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Horizontal and Vertical Networks for Innovation in the Traditional Food Sector

Xavier Gellynck, Bianka Kühne

Ghent University, Belgium
Xavier.Gellynck@UGent.be; Bianka.Kuhne@UGent.be

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ABSTRACT

The locus of innovation is not the individual firm anymore but increasingly the network in which the firm is embedded. Hence, in this paper innovation is investigated in the broader context of networks and applied to the traditional food sector. Networking refers to a process of identifying and acting on complementary interests with or without formal means of cooperation and plays an important role for the diffusion and adoption of innovations, because they increase the flow of information. Two main types of networks exist. Vertical networks relate to cooperation of partners belonging to the same chain. Meanwhile, horizontal networks refer to cooperation among firms which are primarily competitors. Data were collected during focus groups and in-depth interviews in three European countries: Belgium, Hungary, and Italy. In each country, data are collected from retailers/wholesalers, food manufacturers and suppliers in the beer, hard and half hard cheese, ham, sausage, or white paprika chain. In the investigated countries both vertical and horizontal networks exist. However, the intensity of using the network differs. On the one hand vertical networks are well developed based on quality assurance schemes and traceability, though these networks often face difficulties due to high lack of trust. On the other hand, horizontal networks are well developed when a producer consortium is involved. However, these networks can be inhibited through strong competition. The partners in traditional food networks focus mainly on innovation related to product characteristics such as new size, form and packaging without changing the traditional character of the product. The main barriers for innovation in the traditional food networks are the lack of understanding the benefits of networking activities for innovation, the lack of trust, the lack of knowledge of appropriate methods and skills, and the lack of financial and physical resources. Our study points out that successful SMEs use their networks to overcome lacks of knowledge and information and to create possibilities of joint use of resources.

Keywords: horizontal and vertical networks, traditional food products, innovation, focus groups, in-depth interviews

1 Introduction

Recent studies indicate that the network, a firm is embedded in, is becoming increasingly more important for the development and implementation of innovation than the firm itself (Omta, 2002; Pittaway et al., 2004). Networks increase the flow of information and thus play an important role for the diffusion and adoption of innovations (Pittaway et al., 2004). Hence, a network is the place where actors within one or between several related industrial sectors interact and collaborate to add value for the customer (Omta, 2004). Two different forms for networks can be distinguished. Horizontal networks relate to collaboration among firms which are primarily competitors within the same sector or industry (Hendrikse, 2003; Omta, 2004). Horizontal networking encompasses initiatives, such as strategic alliances or joint ventures (Ng et al., 2003), and they are formed to profit from information exchange, social benefits and informal relationships (O'Donnell et al., 2001). Meanwhile, vertical networks refer to collaboration of partners

belonging to the same chain network (Omta, 2004). The chain network includes all the organizations (suppliers, focal companies, customers, and third parties) involved in all the upstream and downstream flows of products, services, finances, and information (Van der Vorst, 2000). The focal company is hereby the food manufacturer. Third parties embrace institutions such as research organisations, governmental institutions, and financial providers all related to one chain network. In consequence, a network is the place where the internal and external resources of a firm are combined and transformed into innovation (Gellynck et al., 2006). Through the optimal use of both internal and external resources in the network, a firm can become innovative and able to achieve competitive advantage (Cassiman, Veugelers, 2002; Lengnick-Hall, 1992).

In an increasingly globalising market, innovation is an important strategic tool for micro, small, and medium sized enterprises (SMEs) to achieve competitive advantage (Avermaete et al., 2004a; Gellynck et al., 2007; Murphy, 2002). Innovation can be defined as an ongoing process of learning, searching and exploring resulting in new products, new techniques, new forms of organization and new markets (Lundvall, 1995). Innovation is a continuous process characterised by three steps: efforts, activities and results. Efforts are all resources, such as human and financial resources, a firm is investing in activities for the development of innovations. Results are the effects of these innovation activities on tangible (e.g. growth of market share, profit) as well as less tangible aspects (e.g. firm stability, efficiency) (Gellynck et al., 2006). Consequently, the measurement of innovation capacities captures also the progress in developing an innovation and not only the result, such as the successful implementation of innovation (Gellynck et al., 2007).

The innovation capacity of a firm is dependent on its internal and external resources (Avermaete et al., 2004b). Internal resources contain a large number of firm characteristics, such as the R&D structure, qualified staff, experience of the manager, the openness toward new ideas, financial structure, and firm's size (Diederen et al., 2000; Fey, Birkinshaw, 2005; Grünert et al., 1997). External resources belong to the firm's strategic environment and include the potential of business-to-business relationships, available infrastructure for collaboration and networking, and access to support from research providers and government (Avermaete, Viaene, 2002; Scozzi et al., 2005; Ussman et al., 1999).

However, most SMEs face numerous problems regarding the introduction of innovations. SMEs are mainly not aware of the importance of being innovative and face limited organizational capabilities, due to a lack of managerial competencies and experiences, and lack of strategic vision (Avermaete et al., 2003; Scozzi et al., 2005). Further difficulties for the development and implementation of innovation appear if the firm has problems with the allocation and coordination of resources, collection of relevant information and knowledge, and when learning is not included in the innovation process (Scozzi et al., 2005). These obstacles can be overcome through collaboration between the partners of a network.

The value of networking for innovation is the fast building of a complex knowledge base and diffusion system of innovations through streamlining information flows (Pittaway et al., 2004; Sawhney et al., 2006). Ideas for innovations can be derived from exchange and alliances with suppliers and customers, participation at fairs and exhibitions, and R&D activities (Scozzi et al., 2005). Collaboration is the way how network partners work actively together to achieve common objectives by sharing information, knowledge, profits, and risks and benefits (Gruat La Forme et al., 2007; Omta, 2002). Collaboration in the network offers opportunities for new relationships, links or markets and allow access to new or complementary competencies and technologies (Lazzarini et al., 2001; Lowndes and Skelcher, 1998; Pittaway et al., 2004). Thus, SMEs are more innovative when they are able to join and manage network activities (Avermaete, Viaene, 2002; Gellynck et al., 2006). Successful collaboration is based on sharing information with all partners of the network, cooperative behaviour among network members, and clear communication of well defined goals and expectations. But also the share of risks and benefits along the network are reasons for successful collaboration, because it improves the teamwork and focuses on common goals among all network members (Elmuti, 2002; Fearne, Hughes, 1999). On the opposite, collaboration can fail due to lack of trust between network members, lack of understanding the benefits of collaboration, and lack of strategic vision (Elmuti, 2002; Fearne, Hughes, 1999; Scozzi et al., 2005).

In the frame of this paper the focus is on networks of traditional food producers, which contain a large majority of SMEs. Within the EU an increasing interest is noticed in preserving its cultural heritage characterising the different European regions (EC, 2006a; EC, 2006b). An important element of the cultural heritage is the production of traditional food products. Only few studies about traditional food products are published (Jordana, 2000; Trichopoulou et al., 2006). Even less studies are in reference to innovation in this specific food sector. The increasing demand for traditional food products in combination with the importance of innovation to gain competitive advantage, underlines the great interest to carry out research in this field (Edwards et al., 2005; Humphreys et al., 2005). Studying the traditional food sector requires a clear definition. Traditional food products are considered as processed goods, both with

and without any form of origin label. Furthermore, in the context of our study, we define traditional food products according to four criteria: (1) the key production steps of a traditional food product must be performed in a certain area, which can be national, regional or local. (2) The traditional food product must be authentic in its recipe (mix of ingredients), origin of raw material, and/or production process. Further, (3) the traditional food product must be commercially available for at least 50 years and (4) it must be part of the gastronomic heritage.

Thus, the present paper aims to investigate how SMEs network on horizontal and vertical level and how networking is contributing to the introduction of innovations. Subsequently, three research questions occur: (1) What kind of networks exists in the traditional food sector?, (2) Which innovations are implemented by traditional food manufacturers?, and (3) What are the main barriers for innovation in traditional food networks?

This paper is structured as follow: In the next section the methodology of our research is described followed by a discussion of the research results. Finally conclusions are drawn.

2 Methodology

Based on a literature review on bottlenecks and success factors of SMEs in relation to innovation, a focus group discussion guide (FG-DG) was set up to explore determinants of these bottlenecks and success factors. The guide contains items related to innovation and network management. The present paper discusses results from these parts.

A pilot test was conducted in one chain to test the FG-DG, which led to adaptations, particularly regarding the length of the session. In addition, the compilation of the groups needed to be modified. Originally, the focus group was compiled of 8-10 participants from the same sector of which 60% were managers from focal companies (traditional food manufacturers), 20% were raw material suppliers and 20% were distributors. This composition was not delivering satisfying outcomes during the pilot test, due to disagreements between raw material suppliers and distributors based on their firm size and power position in the chain. Therefore it was decided not to invite these two groups of respondents to the same focus group, but separately. It means that focal companies were put together with raw material suppliers on the one hand and focal companies with distributors on the other.

In the final FG-DG section on network management the participants were asked to reveal the steps of their typical manufacturing/trading/retailing process as well as the weak points within this process. First an individual exercise was conducted, followed by a group exercise which was used to broaden the discussion to common problems between the different chain levels and how solutions could be achieved together with other chain levels. Following, the participants had to indicate how they perceive their relation with their suppliers and customers in an individual exercise, which was then discussed within the group with the aim to gain detailed information about negatively perceived relationships.

In the section on innovation management the participants' understanding and attitude towards innovation in general and towards innovation in traditional food products in particular were discovered. Further, detailed information were collected about the information sources for innovation, available human and financial resources for innovation and the innovation activities within the firms.

All questions were presented in an open-ended format in order to obtain a broad range of information and to stimulate interaction among participants.

The qualitative explorative research was conducted in three European countries, which represent different cultural heritages – Northern Europe (Belgium), Southern Europe (Italy) and Central Europe (Hungary). The research was conducted between March and May 2007 and each session was audio recorded as well as notes were taken by an assistant. In each country, data were collected from food manufacturers (focal company), distributors, and raw material suppliers belonging to the traditional beer, hard and half hard cheese, ham, sausage or white paprika network (Table 1). Food manufacturers were selected based on our definition for traditional food products and based on the characteristics for SMEs (EC, 2003). In case the requirements were not fulfilled the respondent could not be considered as traditional food manufacturer. The other chain members were selected based on their importance for the food manufacturers in producing traditional food. Per product type, two focus group sessions were organised. In two countries focus groups were conducted, compiling focal companies with raw materials suppliers in the one focus group and focal companies with distributors in the other focus group. Furthermore, in each focus group it was aimed to assemble firms of the same size. The participants of the focus groups were first contacted by phone to introduce the aim of the focus groups. In Belgium, in-depth interviews were conducted instead of focus groups because of high respondent refusal to participate in

focus group discussions. Hence, for the in-depth interviews the FG-DG was adapted according to the interview of a single respondent, but still all topics were covered. Further, also the respondents of the in-depth interview were first contacted by phone to introduce the aim of the research.

Although the application of focus group discussions and in-depth interviews is different, both methods assemble detailed attitudinal and experiential information from the respondents by using open-ended, exploratory questions in a semi-structured way (Powell and Single, 1996). While focus groups can reveal a greater variety of views, opinions and experiences, during in-depth interviews the interviewer is probing the respondent more deeply to uncover underlying motivations, beliefs, attitudes and feelings on a topic (Malhotra, 1999; Hennink, 2007). Hence, with both techniques a broad overview and comparatively rich qualitative data can be assembled (Fein et al., 1997).

Table 1.
Sample description of focus groups and in-depth interviews

Region / Method	Product type	Participants[1]
HUNGARY		
Focus group 1	White pepper	4 medium sized white pepper processing companies 5 retailers/distributors (small shop owners)
Focus group 2	White pepper	2 medium sized white pepper processing companies 6 white pepper growers
Focus group 3	Dry sausage	2 medium sized dry sausage manufacturer 7 animal breeders
Focus group 4	Dry sausage	2 small sized dry sausage manufacturer 1 medium sized dry sausage manufacturer 6 retailers (2 supermarket chains, 4 small shop owners)
ITALY		
Focus group 1	Dry ham	4 small sized ham producers 4 suppliers
Focus group 2	Dry ham	4 medium sized ham producers 4 distributors
Focus group 3	Hard and half hard cheese	4 small sized dairy plants 4 suppliers
Focus group 4	Hard and half hard cheese	4 medium sized dairy plants 4 distributors
BELGIUM		
In-depth interviews	Hard and half hard cheese	4 micro sized dairy plants 1 medium sized dairy plant 2 milk supplier 2 distributors/retailers (small shop owners)
In-depth interviews	Beer	2 micro sized breweries 2 small sized breweries 1 medium sized brewery 1 supplier of malt 2 distributors/retailers (retail and wholesale)
TOTAL	6 Product types	84 participants

For the evaluation of the outcome of the focus groups and in-depth interviews, the written notes were improved with the help of the audio tapes. The results of each focus group and in-depth interview were transcribed and translated into English. The research group in each country prepared national reports of the results. The reports were then reviewed during a group discussion among the researchers in order to resolve unclarities related to cultural differences or translation issues.

3 Results

In this section the results from the qualitative research are presented. First, it is described which kinds of networks exist in the traditional food sector and what their success factors and bottlenecks are. Secondly it is described which innovations are considered in the traditional food sectors and how they are developed. Finally, barriers of innovation in traditional food networks are identified.

[1] Micro sized enterprise: < 10 employees, maximum EUR 2 million annual turnover
Small sized enterprise: < 50 employees, maximum EUR 10 million annual turnover
Medium sized enterprise: < 250 employees, maximum EUR 50 million annual turnover

3.1 Networks in the traditional food sector

In the investigated countries both vertical and horizontal networks exist. However, the intensity of using the network differs (Table 2).

Horizontal networks between firms, which are primarily competitors, are well developed in particular in Italy, where the traditional food manufacturers are mainly involved in a producer consortium. This producer consortium is setting the manufacturing rules of the product and guaranteeing the quality towards third parties. Besides, in Belgium, collaboration of a small group of traditional food manufacturers exists for the achievement of national and European protection of geographical indications (GI). These relationships are mainly based on acquaintance and mutual trust. Furthermore, the Belgian SME-breweries are often incorporated in larger breweries, maintaining their traditional way of production, but gaining easier access to national and international markets. However, in most of the other cases and in particular in Hungary, there is no collaboration between competitors in horizontal networks in the traditional food sector, due to conflict of interests, strong competition, no understanding of benefits of collaboration, and too conservative attitudes of the traditional food SMEs.

Table 2.
Type of networks in the traditional food sector (per country)

Type of network	Hungary	Italy	Belgium
Horizontal	• No collaboration with peers, both white pepper and sausage	• Producer consortium, both hard and half hard cheese and ham	• Small groups of competitors for GI, both beer and hard and half hard cheese • Beer: SME-breweries incorporated in larger breweries
Vertical – direct chain	• Low cooperation among direct chain members • Establishment of regional product sales organisations (pig breeders)	• High vertical integration of suppliers, especially for ham • Less collaboration with customers	• Beer: mainly with exporters and with suppliers • Hard and half hard cheese: suppliers (mainly co-operatives), retailers (mainly small shops)
Vertical – third parties	• Food federations • Research institutions/universities • Governmental institutions	-	• Research institutions (university, vocational schools etc.), communication agencies, NGOs for improving image of Belgian traditional products, and international initiatives (Slowfood- maintenance of regional cuisine)

Vertical networks exist between the direct chain members, meaning the supplier, the food manufacturer and the customer of the same chain. In Hungary there is little collaboration between the direct chain members, due to the lack of competent partners and scarce information exchange between the chain partners. However, there is an initiative between dry sausage manufacturers and the pig breeders to establish a regional product sales organisation. On the contrary, in Italy particularly the ham manufacturers and their suppliers are vertically integrated. However, there is also only little collaboration between the food manufacturers and the customers. This is due to high competition between the customers, which is hampering the establishment of long-term collaboration with the food manufacturers. In Belgium, collaboration among direct chain partners is well established, but there are clear differences between the beer and the hard and half hard cheese sector. While the traditional breweries are mainly collaborating with customers on export markets, the traditional hard and half hard cheese manufacturers are mainly collaborating with small shop owners on the national market. Furthermore, in the traditional hard and half hard cheese sector of Belgium the suppliers are mainly organized in co-operatives.

In addition, there is also vertical networking between the traditional food manufacturers and third parties, such as research institutions, food federations, governmental institutions, communication agencies, and international initiatives to achieve certain aims. However, vertical networking with third parties is only indicated in Hungary and Belgium, but not in Italy. That might be explained by the fact that the producer consortia in the Italian traditional food sector are also responsible for marketing and research and development activities.

In Hungary and Belgium, collaboration with research institutions, such as universities and vocational schools, and with food federations focus primarily on the improvement of product and process innovations of the traditional food products. These networking activities are mainly based on the common

objective to improve quality assurance schemes and achieve traceability. In Hungary, only medium sized traditional food manufacturers collaborate with research institutions. In contrast, collaboration with governmental institutions, non-governmental organisations (NGOs) and communication agencies is mainly aiming at the improvement of the image of the traditional food product on national and international level. One Belgian respondent mentioned that he is participating in an international initiative which is promoting the regional cuisine and cultural heritage. However, generally there is only little vertical networking with third parties.

3.2 Innovation in traditional food networks

Members of traditional food networks mainly focus on innovations related to product characteristics and least on organisational innovation (see Table 3). However, the raw materials as well as the production process must not be changed too much through innovation to maintain the traditional character of the product. In general, innovation in traditional products is only acceptable when it ensures the maintenance and/or supports the improvement of the image of the traditional food product.

Table 3.
Innovations in the traditional food sector (per country)

Type of innovation	Hungary	Italy	Belgium
Product innovation	• Changes in product composition • Package innovation without changing the design too much	• New feeding stuff • Package innovation • New product combinations packed together • New ways of usage of the traditional product	• New product size and/or form • New product composition • New use of product in food preparations
Process innovation	-	- (change in process would be deviation from master's rule)	• New technical solutions to improve quality assurance and traceability along the SC
Market innovation	• Use of alternative distribution channels (e.g. specialised small shops)	• Use of alternative distribution channels (e.g. specialised small shops)	• Use of alternative distribution channels (e.g. specialised small shops) • Search for not widely known traditional food products and supporting their marketability
Organisational innovation	• Formation of membership based research organisations	-	• Joint product development activities • Formation of innovation networks supported by the government

Product innovation includes changes in product characteristics, packaging innovation, and new combinations of products packed together. Acceptable innovations in product characteristics are new sizes or new product compositions. New sizes relate mainly to offering smaller packages or different shapes of the product (e.g. rectangular instead of round shaped cheeses). New product compositions refer to the slight adaptation of the ingredients, providing a new flavour, colour or odour to the traditional food product without changing its specific characteristics too much. For packaging innovation, changes in the design of the package or changes in the type of package, such as vacuum packaging or packaging under modified atmosphere, are acceptable. However, in particular the Hungarian respondents state that the design of the package should be changed very carefully because of the high conservatism and the long adaptation time of the consumers to a new designed package containing the same product. Another product innovation, primarily stated by Italian and Belgian respondents, is to consider new ways of usage of the traditional product in further processed products, such as the use as an ingredient for (industrial) food preparations of ready-to-eat or ready-to-cook meals. Process innovation is considered feasible only in Belgium, and only in case it would lead to the improvement of the quality assurance and

traceability along the vertical network. In Hungary, process innovation is not considered as feasible for traditional food products and in Italy it is even seen as a deviation from the master's rule established by the producer consortium. In all countries, only few respondents mentioned the use of alternative distribution channels, such as small specialised shops, in relation to market innovation. Furthermore, a Belgian small shop owner stated that market innovation would be also to search for not widely known traditional food products and to increase their marketability. Organisational innovation is not mentioned by the respondents in the first place. Only when they were asked how they could improve innovation activities together with other players of the network, Hungarian and Belgian respondents mentioned joint product development and formation of joint research organisations or networks.

During the focus-group and in-depth interviews the respondents were also asked to indicate which methods they use to determine the innovation of their product. In Hungary, the majority of the respondents state that product tastings would be the main method to determine innovations in product development. Similarly, in Belgium direct contact to the consumers at the point of sale is considered an important source of ideas for product development. Another important source of ideas are professional magazines. As a reason the respondents state that the market of traditional food products is very small. Hence, the stakeholders of this market segment can often not afford expensive market studies or expansive new product development processes.

Other methods for determining innovation in traditional food products considered by the respondents are retailer's declaration, discussion and exchanges with competitors and chain members, and having the ideas themselves. Though, these methods are mentioned by only one or two respondents during the focus groups and in-depth interviews in Hungary and Belgium. In Italy, innovating traditional food products was refused in the first place. Nevertheless, later in the discussion the respondents recognized that some changes had occurred to the raw materials or the traditional food products itself during the years, such as the change of the pig's genetics used for the production of traditional ham or the introduction of traditional cheese in gastronomic recipes. Mainly these kind of changes happened on the pressure of the large retailers.

3.3 Barriers for innovation in traditional food networks

For the development and implementation of innovation, the respondents often stated that they lack human resources and, sometimes even more important, financial resources in order to develop their ideas or for finally implementing the developed innovation. From the discussion during the focus groups and the in-depth information during the interviews it also became clear that in all investigated countries most SMEs lack the knowledge of appropriate methods for innovation. These methods refer to the identification of customer needs, market analysis, access to external knowledge and information, and/or identifying competent partners, suitable to solve the problem the at issue.

In some cases, the respondents stated that they are able to overcome (part of) these problems by using their networks. Through networking the SMEs are able to use complementary knowledge and information as well as other resources, which helps them to successfully develop and/or implement innovation.

However, horizontal networking between competitors is often hampered by conflict of interests and/or strong competition among the network partners. Furthermore, competitors in the traditional food sector do not realize the benefits inherent to networking, mostly combined with too conservative attitudes of the companies towards the involvement of other parties into the own innovation process. Vertical networking among direct chain members is frequently hampered by a high lack of trust among the partners, lack of finding potential partners, conflict of interests among the chain partners, the distribution of costs and benefits along the chain and lack of understanding the benefits of collaboration along the chain. Similarly, vertical networking with third parties is hampered by a high lack of trust in third parties and lack of understanding the benefits of collaboration with third parties.

4 Conclusions and future research steps

Our paper explores the kind of networks existing in the traditional food sector, the types of innovation implemented by traditional food SMEs and the main barriers for innovation in traditional food networks.

Both, horizontal and vertical networks exist in the traditional food sector. In line with Omta (2002) and Pittaway et al. (2004), we found that SMEs in the traditional food sector use their networks for the implementation of innovation, in particular for product innovation. Only few SMEs use the networks to achieve other forms of innovations. Horizontal networks are mainly established when a producer consortium is involved or when competitors collaborate to achieve protection of the geographical indication of their traditional food product. Vertical networking between the direct chain members

contributes to the development of innovation capacity when close collaboration is realised. Input and ideas for innovation are mainly obtained through collaboration between traditional food manufacturers and small shop owners as well as raw material suppliers. The networking intensity depends on the position of the members in the chain network. Traditional food manufacturers collaborate better with their suppliers than with their customers, due to the stronger bargaining power of the latter. Hence, to overcome this barrier traditional food manufacturers should increase the collaboration among each other to achieve a stronger position when negotiating with the larger retailers. Other input and ideas for innovation are mainly received from networking with research institutions and food federations. This form of networking primarily results in the improvement of quality assurance schemes and traceability, but also in an enhancement of the image of traditional food products.

However, the main barriers for innovation in the traditional food networks are the lack of understanding the benefits of networking activities for innovation, the lack of trust, the lack of knowledge of appropriate methods and skills, and the lack of financial and physical resources. This is in line with the results of Avermaete et al. (2003) and Scozzi et al. (2005).

Successful SMEs use their network to overcome lacks of knowledge and information, and for creating possibilities of joint use of resources, such as access to information, new technologies, and financial and human resources. The most important success factor is the ability of a firm to join and manage participation in collaborations with its chain members, because this offers the easiest and fastest access to new information and complementary resources as indicated by Lazzarini et al. (2001), Lowndes and Skelcher (1998), and Pittaway et al. (2004). If a firm lacks this ability, it limits its knowledge base and reduces its chance to enter networks in the future (Pittaway et al., 2004). The reason for lacking collaboration capabilities lies not exclusively in the firm itself, lacking trust among network members and inappropriate or no knowledge of feasible network management techniques to assure the confidentiality of exchanged information are hampering the development of innovation as well (Elmuti, 2002; Fearne and Hughes, 1999; Scozzi et al., 2005).

Our study is of qualitative and exploring nature and although we used a cross-country setting, conclusions cannot be generalized for the whole European traditional food sector. In the future, quantitative research should verify the different forms of networks, and explore them also on different levels, such as the regional, local or sector specific level. Furthermore, it is suggested to investigate the network's efficiency and sustainability for innovation.

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