

A System Approach on Organizational Innovations in the Agro-Food Sector: The Case of AFSCs in Flanders

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1 Introduction

Together with the evolution from the agro-industrial model to the sustainable rural development model (Roep and Wiskerke 2004), a part of the agro-food market has evolved from an anonymous, mass food market to a quality-food market. This shift is driven by factors, such as the changing relations between supply chain actors due to concentration in retail and processing, the growing importance of quality standards, considerable changes in consumer habits and preferences, the increasing attention for the multifunctional dimensions of agriculture and the establishment of new markets for public goods and services (Kirwan, Slee et al. 2003; Jahn, Zerger et al. 2007). As a consequence, the contemporary agro-food markets are more and more characterised by coordination between the actors in food supply chains. Collective action is not only adopted to improve supply chain logistics, but can also be used as a strategic instrument to realise market differentiation, to increase market share, or to obtain niche protection (Hobbs, Fearné et al. 2002; Vuylsteke, Collet et al. 2003; Ménard and Klein 2004). Moreover, new forms of dynamism and innovative forms of cooperation, such as alternative food supply chains, are emerging (Marsden, Banks et al. 2000).

In recent years, an impressive number of these alternative food supply chains (AFSCs) have been established in order to meet the increasing consumer demand for safe and high quality food products, but also to create extra income for all members of the chain. This evolution has been studied by a wide field of authors, who have focused on their role in rural development (Marsden, Banks et al. 2000; van der Ploeg, Renting et al. 2000), their ability to guarantee a specific product quality (Ilbery and Kneafsey 2000; Henson and Reardon 2005) and their governance structures (Raynaud, Sauvéé et al. 2002; Ménard 2004; Ménard and Valceschini 2005).

But these AFSCs can also be considered as innovative organizations, which do not develop in isolation, but within the context of a comprehensive system. Innovation, a concept already developed early 20th century by Schumpeter (1911), can be defined as 'the carrying out of new combinations of the means of production'. This can include (i) the introduction of a new good, (ii) the introduction of new production methods, (iii) the opening of a new market, (iv) the conquest of a new supply source of raw material or half-manufactured goods and (v) the carrying out of a new organization of any industry (Schumpeter 1911; Sans 2003; den Hertog and Smits 2004). In this way, AFSCs are a clear example of innovations in the agro-food sector.

The current article focuses on the development of AFSCs in Flanders and does this by using a systems approach. Because AFSCs, or innovations in general, are characterised by being collective, multi-actor process, with users emerging as an important source of innovation and occurring in specific locational and institutional contexts (Wieczorek, Hekkert et al. 2009), they should be looked at as complex systems in which all elements are important. More specifically, the article describes the system structure and the system failures of AFSCs in Flanders. Using this information, it is the objective of the article to define which kind of instruments are wanted to correct for existing failures, and more importantly what the desired functions of these instruments are.

In the next section the systems approach is explained more in detail. Section 3 describes the specific case of AFSCs in Flanders, while section 4 gives the results of the study. Section 5 discusses the results and formulates the article’s conclusions.

2 System approach

The starting point of our analysis is that organizations innovate within a system (Smits and Kuhlmann 2004; Klein Woolthuis, Lankhuizen et al. 2005). Such a system is characterized by information flows and feedback mechanisms between the actors, the occurrence of goods and services, and the fact that changes in any of these relations and interventions have consequences for other actors and the system as a whole (Smits and Kuhlmann 2004). The actors consist, according to the system innovation policy approach (Klein Woolthuis, Lankhuizen et al. 2005), of demand (such as consumers and large buyers), supply (such small, medium and large firms and farms, multinationals), supportive infrastructure (such as universities, technology institutes) as well as intermediary infrastructure (such as banks, consultants, sector organizations) (see top of Figure 1).

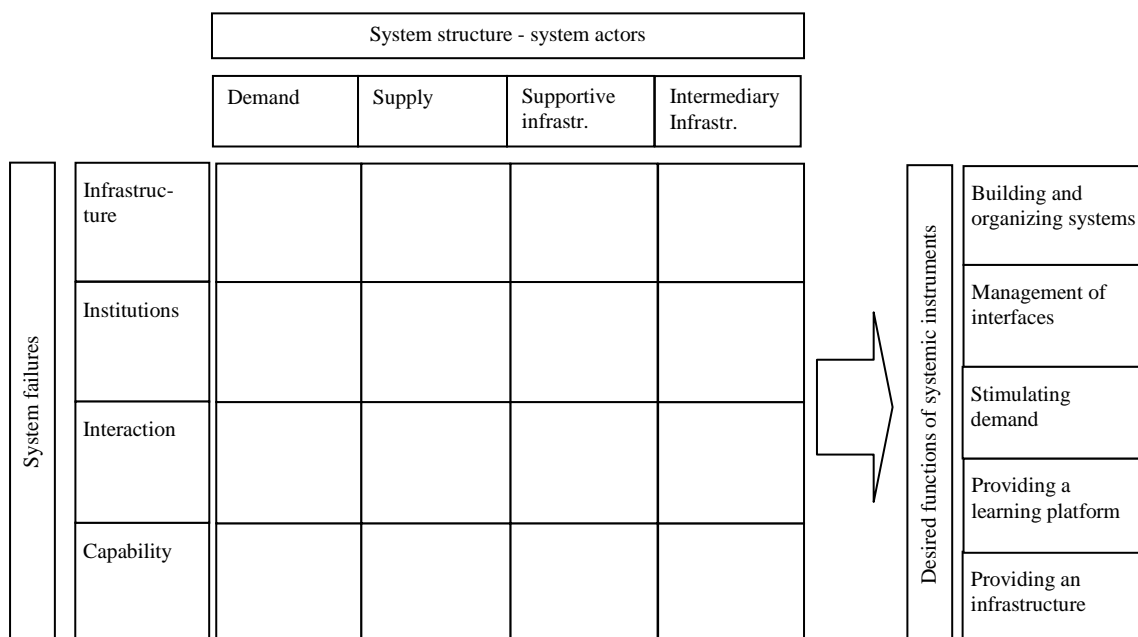


Figure 1 .Elements of a system approach.

System imperfections and failures are intrinsic to the system approach (van Mierlo, Leeuwis et al. 2010) and are represented on the vertical axis of the framework. They occur when the combination of basic mechanisms doesn't function effectively. Experiences show that system failures are generally linked to existing institutions or the 'rules of the game', as they are referred to by New Institutional Economics (see e.g. Granovetter (1985), North (1991), Ménard (1995), Williamson (1985)). The failures, shown on the left side of Figure 1, can theoretically (Klein Woolthuis, Lankhuizen et al. 2005) be divided into infrastructural failures (referring to the need for a reliable infrastructure that enables the companies' everyday operations and supports their long-term developments), institutional failures (related to the institutional context as a defining and structuring element in the system), interaction failures (too much or too little interaction between the different actors), and capabilities failure (caused by a lack of skills, capabilities and tools to achieve the desired innovations).

In order to deal with these failures, innovation instruments should not only target single actors or the interactions between two actors, but the system as a whole. Such systemic instruments need to support five functions (Smits and Kuhlmann 2004) (see right side of Figure 1):

- (i) providing an infrastructure for strategic intelligence: identifying sources and building links between the sources of strategic information, needed by the actors;
- (ii) building and organizing systems: facilitating the (de)construction of systems by preventing lock-in, identifying prime movers and involving all relevant actors;
- (iii) management of interfaces: stimulating debate and create transdisciplinary interaction;
- (iv) providing a platform for learning and experimenting: motivating learning by doing, by using and by interacting; and
- (v) stimulating demand articulation, strategy and vision development: stimulating the search for possible applications, supporting discourse, vision and strategy development.

3 The case of AFSCs in Flanders

The analysis in this paper builds upon the cases of four AFSCs. These were studied within the framework of the EU funded SUS-CHAIN project¹ and a project funded by the Flemish Agency for Innovation by Science and Technology². In the case study analysis, interviews and secondary data sources were used to reconstruct the initiative's stories. In a second phase, the system failures that were encountered by the AFSCs and the support measures applied were analyzed (see Appendix for an overview).

All AFSCs in the study are situated in Flanders, the most northern part of Belgium. They were selected to cover different product groups (fruits and vegetables, dairy and meat), both conventional and organic products, direct marketing and longer supply chains, completely new supply chains and new organizations within traditional supply chains, entrepreneurs'

¹ Marketing sustainable agriculture: an analysis of the potential role of new food supply chains in sustainable rural development. EU FP 5, QLK5-CT-2002-01349, www.sus-chain.org

² Samenwerking en systeeminnovatie als voorwaarden voor de ontwikkeling van duurzame productiesystemen. IWT, programma landbouwonderzoek, Project 50668.

initiatives and project-grounded AFSCs, etc. The choice to use a wide diversity of cases can be framed within John Stuart Mill's (1974) view on the most different system design. In our analysis, we start the analysis from the observation that all AFSCs are faced with different types of system failures, while the support measures that were established to overcome these failures may vary between initiatives.

The first initiative, Bio Brugs Ommeland (BBO), started in 2005 and brought together a small group of organic farmers. The initial aim of BBO was to promote regional farmers' products. In a later stage, BBO took on collective marketing of the products in cooperation with a transporter. He collected the products at the farms and delivered them to the buyers (mainly farm shops, organic stores and restaurants). The initiative stopped its activities in 2008.

The second initiative, the non-profit organization (npo) of De Westhoek Hoeveproducten (WHH), refers to a cooperative venture between farmers, a farmers' wives association and the provincial authorities. It was created in 1994 as a project and transformed to a npo in 2001. The aim was to create a common marketing strategy for fresh and on-farm processed regional products. The initiative was based on the explication, communication and commercialisation of the distinctive features (both intrinsic and extrinsic) of local farm products in order to achieve a higher market value. Since 2006, the npo has broadened its regional scope and WHH today still functions as one of the three regional labels under the umbrella organization of the West-Flemish Farm Products npo.

The third initiative, Sabio (SAB), concerns the collaboration between an organic dairy farmer and a small meat processor. The initiative started in 2002 when the farmer perceived problems to market the meat of reform cows. Together with the processor, a recipe for organic sulphite-free salami was developed. Next, outlets were established for the product through collaboration with small food shops and big retail actors. New products have also been developed to meet the buyers' demand. The collaboration still exists today and has grown significantly.

The fourth and last initiative, Tomabel (TOM) stands for quality differentiation of vegetables (tomato and lettuce) and fruits (strawberries). In order to valorize a high product quality, a group of fruit and vegetable producers started in 1996 a label, that was accompanied by product and process guidelines. For the marketing of the product and the related logistic aspects, the group of farmers collaborates with a nearby auction. The interaction with the customers and market prospection remain in hands of TOM. The label is still used today.

4 Analysis of AFSCs

Collectively, the initiatives were faced with 30 system failures of diverse kinds. A detailed description of these failures can be found in Vuylsteke et al. (2008) and Vuylsteke & Van Huylenbroeck (2005; forthcoming).

In the next paragraphs, a general overview is given of the types of failures that were identified and the support measures that were used to overcome the system failures. The results of the analysis are summarized in Figure 2.

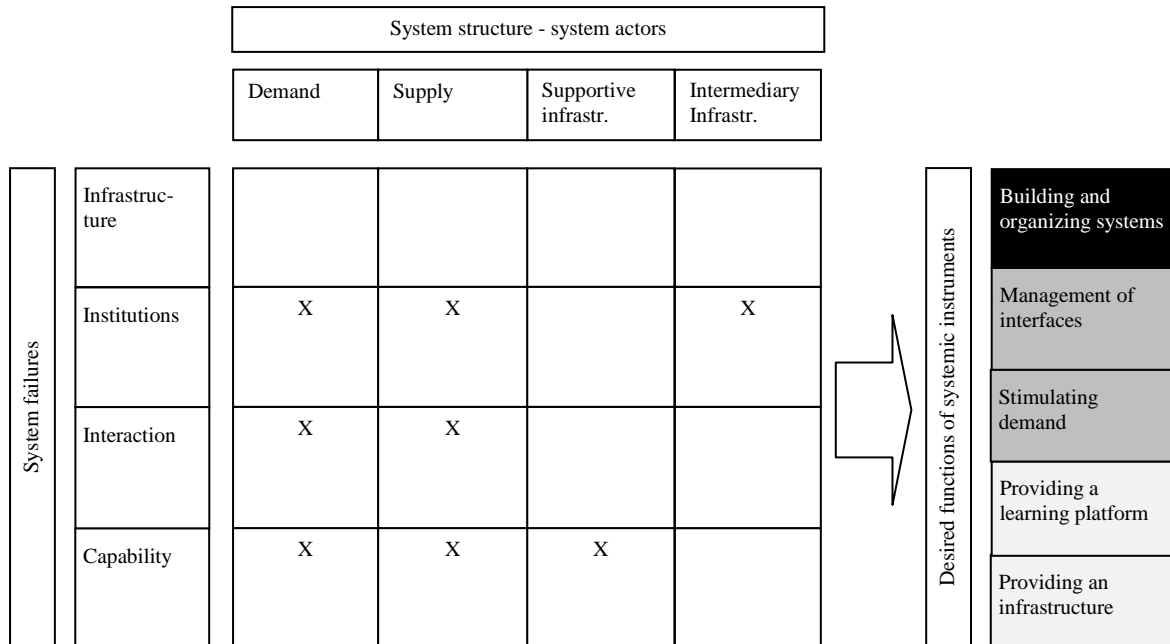


Figure 2 Application of a system approach to AFSCs in Flanders

Note: Xs show where the failures occurred

The darker the box of the desired functions of instruments, the more often they were fulfilled in the cases.

4.1 Infrastructural failures

Infrastructural failures occur when private parties are unwilling to invest in infrastructure, due to the large scale and very long operational horizons involved and the unlikelihood of them generating adequate financial returns (Klein Woolthuis, Lankhuizen et al. 2005). Within the four initiatives, **no important infrastructural failures** were identified.

Two main explanations can be given. Firstly, the nature of the selected initiatives was so that there was no need for investments in big infrastructures. They all concern unprocessed products or processing at the farm, direct sales, collaboration with traditional supply chain actor for both marketing and processing.. Secondly, due to the good infrastructural characteristics in Flanders, good access was guaranteed to the farms on the one hand and between farms and their buyers on the other.

4.2 Institutional failures

A distinction can be made between hard institutional failures, referring to imperfections caused by formal institutional mechanisms such as legislation and standards, and soft institutional failures, referring to informal mechanisms and rules of the game that limit innovation. These last are often a consequence of the broader political context and the social values that shape the policy objectives, the macroeconomic policy environment and the way things are done in society (Klein Woolthuis, Lankhuizen et al. 2005).

- Soft institutional failure

All four initiatives struggled with the contradiction between consumer attitude and consumer behaviour. While Flemish consumers ask for healthy and high quality food product, price and appearance remain important elements in the decision to buy a product (Aertsens, Verbeke et al. 2009). As a consequence, it is very difficult for the producers to create sufficient added value for their quality food products. The case studies illustrate the difficulty for AFSCs to influence **public awareness** about quality products. Through their activities, they can address dedicated consumers or change the buying behaviour of individual consumers. In the cases, the support measure that helped to raise consumer awareness was mainly project funding focus for the creation of alternative supply chains. These initiatives were then able to reach a small group of dedicated consumers.

Another soft institutional failure refers to the limits of the supply channel and its actors. The choice for a certain supply channel implies certain **preconditions**, often initiated by wholesalers and retailers (Aertsens, Mondelaers et al. 2009). *BBO* was established as an answer for the increasing requirements in traditional food supply chains. Similarly to the first type of soft institutional failures, the problem was overcome through the success of the collective organization. Project funding and the guidance by an NGO were the support measures that had an important role in this matter.

- Hard institutional failure

A first hard institutional failure concerns the requirements set out in **regulation and legislation** and is external to the initiative. The participants in *WHH* clearly expressed the farmers' problems to address the legal requirements at the start of the initiative. As small farmers with direct selling activities, they had to comply with the legal requirement for both processed and raw farm products. Especially food safety legislation, traceability and self-regulation were points of concern. Within the project, the initiators addressed these problems and at the very outset of the initiative, the regulatory implications for home processing and sales were investigated. In addition, extension services for agriculture and horticulture were made available to farmers to provide them with individual guidance to strengthen their capabilities.

A second hard institutional failure refers to the **internal organisation** with the enforceability of agreements. Especially *BBO* encountered problems related to this issue. At the start of the collective marketing activities, agreements were made within the group of farmers, but also between the farmers and the independent transporter. This process was guided by an NGO that had already a large experience in guiding groups, especially concerning the (participatory) process to create fair and workable agreements. However, practice learned that the agreements were not enforceable. This would have required an investment that was not in line with the initiative's objective and scope. As a consequence, the rules were violated on several occasions without further consequences and this eventually led to the abandonment of the cooperation with the independent distributor. It seems that the collective was unable to solve the governance issues with the available support measures.

4.3 Interaction failures

Interaction and collaboration between companies (farmers and non-farmers) is a central element in the analysis and can lead to two types of failure: too much interaction (strong

network failure) or too little interaction (weak network failure) (Klein Woolthuis, Lankhuizen et al. 2005). Weak interaction failures were the most pertinent in the four initiatives under study. They originate from differences within the group and insufficient involvement of participants on the one hand; and weak interaction between producers and the consumers that buy their products on the other.

In the case of *BBO*, the involved farmers had each different expectations and goals with regard to the initiative. Therefore, the development of a **common vision** was very difficult and required a gradual approach. The later frictions and disagreements can partially be linked to this lack of a common vision, but also personal characteristics and the seasonal nature of agriculture played an important role. In the case of *TOM*, the internal differences can be explained by the expansion of the initiative towards other product groups. The starting farmers were very dedicated and invested both money and time in the initiative. Farmers that later joined the initiative were satisfied with a status quo of the initiative and less inclined to adopt and update the activities to new market realities.

Although direct **contact between consumers and producers** is an important strength of very short supply chains and direct selling, interaction can be restricted because of the individual nature of sales activities and the small number of consumers reached. This perceived lack of interaction with consumers is an important reason for farmers to join collective organisations. In the case of *WHH*, the network built a range of products and searched for new farmers who could help fill gaps in their product range. In addition, there was a considerable improvement in networking among producers and other stakeholders and a label was developed to reach more consumers and to make them aware of the range of available local products. Project funding and support by the local government (province) offered the opportunity to do this in a successful way.

4.4 Capabilities failures

Within the studied AFSCs, capabilities failures are mostly linked to new activities taken on by the initiative. In this case the organisations lack competences, capacities or resources to make the leap from the old to the new activities (Klein Woolthuis, Lankhuizen et al. 2005).

Firstly, it became clear that at least one member of the AFSC should have knowledge and capabilities with regard to **supply chain organisation** and accompanying **marketing activities**. The stories of all cases show that this is not evident for farmers, as all initiatives initially faced a lack of capabilities with regard to the management of supply, price-setting, the establishment of collective marketing activities, logistics and financial aspects. Promotion and quality differentiation are activities that need a lot of capabilities, lacking in three of the cases at the offset of the project. The organisation of joint promotion was the initial driver for the start of *BBO*, but also belongs to the *WHH* activities. In the case of *TOM*, the product differentiation objective required not only the development of packing materials and promotion campaign, but also the development of standards that describe both the product and process guidelines.

Secondly, capability failures occurred relating to the establishment of an appropriate **internal organisation**, which is a highly technical and legal matter, but very important for the future functioning of the initiative. Both *BBO* and *TOM* had to overcome problems in the

development of the suited internal organisation. The cases furthermore show that adjustments to the organisation may be necessary with the further development and growth of an initiative (*TOM*). To overcome this capability failure, as well as the first one, project funding and facilitation by the government and NGOs were indispensable. These support measures helped farmers to overcome problems by providing a network and opportunities for developing and acquiring new skills. In the case of *BBO*, an NGO was consulted to organise the joint promotion.

Thirdly, *SAB* encountered some capability failures concerning the development of a completely **new product**. One of the partners had a lot of experience with the preparation of pork-based salamis, but a new recipe was needed in order to process beef. Support was not an issue here. The development and refining of the recipe was done by the partners through a trial-and-error process.

5 Discussion and conclusion

The cases show that many of the theoretical system failures can be found in practice. Only infrastructural failures were not mentioned, but this could be explained by the nature of the initiatives and the existing infrastructure in Flanders. Failures at institutional, interaction and capability level did exist, and several actors were involved within or affected by these failures. These findings confirmed the earlier results by Vuylsteke and Van Huylenbroeck (forthcoming), which learned that European AFSCs were confronted with all these categories of system failures, although they took different forms in different cases. Institutional, interaction and capability failures were best addressed by providing the necessary competences and skills. Within the current cases, the organisations tried to deal with the failures by mainly focussing on instruments that act on building and organising the system. One of the most important instruments was project funding, which has given the initiatives the possibility to form an organisation and to start the AFSC. Next to this, the existence of a facilitator (whether it be the government or an NGO) has been of great importance. This facilitator has been able to supply some desired functions such as a better organisation of the system, management of the interfaces and stimulating demand.

However, the cases also show that some desired functions of system support instruments have not been dealt with explicitly: providing a learning platform and providing infrastructure. As mentioned before, problems with infrastructure were not encountered by the initiatives, so that might explain why the used instruments don't focus on providing or improving an infrastructure. Providing a learning platform, which helps to deal with lacking knowledge or skills in the system, seems the most important lacking function of the used instruments. Learning functions are needed to deal with problems internal to the initiative such as dealing with the legal requirements for food processing and selling, the creation of a common vision, realizing support for the initiative by all members or the establishment of enforceable agreements within the limitations of the initiative as well as problems related to being a member of the food supply chain (e.g. how to get a good deal on pricing, how to arrange the logistics, how to create a product that can be differentiated from other products in the chain). Finally learning functions can contribute to solve problems related to the market and the consumer side, think about how to create a public awareness so that the demand increases or how to reach the largest potential of possible consumers. These

learning aspects are especially important in relation with the high number of capability failures encountered by the cases under study. An improved focus on providing a learning platform could furthermore contribute the functioning of the knowledge triangle and the conversion of research results in innovations, both at the level of the firm or the AFSC.

The analysis not only learned that there are shortcomings in the functions addressed by the existing instruments, but also in the width of the instruments' scope and the time during which the instrument can be used. Especially project funding and guidance by experts proved to be important instruments, but these are usually short-term solutions to specific problems. This is for example illustrated by the instruments within the framework of the European Rural Development Policy (Vuylsteke and de Regt 2011).

It is exactly because of these problems and shortcomings within the traditional support systems, that authors like Smits and Kuhlmann (2004) and Hekkert and Negro (2009) call for more systemic instruments. These should not replace the traditional instruments (because they are often very useful and already contribute to several functions), but should complement them in order to "better tune the portfolio [of instruments] to the needs of present day innovation processes" (Smits and Kuhlmann 2004). The instruments should act as system builders and system organisers and need to pay attention to the learning process (especially in the case of AFSCs in Flanders).

Furthermore, the study shows that intermediary as well as supportive actors or not often involved in the traditional instruments. Supportive actors, such as universities and research institutes have focused a lot on innovation as well as on system approaches (see various literature). However, there seem to be problems to link the results of their work with reality (Klerkx and Leeuwis 2009). How do you inform farmers or other members of the AFSC of knowledge created at university level? This issue is also mentioned in the recent analysis of the available instruments to support innovation in Flemish farm enterprises: "a bridge needs to be built between research institutes and companies" (Vuylsteke and Van Gijsegem 2010). Smits and Kuhlmann describe in their article that most of the time traditional instruments focus on the private sector, and much less on the public sector. However, members of the public sector can be very important intermediary as well as supportive actors in the system of AFSCs. Therefore, public-private alliances should be incorporated more in the system (Vuylsteke and Van Huylenbroeck 2005). In the cases, the role of policy and other stakeholders has been limited to project funding and facilitation, but they can have a much more important role as system builder and organiser.

In conclusion, we suggest that the systemic instruments desired in the case of AFSCs in Flanders need to focus on:

- influencing general public opinion, because the initiatives themselves are too small to have an impact;
- tackling governance issues that arise in the creation and maintenance of initiatives;
- personal differences, human relations and individual objectives which are at the core of collective organisations;
- a definition of common expectations and goals at the start of any new initiative;
- developing new skills amongst the participants;

- establishing cooperation with actors in traditional supply chains.

The instruments need to be built around and upon the existing traditional support systems and need to involve not only the demand and supply side, but just as well the supportive and intermediary actors.

This article used AFSCs in Flanders as an example of innovation within the agro-food sector. It has been shown how a system approach can help to define the lacks within the currently used support instruments. Thereby it was possible to define those elements that should be included when systemic instruments were to be developed to stimulate the rise of and to support the existence of AFSCs. Bringing things back to innovation, we can conclude that using a system approach will help to define why some innovations are successful and why others aren't. Furthermore, it will show what failures are not yet tackled by using traditional support systems and therefore what functions new systemic instruments need to fulfil.

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Appendix Existing institutional, interaction and capability failures in the cases, used instruments and served functions

System structure - system actors				
	Demand	Supply	Supportive infrastructure	Intermediary infrastructure
Existing failures at institutional level	Public unawareness, unwillingness to pay	Existence of institutional preconditions		Complex and comprehensive regulations and legislation
		Governance issues such as unforceable agreements		
Used instruments	project creation and funding	guidance by an NGO		extension services
		collective organization		
		facilitator		
Served functions	stimulate demand (limited)	build and organise the system		provide a learning platform
System structure - system actors				
	Demand	Supply	Supportive infrastructure	Intermediary infrastructure
Existing failures at interaction level	lack of interaction with consumers	lack of a common vision		
		different objectives		
Used instruments	collective organization	guidance by an NGO		
	creation of a label	internal organisation board		
	project creation and funding	facilitator		
	support by the local government			
Served functions	stimulate demand (limited)	build and organise the system		
	build and organise the system			
	management of interfaces			

	System structure - system actors			
	Demand	Supply	Supportive infrastructure	Intermediary infrastructure
Existing failures at capability level	Lack of marketing activities	difficulties to upscale	Lack of knowledge on inventing new products	
	Difficulties with product differentiation	develop a suited internal organisation		
Used instruments	development of standards	Experienced advice	including an expert in the initiative	
	project creation and funding	facilitation by NGO or government		
	facilitation by NGO or government			
	hired experts			
Served functions	providing an infrastructure	build and organise the system	build and organise the system	
	management of interfaces			