

Push and Pull for Change

- Local Experiences of the Push-Pull Technology in
South Wollo, Amhara Region, Ethiopia

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Cover picture: View over lake Hayk from Gobeya, showing sorghum in the second of the piles, counted from the left. Photo: Salomon Abresparr, SLU, published with permission from copyright owner

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Keywords: Push-Pull Technology, Ethiopia, sorghum, maize, agroecology, rural development, change, decision-making

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Abstract

Drawing from in-depth interviews with farmers who have implemented the Push-Pull Technology in South Wollo, Ethiopia, this thesis focuses on understanding both local driving forces for changing farming practices and patterns of decision-making. This thesis argues that farmers' decisions are based on more than rational choice, and that there is a complex web of social and institutional patterns which affects their actions and attitudes towards changes of farming practices and use of new technologies. There are many different reasons why farmers change their farming practices, including both voluntary and involuntary actions; some of them are planned strategies, while others are reactions to a dynamic and changing environment. This thesis draws on the work of Ian Scoones, Frank Ellis and David Mosse to argue for the importance to see beyond idealistic liberal analyses that ignore the structural forces affecting decision-making. A number of core challenges for the implementation of Push-Pull Technology are identified, centring on the need to meet the requirements of the households with poor social status.

Keywords: Push-Pull Technology, Ethiopia, sorghum, maize, agroecology, rural development, change, decision-making

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Abbreviations

DA	Development Agent
FSP	Food Security Program
FTC	Farmer Training Centre
ISD	Institute for Sustainable Development
NGO	Non Governmental Organisation
ORDA	Organisation for Rehabilitation and Development in Amhara
PPT	Push-Pull Technology
PSNP	Productive Safety Net Program

Ethiopian-Specific Words

<i>Belg</i>	The short raining season, usually between February and April
<i>Berbere</i>	Mix of Red Pepper varieties (<i>Capsicum annuum</i>), used in almost every part of the Ethiopian cuisine
<i>Birr</i>	The currency in Ethiopia (ETB)
<i>Costa</i>	Leaf beet or chard (<i>Beta vulgaris</i>)
<i>Derg</i>	<i>Ge'ez</i> for committee or council. Short name for the <i>Coordinating Committee of the Armed Forces, Police, and Territorial Army</i> , which ruled Ethiopia from 1974 to 1987
<i>Devo</i>	Work-days, where farmers help each other at their respective farm
<i>Farenji</i>	Stranger, foreigner
<i>Ge'ez</i>	Ancient language in Ethiopia, still used by the liturgy of the Ethiopian Orthodox Church
<i>Gomen</i>	An indigenous species of cabbage (<i>Brassica carinata</i>) used for different stews
<i>Got</i>	Smaller decision-making unit of the <i>kebele</i> , consisting of lead farmers
<i>Guaya</i>	A local variety of legume
<i>Kebele</i>	The smallest administrative unit in Ethiopia, similar to a ward
<i>Keremt</i>	The main raining season, which is usually between June and September
<i>Teff</i>	An indigenous plant (<i>Eragrostis tef</i>) with very small seed, used for making the Ethiopian staple-food <i>injera</i> , which is a big sour pancake, served with different stews (<i>wot</i>)
<i>Woreda</i>	District, the administrative unit above <i>kebele</i>

1 Introduction

Donors often target organisations and individuals as ‘agents of change’ and it is often claimed that such agents will raise awareness, taking issues on board and mobilising resources (Heymans & Pycroft 2003; Leftwich 2007). It is common to argue that the success or failure of change processes in many societies is determined by the commitment and energy of pro-poor agents (*ibid.*). This commitment affects what risks the agents are willing to take and is crucial for the success of developing projects, advocating changes. It is therefore important in the analysis of change processes to understand how participants of development projects reason about risks in deciding if they want to continue participating or not.

This paper examines decision-making in relation to an agroecological method introduced in South Wollo, Ethiopia, the so called the Push-Pull Technology (PPT). The technology is an attempt to meet some of the major challenges farmers are facing in South Wollo, namely the stemborer moth, the *Striga* weed, and poor soil fertility (ISD 2013). PPT was introduced in the region four years ago, in 2011, by the Institute for Sustainable Development (ISD). Starting with two farmers, the project has since grown, and there are now about 410 farmers who have attended skill-training in PPT. I want to examine what drives these farmers to attend skill-training, and to implement the new method. To change farming practices implies a great risk for the farmers, and it is therefore interesting to investigate how they reason when these bold decisions are made. Decision-making, and the various contexts they are a part of, are complex and dynamic and there are many reasons why farmers change their farming practices, including both voluntary and involuntary actions (cf. Eakin 2005).

One theory that tries to grasp this complexity is the ‘drivers of change’ perspective which draws from work developed for the UK Department for International Development (Heymans & Pycroft 2003; Leftwich 2007). The framework centres around three interactive components; actors, structural features, (natural, economic and social structures), and institutions (frameworks of rules which mediate between the actors and the structure). Actors are individuals and organisations, which, it is argued, often offer entry points to change. Since PPT first and foremost addresses farming households, not institutions, it is crucial to understand the driving forces for change of individuals. Additional to the ‘drivers

of change' theory, the thesis draws on the work of Ian Scoones, Frank Ellis and David Mosse to argue for the importance to see beyond idealistic liberal analyses that ignore the structural forces affecting decision-making.

It is appropriate to here discuss the different views of change in a 'development' context. 'Development' and 'change' are often normative expressions, telling *what* this change should look like. There are many who provide solutions for sub-Saharan African farmers, and I want to make clear that it is not evident that farmers in South Wollo *have to* change their lives, but that it is a normative statement. However, for the many households in the region that suffer from food-insecurity and are vulnerable to sudden changes, a modification in farming practices can be *one* solution. However, I want to stress that neither PPT, nor any technology, offers a full solution.

1.1 Aims of the Thesis

A starting point for my research has been to make the individuals participating in the Push-Pull Technology project visible. I want to understand how individuals' actions and behaviours influence the project, and how these affect the success or failure of the project. At the same time I do not want to neglect the fact that structural systems play a central part in the story as well, and my intention is to explore the relationship between structure and agency in the context of PPT. The three research questions listed below will guide the thesis:

- What possibilities and constraints do the farmers in South Wollo who have implemented the Push-Pull Technology see with the method and how do they motivate their decision, for themselves and for others?
- What drives farmers in South Wollo to shift farming practices and to use the Push-Pull Technology?
- What factors affects farmers' decision-making in South Wollo, when it comes to implementing new technologies?

1.2 Limitations

Fundamental to the 'drivers of change' approach is that any political process is framed by a wider national and international environment of economic, political, social and cultural processes and institutions (Leftwich 2007). Also, Heymans & Pycroft (2003) argue that systematic change involves the relationships between structures, institutions, and actors and that the notion of 'system' is important. According to this approach it is not enough to analyse change and incentives from an actor-oriented perspective, also an analysis of the 'system' is needed. Hence, it can be argued that the above research questions require an analysis of institutions,

and the interaction of state, public service providers and civil society, in order to be fully understood (cf. *ibid.*). Due to the scale of this thesis, all these actors will not be addressed. Instead, the focus is on institutions that the villagers meet in their everyday life, which can be argued to be a weakness of the thesis. It is therefore important to stress that this thesis does not provide a full picture of every factor that affects farmers' decision-making and drivers of change, but gives some suggestions on how the driving forces for change can be interpreted.

2 The Study Context

2.1 The Push-Pull Technology

Stemborer moth, *Striga* weed and poor soil fertility are three constraints to efficient production of cereals in sub-Saharan Africa (ICIPE 2007). The Push-Pull Technology (PPT) is an attempt to meet these challenges, making practical use of ecological concepts. PPT is a method developed for integrated soil and pest management in cereal-based farming systems, more specifically the cereals maize and sorghum (*ibid.*). Furthermore, the technology can be described as ‘agroecological’, a notion including both the research of agro-ecosystems, as well as the practical use of ecological concepts in agriculture (SIANI 2015). The agroecological approach also highlights the importance of social processes that value community involvement and Altieri & Toledo (2011) stress that human resource development is the cornerstone of any strategy aimed at increasing options for rural people and especially resource-poor farmers.

PPT utilises the natural characteristics of two plants. *Brachiaria* grass is used as a trap plant, which attracts (‘pulls’) the female stemborer (*Busseola fusca*). The moth lays her eggs in the grass, where the larvae get caught on the sticky hairs of the grass and die. The legume *Desmodium* is used as an inter-crop between the rows of maize or sorghum, since the odour of the plant repels the stemborer (‘push’). The roots of *Desmodium* also release a substance which makes the seeds of the *Striga* weed germinate, before it is able to attach itself to the roots of the maize or the sorghum (ISD2013).



Figure 1. *Desmodium*. Photo: Josefin Årevall, SLU)



Figure 2. *Brachiaria* Grass. Photo: Josefin Årevall, SLU)

Except for reducing the number of stemborers and *Striga* weed, PPT has some other positive effects. Soil fertility is improved, since *Desmodium* is a legume and has a nitrogen fixing effect. Some soil degradation can also be prevented, since the root system of *Desmodium* is quite developed, this effect can especially be seen in hillsides and slopes, where the soil otherwise gets washed away by the rain (ICIPE 2007). The companion plants are also used as animal fodder. The technology requires relatively low input costs, compared to other methods used to prevent the pests, which arguable makes it suitable for smallholders (cf. *Ibid.*).

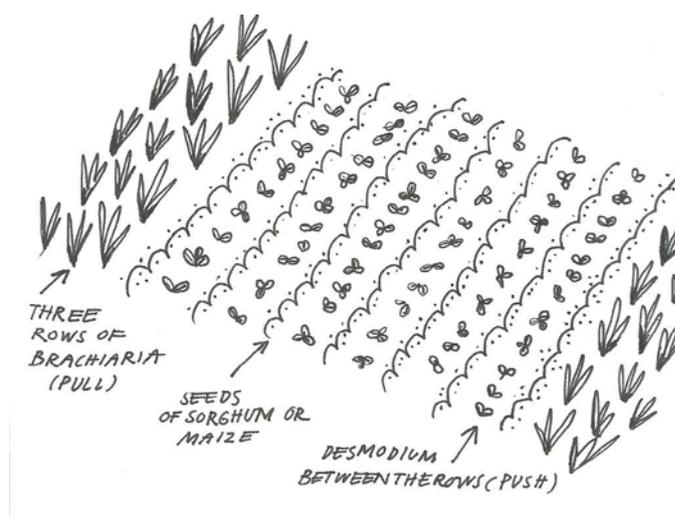


Figure 3. Push-Pull Technology. (Illustration: Josefin Årevall, SLU)

In Ethiopia, PPT has been introduced by a Non Governmental Organisation (NGO), Institution for Sustainable Development (ISD), based in Addis Ababa but with a local office in Dessie, South Wollo zone. Between 2011 and 2014 the technology was introduced in six *woredas* in the South Wollo zone (Tehuledere, Ambasel, Werebabo, Dessie Zuriya, Kallu, and Kombolcha *woredas*), and two *woredas* in Oromia special zone (Dawa Chefa and Artuma Fursie *woredas*). The trainings have been held at the local Farmer Training Centres (FTCs), which will be introduced in the next section. Instructors were mainly ISD employees, but also local agricultural experts. Follow up and technical assistance has been carried out on farmers' fields, beginning from the time of planting until harvest. This far, 66 percent of the farmers who participated in the trainings have implemented the method (ISD 2015). Out of the 410 farmers who attended the training, 50 were women. During the training the farmers were given seeds of both *Brachiaria* and *Desmodium*. Thirteen FTCs have yet adopted the technique and either have demonstration plots for PPT or give trainings to the farmers about PPT, sometimes both. In 2014 ISD organised so called Farmers' field day in three of the *woredas*. 85 farmers, out of which

fourteen were women, six agricultural experts from the *woreda* level, and fourteen Development Agents from the *kebele* level visited fields where PPT had been implemented (*ibid.*).

2.2 The Political Context

The Ethiopian government has several strategies to address poverty, malnutrition and food insecurity (World Bank 2011). Relevant for this field work is the Food and Security Program (FSP), and the Productive Safety Net Program (PSNP), which provides food or cash to the participants, with counter demands that they participate in public work, such as improving local infrastructure (feeder roads, schools, clinics), or improving the farming land in the community (water and soil conservation, building terraces and micro irrigation) (MoA 2014, World Bank 2011). About 7.8 million individuals participate in this program, but the numbers change annually. The PSNP employs about 60,000 agricultural *extension workers*, who work with the extended and developed version of the program, thereof the name (Cohen et al. 2009). In the rest of this paper I will call these employees *Development Agents* (DA), as they are called in the *kebeles* and in the local communities.

The DAs work at local Farmer Training Centres (FTC), which are often situated near the *kebele* administration, the smallest administration unit in Ethiopia. There are about 8000 FTCs in Ethiopia (MoA 2014). The FTCs arrange trainings for some of the farmers in the villages, and advice farmers about farming practices. There are normally four DAs at every FTC. These are experts in plant science, animal science, natural resource management, and irrigation. Some of the common work carried out by the PSNP participants in the three villages concerned in the thesis is organised by the Organisation for Rehabilitation and Development in Amhara (ORDA).

A central part of Ethiopian institutions in the rural areas is the concept of ‘lead’ farmers. These are selected by the *kebele* and form committees, called *gots*. Each *kebele* has several *gots*. Every lead farmer has responsibility for five other households in the village, and are expected to communicate between the governmental administration and the farming community.

Another important institution is the system of ‘model’ farmers. These are farmers who are considered particularly ‘active’ and open to new technologies and farming practices. The model farmers are selected by the local administration, together with the *got* committees. Model farmers are the first ones invited to trainings at the FTCs and the belief of the government is that in this way the farming practices will be spread from farmer to farmer, by showing good practices and successful experiences from the models. It is in this context that the Push-Pull Technology is introduced to the farmers. ISD first introduces PPT to model farmers, and then secondly to other farmers, who also are selected by the local FTCs and the *gots*.

2.3 The Three Villages

The field work was carried out in three villages; Gobeya, Pasomille and Tessabilima in the South Wollo zone, Amhara region. The relative proximity between the villages made it possible to compare differences and also to show similarities. It was in these villages that PPT was first introduced, and therefore the farmers in this area have the longest experience of PPT, needed for seeing any results. The farming practice is primary of subsistence type, dependent on rain-fed and mixed-farming practices, dominated by smallholder farmers. Besides the staple food *teff*, sorghum and maize are the dominating cereal crops (cf. Bogale & Genene 2012).

Many individuals and households in South Wollo have suffered from major famines in the past, the latest in 1984-1985. The primary reasons for the shortage of food for the most vulnerable people were the military conflict between the Mengistu government and the Tigray Peoples' Liberation Front, drought and crop failure, large land reforms, and fluctuations in market prices (Webb & von Braun 1994). Another important historical event, affecting farmers' decision-making, is the redistribution of land which was made during the *Derg* regime (military socialist) in the 1970s.

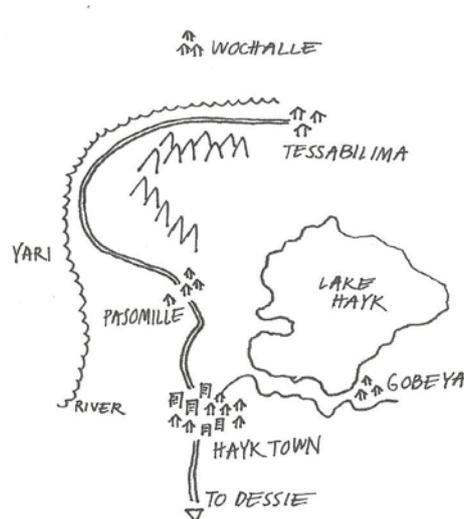


Figure 4. Map over the three villages (not to scale). (Illustration: Josefin Årevall, SLU)

Gobeya is beautifully situated near the lake Hayk. The closest town is Hayk, named after the lake, and this is also where the nearest market is. The village is located at a higher altitude than the other two villages, which makes the farming conditions a little bit different. It is also more remote than Pasomille and Tessabilima, since there is no asphalt road leading to the village. If you do not want to go to the town on foot, which takes about half an hour, the wait for a minibus, used as public transport, can take hours. Still, the distance to the closest market is

shorter than for the farmers in Tessabilima. The local Development Agent in Gobeya estimates that 45 percent of the population in the village are food insecure, meaning that they cannot support their family with enough food throughout the year. In 2014 there were thirteen farmers in the village who practised PPT.

Pasomille is located ten minutes by minibus from the small town Hayk, where the major market is. Some of the farmers I met used an irrigated area in Yari, which is about an hour of walk away. The irrigation was built with help from the Organisation for Rehabilitation and Development in Amhara (ORDA). There is a main road crossing the village, which gives good access to markets in Hayk, or even bigger cities, such as Dessie.

Tessabilima is situated twenty minutes further away by minibus along the same road as *Pasomille*. The closest market is held in Wochalle. Some of the farmers in Tessabilima also have access to irrigation, first built by the villagers in the 1980s. PPT is demonstrated at the local FTC in both *Pasomille* and *Tessabilima*.

3 Conceptual Ideas and Methodology

3.1 The Search for Knowledge

Selection of methods is always related to a number of considerations about the nature of being (ontology) and the nature of knowledge (epistemology) (cf. Öhlander 2011). My epistemological standing point is the post-modern idea that knowledge is not absolute; several truths can co-exist (cf. Hajdu 2006). Furthermore, social science is never truly objective; the choice of theory and method will always influence how a phenomenon is interpreted. Nevertheless one interpretation can be more likely than another (Öhlander 2011). This is a guideline for my work.

Another important premise for this thesis is *grounded theory*, in which the major principle is to start the field work without fixed categories. Instead, these should be developed in interaction with the informants, i.e. the context on the ground (Hajdu 2006). Hypothesis and theory should rather be refined than be either overturned or accepted (*ibid.*). The use of grounded theory is an attempt to resist the temptation of making more far-reaching analyses than the material provides for. Instead, this theory suggests the researcher to make smaller, but well-founded, conclusions from the material (*ibid.*). According to this perspective, responses that follow should correspond with the empiric material from the field, and should not be structured in artificial categories (Scoones 2009).

Finally, showing humility before the fact that the research question is changeable during the field work is in my eyes a sympathetic approach to the dynamic nature inherent to social science. This view makes way for the research question to grow and develop in the interaction with the informants. This is one reason why I have used in-depth interviews to answer my research question, because it is a method that allows dialogue. By this, the research can develop during the field work, with concern to the stories told by the informants.

3.2 Conceptual Framework

The following section explains the conceptual framework of this paper, starting with defining *structures* and *institutions*. Thereafter the concepts of *poverty* and *vulnerability* will be discussed, followed by a brief introduction of the notion *sustainable livelihood*. Finally, issues related to *risk* will be addressed.

In this thesis, one ontological outset is that there are structures that determine the agency of the individual (Bauman & May 2010). This has been a central outset when selecting the conceptions for the thesis. One way to analyse these structures is to look at institutions. The political features that impact the choices at hand of the individual, are in this thesis called *institutions*, defined as ‘frameworks of rules structuring the behaviour of agents’ (cf. Leftwich 2007). *Structural features* are defined as natural and human resources, economic and social structures, and other non-institutional facts (*ibid.*).

Based on the assumption of structure, a relational understanding of *poverty* and *vulnerability* is here suggested, meaning that ‘people are poor because of others ... [They are] unable to control future events because others have more control over them’ (Wood 2003, 456, cited in Mosse 2010, 1158). Persistent poverty is in this view the consequence of historically developed economic and political relations and as an effect of social categorisation and identity (cf. Mosse 2010). Moreover, poverty is in this thesis seen as lack of capabilities and access to resources, rather than only lack of income (cf. Hajdu 2006). No matter what reason, an individual who is unable to secure sufficient food to live a healthy life is starving (*ibid.*). A relational approach to poverty needs to integrate a multidimensional conception of power; both visible power, such as political decision-making, but also the second-order ‘agenda-setting power’ (Lukes 2005, cited in Mosse 2010) that sets the terms in which poverty becomes (or fails to become) politicised (Mosse 2010). Similar to the *sustainable livelihoods* perspectives, a relational approach to poverty look at different dimensions of livelihood, such as environmental, social, economic, and political ones, in order to provide a better understanding of the complex processes of why people are poor (Scoones 2009).

Vulnerability is related to poverty, but not quite the same thing. It is here linked with the “capacity of individuals and social groups to respond to, [...] recover from or adapt to, any external stress placed on their livelihoods and well-being.” (Kelly and Adger 2000, 325, cited in Hajdu 2006, 63). *Livelihood* is defined here as comprising ‘the capabilities, assets (including both material and social resources) and activities for a means of living’ (Scoones 2009, 6). Lack of capacity to respond to external stress defines vulnerability. The notion vulnerability is supposed to help identify certain vulnerable groups. Commonly defined vulnerable groups in this context are for instance widowed or divorced women, disabled and elderly persons, orphaned children and refugees (Hajdu 2006). Factors that contribute to being vulnerable are thus for example a lack of social networks, social stigma, experience of traumatising events and a general lack of voice and empowerment (*ibid.*).

The concept of *risk* used in the research presented here is how agents estimate the outcomes of various income generating activities (Ellis 2007, 13). The risk attached towards a decision or an action is subjective, meaning that two farmers with similar prerequisites can understand risk differently depending on their respective experiences and attitudes. Risk strategies should neither be confused with *coping strategies*, that are involuntary actions; ‘unplanned reactions to unexpected livelihood *failure*’, nor with *adaptive capacity* that is the capacity of a household to alter or structurally reorganise its activities or diminish present threats (cf. Eakin 2005). Moreover, *risk strategies* are in this thesis seen as planned responses to potential threats to household well-being (*ibid.*). Making decisions with uncertain outcomes, such as implementing new farming practises, always implies a risk.

3.3 Interviews

If you want to know the perspective of another person, it is fairly obvious that you have to ask that person about their feelings and thoughts. Within social science this is known as interviews (Kvale & Brinkmann 2013). Interviews can be conducted in many different ways, and in this study they have been conducted in a way that resembles a normal dialogue. In a dialogue, body language, gazes, and intonation are important to get a full picture of what the informants are saying and to build trust between me as a researcher and the informants. Furthermore, I have used semi-structured interviews, in which I have started with some questions in bullet-form, and then allowed the dialogue to take the direction of the informant’s own stories and interests.

The interviews were conducted during a period of three weeks in April 2015, together with Salomon Abresparr, also a student of SLU. Helping us was an interpreter from Wollo University; Samuel Tadesse. The interviews were conducted in the farmers’ homes or at the FTCs and lasted for about one and a half hour each. All the interviews were recorded, and then transcribed. If something in the interpretation was unclear, such as very long monologues or if the answer did not match the question, we asked either the interpreter or an Ethiopian friend to clarify. I have used purposive sampling, where the informants were chosen by their experiences of PPT, rather than for example their socioeconomic status. The farmers were selected with help of the project facilitators at the ISD and the local Development Agents. A positive aspect of this was that I got a good contact with the farmers from the very beginning, and that the selected ones had much information to share.

However, this led to a situation where I mostly met so called model farmers, or better-off farmers, which is a weakness of the study for two reasons; first it risks to only giving a comprehension of the situation for the better-off farmers. Second, the model farmers have good relations with the DAs. Consequently this can lead to a biased picture of the local authorities. In order to compensate this fact, I conducted

additional interviews with two farmers who were not part of the project, out of which one was selected to give perspectives of the young generation. I also selected two more farmers who were not model farmers, but were part of the project. I have also tried to add together the descriptions provided by DAs, farmers, and existing literature done about the poor or non-model farmers in the region in order to get a more holistic picture.

3.4 The Informants

In total, nine farmers were interviewed; five farmers who had implemented PPT, two who had only participated in training, and two who had not participated in the project. In this selection it was important to understand how these various groups thought about decision-making, and if there was any difference. Two local experts from different Farmer Training Centres were also interviewed, as well as the two local employees at the ISD office in Dessie. These four agricultural experts work with farmers every day, and their perspectives are crucial in understanding which processes and institutions that affect farmers' decision-making. The majority of the interviewed farmers were men over forty years old, which can be seen as representative for the countryside in South Wollo, where most households are headed by men. All the names of the informants are changed, in order to protect their integrity. The ages have been rounded off.

Almaz lives in Pasomille and is in her forties. She is divorced from her husband and has taken care of her three children by herself since 2000. She lives at the farm where she grew up, a farm that she and her siblings inherited and divided amongst them in 1988. The farming land is situated right next to the main road between Dessie and Woldia. She grows sorghum, maize and *teff*. She also grows vegetables, *berbere* and onions with help of irrigation. She is active in the *kebele* and is a model farmer. Four years ago, she was the first farmer to try PPT in Ethiopia.

Ibrahim also lives in Pasomille and is about sixty years old. He lives a little further away from the main road and he too lives at his birthplace. He has two children, but they do not live at home any more. He and his wife grow sorghum and *teff*, and sometimes maize, beans and chickpeas. They have recently planted some orange trees. Ibrahim is not a model farmer himself, but one of his brothers holds this title. He has been practising PPT for two seasons.

Eyob lives in Tessabilima and is in his fifties. His home is situated near the main road, but his farmland is further away. He has eight children. He has been a farmer since he was fourteen years old. His parents' land was expropriated during the monarchy (before 1974) and he received the current one that he owns during the *Derg* Regime, in the beginning of the 1980s. He and his wife grow sorghum and maize. They also grow *teff* and *berbere* with help from irrigation. He has used PPT for three seasons. Eyob is working at the *kebele* with land management issues, and this way he learned about the technology. He is now also a model farmer.

Binyam also lives in Tessabilima and is about forty years old. He finished his work as a soldier in 1995 and has been a farmer since. He and his wife have four children together. They grow *teff*, sorghum, and maize. They also grow onions, tomatoes and *berbere* in the irrigated land. He has been working with PPT for the last three years. Binyam is a model farmer.

Rihana lives near Gobeya and is about thirty-five years old. She has two children. Together with her husband she grows beans, wheat, *teff*, sorghum, lettuce, tomatoes, *berbere*, and chat. They have oxen, cows, sheep, donkeys and goats. They got their land from their parents when they got married. Rihana is active in a women's association in the *kebele* and is also a model farmer. She has been practising PPT for three years.

Mergya and Tsegereda are about fifty years old. They live in Pasomille and have one daughter and one son. They grow maize and sorghum, *teff*, beans, and chick peas. If they have a surplus of grain they sometimes sell it at the market. If they need for example *berbere* they sometimes also sell one of the animals. They have oxen, cows and sheep. They have tried PPT, but last year they failed, because of poor germination of the seeds. They will try the technique once again the coming year. Mergya and Tsegereda are model farmers.

Said is about fifty years old and lives near Gobeya. He and his wife have seven children, out of which four are still living at home. Said and his family got the farming land during the *Derg*. He grows sorghum, maize, *teff*, tomatoes, *gomen*, beet root, cabbage, *costa*, *berbere*, oranges, and chat. He has not tried the PPT and is not selected to be a model farmer.

Muhammed is twenty-five years old and is the son of Said. He lives at home with his parents and siblings, close to Gobeya. Muhammed is the chairman of a youth cooperative that grow vegetables near the lake Hayk.

Adane and Moge work in Dessie for the Institute for Sustainable Development (ISD). Adane has earlier worked at the Ministry of Agriculture in South Wollo. Moge works part time at ISD, and part time at the South Wollo zone level of the Ministry of Agriculture. Together they provide training in the Push-Pull Technology to farmers, as well as to the Development Agents.

Omar works as a Development Agent (DA) in Gobeya and is in his forties. He has been working with agricultural issues for eighteen years, twelve years of which were spent in different *kebeles*. He has worked in Gobeya for two years. As a DA he gives advice to farmers regarding farming practices and helps the farmers in Gobeya to solve different kinds of problems with their farming. Occasionally he gives training on how to use fertilisers, and in new farming techniques. Sometimes, he also provides seed of improved varieties. It is the role of the DA to collect feedback from farmers about the current governmental agricultural programs and report these issues to the *woreda* office. The principles of PPT have been taught to the farmers in Gobeya for the last two years.

Tesfaye has the same position as Omar, but in Pasomille, and is about forty years old. He has been working as a DA in this *kebele* for three years, and before

that he had been working in other *woredas* for sixteen years. PPT is practised and demonstrated in a demonstration area at the local Farmer Training Centre.

3.5 Ethical Issues and Experiences from the Field

When doing field work in cultures which are new for the researcher there are several dilemmas, such as the difference of language, working with an interpreter, and understanding the local context (cf. Hajdu 2006). I have found the analysis part of this research challenging in the way that it is not always evident if my perceptions are accurate in an Ethiopian context. This is not only a question of scientific quality aspects, but also an ethical question in relation to the informants. The analysis must be as close to the stories of the informants as possible, otherwise research risks only reproducing the view of the author, who has the power to re-write stories of the informants and make too grand assumptions.

Except for the analysis, there has also been other challenges in conducting a field study. Something that has been very apparent during the field work and my stay in Ethiopia is that there has been some distance between me and the informants, which has been difficult to bridge, even if all the informants have been very friendly, open, and keen to answer the questions. I interpret this as partly caused by our different ethnicity and that in many peoples' eyes my prior characteristics has been as *faenji*, which means 'foreigner'. Gudina (2002) suggests that ethnicity is always a way to make difference between 'us' and 'them' – a non-stop process of 'othering', a process that I have been forced to face. I also interpret this distance partly deriving from a feeling of injustice between the global South and the global North, something which I base on informal dialogues, and comments by random people at the bus stop or in the street.

Finally, a difficult ethical issue in this work is to have a critical approach to my own background, and the presumptions that I carry. Ethiopians are affected, just as citizens from other African countries, of constantly being seen as the 'African other' by a eurocentric perception. This has often been discussed during my stay in Ethiopia, formulated as a frustration about how little Europeans know about African nations. Edward Said's (2004) reflection on how Europeans constructed the 'Orient', a notion he chose to call *orientalism*, can also be used in order to explain the power-relationship between the global South and the global North, and the post-colonial ideas of what Africa is; the stories told in Europe about African countries are almost always told from a perspective from the outside and it is seldom that the 'local people' get the opportunity to speak for themselves. My belief is that it is an ethical responsibility to be aware of this pattern and to avoid reproducing a stereotype or misleading picture of the Ethiopian countryside. One picture that I have been fed with in Sweden, through media, news, literature, films, and NGOs, is that rural people in sub-Saharan Africa are poor victims of corrupt governments, diseases, dramatic natural hazards, armed conflict, and a cruel game of globalisation and liberated world markets. My aim is to see beyond this view,

and instead see the farmers as actors, who make voluntary decisions, without neglecting the fact that there are many other factors affecting their degrees of freedom to act in a way they want.

These things combined have all affected my fieldwork in the way people think about me and which presumptions I carry with me, as a representative of the global North. Even if unaware of it, I have certain experiences from my background that colours the analysis in the thesis. The way I have chosen to handle these difficult questions is to use a phenomenological method, in which as big part as possible of the individuals' perspectives are in focus. With this approach my wish is to tell stories of the farmers in a way they agree with.

4 Driving Forces for Change

4.1 Possibilities and Constraints of the Push-Pull Technology

The way the farmers I have met motivate their decisions, for themselves and for others, is based on what one could call rational choice. They believe that PPT is a good solution of the problems with stemborer and *Striga* weed and this is the primary reason, according to themselves, that they have chosen to implement PPT.

There were four frequent motives given during the interviews; (a) increased yields; (b) more fodder; (c) better soil fertility; and (d) lesser use of pesticides. These arguments highly correlate with the declared aims of PPT as a method, mentioned in the earlier chapter.

Several of the farmers state that their yields of sorghum and maize are larger after they started to use PPT. Two of them, Almaz and Eyob, have seen an increase in harvest by 50-70 percent. However, few other farmers spoke in specific numbers.

The positive side-effect of *Brachiaria* grass, that it provides forage, is highly appreciated by the farmers, since there is little land for grazing around the village.

The third benefit expressed by the informants is increased soil fertility. This was mentioned by the majority of the farmers, even if the knowledge varied about the nitrogen fixing effect of planting legumes such as *Desmodium*.

The fourth advantage stressed by the farmers, is that PPT does not require pesticides. The arguments for this are (a) the impacts for the health for both humans and animals; (b) the degradation of soil; and (c) the costs of chemicals. Thereupon, the farmers regard PPT as a free method for preventing stemborer and *Striga*, compared to pesticides. One farmer, Eyob describes,

“The chemicals are very dangerous both for us and for our animals. They can make the animals and the humans blind and are also harmful for the skin. We pay much for the chemicals. It is also harmful to the soil, and to the microbes that lives in the soil. This PPT has no bad side-effects for our health.”

(Interview with Eyob, April 2015)

PPT is here seen as an alternative to other farming practices. One farmer, Mergya, appreciates that PPT is used in prevention. He argues that other techniques, such as

Integrated Pest Management¹ or traditional methods, are used after the symptoms of the pest already have occurred, which means that the pests have already done some damage to the plants before the farmer treats the pests.

There are three major obstacles described by the farmers in the implementation PPT. First, PPT requires a considerable amount of space. *Brachiaria* is planted in three rows (see *figure 1*). Whereas *Desmodium* is nitrogen fixing, it is an advantage if it is left in the field between the rows after harvest, even if the farmer plans to sow another crop next season. There is then no need to get seeds for *Desmodium* once again, and in theory the farmer saves both time and money. But, as the farmers often have a total area of less than one hectare, every square meter of land is precious. If they for instance want to sow *teff* the next season, they want all space they can get, and both *Desmodium* and *Brachiaria* will be taken away.

Furthermore, Eyob described how Push-Pull-plants are grazed by animals. There is a competition among the farmers to find forage for the animals, and cattle grazing in the farmlands after harvest is a common sight in South Wollo. Many farmers, for example Said, mentioned that he needs to buy fodder. Even if, according to the DAs, most households have some land in the hillsides, this is simply not enough to provide the forage needed. Since many farmers let their cattle freely graze in the fields, and this is an integrated part of the farming system, the problem brought up by Eyob can be difficult to solve.

Several farmers have struggled to get *Desmodium* to germinate. This could either be caused by poor quality of the seeds, or in the way the farmers handled them. Some farmers have solved this problem through growing seedlings, and then planted *Desmodium* as seedlings in the field.

The conclusion is that farmers implementing PPT are enthusiastic about the method. All the informants expressed that the method worked better with time. Clearly, the first year had been a disappointment to some of them, mainly because of poor germination of the seeds. Nonetheless, they were all determined to continue. Moreover, the biggest challenges, farming-wise, for implementing PPT in South Wollo is that the technology requires much space and that the practice to let cattle graze in the field after harvest undermines the growth of PPT-plants.

4.2 Understanding Driving Forces for Producing More

The major driving force for the interviewed farmers to shift to PPT is to increase their yields. Increased yield is a synonym to life improvement. In this section I will go deeper into why increased yields are so central to the farmers' decision-making. Moreover, I will analyse the driving forces through the lens of the 'food security' approach. Firstly, I want to understand the strongest threats to the farmers to remain food secure, and what strategies they use in order to meet these threats.

1 Integrated Pest Management is an approach to pest control, supervised by the Ethiopian Ministry of Agriculture. There are several steps of actions within this approach, where chemicals are the last action.

Secondly, I want to examine one of these strategies more closely, namely the strategy to gain a surplus to sell to the market.

Indeed, higher yields provide options for the farmers to better secure adequate amounts of food, as well as to sell the surplus at the local market. But higher yields alone do not guarantee food security for people. Within the food security approach, 'access' is a key word, trying to grasp the complexity of aspects affecting an individual or a household's food security (Webb & von Braun 1994). It is argued that the risk of individuals and households not having access to food derives from all aspects of livelihood as well as from environmental features (physical, health and socio-political). Hence, food security for an individual or a household depends on the natural, socioeconomic, and political context of every action in the food chain (resources, production, income, consumption, and nutrition). Each action within the food chain interacts and determines the outcome of key elements for successful food security; food availability, access, and use (*ibid.*). There are many factors that determine accessibility, such as price fluctuations caused by dysfunction of institutions or markets. The notion provides a tool for analysing the abilities of individuals to obtain *control* over food, and aims to see beyond the focus on food production (*ibid.*). With this complexity in mind, I will now examine the three reasons most frequently mentioned in the interviews limiting the households' food security; the risk of changing weather conditions, lack of savings, and scarcity of arable land. Even if I will focus on these reasons that were mentioned by my informants, there are many additional challenges to people's food security in South Wollo.

Firstly, changes of natural conditions were issues that many of the farmers mentioned, which can suddenly lead to a loss of productive assets. The rain-fed production makes the farmers in South Wollo vulnerable, in the way that the farmers are highly dependent on the rain seasons. During the time we conducted the interviews, the farmers were waiting in vain for the *belg* (small rains) to fall. Even if *belg* is not the main farming season, it is important for the food supply of the households (Haakansson 2009). When the rains do not come, all farmers are in the same situation and have to buy food, which makes the prices rise. The way farmers adapt to changes of natural conditions is further investigated in the last section of this chapter.

Secondly, most farmers do not have savings, which also makes them vulnerable and contribute to their susceptibility to change and external stress, as for example the shortage of rain mentioned above. The state of vulnerability among households in South Wollo has been much discussed, and Devereux and Sharp (2005) claim that rural Ethiopians perceive themselves to be poorer and more vulnerable than in the past, contradicting much qualitative research that has been done on the subject. Even so, the DA Tesfaye told a story about how farmers had started to use bank services. This was, according to him, one of the biggest improvements that he could see over the years. He told a success story of a farmer who had shown him his bank book, where he had saved 128 000 Birr. However, this is just one example; I also came across stories that challenge this view. For instance, Adane at the ISD

stated that farmers are today no more prepared for crisis caused by natural hazards, such as drought, than before.

The third parameter challenging households' food security is the scarcity of land of good quality. The land size for most farmers in South Wollo is less than one hectare. This is a central reason for farmers to produce in a more efficient way, but also to seek completely new ways of structuring farm activity. One example of innovations in farming system is the youth cooperative that Muhammed is a part of, where they grow vegetables together, borrowing land from their parents and from the *kebele*. In general, the youth in South Wollo have no chance of making a living of farming. To take over the farm is not an option until the parents cannot work any longer, and even when this moment occurs, the land is too small to split up among the siblings. Another example of a new way of structuring the farming is the transition from mixed-farming systems to specialized production of cash crops such as coffee, fruits and chat. One farmer who was not formally interviewed, but came in to the DA Tesfaye's office told us that he is much better off now when he grows only fruits and coffee. Even if his land is limited to 0,4 hectares, he is able to support his family.

"I have 0,4 hectare of land, [...] [and have] about 32 mango and coffee plants [...] The prizes are increasing. Thanks to the Lord, I don't need to ask anyone for money. [...] Before, we had to ask others for money. I am doing better than the farmers who are ploughing and sowing cereals or crops. So I harvest more than a crop farmer. I can harvest more, much more, than a crop farmer... so it's a great improvement. I think that the extension people and the ORDA are doing a good work. Seeing is believing – it's not only about talking. You should visit my fields."

(Anonymous farmer, from interview with Tesfaye, April 2015)

This step towards new crops and a definite break with cereals and animal keeping is uncommon in the villages, even if the MoA strongly recommend the farmers to grow more fruits (ISD 2015b). The shift of the whole production system is a great risk, which few are ready to take.

Another important reason for the scarcity of land is that in Ethiopia, all land is owned by the state, although the right to use land is managed by the local administration (the *kebele*), a restriction already in place under the *Derg* regime (Crewett *et al.* 2008). When the farmers speak of owning land, this means rights to land, but without transfer rights, such as sale or mortgage (*ibid.*). In addition, it is forbidden for a private person to sell or buy land, which is why many of the informants borrow land from neighbours, often under unfavourable contracts. Binyam and Eyob explain,

"Yes, because my land is in the dry area so I can't access the irrigation. If the farmers in the irrigation site, if they are too old and weak, I rent from them."

(Interview with Binyam, April 2015)

“Because I rent the irrigated land, half of the production is paid for land rent, this is the problem. If all the production was for me - I would be rich!”

(Interview with Eyob, April 2015)

Above quotes show that renting land is not only about getting *more*, but is additionally a question of getting access to the right land. Even for the farmers who have access to an irrigation system, without renting from a neighbour, this is a time-consuming activity. For one farmer, Almaz, the walk to this area took her two hours every day.

Returning to which strategies there are in order to meet the challenges above, I will now examine the way the farmers sell their surplus to the market. I have found two major factors why most of the farmers produce to the market, and do not only produce for home-consumption. The first one is very connected to the discussion about food security; farmers need money as a security, if something unforeseen would happen. This is how the intricate dynamics of food security has come full circle; money is required to be food secure, but to get money the household has to meet their needs before selling to a market and gain money (cf. Ellis 2003).

Secondly, the farmers spoke highly of education, and want to send their children to university. Even if the universities are free in Ethiopia, clothing and accommodation are costly, and this seems to create a new challenge for the household. When the children still live at home, their needs can be met by the food grown at the farm. On the contrary, everything costs in the city.

Selling to the market is, according to most of the farmers interviewed, their only income. Hence, agriculture is a key for them to gain food security. All the farmers sell some of what they grow or have produced at the market, even if the amount varies from farmer to farmer. The ones producing vegetables, fruits and chat always sell these products in the market, whereas the farmers who only grow cereals sell this when they have got a surplus. This pattern also depends on the overall economy of the household. The better-off farmers often have a more diverse production (cf. Bogale & Genene 2012).

These patterns could be explained as strategies of first grow food for the family, secondly grow fodder to the animals, and then thirdly grow fruits or vegetables for market purpose. Cash crops are in this sense something the farmers grow when they can ‘afford it’. This is showed in the way Eyob speaks of how the scarcity of food for both humans and animals was the main driving force for people to engage in an irrigation project in the 1980s. He said,

“We have had many problems in this *kebele* throughout the years with famine. The problem at that time, the shortage of food, was the driving force to build the irrigation. We didn’t have enough food for ourselves, nor for our animals. [...]Through the irrigation we could get more fodder to the cattle. Then we continued [to expand the project], until this time. [...] [Now we also] grow different kinds of fruits and vegetables.”

(Interview with Eyob, April 2015)

In the above quote, Eyob describes how the primary aim with the irrigation project was to produce food directly to the families in the village. Later on, when things got more stable, they started to produce animal forage, followed by cash crops. I interpret these stages of different production as a common livelihood strategy in the area, also connected to food security. The farmers cope with the risk of food insecurity by prioritising having food at the table produced at the farm.

In short, higher yields is the principal driving force for changing farming practices, which is both a question of food security, as well as a question of meeting other economic needs, such as sending the children to university. To be food secure is here seen not only as to be able to grow the food needed for a healthy life, but also to have the possibility to create a buffer through selling some surplus at the market and by this having access to food in other ways than from the farm, in case of sudden changes.

4.3 Becoming Independent and Being a Model

Another driving force for farmers to implement new farming practices is to become independent. On our way to Almaz's farm, we met a group of women. Almaz asked why they were not at the meeting that was held at the FTC and then told them that more women were needed at the meeting. When asking her why this was such an important issue. Almaz responded that it was essential to create change, that is needed in order to be independent from aid, especially the aid which comes in form of direct money or food. This came up already during our very first interview, but followed us throughout the work. As Adane at ISD said; "Who wants to be dependent anyway?".

South Wollo is famous, nationally and internationally, for their great struggle against famine. Between 1984 and 1985 over eight million people were affected by famine and over a million people died (Haakansson 2009). This history explains why Non Governmental Organisations have been major actors in the area since then. With aid there is a risk of creating dependency, something that has been much discussed within 'development studies' (cf. Moss *et al.* 2006). All Ethiopians I have met during our field work are proud of their culture. Not a single day has passed by without us hearing the sentence "this is our culture", explaining different customs, from sharing food to the way the coffee ceremony is held. Being dependent on aid is simply *not* a part of this culture. The farmers sound proud when they tell us about their ability to cover their expenses or family needs.

Most of my informants were model farmers. They were all proud of this fact, although they put more or less attention to it. I find that one driving force to change farming practices may be to fulfil the expectations of the local FTC and the DAs. There is much prestige in being a model farmer; in the long run it can be interpreted as recognition from the Ministry of Agriculture, and it is a position that the farmers want to hold on to. By being a model farmer one gets attention, appreciation and support from local authorities, and sometimes also the admiration

of other farmers. Moreover, one of the DAs, Omar, held a speech during our interview about the great need for the youth to stand on their own feet. Omar argued strongly that dependence is ‘toxic’ and that it is a hinder for young people to take care of themselves. That an agricultural expert has this image of aid and dependency is interesting, as it tells us something about how this is seen among the DAs, and possibly also among many model farmers. Being a model farmer can be one way of getting independence, even if it implies a bigger reliance on the local institutions, such as the FTC and the DAs.

4.4 The Dynamics of Climate Change

The final major incentive for farmers to change farming practices is the change of natural conditions. The farming practice in South Wollo is often described as based on traditional knowledge (cf. Bogale & Genene 2012), yet there is also evidence that traditional agriculture is in no way static; instead it is in an infinite process of change (cf. Eakin 2005; Altieri & Toledo 2011). This is something which I have found proof of also in my own research. When asking the farmers about the past or about historical events, it becomes clear that the farmers have changed their production, may it be in what they are growing or how they do it. Many farmers mentioned practices, such as compost, sowing in rows, or chemical fertilisers. Changes which they often did not think about at first, was use of irrigation and the land reforms. Even the farmers who do not seem to be open to changes in the way they talk, are forced to use new practices in order to adapt to new conditions, may it be natural, political, or social. For instance, Mergya observed that,

“In the past, nature was very good. It provided everything that we needed. There were no insects. *Keremt* was good. And we could harvest what we had sown; there were no big variations in yields. But now, nature has changed, for example the drought. There is a shortage of rain, and uneven distribution of rain. And there are so many insects in the farmland. To grow pepper in our area nowadays is very, very difficult, because of a disease. Before, it was almost overproduction here. [...] But nowadays, the seasons are challenging us. The drought, the diseases, the insects, they are the reason why the government recommend us to use improved varieties, different methods and short-period-varieties. So, almost everything is different now.”

(Interview with Mergya, April 2015)

Indeed, climate change is playing a cruel game with the farmers of South Wollo. The short rains (*belg*) are becoming more unpredictable (Haakansson 2009). The farmers in this area normally sow twice a year – once after *belg*, and once after the long rains (*keremt*). If they have access to irrigation, they can grow vegetables all year round. When *belg* does not come, they are fully dependent on the second farming season for providing their annual consumption of food. Adaptation to climate change is needed in some way. Mergya remarked,

“We would like to have more short-period-varieties, fast-growing plants, because of the shortage of rain and other challenges as birds and insects. For example, we grew wild *teff* previously, which took from five up to six months to ripen.”

(Interview with Mergya, April 2015)

Using short-period-varieties is one way to cope with drought, or failure of rain seasons, that is recommended by the FTCs in the area. With these varieties, the farmers do not have to rely on the length of the rains. Nevertheless, farmers see many benefits with the old varieties, even if they need a longer period of time to mature. They can survive longer without rain, and they have long straws, which serve as fodder to the cattle, and are used for construction as well as fuel. This is an example of how complicated it is for farmers to make good decisions in coping with climate change. The solutions provided by the agricultural experts do not always take all aspects into account.

Furthermore, Mergya’s quote above can be read as he has gained knowledge to make well-grounded decisions about how to cope with the risk of changing climate conditions, where he is able to reason about pros and cons. This makes his plans both part of a risk strategy, defined as a planned response to potential threats to household well-being, and shows a big adaptive capacity to alter activities to diminish present threats (cf. Ellis 2007, 13; Eakin 2005). Eakin (2005) suggests that households’ adaptive capacity and management of climate risk is not simply a question of their ability to directly face climate impacts. Instead, adaptive capacity is about the households’ ability to engage in livelihood activities that make them less vulnerable to climate. This is further a question of having sufficient degrees of freedom to make decisions in this way (*ibid.*).

Finally, a strong driving force for farmers to shift agricultural practices is to adapt to climate change. Decisions about changing technologies or crop varieties are not easily made. The adaptive capacity is heavily based on the farmers’ degrees of freedom to make decisions, including which knowledge they have access to.

In summary, the positive effects of PPT, according to the farmers, are increased yields, more forage, better soil fertility, and less use of pesticides. The negative effects are that PPT requires much space, that the Push-Pull plants are grazed, and that the seeds fail to germinate. During my field study, I have found four main factors that drive farmers in South Wollo to shift farming practices, which are (a) producing more; (b) becoming independent; (c) being a model for others; and (d) adapting to changing conditions.

5 Farmers and their Decisions

In order to understand how decisions are made among farmers, some emphasise the necessity to encompass questions of power and politics cf. Scoones 2009). Within for example the sustainable livelihood approach, it is claimed that institutions – ‘the rules of the game’ governing access – are always mediated by power relations (*ibid.*). Also, it is stressed that the economic attributes of livelihoods must be seen as mediated by social-institutional processes (*ibid.*). In the following chapter these questions will be addressed, in order to better understand the local political landscape that affects farmers’ decision-making in South Wollo, when it comes to implementing new farming technologies. Here, the drivers of change approach will guide the analysis.

5.1 Institutions, Politics, and Power

From a political perspective, the FTC and the DA can be interpreted as institutions, which to a great extent affect farmers’ decision-making. The FTC enables farmers to make well-grounded decisions in providing new techniques, methods and knowledge. Meanwhile, the FTC is also a key actor, together with the local *got* committees and the *kebele* administration, in the selection of whom in the farming community that will get all this information, and who will not. In this section, I will take a closer look at the FTC as an institution and how the DAs interpret their role, with help from a relational approach to poverty. Thereafter, I will discuss how these power-relations between the FTC and the citizens can be understood, using the ‘two-dimension’ approach to power.

Firstly, it has been clear during the interviews that the FTC is important for many farmers’ reasoning about decisions. For instance, Mergya says,

“When I take decisions... I look on how the neighbours do. If it works or not.. the new technology. The DAs are also important when I decide what to do. And when we see the benefits, or the improvements from the new technologies, the others also follow, and they leave the traditional technologies.”

(Interview with Mergya, April 2015)

It should be clarified that the importance given to the FTC in farmers' decision-making partly derives from the selection of informants and that the model farmers in general have close relations to the FTC. However, the DAs have much influence on the farmers' decision-making, not only for the ones who use the services. Those who are *not* selected to take part in trainings will be affected in the way that they are left in a worse position for making their decisions. This makes it interesting to analyse how the DAs think and act about the villagers.

I argue that the DAs interviewed lack a 'relational' approach to poverty, i.e. a view of poverty as a consequence of historically developed economic and political relations and as an effect of social categorisation and identity (Mosse 2010). Furthermore, I argue that the lack of broader perspectives of poverty among important institutions leave many poor in the villages behind. One example of this view is mentioned in the previous chapter, when the DA Omar called dependence on aid 'toxic', indicating that some of the farmers were not 'active' enough because of aid. Moreover, both of the DAs spoke in the interviews of lazy and close-minded farmers. When discussing why some farmers do not come to trainings, the DA Tesfaye argues that the reason is,

“..because they are close-minded. They only use the traditional knowledge and do not want to use newly recommended practices. The problem is the way of thinking.”

(Interview with Tesfaye, April 2015)

In the perspective of the DAs, it is the farmers themselves that carry the responsibility for their situation; if you are not successful, it is because of laziness. By this, the poor are accused for acting or thinking wrong. These kinds of statements by the DAs may explain why some farmers are addressed by trainings at the FTCs and some not. If the DA believes that some farmers are lazy and do not *want* to participate, it is not surprising that these farmers are not invited.

Another way of analysing the power relations between the farmers and the FTC is through a closer look on who is setting the agenda. It is argued that a relational approach to poverty needs to integrate a multidimensional conception of power; both visible power, such as political decision-making, but also the second-order 'agenda-setting power' (Lukes 2005, cited in Mosse 2010). The 'two-dimension' approach to power sets the terms in which poverty becomes (or fails to become) politicised and can explain why the interests of poor people often are excluded from the political agenda (Mosse 2010). As mentioned earlier, the selection of model-farmers affects the farmers' possibilities to make rational decisions, and I will now further investigate what thoughts the informants have expressed about the selection process.

I argue that the selection process of model farmers serve as an example of how power can be manifested in the non-issue, the non-decision (cf. *ibid.*). Systematically throughout the interviews, the DAs did not talk about the poor farmers, but spoke exclusively about the model farmers or the ones coming to trainings. One example of this is how the DA Tesfaye conveys that it is only the

very poor that receive help from the Productive Safety Net Program (PSNP), but after some questions it becomes clear that it is actually a third of the population who work for the program. If so, then an even bigger proportion is dependent upon it, since not all in a family work in the program. If two in the family works for money or food and the family consist of seven individuals, then seven is the accurate number of how many that depend on the program. The view expressed by the DA is important to the farmers' prospects to make decisions.

One reason for this neglect of the poor population could be that the DAs simply wanted to focus on the positive results when talking to researchers and *farenjis*. It can also be seen as a sign of not wanting to include the poor families as a part of their responsibility.

However, earlier research of how the FTC trainings reach different income groups shows that better-off farmers in Ethiopia often get better access to assets and institutional support, compared to the poor, that enable the better-off farmers to engage in better livelihood activities and resource management (Oumer and de Neergard 2011). Additionally, women are seldom reached by the trainings (Moogues *et al.* 2009), which is also the case in PPT project (ISD 2015). Connecting this to the two-dimension of power, it shows that the most vulnerable households are not addressed in the way trainings are organised.

This phenomenon of unequal treatment of households in the interaction with authorities can be analysed with the 'drivers of change' approach. Due to this, every decision-making theatre has 'gatekeepers' (Leftwich 2007). Gatekeepers are defined as agenda setters, who can largely determine which issues, demands or expressions 'get through' and which do not (*ibid.*). In my point of view, *got* committees and the DAs can be seen as important gatekeepers, who can largely set the local agenda in the selection of model farmers. An example of this is how some informants insinuated that the selection is made based rather on the social status or the relation to the government, than on the farmers' skills and good practice.

Relating these issues to PPT and the 'drivers of change' approach, Heymans and Pycroft (2003) argue that any strategy for change requires an understanding of the underlying rules of political and social systems, and the extent to which they create space for agents to either drive or prevent change. Moreover, they also state that donors often target organisations and individuals as 'agents of change' and that there is a common perspective that such agents will raise awareness, taking issues on board and mobilise resources (*ibid.*). This description is very similar to the outset for the system of model farmers. However, Heymans and Pycroft also admit that the success or failure of change processes also is affected by the commitment of pro-poor agents (*ibid.*). Thus, by focusing on the individual actors, such as the model farmers, projects may fail by neglecting the political structures. I argue that the farmers who are not invited to training are in a worse position to make well-grounded decisions, than those who attend trainings. The reason why some do not get this chance is political, and derives from the structures of selecting farmers to the trainings.

In short, the lack of relational perspectives on poverty, the tendency to neglect the poor farmers, the unwillingness to invite everyone in the village to the trainings, and the fact that selections of model farmers easily could be made upon other criteria than farming practices, leaves some question of the legitimacy of the FTC as institution. This points to a problem with decentralisation. Ellis (2005) claims that a naive faith in local democratic processes has dominated development studies and the work of NGOs in the past decades, and argues that instead of bringing up the 'voices of the poor', decentralised authority can also become a part of the problem of rural poverty. Clearly, the DAs interpret their role as being a help for the model farmers. Important for this thesis, is that if gatekeepers such as the *got* committees and the DAs get more power and meanwhile lack a relational approach to poverty, this may hinder a big proportion of farmers to get relevant information. This leaves them in a worse position for making rational choices. This needs to be considered in the future when selecting the participants of PPT.

5.2 Relations and Social Structures

One way to understand the questions of power in this context is through opening the door to the complex web of social relations and structures. In this section I will look at the structural relations in the three villages, affecting farmers' decision-making. Structural features are in this thesis defined as 'natural and human resources, economic and social structures, and other non-institutional facts' (cf. Leftwich 2007). Moreover, I am in particular interested in how 'social trust' (Putnam 2011) between different agents concern the changing of farming practices. Crucial to this discussion, is that farmers' decisions are based upon additional factors than rational choice in an economical sense. What makes methods meaningful to farmers can sometimes become clearer when taking the social structures into account.

The reason I suggest farmers' decisions are not only results of rational choice, is mainly because of the uncertainties among the farmers about the results of PPT. As mentioned in the previous chapter, farmers show enthusiasm over PPT, even if it is often unclear to what extent the main goal, to remove stemborers and *Striga* weed, is achieved and how PPT has affected yields. Even if PPT is a multifunctional method, with many positive side-effects, these are not alone sufficient reasons to be fully satisfied with the technology. This shows that decisions are not only based on rational choice and experiences of the technology. I argue that one reason why they are happy about the method is because of their trust in experts at the FTC and ISD. This trust also plays an important role in calculating the risk of trying out a new technology.

To show how PPT becomes meaningful for the farmers, I will once again discuss the relation between the DA and the farmers. As mentioned before, of those informants who have implemented PPT, all of them expressed that they had good contact with their DA. Binyam says,

“I use all the knowledge and expertise regarding the natural resource management, the crop and animals . For example, I have cows for breeding [...] and I engage in all these activities. I have all these activities [promoted by the FTC] except honey. So I use their advice, their recommendation, their knowledge.”

(Interview with Binyam, April 2015)

Similar to the previous discussion about why the DAs are important to decision-making, the quote above can also be a result of the selection of informants. The ones who have so far implemented PPT are those who have strong connection to the FTC. This trust is not shared by everyone in the community. For instance, Said, who is not a model farmer, says,

“That [model farmers] is a good thing. If they are active and participate they will be called a model farmer. But.. about their wealth, only Allah knows.”

Josefin: “Do you use to go to the model farmers and look at their farms?”

“I don’t go there. They don’t ask me to, and even if they did I wouldn’t go.”

Josefin: “Why not?”

“I am not interested of their work.”

(Interview with Said, April 2015)

Said would not say why he was not interested in the model farmers’ work, but the quote shows that the DAs do not influence every households’ decision-making equally and is something that I will come back to in the end of this section.

However, the trust given the DAs by the model farmers and the farmers that have implemented PPT, can be explained as a ‘social capital’ (Putnam 2011). This notion tries to grasp societal phenomena that are neither economic capital, nor human capital, such as knowledge or experience. Drawing from Putnam’s work, the trust among the model farmers in the local FTC could partly be explained by their in general high grade of participation in the *kebele* and the local community. Almaz and Rihana say,

“When I have free-time, I spend my time there [at the *kebele*]. Unless I’m in the field, I can go there and participate in the demonstration sites [at the FTC].”

(Interview with Almaz, April 2015)

“I have participated in the *kebele* activities since I was young, because of that I’m accepted by the *kebele*. My father is a religious father, so I have participated since I was a girl. We [the family] are social, and we trust in each other in the *kebele*.”

(Interview with Rihana, April 2015)

Both Almaz and Rihana have been active in different ways in the *kebele* since they were young. Eyob works several days per week at the *kebele* with land management issues. Mergya and Tsegereda describe how they engage in the

community, as in for example putting up fences around the school and joining meetings at the *kebele*. The farmers, who have so far implemented PPT, are all involved in the community. Putnam argues further that the trust of citizens in institutions facilitates different types of networks, and that this often is a strong driving force for increased engagement in the community as whole. The engagement in the local community among the interviewed farmers points to that there is social trust in both the administration and the local community. Meanwhile, Said's attitude towards the model farmers and the DA shows that there are people in the communities who do not have this trust, making social trust something that can exist in a society without being shared by everyone.

So how is the social trust linked with decisions? It appears that the trust in agricultural experts is crucial for taking risks, which is an inevitable part of making decisions. For those households getting their entire income from farming, every decision about new technologies needs to be given careful consideration. The reasoning about risk-strategies was maybe most visible in the interview with the farmer Rihana. She had a big argument with her husband before implementing PPT. The husband was afraid that they would get smaller yields, due to the space that PPT-plants require. Rihana says,

“I am happy to learn from new technologies. But my husband asked me “What will you do if this technology fails?”. Then I answered “Let's try it. If it fails it doesn't matter and if it success, we'll share the success”. One of my arguments was that if this technology is recommended by experts, by scholars, it cannot be bad.”

(Interview with Rihana, April 2015)

Some of the differences in attitudes between Rihana and her husband towards taking risk, could be explained by their different education level. Rihana has longer education than her husband, and when answering how they share the responsibility for the farm, she answers with a smile that she maybe takes a 60 percent responsibility and her husband 40 percent. I also interpret that Rihana has a strong trust in 'experts', which could be explained by her long engagement in the *kebele*. The farmers have also expressed their trust in ISD and in almost every interview the farmers proudly tell how the experts from ISD are amazed by the outcome of the use of PPT. Also the DAs have stressed how ISD supports the farmers. The attention given to the farmers, I argue, is a strong driving force for the farmers to proceed and continue with the method. Additionally, the trust between the farmers, the DAs and ISD is crucial for taking bold decisions.

In summary, experts are central to many farmers' reasoning about decisions and choice of farming practices. Despite the risk, shifts of farming practices are made thanks to trust in the experts' advices. Since trust is so central, it is crucial that organisations like ISD maintain the relations. Coming back to what Said expressed, his lack of interest in the work of the model farmers challenges the way trainings are held, since the system of model farmers presumes that the farming community will follow automatically if the already ambitious farmers get information about

new farming technologies. This is often explained by the assumption that farmer-to-farmer interaction works better than expert-to-farmer communication. A risk with this assumption is that some farmers who, in similarity with Said, do not have close contact with the model farmers or the FTC, will not be reached by the introduced technologies. This is a big challenge that must be addressed if the PPT project wants to reach all parts of the farming community in South Wollo.

6 Conclusions

A farmer's decision-making, and the various contexts they are a part of, are complex and dynamic. There are many different reasons why farmers change their farming practices, including both voluntary and involuntary actions; some of them are planned strategies for life improvements, while others are reactions to a dynamic and changing environment. I argue that PPT becomes meaningful to farmers when it both meets the 'rational' requirements in life (money, food, higher yields), makes sense to the farmers in their social context (depending on relations with experts, local authority, etc.), and meets the priorities of the farmer (i.e. meets recognised problems).

An important point that has been made is that the farmers are very positive towards the technology, even if they may not know if the main goal has been achieved. This points at the presence of more factors, than the direct economical ones, affecting the farmers' attitudes. The farmers who have up to this point implemented PPT are model farmers, who trust both the local Development Agents and the representatives from ISD. This trust has been crucial for the farmers when calculating the risk of trying the new technology.

This study has also shown that PPT training mainly addresses households with good social relations in the community, and with a relative stable economy. Women are for instance seldom reached, which is shown by the statistics of participating farmers (ISD 2015). This is a conclusion that has been drawn in other studies as well (Moogues *et al.* 2009). Relating this to the 'drivers of change' approach, Heymans and Pycroft (2003) argues that any strategy for change requires an understanding of the underlying rules and relationships of political and social systems, and the extent to which they create space for agents to either drive or prevent change. In my point of view, gatekeepers (agenda setters), such as the *got* committees and the DAs, can largely determine which issues, demands or expressions 'get through' and which do not in the selection of model farmers, which highly affect farmers' decision-making. This system prevents farmers with poor social status to attend the farmers training, which in the long run hinders them to get the information needed to make decisions on a rational basis. Following Ellis' (2005) claim that a naive faith in local democratic processes has dominated development studies and the work of NGOs, this thesis questions the normative

statement that the poor automatically are better addressed by decentralised and local authorities. Instead of bringing the 'voices of the poor' to the agenda, decentralized authority can become a part of the problem of rural poverty. This issue needs to be considered when in the future designing the execution of PPT.

During the field work I mostly had contact with model farmers. Further investigation of how the non-models and the poor households think about their possibilities to make the decisions they want would be appropriate. It would also be interesting to further discuss the findings in this thesis related to agroecology, which emphasises the capability of local communities to experiment, evaluate, and scale-up innovations through farmer-to-farmer research and grass-roots extension approaches (Altieri & Toledo 2011). With this outset, it is in my point of view crucial to take the local context into consideration before making assumptions that local administration and decision-making will include all part of the community and enable the households to make well-grounded decisions about their farming practices.

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