

# Food value chains: a challenge for innovation

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## 1. Introduction

Today the largest part of agricultural production in developed and developing countries does not reach consumers directly from the production but is marketed via multilevel marketing systems. As a result, most farmers are increasingly integrated into value chains with forward (marketing) and backward (input supply) linkages (FAO, 2007). In industrialised countries, this division of labour is already more intensive and differentiated, while in many developing countries production and consumption partly still takes place together (subsistence) or spatially very close together.

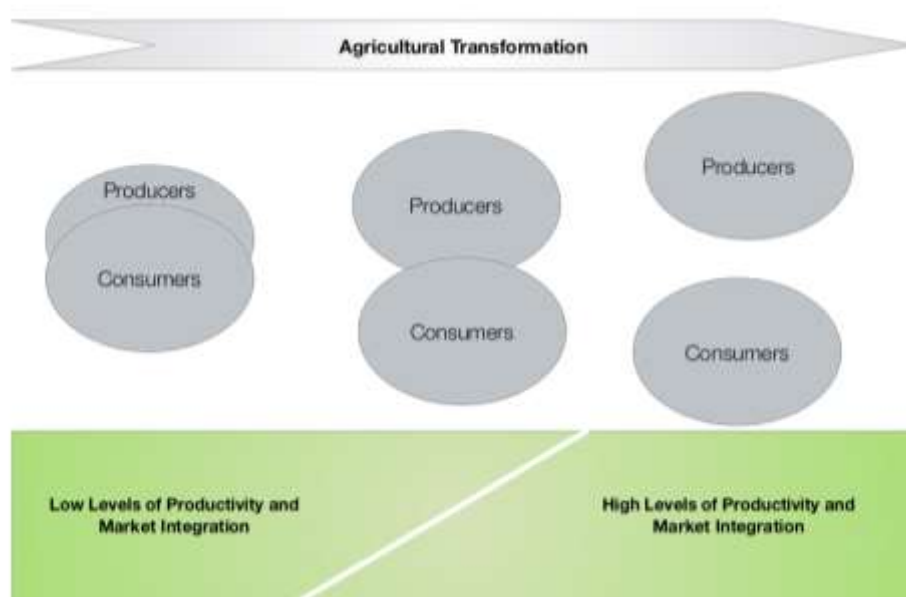


Figure 4.1. The Food System Transformation (FAO 2007).

Figure 4.1 provides a more historical look at the development of the agricultural transformation process. Consumption and production have increasingly become separated both in time and in space in the course of the growing international division of labour as well as intensified urbanisation. Overcoming these spatial and temporal differences caused by the division of labour requires organised cooperation among all players in the value chain.

### 1.1. The value chain perspective

The emerging debate about whether our food system is sustainable and able to meet future challenges, leads to greater public interest towards the different activities within the food system (Ingrim *et al.*, 2013; McMichael, 2011; Godfray, 2010). These activities take place in so-called value chains. Food value chains include everything from the production of agricultural raw materials and their inputs to transportation, processing for the retail trade and arrival on consumers'

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tables. Food chain management also has a significant economic importance. In the European Union, approximately 280,000 companies are involved, with a sales volume of around 840 billion euros in the food industry and about 4 million jobs.

Food Chain Management has gained increasing social significance, especially due to food scandals and consumer demands for transparency and sustainability. At the same time, the food industry has to act in an increasingly complex environment of growing competition and must consider legal regulations and specific standards.

For society, the issue of whether these value chain activities are sustainable has become a frequently discussed topic. What adverse effects it has on the environment, the health effects associated with it, and whether people working in the sector can earn an adequate income are cited as concerns. These issues are of even greater importance when we consider that value chains are increasingly organised globally (Deloitte 2013, Erickson 2008). Ultimately value chains are an expression of an increasing social division of labour. Value chain management today must find its place in both practice and in scientific discussion.

## 1.2. Types of value chains

A look at the fresh food supply of the population in industrialised countries shows that there are a large number of possible combinations resulting to different types of value chains. In nearly all countries, typical local value chains still exist, for example as direct selling agricultural holdings. This means production and consumption still take place locally or regionally to a large extent, although some of the necessary production inputs/resources is often sourced from other regions. In such local value chains, production, consumption and waste disposal occurs here. There are additional activities in the region, such as craft enterprises or service companies supporting the functioning of value chain activities.

Global value chains are often associated with large food manufacturers. Here there is a very clear decoupling of production and consumption, which occur far apart in in spatial terms. To bridge the gap across space and time, various actors must be involved to ensure product quality and freshness.

Today, so-called “coordinated value chains”, which have emerged through the growing importance of very concentrated organised food retailing, are much discussed. It is widely acknowledged that these food retail chains are taking a type of lead function in contemporary value chains. As an agent of the consumer, they determine the quality requirements and standards for delivery. However, due to intense competition in the food retail sector, they also have a strong focus on efficiency aspects which they try to implement in the coordination of the value chain. This topic is discussed in more detail in the section “The need to coordinate value chains”.



Figure 4.2. Coordinated value chains.

### 1.3. A systemic perspective

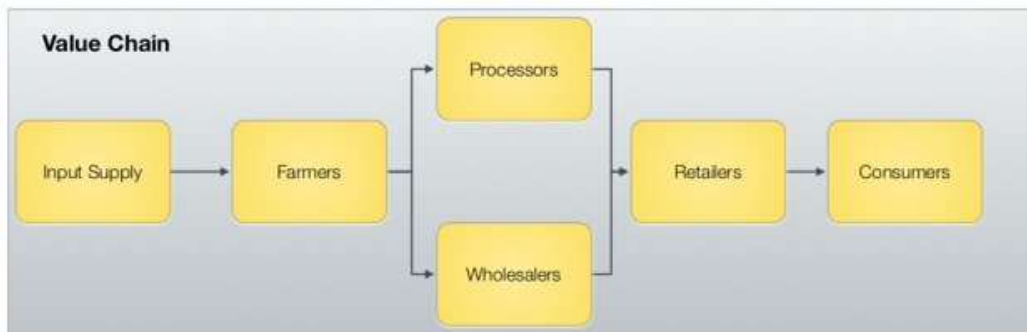


Figure 4.3. Typical value chain actors in modern food chains.

Value chains can be described via a simplified schema (see Figure 4.3 above). The chain typically includes supplier companies, producers, processors or, in the case of fresh products, wholesalers who then resell to the food retail industry. From there the product reaches consumers. In the field of fresh products, the importance of food retailers in Europe is quite huge. This is particularly true in northern Europe, where food retailers supply populations with 80% or more of their fresh produce. As such, retail chains are a dominant player in this system.

Explaining the outcomes of a food system by observing only the value chain members is an overly restrictive approach. Additionally, there are service companies, the finance sector and the increasingly important consultancy sector that must be taken into account; they all contribute to the functioning of value chains. Due to rising globalisation, logistics is facing major challenges. In many industrialised countries, the existing infrastructure is taken for granted, which may cause their importance for value chain development to be underestimated. This infrastructure includes research and education systems, information and communication technology, the entire transport system (including roads and railways), the cooling facilities across the value chain as well as the various control institutions that monitor compliance with certain product and process standards. The importance of infrastructure is especially clear when one considers the situation in developing countries, where it often constitutes an essential obstacle to the development of value chains.

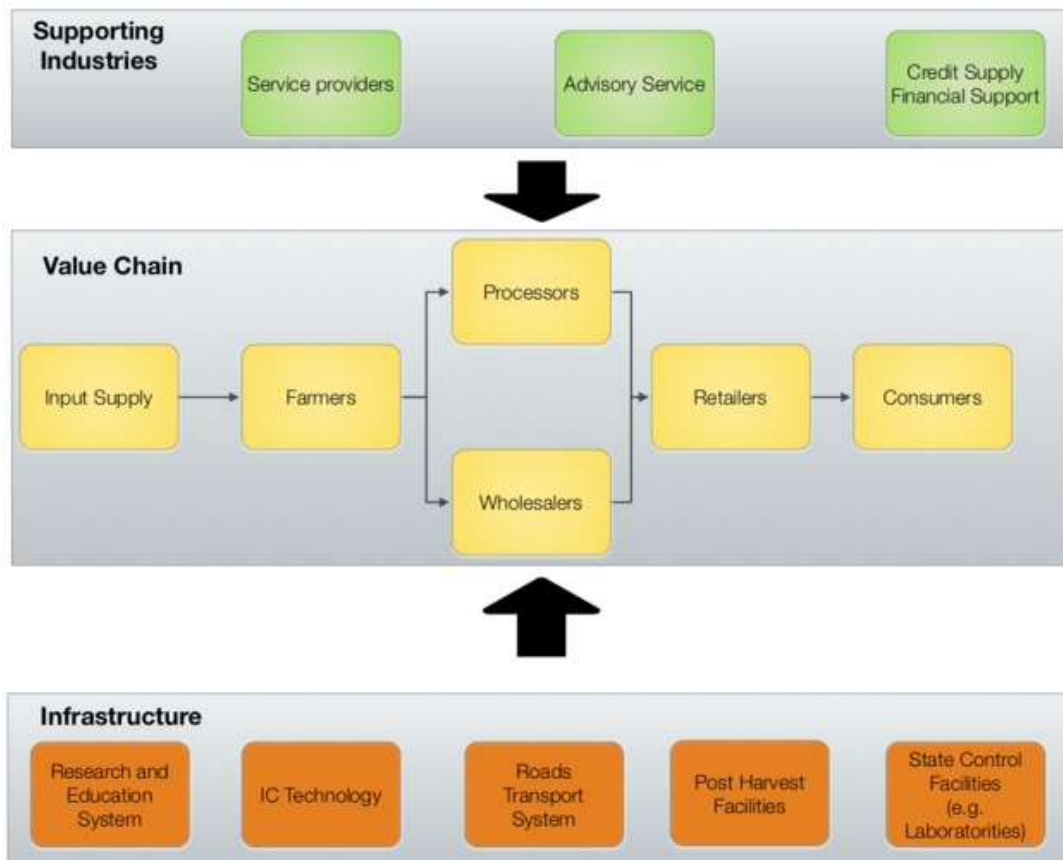


Figure 4.4. A broader value chain perspective.

#### 1.4. The need to coordinate value chains

If one could assume that the coordination within value chains occurs exclusively via market transactions in ideal markets, then little thought would have to be given to coordination issues in value chains. However, the issues of quality and product safety remind us that such coordination on the market is insufficient to rule out opportunistic behaviour and careless product handling. There are often public and private efforts to ensure and control product promises and food safety.

If value chains are to be organised efficiently and cost effectively, transaction costs must be reduced. This can be achieved, for example, by creating commercial categories (grades). Direct information and communication also play a very significant role, especially in local food systems. Recently developed technologies like radio frequency identification (RFID) are expected to be important in the future (Bourlakis *et al.*, 2011).

The debate about climate change and the emissions generated by food systems has also directed public interest to the externalities associated with supply chains. Market coordination frequently falls short while there are significant information problems at all stages of the value chain. Reducing external effects in supply chains is a major challenge for future value chain management. From a global perspective, the issue of whether our food systems can supply the growing world population with enough healthy foods must be addressed soon. This is a key issue which is also linked to the debate on environmental pollution.

In global value chains, coordination is also considered from a perspective of competitiveness. In some markets, there is an oversupply of products. Under these conditions, the question arises whether it is possible to generate benefits for consumers compared to other value chains, such as

lower prices or certain user benefits through product and service differentiation.

## 2. Means of coordination: the governance perspective

To operate successfully in an international agricultural and food market, precise knowledge of the food and its production, as well as marketing strategies and information about consumers, are necessary. The high degree of complexity of the food chains from manufacturers to the end user through the plurality of parties, each with specific requirements and needs, requires a comprehensive management approach.

This leads to the question of how value chains can be governed in a targeted way. In particular, it must be determined how the various interdependencies can be managed (FAO). This problem is often discussed under the concept of governance or governance mechanisms of value chains. The aim here is to analyse the “rules of the game” in the system and from a practical perspective to define those rules.

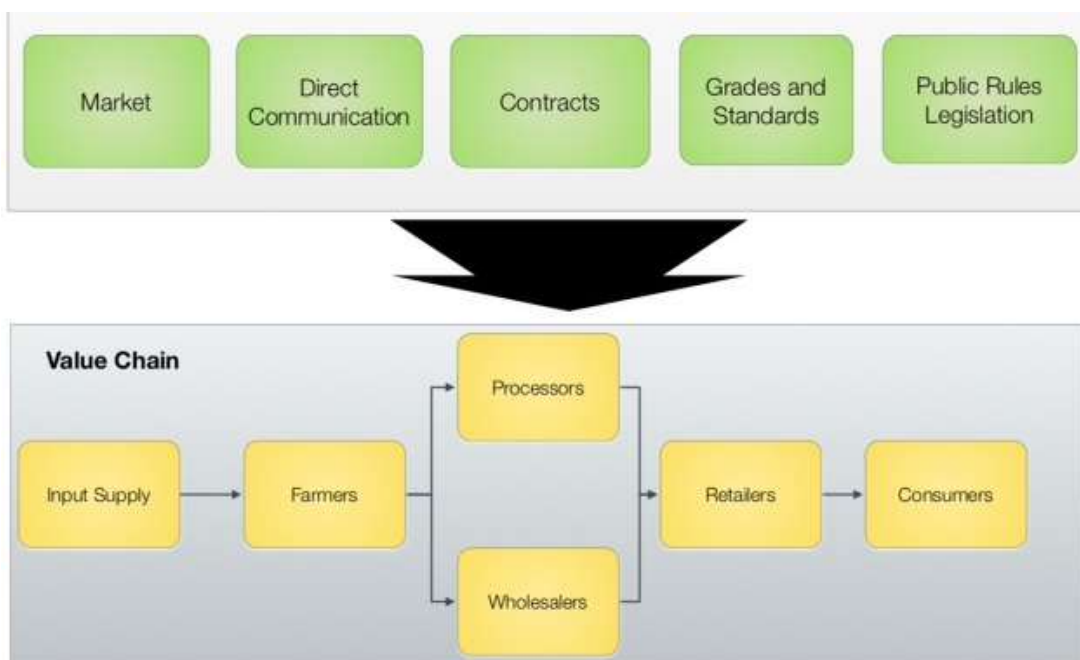


Figure 4.5. Means of coordination: the governance mechanism.

In poorly differentiated markets market coordination still plays an important role, and in more local value chains direct communication continues to be of great importance. With the introduction of private labels in food, retailing contracts between two partners are gaining increased significance. This is also true for food production and processing. Large processing companies especially source their products often on a contract basis. Rather general forms of coordination are carried out through grades and standards. In this case, product standardisation must be addressed, such as in the form of commercial classes (grades). Standardisation is also applied to processes. Examples include quality management systems, which are expected to be increasingly used by producers. Finally, public and global rules also play a role, such as with the Codex Alimentarius. It would be fair to say that the coordination of value chains today relies on an increasingly close network of various arrangements. Relevant mechanisms are located between public and private institutions and always require intensive documentation on the production side. As such, they have a significant impact on the structure and structural changes in the agricultural sector.



	Costs Orientation / Productivity		Product-safety	Strategic Differentiation	Societal Requirements
Level	Production	Logistics	Across the Value Chain	Retail/Whole-sale Trade	Across the Value Chain
Strategy Technology	Economies of Scale, (Growth, Specialisation) Productivity	Centralisation Standardisation; GPS, RFID, JIT Outsourcing	Traceability, Documentation, Transparency	Private Brands, Producer-Brands, Price Differentiation	'Responsiveness', CSR, Dialog with the Society
Institutions	Horizontal Co-operation	Vertical Co-operation, Horizontal Co-operation	Certification systems, Grades and (private) Standards GlobalG.A.P., QS,	Individual Contracts, IFS	Involvement of NGOs (Fair Trade, )
Human-resources/ Infra-structure	Process Management, Corporate Capabilities Human Ressource Development		Communication Laboratories /Food inspection Infra-structure, Consumer Information, -education	Communication, consumer education	Training, Communication, Dealing with new Media

Figure 4.6. Changing focus in the development of food value chains.

If we look at the focus of food value chain coordination efforts in recent years, we can distinguish several phases. When there was intense competition, the issues of cost reduction and productivity received considerable attention. Economies of scale, specialisation and increased productivity played a major role here and were supported by horizontal cooperation (marketing cooperatives). With regard to logistics, centralisation and standardisation were of greater significance while cooperation along the value chain (vertical) significantly intensified. As for corporate management skills, efficient process design played a more important role.

As concentrations in both the production and the retail value rose, chains always became less transparent and more anonymous. This became especially clear by the early eighties, when food scandals became increasingly frequent. Without neglecting cost and productivity, the need to increase consumer trust became ever more important. Transparency, documentation and traceability were only a few key issues that arose. Attempts were made to resolve these problems through certification systems and the development of process standards. In this context, the issue of communication with consumers has grown in importance.

However, increasing competition also meant that greater product differentiation was necessary to address all consumer segments. Both producer brands and food retailers' private labels received more attention, not just in agriculture but in the food industry as a whole. To avoid jeopardising investment in those brands, comprehensive contracts were concluded with suppliers. This process was supported by a huge increase in investment in advertising and other communication measures.

Currently, societal demands on the food system increasingly occur in public discussion, with strong attention being paid to the environmental problems and climate change linked to food production. New actors have emerged in the area of food systems, including non-governmental fair trade organisations and environmental organisations. Companies must act responsibly and enter into dialogue with society. Once again, trusted and genuine communication is key.

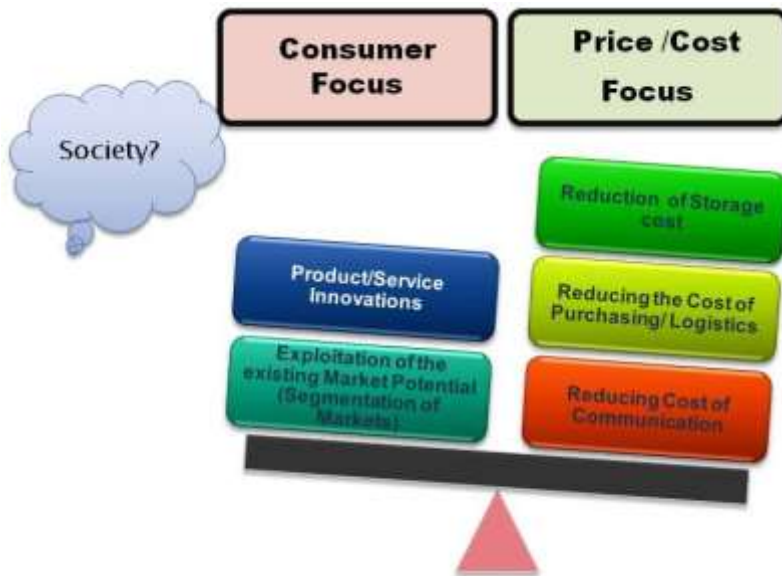


Figure 4.7. Balancing perspectives in the food system

A critical examination of whether efforts to reduce costs and boost production have come at the expense of consumers and societal needs must be carried out.

### 3. Future challenges

The following challenges should be considered in finding innovative pathways for food value chains:

- How can agricultural value chains be more closely aligned with the changing needs of society (e.g., food waste) (Wunder and Bausch, 2014)?
- How can agricultural value chains be adapted to global challenges, and especially climate change (FAO, 2008)?
- How can the potential resulting from societal shifts and income changes (distribution) be exploited to improve quality (Grunert *et al.*, 2008)?
- How can consumer trust be improved when value chains are increasingly anonymous?
- How can farms play a more active role in the design of value chains and improve their position as links in the chains?

### 4. References

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