15% of fresh vegetables produced in Europe and about 15% of tomatoes. The importance of the Spanish vegetables sector is evident. Spain has been historically able to supply its internal consumption of vegetables by its own production. Currently, half of the produced and imported vegetables are consumed by households, and about 40% is exported as fresh or processed products. Tomatoes account for about one third of the total production and imports of fresh vegetables; about 60% of that in consumed internally and the rest is exported.

In general, there is a trend of increasing production, internal consumption and exports. However, in relative terms, one can observe a trend of increasing the share of exported tomatoes with regard to production plus imports, while the share of internal consumption is slightly decreasing.

Despite this trend to allocate production to external markets, during the last decade alternative food networks have grown exponentially in Catalonia. This fact is expressed by the increasing number of cooperative and consumption groups from the year 2000. Currently, there are more than 120 consumer groups, encompassing about 5 thousand familiar units and about 15 thousand persons[2]. Besides this increase of consumer groups, the Catalan administration is promoting the participation of farmers in local markets as a mean to reduce intermediaries and increase farmers' income.

In this context, we consider pertinent to study the difference between farmers producing tomatoes for the local and global markets. The business model of the former is based in direct sales to consumers through sales in local markets or to consumption groups. On the other side, the business model of farmers participating in global food chains rely mostly in selling their products to the big wholesale distribution market, namely Mercabarna (in Catalonia). About 60% of the tomatoes sold in Mercabarna come from Almería, Andalucía, which are produced mainly in greenhouses.

Local and global food chains

The distinction between global and local food chain has been usually made on the basis of the distance travelled by the product from the production to the consumption point. However, the distinction between local and global food chains can be articulated around additional criteria, such as the type of governance and/or organization of the supply chain, the resource, knowledge and technologies used, and territorial aspects shaping the identity of the product.

In the European context, the use of machinery and the dependency on fossil fuels make the majority of production processes to be considered global under technological criteria. However, the reduced (or inexistent) number of intermediaries in direct sales schemes makes a big difference when comparing those (global) models of food supply chains encompassing wholesale distribution markets, supermarkets and retailers before the product arrives to the point of consumption. The following table defines, under the four criteria, what is considered global and local in the supply chain of tomatoes.

2 This figure is obtained by considering 3 persons in each familiar unit. In average, a consumers group is comprised by about 40 familiar units.

Criteria	Local	Global
Geographic distance	Within Catalonia	From and to outside Catalonia
Governance and/or organization of the supply chain	Direct sales schemes	More than 2 intermediaries (wholesale market and retailers)
Resource, knowledge and technologies used	Local natural resources (e.g. manure) and traditional seeds	Use of chemical fertilizers and pesticides, greenhouses and hybrid seeds
Territorial aspects shaping the identity of the product	Local varieties	Hybrid varieties

Based on those distinctions, the following cases were selected:

Local food chain

A network of 9 agroecological producers from the Catalan *comarcas*[3] Vallès Oriental, Osona, el Maresme i la Selva participate in this supply chain. These farmers produce seasonal vegetables according to agroecological principles defined within the Network[4]. The farms are of small size (i.e. between 1 and 4 hectares), usually ceded or rented. The farms are managed collectively by groups of 2 to 5 persons that operate in assemblies. Their business model is based on the commercialization through local food chains: from delivering weekly vegetable baskets to organic consumption groups and/or cooperatives, direct selling in the farm or local markets, selling bulk products to restaurants and/or organic school canteens.

These farmers work in network in order to exchange knowledge, give mutual support, and disseminate the ideas of agroecology and food sovereignty. Also, they exchange products in order to complement the production of each farm and the supply of organic, local and seasonal vegetables. Most of the seeds are reproduced within the farm or obtained from an organic seed bank. Production task are performed mostly manually or with small machinery. One case is re-introducing animal traction to plough and weeding. Manure is used as fertilizer, which is obtained locally.

3A *comarca* is an administrative terrirotial entity that has a certain continuity in terms of natural conditions, its history and the neighbouring relations between the municipalities making it up.

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In order to certify the quality of their products, these producers have developed a Participatory Warranty System (SPG). Quality is here understood in a wider sense: it consider the organoleptic and nutritional properties of the products, as well as the social, ecological and political commitment of the farmers. Which is expressed in the production, distribution and consumption model they promote; that is, organic, local and seasonal. It is fair to say that the norms expressed in the SPG are much stricter than official organic labelling

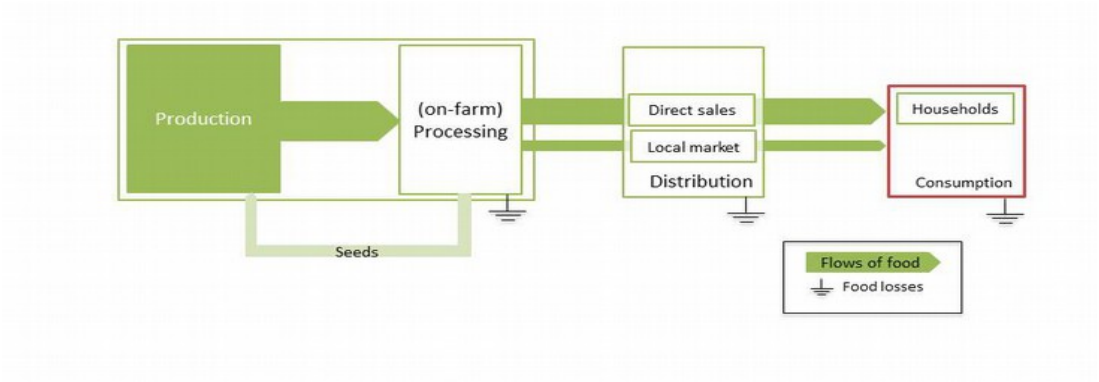

Figure 1. Flows of the product across the local food supply chain

As showed in Figure 1, after production and harvesting, the food processing is performed on-farm. It consists mainly in cleaning the product and the preparation of individual baskets and/or bulk products. This task is performed once a week, in the morning of the distribution day or in the day before that. Products then are transported by one or two members of the project to the distribution points. Few projects also sell their products in local markets also once a week.

Global food chain

The global supply chain of tomatoes considers the production of tomatoes in the South of Spain: Almería. One fourth of the Spanish tomatoes are produced there, usually in greenhouses and using conventional techniques; entailing the use of commercial hybrid seeds, chemical fertilizers and machinery. It is worth noticing that about 60% of the tomatoes sold in in the main wholesale market in Catalonia (i.e. Mercabarna) come from Almería.

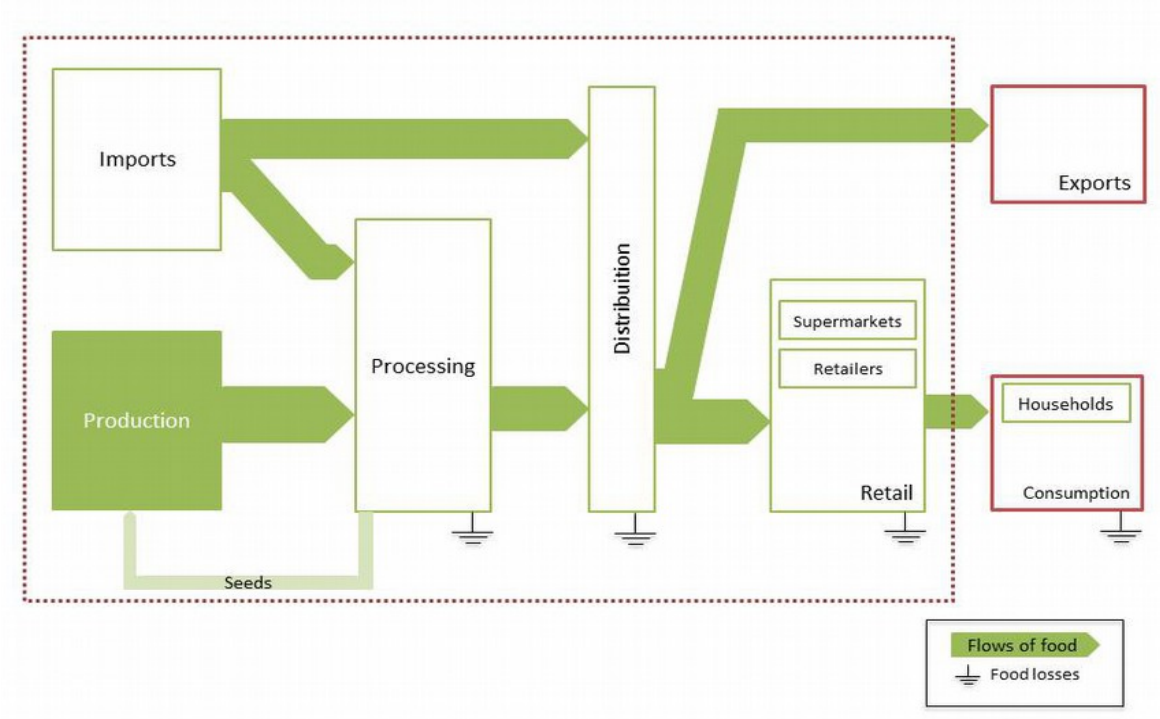

Figure 2. General diagram of a global food supply chain

Then, the tomatoes (and other vegetables) we found in supermarkets, retailers and local distributors were bought from Mercabarna. A general picture of the global food supply chain is presented in Figure 2.

Comparison of local and global tomatoes supply chains

After performing a literature review (i.e. qualitative text analysis) and a set of in-depth interviews, a set of 4 discourses about food supply chains were identified: the Commodity, Livelihood, Rights and Deep Ecology discourses. Each discourse prioritizes a set of attributes to describe and represent the performance of food supply chains. Attributes are operationalized by a set of multidimensional indicators.

The following tables present the attributes prioritized by the different discourses. These attributes are the basis to compare the performance of the local and global food supply chains from different perspectives[5].

By means of this analysis, it is possible to contrast the perception that different actors have about the performance of local and global tomato supply chains against the performance in terms of biophysical attributes they found relevant for the evaluation. Therefore, it is possible to check coherence and whether public perception is in accordance with buiphysical performance.

Matrix concerning the "Right discourse"

	Dimension				
Sphere	**Economic**	**Social**	**Environmental**	**Health**	**Ethical**
Public	-Risk -Affordability -Value added	-Information -Participation of consumers -Food sovereignty -Food security -Quality of food (organol.) -Traceability -Convenience	-Wasted food	-Nutritional value of diet -Food safety	-Animal welfare
Scientific				-Nutritional value of diet	
Market		-Food security -Skilled workers		-Quality of the product	
Policy		-Employment -Quality of jobs		-Food safety	

Matrix concerning the "Commodity discourse"

	Dimension				
Sphere	**Economic**	**Social**	**Environmental**	**Health**	**Ethical**
Public	-Costs -Prices -Profit -Depend. on subsidies -Depend. on import. inputs	-Distribution of profit -Traceability -Info. for consumers -Negot. power consumers		-Quality of the product	

5 The evaluation of the corresponding indicators is work-in-progress and it is expected to be finished before the end of May.

	-Efficiency -Market share				
Scientific	-Profit -Contribution to GDP -Innovation -Costs	-Employment	-Depend fossil fuels		
Market	-Productivity -Costs -Access to finance -Negotiation power -Price -Availability	-Quality of the product			
Policy	-Contribution to GDP -Profitability -Productivity -Farmers income	-Skilled workers -Quality of the product -Employment -Living standard farmers -Information -Food security			

Matrix concerning the "Livelihood discourse"

	Dimension				
Sphere	**Economic**	**Sphere**	**Economic**	**Sphere**	**Economic**
Public	-Economic viability -Depend. on price fluctuations	-Living standards of farmers -Territorial compatibility		-Nutritional value of food	
Scientific					
Market		-Labour availability -Rural development			
Policy		-Labour availability -Respect of territory (culture) -Rural development			

Matrix concerning the "Deep ecology discourse"

	Dimension				
Sphere	**Economic**	**Sphere**	**Economic**	**Sphere**	**Economic**
Public			-CO2 emissions -Energy consumption -Material consumption -Soil pollution -Disruption of ecosystems	-Quality of food (healthy)	
Scientific			-Energy consumption -Land use		
Market					
Policy			-Soil pollution -Erosion -Water pollution		