

## Elaborating hypotheses on motivations for participation in cooperation initiatives for sustainable farming.

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### Abstract (250 words)

Farmers can be motivated in different ways to participate in initiatives aiming stimulate farmers towards sustainable farming. The dynamic interaction between an initiative's design, farmer motivations to participate and their motivations to contribute to sustainable farming, makes research on farmer motivations to participate in sustainable farming initiatives (SFI) very interesting for SFI organizers. To grasp this dynamic relation between motivations and an initiative's design, 9 hypotheses were developed, using Self-determination theory (SDT). Based on these hypotheses we constructed a methodology to test them in SFI cases.

### 1. Introduction

During last decades, a variety of initiatives aiming to stimulate farmers towards sustainable farming were initiated. These sustainable farming initiatives (SFIs) are very diverse, and can in literature referred to as innovation networks (e.g. Hermans et al., 2011; Klerkx et al., 2010; Kroma, 2008; Spielman et al., 2010), communities of practice (e.g. O'Kane, Paine, & King, 2008; Oreszczyn et al., 2010), learning initiatives (e.g. Keen & Mahanty, 2006; Lankester, 2013; Restrepo et al., 2013), advisory services (e.g. Faure et al., 2012), farmer field schools (e.g. Butt et al., 2015; Charatsari et al., 2015; Vaarst et al., 2007), agri-environmental initiatives (e.g. Smithers & Furman, 2003), agro-environmental schemes (Atari et al., 2009; Wilson & Hart, 2001; Wilson, 1997), conservation covenanting programmes (Kabii & Horwitz, 2006), or agri-environmental policies (Defrancesco et al., 2008; Siebert et al., 2006; Stobbelaar et al., 2009).

The common goal of SFIs is encouraging farmers to adopt sustainable farming practices<sup>1</sup>. SFIs are based on cooperation between farmers and other agro-food system actors (e.g. farmer's union, food processors, NGO's, government), as described in the definition of Learning and Innovation Networks for Sustainable Agriculture (LINSAs) ([www.solinsa.org](http://www.solinsa.org)). Depending on the SFI, sustainable practices can be differently defined: e.g. one might focus on the adoption of practices favouring soil fertility, others focus on sustainable management decisions on farm level. Despite their common goal, i.e. encouraging sustainable development within the agri-food chain, SFIs vary in their rate of success. Some initiatives are very successful in motivating farmers and other agri-food chain actors to participate and realize growing public recognition. Other initiatives encounter difficulties in motivating actors to participate and eventually disappear.

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<sup>1</sup> "A practice" is described by C. Blackmore et al. (2012)) as "a generally accepted and shared habitual, taken for granted ways of performing an activity, with its attendant values, understandings, communications and cooperative routines". An example of a sustainable farming practice is no till farming.

In this paper, we scrutinize the ways farmers can be motivated to participate in SFIs (Wilson & Hart, 2000). Some initiatives offer direct financial rewards or penalties, such as subsidies and fines; e.g. agro- environmental schemes (Atari et al., 2009; Wilson & Hart, 2001; Wilson, 1997), conservation covenanting programmes (Kabii & Horwitz, 2006), agri-environmental policies (Defrancesco et al., 2008; Siebert et al., 2006; Stobbelaar et al., 2009). In these initiatives, financial drivers often are the primary motivation for farmers to participate (Wilson & Hart, 2000). But as in other initiatives who lack these direct financial rewards or penalties, also other and even multiple motivations can be at play (Wilson & Hart, 2000), e.g. improving the economic performance of one's farm or seeking social contacts.

Research has been performed on the influencing factors for farmer participation in SFIs, e.g. in agro- environmental schemes (e.g. Atari et al., 2009), conservation covenanting programmes (e.g. Kabii & Horwitz, 2006), agri-environmental policies (e.g. Defrancesco et al., 2008), farm-level agri-environmental management and planning (Smithers & Furman, 2003) and Farmer Field Schools (Charatsiri et al., 2015).

Reported influencing factors for participation are: (i) farmer characteristics (e.g. age, education, dependency of farmers income), (ii) farm and farming system characteristics (e.g. farm size, production), (iii) the SFI characteristics (e.g. SFI design and objective, actors involved, tools used, rules for participation) and (iv) context factors (e.g. agricultural policies, vicinity of natural parks). Although these factors offer interesting information for SFI initiators and organizers, they do not give insights in farmers' psychological motivations to participate. Despite its recognized importance (Wilson, 1997), limited research has been done on this topic so far (Charatsari et al., 2015). A reason for this research gap might be that SFIs are often studied within specific research domains such as innovation, social learning or advisory and extension. Because of these specific foci, we suppose that researchers do not scrutinize the motivations to participate, as researchers automatically link farmer motivation to the specific research foci (i.e. innovation, learning, advise). However, a farmer can, for example, participate in a social learning initiative mainly because he/she is seeking social interaction and not because he/she wants to learn about sustainability.

We discern two motivational processes regarding farmer participation in SFIs: the motivation to participate in an SFI and the motivation to contribute to sustainable farming. Both motivations are dynamically linked to each other and the SFI design. Indeed, farmer motivations to participate can influence both their commitment to the SFI and their attitude towards sustainable farming. Therefore, the interaction between their motivation to participate and the SFI design aiming to foster sustainable farming, can offer valuable information for SFI organizers. For example, farmers can initially decide to participate for other reasons than sustainable farming, while during their participation, their attitudes towards sustainable farming changes.

In this paper we take farmer motivations as the core subject of our study and in doing this we want to contribute to an in depth understanding of farmer participation in SFIs. We use self-determination theory (SDT), a theory of human motivations that provides a framework to investigate the motives of human behaviour, in our case participation in SFIs. The theory is grounded in the humanistic psychological theoretical perspective stating that human beings have an inherent need to develop, grow and reach their full potential when conditions are favourable (Schacter et al., 2012). SDT provides a frame to investigate the particular conditions of SFIs that foster or undermine these positive human potentials (Ryan & Deci, 2000).

The aim of this paper is to refine our research objectives by formulating hypotheses on farmer motivations to participate in SFIs using SDT. We first discuss some basic principles of SDT and

illustrate them with the subject of our study: motivations to participate in SFIs. Then, we develop hypotheses based on SDT. Finally, we elaborate on a methodology to test our hypotheses.

## **2. Self-determination theory**

Self-determination theory (SDT) focuses on the extent to which an individual's behaviour is self-motivated and self-determined (Ryan and Deci, 2004). It is a theory of human motivation, emotion and personality that has been under development for over 40 years (Vansteenkiste et al., 2010). It is widely used in several research domains such as education, organizations, sport and physical activity and health and medicine (Vansteenkiste et al., 2010). To our knowledge SDT has been used rarely in agricultural contexts: Stobbelaar et al. (2009) researched the internalization of agri-environmental policies and the role of institutions, Zhu and Yang (2012) investigated farmer motivations for participation in Publicly Funding Training programs in China, and Zepeda et al. (2013) studied CSA membership and psychological needs fulfilment using SDT. These few examples of SDT use in agricultural contexts show the innovative character of our research.

SDT consists of five mini-theories and different concepts (Vansteenkiste et al., 2010). For the purpose of our paper we will focus on only three closely linked basic concepts of SDT: the self-determination continuum, internalization and basic needs. These are explained in the following paragraphs, using fictional examples of our study object (farmer participation in SFIs).

### **2.1 Motivations**

Motivations to participate in SFIs can be very diverse or even multiple: farmers may engage in SFIs because they value specific characteristics in an SFI, e.g. social contact, working on sustainable development, business opportunities. In our paper we call these motivation themes.

Besides the motivation theme, motivations can be further distinguished by the motivation type. Motivations are often subdivided in intrinsic and extrinsic motivations. When intrinsically motivated, people perform an activity or engage in behaviour because they enjoy what they are doing. The activity itself, not the outcomes act as incentive (Barbuto and Scholl 1998) and therefore people engage in autonomous and self-determined behaviour. For example, a farmer decides to participate in an SFI because he enjoys to exchange ideas with colleagues.

However, the majority of behaviours in which people engage are not inherently interesting or enjoyable (Ryan & Deci, 2000). In this case not the performance of the activity itself gives satisfaction (i.e. intrinsic behaviour), and therefore behavioural engagement requires external forces to motivate behaviour (Vansteenkiste et al., 2010; Zepeda et al., 2013). This is called extrinsic motivation.

Extrinsic motivation is a main focus of SDT, and SDT developed a framework for nuanced investigation of extrinsic motivation, comprising: (i) a continuum distinguishing different extrinsic motivation types, (ii) a frame for investigation of the impact of context factors on these extrinsic motivation types.

### **2.2 Self-determination continuum**

According to SDT, extrinsic motivation can vary significantly in its relative autonomy (Ryan & Deci, 2000). For example (based on Ryan & Deci, 2000), farmers can participate in an SFI because they personally endorse the value of sustainable farming or because they feel their consumers want

them to work sustainable. Both are examples of external motivation because the outcome of their behaviour (in this case participation) is pursued. However, the first is accompanied with higher relative autonomy than the latter. So extrinsic motivation will be experienced as autonomous and volitional when people concur with the reason of their behaviour (e.g. participation in an SFI) and have fully endorsed the personal value and significance of the behaviour (Vansteenkiste et al., 2010). To specify these differences in the degree of relative autonomy, a self-determination continuum with different types of extrinsic motivation was developed (Figure 1) (Ryan & Deci, 2000).

In Figure 1, these nuances between motivation types are organized according to the degree to which motivations originate from the self. From left to right motivations are perceived as more autonomous (Ryan & Deci, 2000):

- Amotivation: a state of lacking the intention to act. People either do not act at all or act without intent and just go through the motions (Deci & Ryan, 2000).
- External motivation (Vansteenkiste et al., 2010):
  1. External regulation: people are motivated to obtain a reward or to avoid punishment. The value of the behaviour has not been internalized and problems with maintenance and transfer of the behaviour to other settings occur. E.g. farmers participate in an SFI because they are promised better prices for their products.
  2. Introjected regulation: people are motivated to comply with a partially internalized possibility to gain pride and self-esteem, or to avoid feelings of guilt and shame. This second type of extrinsic motivation only predicts short term persistence of the activity. E.g. farmers participate in an SFI because they feel their neighbours expect them to do so.
  3. Identified regulation: people understand and endorse the personal value and significance of specific behaviour and, as a result, experience a sense of freedom in doing it. This third type of extrinsic motivation is guided by personal values and self-endorsed commitments. E.g. farmers participate in an SFI because they understand the importance of sustainable farming.
  4. Integrated regulation: involves the assimilation of identified values and goals and the alignment of those identifications with other aspects of the self. This process requires considerable effort, reflection and self-awareness. Integrated regulation does not become intrinsic motivation, but is still considered extrinsic motivation because the motivation is characterized not by the person being interested in the activity but rather by the activity being instrumentally important for personal goals (Gagné & Deci, 2005). E.g. farmers participate in an SFI because they are interested in sustainability since they were young.
- Intrinsic motivation: people are motivated to perform work or engage in behaviour because they enjoy it (Barbuto & Scholl, 1998). According to Deci & Ryan (2000) intrinsic motivation is the prototypic manifestation of human learning and creativity. E.g. farmers participate in an SFI because they enjoy working on sustainable farming.

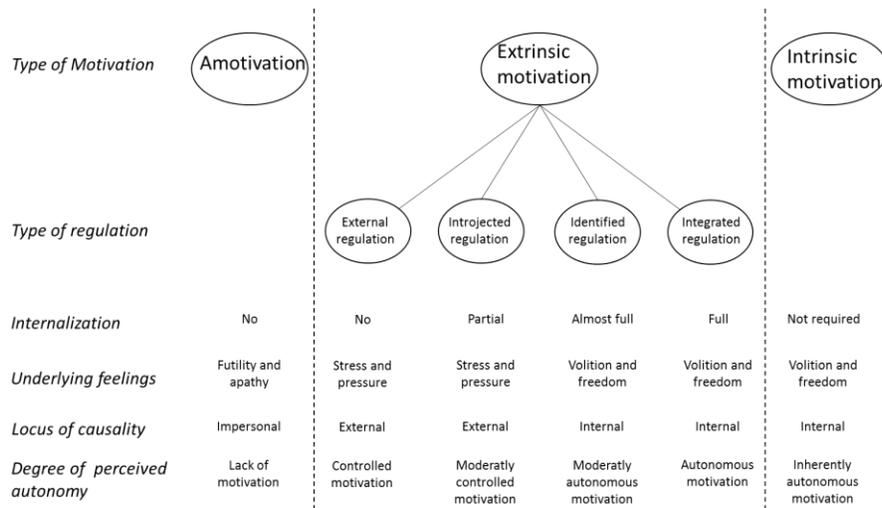


Figure 1: Self-determination continuum (Adapted from: Gagné & Deci, 2005; Ryan & Deci, 2000; Vansteenkiste et al., 2010)

In this theory an important distinction is made between autonomous and controlled motivation. Motivational types are attributed to autonomous motivation when behaviour is accompanied with feelings of volition and psychological freedom. In this case people stand behind their behaviour out of their interests and values (Ryan & Deci, 2000). They perceive internal reasons for their behaviour (i.e. internal locus of causality) and endorse the values of their behaviour. Besides intrinsic motivation, which is inherently autonomous, also identified and integrated regulation can be categorized as autonomous motivation. Contrary, controlled motivations are accompanied with feelings of pressure to think, feel or behave in particular ways. In this case, people act for reasons external to the self (external locus of causality) (Ryan & Deci, 2000). In the SDT continuum, external regulation and introjected regulation are both forms of controlled motivation (Vansteenkiste et al. 2010).

Interesting about this distinction is that SDT associates more autonomous motivation with greater persistence, performance, social functioning and physical and psychological wellness compared to controlled motivation (Vansteenkiste et al., 2010). Contrary, SDT also defines that controlling factors might influence autonomous motivation negatively, in such a way that controlling external events (e.g. threat of punishment, deadlines, evaluation, competition, and surveillance) can even undermine intrinsic motivation (Vansteenkiste et al., 2010). These controlling factors contribute to less cognitive flexibility, more shallow learning, less creativity and less positive emotional tone (Vansteenkiste et al., 2010). These important findings will be used to unravel the dynamics between farmer motivations to participate and an SFI's design to foster sustainability. For example, a farmer might primarily have an integrated motivation to participate in an SFI. However, when an initiative imposes too stringent rules for participation, this might negatively affect this farmer's motivation to participate.

## 2.2 Internalization

A crucial process within SDT is internalization. The four types of extrinsic motivation reflect different degrees to which the value or regulation of a requested behaviour is incorporated or internalized. So, internalization refers to the incorporation of a value or regulation (Ryan & Deci, 2000). Subsequent integration is the personal transformation of this incorporated value or regulation, in a way that a person perceives it as originating from him or herself. So, when people internalize and integrate regulations and values of an extrinsically motivated behaviour they will experience their behaviour as being more autonomous (Ryan & Deci, 2000). This is also shown in Figure 1. Interesting is that SDT attributes an important role to this internalization process for successful socialization, in which socially important behaviours, that are not intrinsically motivated, are self-initiated and maintained. This means that when a person personally endorses societal norms and rules, it is more likely that he will freely follow them, even when controlling factors are absent (Vansteenkiste et al., 2010). Transposed to our research topic, this means that farmers will more likely engage in sustainable farming when they personally endorse the value of sustainable farming.

## 2.3 Basic Needs

Previous paragraphs showed the importance of autonomy for personal growth and optimal functioning. Across the years, SDT researchers have identified three universal (across age, gender and culture) innate psychological basic needs that have to be fulfilled for optimal functioning and personal growth (Deci & Ryan, 2000). Contexts that satisfy participant's basic needs stimulate self-determined motivations. Hence, fulfilment of the basic needs is required for intrinsic motivation and has a positive influence on the internalization process (Vansteenkiste et al., 2010).

The first need is autonomy. Autonomy satisfaction concurs with the experience of volition and psychological freedom, in which one experiences choice in and ownership of a behaviour (Vansteenkiste et al., 2010): the behaviour is perceived as emanating from the self. For example, an SFI participant experiences choice and freedom in the activities he engages in. In contrast, *"Autonomy frustration involves feeling controlled through externally enforced or self-imposed pressures (Chen et al., 2015)"*. The second need is competence. Competence satisfaction *"refers to feeling effective in one's ongoing interactions with the social environment and experiencing opportunities to exercise and express one's capacities (Ryan & Deci, 2002)"*. For example, an SFI participant experiences his ability to fulfil the initiative's expectations. Competence frustration accompanies with *"feelings of failure and doubts about one's efficacy (Chen et al., 2015)"*. The third need is relatedness. Relatedness satisfaction concurs with experiences of reciprocal care and concern for important others (Vansteenkiste et al., 2010), and a sense of belongingness with individuals and one's community (Ryan & Deci, 2002). For example, a SFI participant experiences a close connectedness with other participants he values in the SFI. *"Relatedness frustration involves the experience of relational exclusion and loneliness (Chen et al., 2015)"*.

These needs can be satisfied independently from each other, e.g. a farmer can feel free in his decisions while participating in an SFI (autonomy satisfaction), but can lack a feeling of reciprocal understanding with other participants (e.g. because the other participants have other beliefs and neglect his beliefs) (relatedness frustration).

Since the importance of basic needs fulfilment for optimal functioning, presence of a basic need fulfilling context is a necessary prerequisite for self-determined motivations. Vansteenkiste et al. (2010) posit that *"full internalization is most likely to occur in social contexts that are autonomy-supportive (rather than controlling), competence supportive (rather than chaotic and demeaning),*

and relatedness supportive (rather than rejecting and withholding)". So analysis of SFIs regarding these characteristics allows to elicit the dynamics that promote or hinder "high-quality" motivation (i.e. more autonomous motivation) (Vansteenkiste et al., 2010).

### **3. SDT and initiatives for sustainable farming: Building hypotheses**

Based on these theoretical insights, we develop hypotheses about farmer motivations to participate in SFIs. We discern three main topics. The first concerns the reason for participation: why do farmers decide to participate? The second concerns the persistence of one's participation: does the motivation influence farmers' participation persistence and how? The third concerns the results of one's participation in an SFI. The initiatives' goal is to encourage farmers to adopt more sustainable farming practices. Does the motivation influence the outcomes regarding this goal?

#### **3.1 Reason for participation**

Although SFIs all serve the same goal, i.e. farmer's adoption of sustainable farming practices, their means to accomplish this can differ widely. Initiatives offer a variety of activities such as social learning groups with farmers, sustainability assessment tools or experience and knowledge exchange via field trips. Because of this variety, farmers can be motivated to participate in an SFI for a number of reasons (motivation themes), other than merely working on farm sustainability. Because a person's behaviour can be affected by multiple motivation themes (De Young, 2000), farmers can participate in an initiative for multiple reasons.

*H1. Farmers can have multiple motivations to participate in an initiative.*

Previous studies with SDT have shown that people are more likely to engage in a behaviour if they perceive their motivation as more autonomous (Osbaldiston & Sheldon, 2003; Vansteenkiste et al., 2010). An autonomous motivation, contrary to external pressure, is also needed to stimulate people to take responsibility for their behaviour and the environmental health of the planet (Osbaldiston & Sheldon, 2003). Therefore we hypothesize that farmers who participate in SFIs for reasons that can be attributed as socially important, such as sustainability or environmental responsibility, will be autonomously motivated. Otherwise, we wonder how more ego-centric reasons, such as benefits for their business or a craving for new knowledge, are related to autonomous or controlled motivations (Figure 2).

*H2. Farmers who primarily participate in initiatives because of sustainability, will be autonomously motivated.*

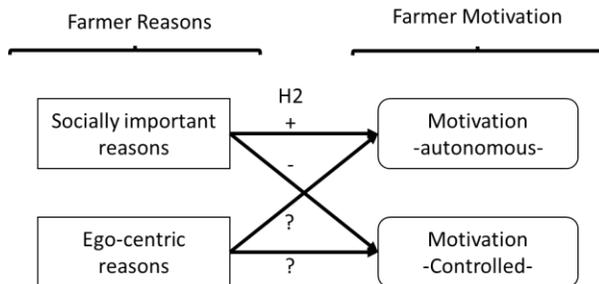


Figure 2: Concepts and relations for the hypothesis on reasons for participation

### 3.2 Participation persistence

Persistent farmer participation is important for an initiative's success. The longer farmers participate, the more an initiative can contribute to their learning on sustainable farming. According to SDT, participation will be more persistent when a farmer's decision to participate is perceived as more autonomous, provided that the initiative creates a context that supports the basic needs. Thus, an initiative will have greater growing opportunities, making it more successful, when a basic needs supportive environment is created (Figure 3). This also means that persistent farmer participation is likely to occur when the initiative provides the information and guidance needed for a farmer to pursue his farming goals.

*H3. Autonomous motivations to participate are positively related to fulfilment of the basic needs.*

*H4. Fulfilment of the farmers' basic needs results in more persistent farmer participation.*

To accomplish a good functioning and trustworthy results, SFIs develop rules that have to be met by their participants. The less participants perceive the rules as a burden, the less they will give up participation. Not all participants accept these rules easily and some struggle to meet them. We hypothesize that participants who are autonomously motivated to participate in an SFI, will show a higher acceptance of these rules (Figure 3).

*H5. A more autonomous motivation results in higher acceptance of an initiative's participation rules.*

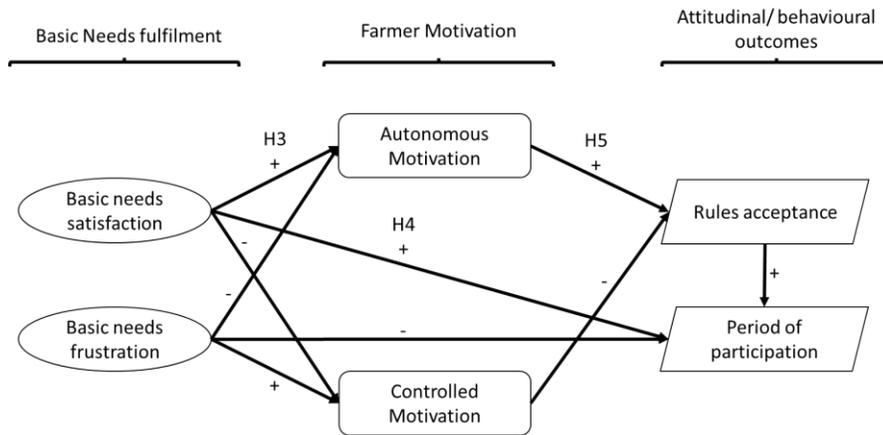


Figure 3: Concepts and relations for the hypothesis on participation persistence

### 3.3 Participation results

Farmers initially might have other motivations than sustainable farming to participate in SFIs. However, the initiative's goal in favour of sustainable farming presumes that participant motivations to work on sustainable farming will become more internalized with longer participation. To accomplish this, according to SDT, the initiative should provide a context that supports the basic needs (Figure 4).

- H6. Internalization with respect to sustainable development occurs when participants participate in the initiative for a longer time.*
- H7. Fulfilment of the basic needs results in an internalization process with respect to sustainable development.*

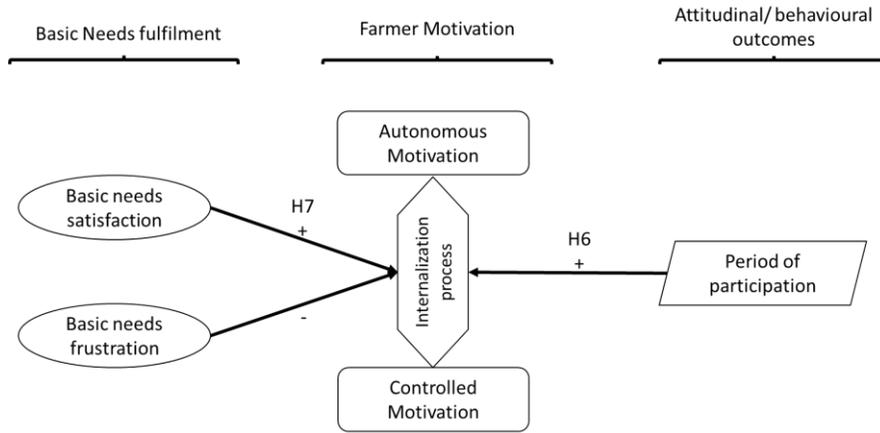


Figure 4: Concepts and relations for the hypothesis on internalization.

To achieve more sustainable behaviours by its participants, learning should be an essential element of SFIs (Loeber et al. 2007). To realize sustainable development in agriculture, transformative learning is necessary to change a farmer's vision, strategy and farming practices (Lankester, 2013). The transformative learning theory differentiates domains of learning and reflection processes (Lankester, 2013): instrumental learning (task oriented, problem-solving actions to improve performance of current activities), communicative learning (ability of individuals to examine and reinterpret meanings, intentions and values associated with actions and activities of others) and emancipatory learning (involves critical self-reflection and is often transformative, thus achieving change in meaning structures and perspectives (Blackmore, 2007)). To come to transformative learning, we posit that the motivation to work on sustainability has to be internalized. Since basic need satisfaction has a positive influence on the internalization process (Vansteenkiste et al., 2010), and thus more autonomous motivations to participate, we argue that basic need satisfaction has a positive influence on communicative and transformative learning (Figure 5).

- H8. A more autonomous motivation to participate for sustainability results in more communicative and transformative learning (on sustainability).
- H9. Fulfilment of the basic needs are more likely to result in communicative and transformative learning (on sustainability).

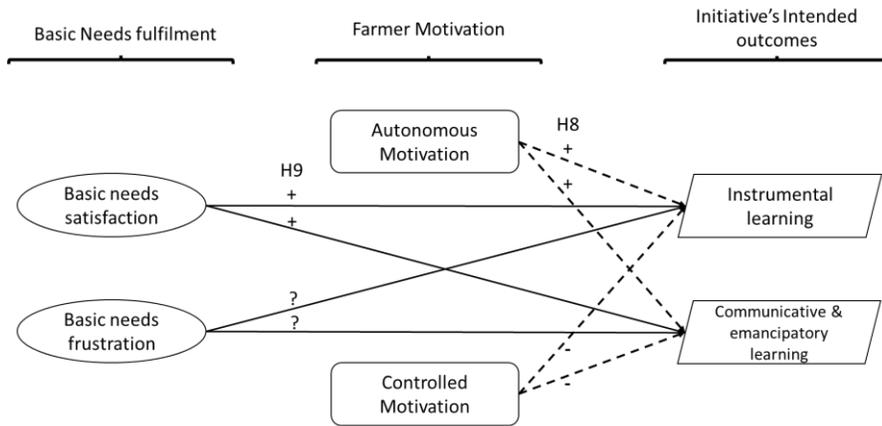


Figure 5: Concepts and relations for the hypothesis on participation results

### 3.4 Overview

Based on the formulated hypotheses, different concepts need to be measured. Following table 1 gives an overview of the relevant concepts per hypothesis group, the relations between them and the sign that can be attributed to them.

Table 1: Overview of the hypothesis.

Hypothesis group	Concepts	Relations	Sign
Participation motive	Motive for participation (socially important vs. ego-centric)	Socially important motive > autonomous initial motivation	+
		Socially important motive > controlled initial motivation	-
	Initial motivation type (autonomous vs. controlled)	Ego-centric intended goal > autonomous initial motivation	?
		Ego-centric intended goal > controlled initial motivation	?
Participation persistence	Initial motivation type (autonomous vs. controlled)	Needs fulfilment > period of participation	+
		Basic Needs fulfilment	Needs fulfilment > autonomous current motivation
	Rules acceptance	Needs fulfilment > controlled current motivation	-
		Period of participation	No needs fulfilment > period of participation
	Period of participation	No needs fulfilment > controlled current motivation	+
		No needs fulfilment > autonomous current motivation	-
	Autonomous current motivation > rules are no burden > period of participation	+	
	Controlled current motivation > rules are burden > period of participation	+	

Participation results – Internalization	Initial motivation type (autonomous vs. controlled)	Autonomous initial motivation > more autonomous current motivation	?
	Current motivation type (autonomous vs. controlled)	Controlled initial motivation > autonomous current motivation	?
	Internalization (more autonomous current motivation)	Period of participation > internalization	+
	Basic Needs fulfilment	Needs fulfilment > internalization	+
	Period of participation	No needs fulfilment > internalization	-
Participation results – Learning on sustainability	Current motivation type (autonomous vs. controlled)	Autonomous motivation > instrumental, communicative and emancipatory learning	+
	Basic Needs fulfilment	Controlled motivation > instrumental learning, communicative and emancipatory learning	?
	Learning type (instrumental, communicative, emancipatory)	Needs fulfilment > instrumental, communicative and emancipatory learning	+
	Implementation of sustainable practices	No needs fulfilment > instrumental, communicative and emancipatory learning	?
		Autonomous motivation > implementation of sustainable practices	+
		Controlled motivation > implementation of sustainable practices	?
		Needs fulfilment > implementation of sustainable practices	+
		No needs fulfilment > implementation of sustainable practices	?

#### **4. Methodology to test the hypotheses**

In following paragraphs, we propose a mixed methods approach to test the hypotheses. The approach can be used in any or multiple SFIs. In our qual-QUAN design (Creswell, 2003; Teddlie & Tashakkori, 2009), we first use qualitative research to test our first hypothesis H1. These results are used as input for the quantitative research step, in which the other hypotheses will be tested.

##### **Qualitative research step**

The first step encompasses a qualitative research approach to gain insights in farmer motivations to participate in SFIs (H1). For data acquisition, several sources such as interviews with participants and SFI organizers, field notes, reports and scientific literature can be used. Coding of these sources on the reported motivations for participation is twofold. First, reported motivations should be coded according to motivation themes: e.g. working on sustainable development, knowledge exchange, ... . Second, they should be coded according to the motivation types of the SDT continuum.

##### **Quantitative research step**

Testing the other hypothesis (H2 – H9) includes the distribution of a survey amongst participating farmers in an SFI. Based on the concepts used in our hypotheses, the survey consists of five main parts.

A first part gathers information about the farmer's participation in an SFI (e.g. since when does he participate?).

A second part asks about their motivations for initial and current participation. Based on the input of the qualitative research step, several Likert type items can be constructed, testing both motivation themes and types. To obtain data about possible internalization processes, farmers should answer how much they agree with the items, regarding both their initial decision to participate and their current decision to stay participated.

A third part, asks participants about their experiences with the initiative: who they value most, what they have learned since their participation (based on the distinction between instrumental, communicative and emancipated learning as described by (Lankester, 2013)), if they already implemented new knowledge and skills on their farms, and how they perceive the initiative's participation rules.

A fourth part tests the farmers' basic needs fulfilment in the SFI using twenty Likert type items. The items of the "Basic psychological needs and frustration scale for physical education" developed by Haerens et al. (2015) can be adjusted to the SFI context.

The last part of the survey can be used to ask general questions about the respondent, such as its residence, education, birth year, membership of other study groups etc.

Statistical analysis on the survey results will test our hypotheses.

#### **5. Case: Foundation Skylark**

We distributed a survey amongst all farmers participating in the SFI "Foundation Skylark". It is a successful Dutch knowledge exchange network of arable farmers and their supply chain partners, that started in 2002. Their aim is to establish on-farm sustainable development and facilitate the development of sustainable arable food chains. Currently, more than 400 farmers, 25 chain

partners and 15 advisory firms are involved. So far, we retrieved answers from 96 respondents, of which 74 completed the whole survey. The results will be used to test our hypotheses.

## 6. Conclusion

Literature on factors influencing participation in SFIs lack insights in farmers' psychological motivations to participate. However, research on the dynamic interaction between an initiative's design, farmer motivations to participate and farmer motivations to contribute to sustainable farming can offer valuable information for organizers of SFIs. To grasp these dynamics, nine hypotheses were developed, using Self-determination theory (SDT). Three basic concepts of SDT (SDT continuum, internalization and basic needs) proved to be valuable to focus our research. Based on our hypotheses, we developed a methodology to test them in SFI cases. However, this methodology has yet to be tested on case studies to prove its usefulness.

## 6. References

- Atari, D. O. a, Yiridoe, E. K., Smale, S., & Duinker, P. N. (2009). What motivates farmers to participate in the Nova Scotia environmental farm plan program? Evidence and environmental policy implications. *Journal of Environmental Management*, 90(2), 1269–1279. doi:10.1016/j.jenvman.2008.07.006
- Barbuto, J. E., & Scholl, R. W. (1998). Motivation Sources Inventory: Development and Validation of New Scales to Measure an Integrative Taxonomy of Motivation. *Psychological Reports*.
- Blackmore, C. (2007). What kinds of knowledge, knowing and learning are required for addressing resource dilemmas?: a theoretical overview. *Environmental Science & Policy*, 10(6), 512–525. doi:10.1016/j.envsci.2007.02.007
- Blackmore, C., Cerf, M., Ison, R., & Paine, M. S. (2012). The role of action-oriented learning theories for change in agriculture and rural networks. In I. Darnhofer, D. Gibbon, & B. Dedieu (Eds.), *Farming Systems Research into the 21st Century: The New Dynamic*. (pp. 159–177). Dordrecht: Springer Netherlands.
- Butt, T. M., Gao, Q., Zakaria, M., & Hussan, Y. (2015). An Analyze of the Effectiveness Farmer Field School (FFS) Approach in Sustainable Rural Livelihood (SRL): The Experience of Punjab-Pakistan. *Agricultural Sciences*, 6(6), 1164–1175. doi:10.4236/as.2015.610111
- Charatsari, C., Koutsouris, A., Lioutas, E., Kalivas, A., & Tsaliki, E. (2015). Social and psychological dimensions of participation in Farmer Field Schools : Lessons from rural Greece. In *International Conference Meanings of the Rural- between social representations, consumptions and rural development strategies; 28-29 September 2015, University of Aveiro, Portugal*.
- Chen, B., Vansteenkiste, M., Beyers, W., Boone, L., Deci, E. L., Van der Kaap-Deeder, J., ... Verstuyf, J. (2015). Basic psychological need satisfaction, need frustration, and need strength across four cultures. *Motivation and Emotion*, 39(2), 216–236. doi:10.1007/s11031-014-9450-1
- Creswell. (2003). *Research design. Qualitative, Quantitative, and Mixed Methods Approaches*. (J. W. Creswell, Ed.) (Second edi.). Sage Publications.
- De Young, R. (2000). Expanding and Evaluating Motives for Environmentally Responsible Behavior. *Journal of Social Issues*, 56(3), 509–526.
- Deci, E. L., & Ryan, R. M. (2000). Psychological Inquiry : An International Journal for the Advancement of Psychological Theory The “ What ” and “ Why ” of Goal Pursuits : Human Needs and the Self-Determination of Behavior The “ What ” and “ Why ” of Goal Pursuits : Human Needs and the Sel. *Psychological Inquiry*, (May 2014), 37–41.

doi:10.1207/S15327965PLI1104

- Defrancesco, E., Gatto, P., Runge, F., & Trestini, S. (2008). Factors affecting farmers' participation in agri-environmental measures: A northern Italian perspective. *Journal of Agricultural Economics*, 59(1), 114–131. doi:10.1111/j.1477-9552.2007.00134.x
- Faure, G., Desjeux, Y., & Gasselín, P. (2012). New Challenges in Agricultural Advisory Services from a Research Perspective: A Literature Review, Synthesis and Research Agenda. *The Journal of Agricultural Education and Extension*, 18(5), 461–492. doi:10.1080/1389224X.2012.707063
- Gagné, M., & Deci, E. L. (2005). Self-determination theory and work motivation. *Journal of Organizational Behavior*, 26(4), 331–362. doi:10.1002/job.322
- Haerens, L., Aelterman, N., Vansteenkiste, M., Soenens, B., & Van Petegem, S. (2015). Do perceived autonomy-supportive and controlling teaching relate to physical education students' motivational experiences through unique pathways? Distinguishing between the bright and dark side of motivation. *Psychology of Sport and Exercise*, 16(P3), 26–36. doi:10.1016/j.psychsport.2014.08.013
- Hermans, F. L. P., Haarmann, W. M. F., & Dagevos, J. F. L. M. M. (2011). Evaluation of stakeholder participation in monitoring regional sustainable development. *Regional Environmental Change*, 11(4), 805–815. doi:10.1007/s10113-011-0216-y
- Kabii, T., & Horwitz, P. (2006). A review of landholder motivations and determinants for participation in conservation covenanting programmes. *Environmental Conservation*, 33(01), 11. doi:10.1017/S0376892906002761
- Keen, M., & Mahanty, S. (2006). Learning in sustainable natural resource management: challenges and opportunities in the Pacific. *19(6)*, 497–513.
- Klerkx, L., Aarts, N., & Leeuwis, C. (2010). Adaptive management in agricultural innovation systems: The interactions between innovation networks and their environment. *Agricultural Systems*, 103(6), 390–400. doi:10.1016/j.agsy.2010.03.012
- Kroma, M. M. (2008). Organic Farmer Networks : Facilitating Learning and Innovation for Sustainable Agriculture, (January 2015), 37–41. doi:10.1300/J064v28n04
- Lanckester, A. J. (2013). Conceptual and operational understanding of learning for sustainability: a case study of the beef industry in north-eastern Australia. *Journal of Environmental Management*, 119, 182–93. doi:10.1016/j.jenvman.2013.02.002
- Loeber, A., van Mierlo, B., Grin, J., & Leeuwis, C. (2007). The practical value of theory: conceptualising learning in the pursuit of a sustainable development. In A. E. J. Wals (Ed.), *In Social learning towards a sustainable world*. (pp. 83–97). Wageningen, The Netherlands: Wageningen Academic Publishers.
- O'Kane, M. ., Paine, M. ., & King, B. J. (2008). Context, Participation and Discourse: The Role of the Communities of Practice Concept in Understanding Farmer Decision-Making. *Journal of Agricultural Education and Extension*, 14(3), 187–201.
- Oreszczyn, S., Lane, A., & Carr, S. (2010). The role of networks of practice and webs of influencers on farmers' engagement with and learning about agricultural innovations. *Journal of Rural Studies*, 26(4), 404–417. doi:10.1016/j.jrurstud.2010.03.003
- Osbaldiston, R., & Sheldon, K. M. (2003). Promoting internalized motivation for environmentally responsible behavior: A prospective study of environmental goals. *Journal of Environmental Psychology*, 23(4), 349–357. doi:10.1016/S0272-4944(03)00035-5

- Restrepo, M. J., Lelea, M. A., Christinck, A., Hülsebusch, C., & Kaufmann, B. (2013). Collaborative learning for self-driven change in complex situations Collaborative learning to foster self-driven change, (i).
- Ryan, R. M., & Deci, E. (2002). Overview of Self-determination theory: An organismic dialectical perspective. In *Handbook of Self-Determination Research* (pp. 3–33). doi:citeulike-article-id:10086705
- Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *The American Psychologist*, 55(1), 68–78. doi:10.1037/0003-066X.55.1.68
- Schacter, D. L., Gilbert, D. T., Wegner, D. M., & Hood, B. . (2012). *Psychology: European edition* (European e.). Houndmills, England: Palgrave MacMillan. Retrieved from [https://books.google.be/books?id=jqAcBQAAQBAJ&printsec=frontcover&hl=nl&source=gbs\\_ge\\_summary\\_r&cad=0#v=onepage&q&f=false](https://books.google.be/books?id=jqAcBQAAQBAJ&printsec=frontcover&hl=nl&source=gbs_ge_summary_r&cad=0#v=onepage&q&f=false)
- Siebert, R., Toogood, M., & Knierim, A. (2006). Factors affecting european farmers' participation in biodiversity policies. *Sociologia Ruralis*, 46(4), 318–340. doi:10.1111/j.1467-9523.2006.00420.x
- Smithers, J., & Furman, M. (2003). Environmental farm planning in Ontario: Exploring participation and the endurance of change. *Land Use Policy*, 20(4), 343–356. doi:10.1016/S0264-8377(03)00055-3
- Spielman, D. J., Davis, K., Negash, M., & Ayele, G. (2010). Rural innovation systems and networks: findings from a study of Ethiopian smallholders. *Agriculture and Human Values*, 28(2), 195–212. doi:10.1007/s10460-010-9273-y
- Stobbelaar, D. J., Groot, J. C. J., Bishop, C., Hall, J., & Pretty, J. (2009). Internalization of agri-environmental policies and the role of institutions. *Journal of Environmental Management*, 90(SUPPL. 2), S175–S184. doi:10.1016/j.jenvman.2008.11.019
- Teddlie, C., & Tashakkori, A. (2009). *Foundations of mixed methods research. Integrating quantitative and qualitative approaches in the social and behavioral sciences*. SAGE Publications.
- Vaarst, M., Nissen, T. B., Østergaard, S., Klaas, I. C., Bennedsgaard, T. W., & Christensen, J. (2007). Danish stable schools for experiential common learning in groups of organic dairy farmers. *Journal of Dairy Science*, 90(5), 2543–54. doi:10.3168/jds.2006-607
- Vansteenkiste, M., Niemiec, C. P., & Soenens, B. (2010). The Decade Ahead: Theoretical Perspectives on Motivation and Achievement. *Advances in Motivation and Achievement*, 16, 105–165. doi:10.1108/S0749-7423(2010)000016A007
- Wilson, G. a. (1997). Factors Influencing Farmer Participation in the Environmentally Sensitive Areas Scheme. *Journal of Environmental Management*, 50(1), 67–93. doi:10.1006/jema.1996.0095
- Wilson, G. a., & Hart, K. (2000). Financial imperative or conservation concern? EU farmers' motivations for participation in voluntary agri-environmental schemes. *Environment and Planning A*, 32(12), 2161–2185. doi:10.1068/a3311
- Wilson, G. a., & Hart, K. (2001). Farmer Participation in Agri-Environmental Schemes : Towards Conservation-oriented thinking. *Sociologia Ruralis*, 41(2), 254–274.
- Zepeda, L., Reznickova, A., & Russell, W. S. (2013). CSA membership and psychological needs fulfillment: An application of self-determination theory. *Agriculture and Human Values*, 30(4),

605–614. doi:10.1007/s10460-013-9432-z

Zhu, Y., & Yang, J. (2012). Effects of Farmers' Motivation on Their Participation in Publicly Funding Training Programs in Sichuan Province, China. *Journal of Agricultural Science*, 4(10), 68–74. doi:10.5539/jas.v4n10p68