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# Factors Underlying Farmers' Decisions to Participate in Networks

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## ABSTRACT

The objective of this elicitation study is to provide insights into farmers' beliefs which influence their participation in knowledge exchange and innovation networks to enable the enhancement of network participation. A set of facilitating and impeding factors was obtained. Participants identified (a) 13 categories of behavioural beliefs (e.g. 'You learn something' and 'Low perceived return on investment'), (b) 4 groups of normative beliefs (influence of colleagues, spouses, network coordinators and chain partners) and (c) 11 control beliefs (facilitators or barriers related to, for example, 'Network skills', 'No time' and 'Perceived restraint by farmers in communicating openly and honestly').

*Keywords: farmer, decision making, network participation, knowledge exchange, innovation, Flanders*

## 1 Introduction

Networks play an important role in widening access to knowledge and other resources and have become increasingly important as external sources of innovation (Pittaway et al. 2004), including within the agri-food industry (Batterink et al. 2010; Bertolini and Giovannetti 2006; Gellynck and Kühne 2010; Gellynck et al. 2007; Oreszczyn et al. 2010; Pannekoek et al. 2005; Pascucci 2011; Vuylsteke and Van Gijseghem 2010). From this perspective, it is believed that farmers could benefit from network participation.

Since the mid-1990s, an increasing amount of research has been undertaken in relation to networks. Researchers from various fields such as economics, including economic sociology and strategic management, have continually engaged in investigations - theoretical/conceptual, methodological or empirical (Hamdouch 2010; Pascucci 2011). Despite it is generally agreed that participation in networks can be beneficial to competitiveness of individual farms and firms (Gellynck et al. 2006), empirical studies show that farmers' participation in networks is often limited (Deimel and Theuvsen 2011). Yet, there is relatively little information regarding factors that influence farmers' participation in networks within the agricultural and horticultural sectors. The objective of our study is hence to provide a better understanding of the underlying factors that positively or negatively influence farmers' participation in networks within the agricultural and horticultural sectors in Flanders (northern Belgium), in order to enable network managers and farmers to maintain or improve network participation of farmers. In particular, the focus will be on networks for knowledge exchange and innovation. The next section provides a short literature review with regard to the importance of networks and salient beliefs. The applied methodology is then described, and the results are presented. Afterwards, conclusions are drawn and potential future research challenges are identified.

# 2 Literature review

## 2.1 Importance of networks for innovation and knowledge exchange

Successful innovation requires the continuous integration of new knowledge and knowledge exchange. Thereby, *innovation* is defined as the implementation of new combinations of existing resources, examples of which include new or improved products, methods of production, sources of supply, ways to organise business, and the exploitation of new markets or new ways to reach existing markets (Lundvall 1995; Pittaway et al. 2004). *Knowledge exchange* is defined as the transfer of knowledge as the result of interaction between different parties, through linkage and interchange, which can result in mutual learning (based on: Argote and Ingram 2000; Education 2011; Inkpen and Tsang 2005; Nonaka and Takeuchi 1995).

Plenty of recent studies indicate that the locus of innovation is no longer the individual firm, but increasingly the network within which the farm is embedded (Omta 2002; Pittaway et al. 2004; Powell et al. 1996). A *network* is defined as a set of actors connected by a set of repeated interactions with formal and/or informal ties. The actors are firms (e.g. competitors, suppliers, customers, auxiliary businesses), individuals (e.g. boundary spanners), knowledge centres (e.g. universities, research centres) and other actors (e.g. network organisations, governments, special-interest groups, industry organisations). The ties are the relationships between the actors. Ties may be formal (contractual, institutionalised) or informal (social, trust-based) (based on Borgatti and Foster 2003; Granovetter 1973; Hamdouch 2010; Owen-Smith and Powell 2004).

Every farmer has knowledge about products and/or services, processes, prices and the market but this knowledge is heterogeneous and dispersed, and it has become more complex (Knowler and Bradshaw 2007; Pannell et al. 2006). By making contact with different actors, exchanging information and collaborating within networks, farmers could acquire ideas and knowledge for new or improved products and processes, new organisational structures, the exploitation of new markets or new ways to reach existing markets. Hence, networks are considered a relevant means for obtaining access to knowledge, and other resources important for innovation (Batterink et al. 2010; Bertolini et al. 2006; Gellynck et al. 2007; Oreszczyn et al. 2010; Pannekoek et al. 2005; Pascucci 2011; Pittaway et al. 2004; Vuylsteke et al. 2010). Different types of networks for knowledge exchange and innovation are consulted by Flemish farmers (Lambrecht et al. 2013). They can be divided in three major categories: horizontal and vertical networks as well as collaboration with third parties (based on Gellynck and Kühne 2008). Within the category of horizontal networks (peers), there is a large variety of formal collaboration possibilities with peers, including study groups or producer organisations. More informal networks are the exchange of information with colleagues from inside as well as outside the sector, both home and abroad. With respect to vertical networks (chain), suppliers play a role to inform farmers about the novelties on the market and the possibilities for their farm on the level of infrastructure, feed, phyto-products, seeds, young plants, races, etc. Via collaboration with customers such as wholesalers, international traders, retailers, etc., access to market needs can be obtained. The category of third parties includes several persons or entities other than peers or the chain, such as administration, research institutes or universities, veterinarians, consultants, extensionists and financial providers. Important places where these partners can meet are open days or fairs where different stakeholders of the sector are present such as all kind of suppliers, farmers, financial providers, research institutes, governmental organizations and educational establishments.

Although networks are considered a relevant means for innovation, empirical studies show that farmers' participation in networks is often limited (Deimel and Theuvsen 2011). Literature shows that small and medium enterprises (SMEs) often experience difficulties in networking (De Groot 2003; Hoffmann and Schlosser 2001; Kaufmann and Tödtling 2002; Senker and Faulkner 2001; Van Gils and Zwart 2004). For example, it is quite frequent for firms — SMEs as well as large firms — to have external relations with business organizations contributing to their innovation activities (e.g. Fritsch and Lukas 1997; Kaufmann and Tödtling 2000; Kaufmann et al. 2002; Sternberg 1998). However, when it concerns interaction with knowledge providers, there is a significant difference between large firms and SMEs. SMEs are rarely interacting with universities, research organizations, technology centres, and training institutions (Cooke et al. 2000; Kaufmann et al. 2002). An important reason for the lack of relations with innovation partners outside the business sector is the small number of employees in SMEs who are able to act as nodes establishing and maintaining links to innovation networks. This restricts the potential to search for and collect innovation-related information and to collaborate in cooperative innovation projects. There is a lack of experienced employees as well as a lack of time in the case of the few adequately qualified persons due to routine and administrative work. Furthermore, SMEs focus more on the region than large firms as

far as external relations in the innovation process are concerned (Gellynck et al. 2007; Kaufmann et al. 2002). A too dominant focus on the region limits the scope of available technical information, technologies, and accessible markets. There is also the problem of a lack of adequate innovation partners to cooperate with due to the limited scope of the region. Moreover, it seems that SMEs often experience difficulties in defining and expressing their demands to get information that meets their requirements (Klerkx and Leeuwis 2008). Conversely, the providers of knowledge have to be responsive to clients 'needs, i.e. they have to be 'demand driven' (Byerlee et al. 2002; Katz and Barandun 2002). However, researchers are often unaware of SMEs' innovation needs (Caputo et al. 2002; Pannekoek et al. 2005) 'Cognitive distance' between the different actors involved may cause coordination and learning problems during innovation processes (Nooteboom 2000), and different norms and expectations with regard to desired output exist (AWT 2005; Beesley 2003).

In order to maintain and improve network participation within the agricultural sector, insight is needed into farmers' specific situation and the factors that positively or negatively influence their participation in networks. These insights could enable network managers and farmers to tackle the difficulties and hence to align the services of networks better with the needs of the farmers.

### 2.2 Salient beliefs in the context of the Theory of Planned Behaviour

Insights into the latter can be obtained by identifying their most noticeable beliefs, termed salient beliefs. In order to do this systematically, the Theory of Planned Behaviour (TPB) (Ajzen 1991) is used as a theoretical approach. The TPB is a belief-based social cognitive theory which was developed from the earlier Theory of Reasoned Action (Fishbein and Ajzen 1975) and assumes that people behave rationally, in terms of what they consider to be the implications of their actions. Both theories apply to situations involving a choice of behaviour, where reasons can be attributed to the choice made (Tonglet et al. 2004). The TPB assumes that people's expectations and values about engaging in a particular behaviour form their behavioural, normative, and control beliefs. The beliefs are formed by weighing up all available information and influences from personal instinct, policy, advisory services, the media, family, friends and peers. These beliefs in turn, influence people's attitude, subjective norm, and perceived behavioural control toward their intention, and ultimately, their behaviour. This paper will focus specifically on analysing farmers' salient behavioural, normative, and control beliefs.

The relevance of using the TPB to understand farmers' salient beliefs about participation in networks is demonstrated in other studies. An application of the theory was noted for the prediction of science communication behaviour (Van der Auweraert 2008). This communication behaviour can to some extent be compared with network behaviour, in which the interaction between people is a central aspect. Furthermore, reviews of the TPB showed that each of its constructs is highly applicable to agricultural research (Jackson et al. 2006). Nevertheless, agribusiness-related studies based on the theory are sparse (Jackson et al. 2006). These studies principally focus on farmers' intentions to adopt environmental strategies on farms (Beedell and Rehman 2000; Lynne et al. 1995; Mattison and Norris 2009; Zubair and Garforth 2006), but other aspects were also studied, such as farmer response to policy initiatives (Burton 2004). The present study is an elicitation study. This type of study is important because it provides researchers with valuable information concerning people's thoughts and feelings about a particular behaviour (Symons Downs and Hausenblas 2005). The purpose of an elicitation study is to determine the behavioural, normative, and control beliefs of a population, and to obtain substantive information about the cognitive foundation of people's behaviour (Ajzen & Fishbein, 1980). In spite of the importance accorded to this by the developers of the TPB, in general, the elicitation stage has received little research attention to date (Symons Downs et al. 2005).

## 3 Method

### 3.1 Case study

The research strategy is a case-study design. For this qualitative research, elicitation interviews were conducted. To determine a population's salient beliefs, Ajzen and Fishbein (1980) recommended that researchers: (a) conduct an elicitation study with open-ended questions to assess a population's behavioural, normative, and control beliefs; (b) perform a content analysis to rank-order the beliefs; and (c) determine the 5–10 most salient beliefs. They suggested that the simplest procedure to elicit a person's most salient beliefs about performing a particular behaviour is to ask that person directly about his beliefs. Thus, in the present study, in-depth interviews were conducted with farmers (owners and managers of farms) in Flanders, to allow an open discussion of their own ideas and beliefs regarding participation in networks which are important for knowledge exchange and innovation. During the interviews, respondents provided information with regard to their own farm, as well as what they

observed from their peers, partners in their chain, or network, or the sector in general. They were asked open-ended questions with regard to their behavioural, normative and control beliefs about participation in networks and the estimated influence on their innovativeness. The applied definitions of these categories are presented in the table below (Table 1).

**Table 1.**
Selected definitions of Theory of Planned Behaviour components applied to network participation (Ajzen 1991)

| Beliefs | Definition |
|---|---|
| Behavioural | Beliefs that network participation leads to certain consequences with regard to innovativeness |
| Normative | Beliefs identifying significant others who think farmers should or should not participate in networks |
| Control | Beliefs identifying the facilitators or barriers to participate in networks |

In addition, questions about socio-demographic and socio-economic characteristics (age, education, years in farming) and farm characteristics (expected future development, total acres in production, number of animals, most recent innovations, reason for innovation) were included.

In-depth interviews are a qualitative research technique. Qualitative research techniques are very suitable for relatively unexplored themes and can illustrate underlying motivations and attitudes (Malhotra 1999 p.148). The lack of a priori information on facilitating factors or impediments to participate in network activities means that qualitative research is highly appropriate as a first step.

### 3.2 Recruitment

Respondents from three different agricultural and horticultural subsectors were selected so that beliefs could be identified for a variety of populations and network types. These subsectors comprised the ornamental plant cultivation, poultry and vegetable sectors. In each of the three subsectors, two initial respondents were identified via a sector organisation and a research institute. The other respondents were selected via snowball-sampling. The first contacts were asked to nominate talkative colleague-farmers who would be willing to participate in such a research project. This involves a bias towards a high level of network participation among the participants. Participants can thus be seen as 'prime witnesses', i.e. people who are particularly interesting because of their specific socio-demographic, attitudinal or behavioural profile. It can be assumed that due to a higher awareness and involvement in network activities, more information can be obtained through these prime witnesses.

Farmers were contacted by telephone to arrange an appointment for a personal interview, during autumn 2011 and spring 2012. The interviews were conducted on the farm so that the farmers would feel more at ease. All interviews were undertaken by the same interviewer in order to exclude interviewer bias. The interviews required one to two hours per respondent.

### 3.3 Analysis and interpretation

The topic guide consisted of the following four parts.

(a) Generic section about profile, background and company characteristics of the respondent
(b) Innovation and innovation capacity
(c) Social relationships and networks
    1. Expected advantages and disadvantages of networking (behavioural beliefs)
    2. People supporting or disapproving when joining network activities (normative beliefs)
    3. Situations and factors making it easier or more difficult to network (control beliefs)
(d) Knowledge for innovation via networks

The focus of this paper is mainly related to part c. This part was developed using the different belief components of the Theory of Planned Behaviour (TPB) and contained open-ended questions to elicit the behavioural, normative and control beliefs in accordance with the theory. This study is therefore not an application of the Theory of Planned Behaviour, but makes use of it to provide a framework for the determination and analysis of the beliefs, similar to other studies in the agribusiness sector (e.g. Lautenschlager and Smith 2007).

To obtain as much information as possible, additional sub-questions were asked. Projective techniques were also used. Projective techniques may be classified as a structured-indirect way of investigating the

why's of situations (Webb 1992 :125). They are not used to measure but to uncover, among other things, beliefs and motivations which respondents find difficult to articulate (Gordon and Langmaid 1988 :90; Webb 1992 :125-126). An example of such a question is: 'Why do you think that other farmers don't participate in networks?'.

All interviews were recorded and transcribed. The data were sorted and coded using NVIVO. The beliefs were coded behavioural, normative and control according to the TPB. Consequently, for each node, different subcategories were coded as illustrated in tables 2, 3 and 4. The first-level subcategories for behavioural beliefs are 'advantages' and 'disadvantages', for normative beliefs 'approval' and 'disapproval' and for control beliefs 'facilitators' and 'barriers'. The last two categories were further refined into 'internal' and 'external' factors. Internal characteristics refer to e.g. skills, abilities and emotions, while external characteristics of the respondents refer to e.g. opportunities and available resources. The codes of the lowest sublevel were based on common similar words, concepts or themes. These codes were discussed with other researchers of the project consortium and further refined into the current analytical categories.

Consequently they were rank-ordered, and the five-to-ten most frequently mentioned items were selected as the salient set, as recommended by Ajzen and Fishbein (1980).

# 4 Findings

## 4.1 Respondents

Out of the 27 farmers contacted, 24 agreed to participate. All 24 respondents lived in Flanders, with the majority in the province of West-Flanders (15) as this is an important region in the Belgian agricultural and horticultural sectors, particularly for the vegetable and poultry sectors. Different subsectors within each sector were included. For the ornamental plant cultivation sector, horticulturists concerned with improving strains, as well as reproduction and production, were included, and these within different domains as follows (number of respondents in brackets): indoor plants (2), chrysanthemums (2), azaleas (2), boxwood and taxus (1) and a combination of other garden plants (2). In the poultry sector, all subsectors were represented: reproduction farms (3), rearing farms (1), egg farms (2) and broiler farms (2). In the vegetable sector, growers of leeks and cabbage (2), tomatoes (1), chicory (2), celery & fennel (1), and beans, spinach, celery and cabbage (1) were included.

## 4.2 Understanding network participation

First, respondents were asked about their definition of a network. This is an unaided recall, which is a research technique to learn whether respondents are familiar with a particular term. Four interviewees thought 'networks' were related to computers or the internet, while another eight farmers were unable to answer the question. Afterwards, we formulated our definition of a network (a set of actors connected by a set of repeated interactions with formal and/or informal ties. The actors are firms (e.g. competitors, suppliers, customers, auxiliary businesses), individuals (e.g. boundary spanners), knowledge centres (e.g. universities, research centres) and other actors (e.g. network organisations, governments, special-interest groups, industry organisations), to ensure that everyone was talking about the same thing. After this had been done, respondents appeared to have a relatively good knowledge about the existing networks, in line with our definition, and often made use of them, corresponding with the bias in the sample. Furthermore, we stressed that the focus of this study was on the networks which could, in their view, potentially contribute in any way to knowledge exchange and innovation. For clarity, we therefore provided the respondents with our definition of knowledge exchange and innovation.

This study is an elicitation of salient beliefs. Hence, this result section comprises three parts in accordance with the three categories: behavioural, normative and control beliefs. This is followed by the determination of the most salient beliefs.

## 4.3 Behavioural beliefs about participation in networks

Beliefs associated with knowledge exchange and innovation were identified, leading to 13 analytical categories of behavioural beliefs (Table 2). Advantages as well as disadvantages were explored. The higher frequency of advantages could be related to the sampling bias. The most frequently identified advantage with regard to network participation was: 'You learn something'. Other advantages given were very diverse and varied from 'Reduce distance between sector and policymakers' to 'More bargaining power'. The most frequently mentioned disadvantages were 'Low perceived return on investment' and 'Information obtained is not objective'. These two disadvantages were related, given that respondents identified the need to attend meetings on the same topic but with different organisers in order to obtain

objective information, and this is time-consuming.

Farmers indicated that to increase the perceived return on investment a programme must be attractive. According to the respondents, important factors which make the programme attractive are the subject, the approach and the speaker. Organisers of an activity mostly seek to put on a programme which is interesting for a broad audience. However, as farmers' problems, and hence the information and knowledge they require, are very company specific, they spend a lot of time listening to less relevant information. Respondents identified a preference for activities with a practical orientation over theoretical meetings. They also emphasised the importance of appetisers, refreshments and drinks, as these are linked to the social part of a meeting and the opportunity to network. The invited speaker is often perceived as not being objective and acting for his own interests. For example, the speakers often work for a specific company and promote the company's products, systems or services, which prejudices the information provided. Respondents further emphasised the importance of the speaker's experience, because sometimes the farmers are more experienced than the speakers. In such cases farmers feel that their time has been wasted, as the speaker is not able to respond to their specific and practical questions.

**Table 2.**

Identified behavioural beliefs, illustrated with quotes and frequency of appearance from the interviews

| **Expected outcomes (advantages and disadvantages) of network participation** | **N** |
|---|---|
| **ADVANTAGES** | |
| You learn something | 7 |
| *"You always learn something when participating in a network activity and small things can make a big difference [for the farm]."* | |
| *"When you see or hear a lot, you can implement some things in your company."* | |
| Reduce distance between sector and policymakers | 5 |
| *"If you have a problem and need changes from above (policy), it is always more easy if you know them."* | |
| *"To keep policy makers awake and to inform them about producer issues."* | |
| Prevent from isolation | 5 |
| *"When not networking, you live on your island and you are not or only one-sided informed so you miss crucial information for your company."* | |
| *"A lot of farmers work 12-14 hours each day, they go home, have a good diner, are tired and go to bed, but they aren't aware of what happens in their sector. The next day, it is the same, and on some farms even on Sundays. But not the ones who work most earn most. You need social contact to know what you are working on."* | |
| Know the right people/place when information is needed | 5 |
| *"Once you built up your personal network, you know which question you can ask to whom. Also when you have for example the same feed supplier, you can ask the other if he noticed this or that. We have a lot of people which we contact regularly, via phone or mail."* | |
| Information from outside the sector (management thinking) | 5 |
| *"People from outside the agricultural sector [...],you learn something about management thinking, outsourcing, tax system. [...], also employment.* | |
| Exchange of knowledge with colleagues | 4 |
| *"To exchange knowledge with colleagues. [...] From the moment you mobilise people and can bring farmers together, one can speak about knowledge exchange."* | |
| *"If all the farmers would exchange their experiences and problems with each other, I think we could learn a lot from each other."* | |

| | |
|---|---|
| Higher awareness of things that happen/ new trends | 3 |
| *"To be more aware of the things that happen, about products, about quality, which is necessary to make the right decisions for the farm."* | |
| *"In our sector, it is important to be active in networks to be able to obtain something, to anticipate on market demand by continuous changes."* | |
| Creation of better image for sector as well as personal | 2 |
| *"To know how people think about you, and to be able to fit in the society."* | |
| More bargaining power | 2 |
| *"Indirectly, networking gives you more bargaining power. If salesmen know that you are well informed and that they can't fool you, you have more power."* | |
| Creation of ideas | 2 |
| *"I am a member of the board of the cooperative and yearly, we organise a study trip. [...] This created a lot of ideas for me."* | |
| **DISADVANTAGES** | |
| Low perceived return on investment | 7 |
| *"All those hours, that is unpaid!"* | |
| *"I only want to spend time on it if is relevant for my company."* | |
| *"Often, it is just boring and difficult to stay awake."* | |
| *"The problem of organized networking activities is that you spend there two hours, and for your company in specific, only 15 minutes are interesting."* | |
| *"If a young student is standing there in front and telling how the vegetables have to be cultivated to someone with 20 years of experience, of course [….] And if they are telling all things which you already know, farmers say: Do we really have to spend our time on such activities?"* | |
| Obtained information is not objective (one-sided) | 6 |
| *"Speakers coming to tell something about their products, this is also too one-sided. You need a speaker who can speak about anything, who doesn't have to take into account others when he is saying something, for example someone of a university. Mostly those are interesting speakers. They are not linked to a company. [...] The truth is not always that beautiful. "* | |
| *"Some farmers will make, or already made mistakes by just following the advice of the integrator."* | |
| You receive a lot of negative attention | 2 |
| *"When being active in a lot of networks, you become more well-known, and more people aim at you."* | |

### 4.4 Normative beliefs about participation in networks

Normative beliefs refer to the perceived behavioural expectations of important individuals, leaders, groups or colleagues. While none of the interviewees explicitly stated that their decision to participate in network activities was influenced by the opinions of other individuals or groups, some of them did refer to four categories of influential reference groups (Table 3). This suggests there might be normative influences on their decision whether or not to participate in network activities to improve knowledge exchange and innovation. The identified reference group categories are: colleagues, spouses, network coordinators and chain partners. It was noted that spouses and colleagues are the most important reference group within this sample and that they were seen by some farmers as approving participation in networks and as disapproving by other farmers. An important disapproving category, which was only observed within the poultry sector, is the integrator. Integrators seem to prohibit farmers from coming together to exchange knowledge and data.

**Table 3.**
Identified normative beliefs, illustrated with quotes from the interviews

| Influential reference groups | N |
|---|---|
| **APPROVAL** | |
| Network coordinator | 2 |
| *"The sector representative calls us to inform us about organized network activities and asks us why we would not attend the meeting."* | |
| *"We probably do not participate enough in networks, but for this network, it is different. We are invited personally by the coordinator, who reminds us regularly and writes newsletters and invites us to be creative."* | |
| Colleague | 2 |
| *"According to me, he should more participate in networks, and I already said it to him too."* | |
| Chain partner (supplier) | 1 |
| *"He [supplier] said to me: 'You should attend this study day, it will be interesting!'"* | |
| Spouse | 1 |
| *"I already manage to convince him to come outdoors once."* | |
| **DISAPPROVAL** | |
| Spouse | 5 |
| *"My husband is member of different unions. For a while, he was also member of the board of management of the strawberry union, but I obliged him to choose. It was not feasible anymore. He was never at home."* | |
| *"My woman always says: '… the time you spend on it [network activities], you would earn much more money if you would stay at home."* | |
| Colleagues/ competitors | 3 |
| *"I have 29,000 layers, some have 60,000 or even 100,000 and then they ask me: what are you doing all day? They look a bit down on us."* | |
| *"When we started with our activity, the other farmers were tread on their toes. [...] For us, it is difficult to find access to the networks."* | |
| Chain partners (integrators) | 2 |
| *"In my contract is mentioned that I am not allowed to exchange data of the company with colleague farmers."* | |
| *"We once took the initiative with some farmers to organize a network activity and to invite some independent speakers. The integrators did not agree with that and took over the organization in order that they could decide what information would be communicated with us. They want to keep us ignorant."* | |

### 4.5 Control beliefs about participation in networks

Respondents reported several facilitators or barriers for participation in knowledge exchange and innovation networks, which represent the perceived behavioural control component of TPB. These facilitators or barriers relate to personal or internal characteristics (e.g. skills, abilities, emotions), as well as to environmental or external characteristics of the respondent (e.g. opportunities, available resources). Eleven categories of control beliefs were identified (Table 4). The majority of the categories identified are barriers. Three facilitators were observed. The internal facilitators are 'Network skills' and 'Different people on the same farm who are able to manage the business.' If more than one person is able to manage the business, one of them can leave the farm for some hours and spend time on networking. One external facilitator identified is a 'quiet period', during which the farmer is able to leave his farm for a while.

With regard to the internal barriers, two categories constitute the direct opposite of the internal facilitators namely 'Only one person on the farm who can manage the business' and 'No network skills'. In

addition, one other category was identified: 'Not willing to share information'. According to the respondents in this study, most of the farmers only want to gain information and knowledge, but they are not willing to share information, knowledge or their own experiences. However, in accordance with the sampling bias, the majority of the respondents in this study declared that they are open to share knowledge, information and their experiences with others. Some even pretended that they would share everything they know, while others would prefer to share only a limited amount of knowledge. The external barriers observed are 'Farmers' restraint in communicating openly and honestly', 'No time', 'Not aware of activities', 'Difficulties finding connections with others' and 'Dependency on weather'. With regard to the farmers' restraint in communicating openly and honestly, we can refer to the internal barrier 'Not willing to share information'. Almost all the respondents perceive that Flemish farmers are not open enough to be able to work together and to share information, experiences and knowledge. According to them, they are rather reserved in the presence of colleagues (or competitors, as they often call them). Farmers who are willing to work together face difficulties finding like-minded farmers with whom they can communicate in an open and honest way. Discussions about performance, economics and processes appear to be particularly difficult. Respondents indicated that farmers almost always try to put a gloss on farm results. In relation to the second barrier 'No time', it was observed that this is principally the case in the vegetable sector where there is a continuing need to expand to be able to survive. Also the increasing amount of administration requires a lot of time. As a result of this development, there is hardly any time left to participate in networks. The farmers further stated that they need some free time for relaxation and for their family. Some respondents indicated that they are not aware of organised network activities. According to them, these are insufficiently or not properly publicised.

**Table 4.**

Identified control beliefs, illustrated with quotes from the interviews

| **Facilitators or barriers for participation in network activities** | **N** |
|---|---|
| **FACILITATORS** | |
| **Internal** | |
| Different people on the same farm who are able to manage the business<br>*"She is rarely at the farm [due to the attendance of network activities], but they can manage it, because her husband is the manager."*<br>*"We always look within the company. Who will attend the network activity? Who can join him/her? Who has time? For who would it be interesting?"* | 3 |
| Network skills<br>*"He loves to explain things. He would talk to everybody. In that field, he is much more social than me."* | 3 |
| **External** | |
| Calm period<br>*"For our company, it was a rather calm period so I was able to spend the day on the [network] event."* | 2 |
| **BARRIERS** | |
| **Internal** | |
| Only one person on the farm who can manage the business<br>*"If I am not here, they can't do anything without me."*<br>*"If I leave my farm, every time something happens. I need to be in the neighbourhood."* | 5 |
| Not willing to share information<br>*"We do not always say everything."*<br>*"If your results are bad, than you are discouraged to come outside and share your problems."* | 3 |
| No network skills<br>*"I have difficulties in taking initiatives in making contacts."*<br>*"Some feel uncomfortable in big groups and don't dare to ask questions. A successful colleague sometimes says to me: I have this question, but can you pose it for me?"* | 3 |

| | |
|---|---|
| **External** | |
| Perceived restraint of farmers to communicate open and honestly<br>*"When asking a farmer how he is performing, everything is always good. Few farmers would share their problems."*<br>*"When asking a farmer how many 'ground-eggs' he has, he always say: almost none. If you hear it via another channel, you hear that it is not like that. People don't dare to share that."*<br>*"We are here in our region with four farmers who all planted a new crop this year. It is new for all four of us and a difficult crop to raise, but nobody is willing to deliberate about the process. Everybody developed on his own a method and a machine, and nobody wants to talk about it. [...] Coincidently, we saw another farmer in another region with the same crop and asked if we could have a look at his machine, but the farmer was not prepared to show his machine. That would be an ideal situation to learn from each other. But he sent us away. […] This is very sad, people are not willing to help each other."*<br>*"Colleague-competitors become more and more competitors. They often can't stand the sight of one another."* | 15 |
| No time<br>*"All companies are becoming so big, too big. Ours is also becoming too big. But we have to grow to survive. We also have the administration. Every evening, I am sitting there on my desk for some hours. [...] And also on family level, there is much more work. [...] Society expects more of people and you don't want that your children have fewer opportunities than others because they are growing up on a farm."*<br>*"I am attending less network activities than I'm used to, because it also takes a lot of time."*<br>*"No, I don't have time for that!"* | 8 |
| Not aware of activities<br>*"I think they should announce the network activities more and better. If we are not aware of it, we cannot join."*<br>*"A lot of my colleagues are not aware of the services offered by Innovatiesteunpunt*[*]*.[…] I think they should put themselves more in the spotlight."* | 4 |
| Difficulties to find connections with others<br>*"I am a chatterbox, but still… You are standing there. This is very difficult. You are standing there on your own on the bar. […] Then, you hope that you'll meet someone who can form a link, but sometimes, it is like dying. I don't know, but personally, this is not always easy for me."*<br>*"You need connections, the barrier to attend a meeting or network activity is always bigger if you don't know anyone than if it is here on the corner of the street where you know everybody."* | 3 |
| Dependency on the weather<br>*"If we want to finish a job and the day after rain is forecasted, we will continue and skip the network activity."* | 1 |

### 4.6. Determination of the most salient beliefs

As prescribed by Ajzen and Fishbein (1980), firstly beliefs about the consequences of the behaviour, beliefs about social norms and beliefs about facilitators and barriers that are important in the farmers' decision making process were elicited. This was followed by an analysis to rank-order the beliefs, which was based on how many times they were mentioned. The strength of the belief is not taken into account because this often differs depending on the respondent. For each belief, some citations from the respondents were included as examples, to illustrate what exactly is meant and in which circumstances the beliefs were mentioned. Similar beliefs were observed in the three different subsectors, which could

[*] *innovation support organization*

indicate that they are not specific to each subsector but valid across them all. In this section, the third stage of the procedure is executed: the determination of the 5 to 10 most salient beliefs. The following paragraphs present a summary of the most salient beliefs for each category.

With regard to behavioural beliefs, participants reported that the expected outcomes of network participation were generally advantageous: to learn something, to reduce the distance between the sector and policymakers, to prevent isolation, to know the right people/place when information is needed and to obtain information from outside the sector. Further advantages mentioned were the opportunity to exchange knowledge with colleagues and increased awareness of things that are happening and new trends. Most of these advantages are identified in network literature (e.g. Omta 2004; Pittaway et al. 2004). The belief 'prevent isolation' is rather typical for the agricultural and horticultural sectors. Perceived disadvantages were: low return on investment, lack of objectivity of the information and the fact that active farmers receive more negative attention. In relation to the normative beliefs, it was noted that spouses are an important reference group in terms of the decision whether or not to participate in a network. In this study, spouses were mostly seen as disapproving. Colleagues and chain partners were seen as approving by some and disapproving by others. Another reference group are the network coordinators, who convince farmers to attend the activities.

Thirdly, we explored internal and external control beliefs. Most of the categories identified constituted external barriers. Farmers indicated, for example, that it is very difficult to find partners with whom they can communicate openly and honestly; and networking with people who are withholding information or lying makes no sense. Another factor is the lack of time.. Furthermore, farmers are not aware of organised activities and experience difficulties in finding connections with others. Internal factors pertain to the structure of the farm (number of people who can manage the business), unwillingness to share information and experiences, and the skills to network. The latter confirms earlier findings (Van der Auweraert 2008). In addition, one external facilitator was mentioned, namely a quiet period.

## 5 Discussion and conclusion

An interesting finding of our study is that a lot of farmers are not familiar with the term 'network' as such. They are aware of the existence of networks and frequently make use of them, but in most cases they do not refer to them as 'networks' or talk about 'networking'. This term has not yet become established in the agricultural sector. Hence, it was important for us to provide a definition of a network to make sure that all the respondents were talking about the same thing. During the interviews, we observed that a lot of farmers are aware of the possible advantages of networking in terms of knowledge exchange and innovation. Advantages mentioned were, for example, that 'you always learn something', that 'you know the right people and places when information is needed' and that 'you become aware of things from other sectors which can be useful in your own sector'. Unless farmers are aware of the existence and possible advantages of networks, they often do not participate actively. Factors withholding them are a.o. low return on investment, lack of objectivity of the information and the fact that active farmers receive more negative attention. In the study on science-communication behaviour by Van der Auweraert (2008), mentioned in the literature review section (section 2), the limited insight into the return obtained was also perceived as a disadvantage. The low return on investment could probably be explained by the fact that SMEs focus more on the region than large firms as far as external relations in the innovation process are concerned (Gellynck et al. 2007; Kaufmann et al. 2002). The dominant focus on the region could limit the scope of available technical information, technologies, and accessible markets, resulting in a low perceived return on in investment. Furthermore, because of the increasingly heterogeneous market for agricultural R&D, service value can hardly be discerned and is difficult to identify (Klerkx et al. 2008), often leading to a low perceived added value. Furthermore, it seems that SMEs often experience difficulties in defining and expressing their demands to get information that meets their requirements (Klerkx et al. 2008), resulting in services that don't meet their needs, and hence a low perceived return on investment. A possible explanation regarding the lack of objectivity, could be the fact that SMEs mostly interact with their business relations such as suppliers who want to sell their product, and less with external knowledge providers such as research institutes and universities (Cooke et al. 2000; Kaufmann et al. 2002), delivering objective knowledge. Furthermore, we found that the decision to network can be hampered by some reference groups of actors, such as spouses, colleagues and chain partners. Danckaert et al. (2011) also observed that farmers are influenced by colleague-farmers in their decision-making process. Other barriers observed were difficulties to find partners with whom they can communicate openly and honestly. This corresponds to farmer individualism often being strong (ABS 2005; Boerderij 2012; Rijn and Rienks 2007; VILT 2011). Another factor is the lack of time. This was also an observed impediment in the study by Van der Auweraert (2008) en the one of Kaufmann et al. (2002). Another barrier is related to the management of the farm, i.e. the limited number of people who can manage the

farm and the skills of the employees. This is also in line with the finding of Kaufmann et al (2002) that SMEs face a lack of experienced employees as well as a lack of time in the case of few adequately qualified persons to set up relations with innovation partners.

### 5.1 Managerial implications

A series of reasons for attending or ignoring network activities has been identified, and this has implications for network coordinators and farmers in terms of increasing network participation.

According to the literature, participation in organised education and training assists in the establishment of farmers' networks for knowledge exchange and innovation. Hence, farmers need to experience successful education and training outcomes to motivate them to undertake further education and training (Kilpatrick 1996) and to stimulate networking. As farmers often face difficulties in defining and expressing their demands to get information that meets their requirements, we made an analysis of issues which are according to them critical for organised education and training sessions to be successful. They stated a preference for interesting meetings that cover varied topics in brief, are to the point and focused on a specific audience. According to them, only the most important and relevant issues should be included, and details should be provided as to where they can find more information about the different topics which are relevant to them. From the interviews, there appeared to be interest in network activities relating to market trends and other commercial topics. Furthermore, respondents indicated a preference for practical and applied knowledge over theoretical explanations. In addition, according to the responding farmers, network activities are very much more appealing if they include an opportunity to socialise with appetisers, refreshments and drinks. Furthermore, they emphasise the importance of a neutral and experienced teacher. These factors are similar to the ones identified by Kilpatrick et al. (1996). Hence, network coordinators should take these factors into account when organising network activities in order to stimulate network participation by farmers. Furthermore, the elicited normative beliefs show that network coordinators putting pressure on the members to join organised activities has a positive influence on attendance. For network coordinators of a vertical integrated network, (termed integrators), who according to our respondents appear to disapprove networking, it is advised that they seek open communication with the farmers and do not leave them feeling ignorant. Furthermore, as farmers indicated that they are often unaware of network activities, network coordinators need to publicise activities early enough and via appropriately selected channels. According to the respondents, this could be done through specialist newspapers, magazines, websites frequently used by farmers (e.g. auction websites, sector organisations, etc.), email, or just by distributing informational brochures to farmers. These channels can also be used to persuade farmers of the possible advantages of networking, for example by illustration with real-life cases. Another important issue for network coordinators to bear in mind is the fact that colleagues and spouses are major influencing factors in farmers' decisions with respect to their attendance at a network activity. Network coordinators could therefore encourage farmers to inform colleagues about upcoming activities and to convince them to join. As spouses are mostly disapproving, respondents suggest that a line of thinking for network coordinators would be to organise social activities to which farmers as well as their spouses and/or children are invited, and these may also include a company visit. In this way, farmers will not have to leave their family to attend a network activity. The spouses can enjoy the social activity and might also pick up some information and become better acquainted with activities and understand their importance. From the interviews, this appeared to be a good alternative to the standard activities. When such an activity is organised, a high attendance is noted.

Farmers are also advised to consider the long-term benefits of networking on all innovation processes. Those long-term benefits relate to achieving competitive advantage and survival in the long term. Most farmers do not believe in the benefits of open and honest communication and knowledge-sharing with colleagues. According to the respondents, Dutch farmers are more open about, for example, the economic performance of their farms than Belgian farmers. In the Netherlands, for example, multiple successful study clubs exist, whereas in Belgium, if someone takes the initiative to develop such a network, it mostly fails as the farmers are not willing to share their farm-specific information. If Flemish farmers were to change their beliefs towards the benefits of open and honest communication, taking the Dutch as an example of best practice, they would be able to improve their individual situation as well as that for their sector. Secondly, as most of the smaller farmers indicated that they cannot leave their farms during operational periods, one option could be for farmers to revisit their organisation and management strategy. To benefit from networking, farms need to be structured in such a way that the managers or employees are able to leave the farm to attend a network activity. With regard to the farms' network management approach, the farmers should search for strategies that best fit their situation in order to connect with the networks in the most effective and efficient way. This strategy includes an understanding of their own knowledge needs and what is available in the networks. From this perspective,

it is important that farmers communicate their needs to the network coordinators clearly with regard to networking and information. In general, these findings are confirmed by a study from Klerkx et al. (2008) and Vermeire (2009) in the agri-food sector that identified the role of external knowledge sources (with regional networks as an example) in the innovation process.

To conclude, in order to maintain and improve network participation among farmers, a better understanding of the underlying factors that positively or negatively influence farmers' participation in networks within the agricultural and horticultural sectors is needed. Up to now, limited research has examined farmers' salient beliefs about network behaviour (Jackson et al. 2006). This study tackles this gap by analysing Flemish farmers' salient behavioural, normative and control beliefs with regard to their participation in networks that are important for knowledge exchange and innovation. Although reviews of the TPB showed that each of its constructs is highly applicable to agricultural research, agribusiness-related studies based on this theory are sparse (Jackson et al. 2006). Moreover, most of the available studies do not include an elicitation phase. Yet elicitation studies are important because they provide researchers with valuable in-depth information concerning people's thoughts and feelings about a behaviour (Symons Downs et al. 2005). An important strength of this study is thus the qualitative exploration of salient beliefs among the farmers, with regard to participation in networks that are important for knowledge exchange and innovation. The subject and the approach of this study are rather unique in the agricultural and horticultural sectors and deliver valuable insights and implications for network coordinators and farmers, as outlined in the previous paragraphs.

### 5.2 Limitations and future research

Since this case study provides results from respondents limited to so-called prime witnesses, due to the recruitment process, this study involves a bias toward a high level of network participation among the participants. This has enabled more detailed and in-depth information to be obtained about the topic, but does not provide representative farmers' perceptions. The list of beliefs can form the basis for a quantitative study to be conducted among a representative sample of farmers, in order to validate the facilitators and barriers among farmers with different levels of network participation.

In addition, as this study is among the first to explore the salient beliefs within the agricultural and horticultural sectors and provides proof of the applicability of TPB to this sector, other researchers are encouraged to conduct similar elicitation studies in other countries and within other agricultural or horticultural subsectors to further address the gap in this research area.

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