Wageningen University - Department of Social Sciences

MSc Thesis Development Economics

A Socio-Economic Impact Study of the DE Foundation Coffee Project Peru

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I. Acknowledgements

Having the privilege of living in a prosperous country such as the Netherlands, getting the opportunity to develop my knowledge through good education and being able to travel the world, are not issues which I take for granted. Instead I hope to use my knowledge and my opportunities to contribute to the lives of those for which they are not so common. This thesis is one of the ways in which I hope to achieve this.

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II. Summary

As a consequence of several developments in the coffee market, the coffee price has decreased significantly in the last decades. Combined with the overall poor economic and institutional environment of coffee farmers in developing countries, this has resulted in a decrease in the social, economic and environmental sustainability of the livelihoods of small scale coffee farmers in many parts of the world. Within this context, and within the context of Corporate Social Responsibility of large multinationals in the coffee sector, a support project was initiated in the Ubiriki valley of Peru in March 2003, sponsored by Sara Lee and managed by the DE Foundation through Plant Research International Wageningen. The broad scope of the project already becomes apparent of the activities analysed in this study, being the Farmer Field Schools in which farmers receive capacity building, the establishment of a producer cooperative and the certification of coffee.

The purpose of this study is to contribute to the understanding of the role of these types of projects in poverty alleviation by performing a quantitative impact study of the DE Foundation Coffee Project in Peru. The main research question of this study is 'what has been the socio-economic impact of the DE Foundation Coffee Project on the livelihoods of the households in the Ubiriki valley?

From a review of the literature it becomes clear that increased income is but one of the potential benefits of projects that incorporate both market-related as well as additional aid activities. Other impact areas which have been identified are for example related to production costs, market access, local capacities, access to credit, community development, gender equity, coffee quality and a sense of ownership. The presence and size of the impact is however often indefinite.

One of the shortcomings of much impact research is that the relation between the project activity and the impact is not always clearly explained. The input-output-outcome-impact framework is a framework which can be used to structure these relations and underscores the need for differentiating between direct and indirect impact. The framework will be combined with the sustainable livelihood framework. The use of this framework makes it possible to highlight the most important socio-economic impacts at household level while explicitly depicting and interpreting these results into the 'big picture'.

For evaluating the impact of the DE Foundation Coffee Project in Peru, a counterfactual is constructed to estimate what the situation of participating farmers would have been, had they not participated in the project. Several data collection techniques and data analysis methods were used to construct this counterfactual. In the first phase of fieldwork several qualitative data collection techniques were used including he revision of key documents, informal observations and interviews, and focus group discussions. Based on this information the socio-economic indicators were developed and a survey was constructed in order to measure those impacts. The information is also used to support and explain the result of the quantitative analysis and to present them within the analytical frameworks. In the second phase of fieldwork 208 structured surveys were conducted, divided into participating and non-participating farmers. The sampling method was designed in such a way as to minimize the differences between both groups. The remaining difference was solved statistically by applying and partly combining propensity score matching and regression analysis. Combined with a direct comparison of the survey data, the use of both methods provides a convincing series of evidence on the impact of the project.

From the analysis it becomes clear that the project has had a significant socio-economic impact within its five years of existence mainly in relation to an increase in capacity building, membership of producer organizations, a broader and more intensive coffee production process, an increase in production and processing equipment, coffee certifications, self esteem, price and diversification of marketing channels. The socio-economic impact relates to the livelihoods of farmers in many different ways; through different types of assets, through structures that shape the livelihoods of the farmers, the livelihood strategies to achieve certain livelihood outcomes, and the livelihood outcomes themselves. This broad impact corresponds to the broad scope of the project and corresponds to the main social, economic and environmental problems indicated by the farmers at the start the project.

III. Abbreviations

CACSVU	Cooperativa Agraria Cafetalera Sostenible de Valle Ubiriki
CSR	Corporate Social Responsibility
DFID	UK Department of International Development
ICA	International Coffee Agreements
ICO	International Coffee Organization
ICS	Internal Control System
FFS	Farmer Field Schools
FLO	Fair Trade Labelling Organization
MSC	Most Significant Change (study)
PSM	Propensity Score Matching
SAN	Sustainable Agriculture Network
SI	Sustainability Indicator (study)
SLF	Sustainable Livelihood Framework

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1 Introduction

1.1 Background

Despite the fact that the indicator price of coffee fell by more than 50% between 1997 and 2001 and the price in 2001 was the lowest since 1971, many developing countries, including Peru, have rapidly expanded their coffee production over the last decade. In the year 2007 Peru was one of ten largest exporters of coffee in the world (ICO 2007). In the figure below the most important coffee regions in Peru are indicated

Figure 1: The Important Coffee Regions of Peru

Source: Project Proposal 2002 (Belder 2002)

Approximately 34% of this coffee is produced in the central region, including the department of Junín. One of the coffee producing provinces in this district is Chanchamayo, indicated as the Selva Central in the figure above. Of the approximately 142.000 inhabitants 70% live in rural areas and depend to a large extent on agriculture. Due to climatic conditions the Chanchamayo province is very suitable for coffee production, which was introduced 15 to 20 years ago and about 8% of the population depends on coffee. (den Belder 2002)

In the Ubiriki valley, where the project is located, the importance is even higher, since an estimated 80% of the farmers depend almost entirely on coffee. The Ubiriki valley is one of Peru's 26 poorest economic regions and Gross Domestic Product (GDP) in this region is about $180 while average GDP of Peru is $300. The base-line study conducted at the start of the project further indicated that the area has a high rate of child malnutrition, lack of healthcare, safe drinking water, sanitary facilities, education and little access to public facilities. (den Belder 2002) These statistics illustrate the overall poor conditions in the region before the start of the project.

At the same time, the data above illustrates the importance of coffee as a source of potential development at household level and for the region in general. However, as a result of low product quality, lack of market knowledge and sub-standard storage and transport facilities, farmers often have to sell their product to low paying local middlemen (den Belder 2002). The situation resulting in low quality coffee and low prices have been worsened by the guerrilla activities until the mid-90s and the plunge in coffee prices at the world market as a result of the coffee crisis in the mid nineties.

1.2 DE Foundation Coffee Project in Peru

The problems related to the lack of organization at farm level and the low coffee quality were recognized by Prodelsur, a processing and exporting agency who by the time bought coffee from about 388 families in the Ubiriki valley and exported this to, amongst others, Sara Lee/Douwe Egberts. As a result Prodelsur established La Central, hereby joining six relative new farmer associations in one single cooperative. Besides commercializing coffee, La Central provided some conventional technical assistance with support from Sara Lee, although those activities were considered very limited since only 5% of the farmers participated. (den Belder 2002)

Considering the importance of coffee quality for international roaster such as Sara Lee and within the context of the rising awareness on Corporate Social Responsibility of such roasters, a dialogue between different stakeholders was initiated and resulted in the development of several activities in the Ubiriki valley. The initial paths for improvement identified by the project focused on the need to increase income by reducing costs, increasing yield and the quality of coffee. The main beneficiaries are therefore the coffee producers, with an initial focus on those farmers with less than three hectares of coffee cultivation. Prodelsur could broaden their capacity to identify and improve local production, processing and commercialization processes. Besides this, they could benefit in terms of a better image, as was the case for SaraLee/DE. (den Belder 2002) The activities were bundled in the 'Peruvian Coffee Producers Quality Support Project' which was initiated in March 2003, sponsored by Sara Lee and managed by the DE Foundation Coffee Project in Peru through Plant Research International Wageningen[1].

Some of the key activities of the project are the development of an extension group; organization of Farmer Field Schools (FFS) as focal points of training and extension; stimulation of farmers to learn from their own experiences through registration of field activities in field books; adaptation of tools for the farmer promoters in charge of assisting the FFS to give better service to farmers; testing of alternative crop management practices; establishment of a cooperative and certifying part of the coffee production. (den Belder 2005) Taking into account the focus of research (see 1.5), the two main activities that will be analysed are the Farmer Field Schools (FFS) and the organization of farmers in the producer cooperative Cooperativa Agraria Cafetalera Sostenible Valle de Ubiriki (CACSVU). In paragraph 5.1, more information on those activities will be given since it provides the answer to the first research question of this study (see 1.6).

1.3 Problem Definition

The problems faced by the farmers in the Ubiriki Valley are similar to the problems faced by coffee farmers worldwide. Different approaches have been implemented in order to improve the living conditions of which the DE Foundation Coffee Project in Peru, characterized by market-related and additional aid activities, is one example. Although this project has its own specific characteristics, it will be argued in the literature review (chapter 2) that it can be compared to Fair Trade projects in many ways. Considering the recent upsurge of fair-trade initiatives[2] in general it is important to evaluate the contribution of this approach to poverty alleviation.

There have been several in-dept studies that evaluate the impact of these types of projects using qualitative methods. This growing amount of literature sheds light on the context in which these projects are implemented and the potential role these projects have in the livelihoods of small-scale coffee producers. However, little quantitative research has been performed on the impact of this type of projects, especially not the type of research that uses a group of farmers that did not participate in the project in order to construct a realistic counterfactual, i.e. what would have happened, had the project not been implemented? The lack of such impact studies contributes to the uncertainty on the contribution of fair-trade initiatives to poverty alleviation of coffee producers.

[1] The 'Peruvian Coffee Producers Quality Support Project' will be referred to as the *DE Foundation Coffee Project in Peru* or simply *the project* in the remainder of this thesis.
[2] Initiatives incorporating market-related aspects and additional aid activities are referred to as *fairtrade initiatives* in the remainder of this paper.

1.4 Research Objectives

The research purpose of this study is twofold. On the one hand, based on the problem definition above, this study will contribute to the understanding of the role of fair-trade initiatives in poverty alleviation of small-scale coffee farmers, by performing a quantitative impact analysis of the DE Foundation Coffee Project in Peru. Outcomes of this research can thus contribute to the discussion on potential solutions to the situation of small-scale coffee farmers in developing countries.

On the other hand, it is important to measure the impact of the project to be able to evaluate the effectiveness of its activities in developing the region or in decreasing poverty in general. The conclusions would provide the project with ideas about how to reshape the project in such a way that successes are strengthened, limited positive impacts are reinforced and negative impacts are reduced.

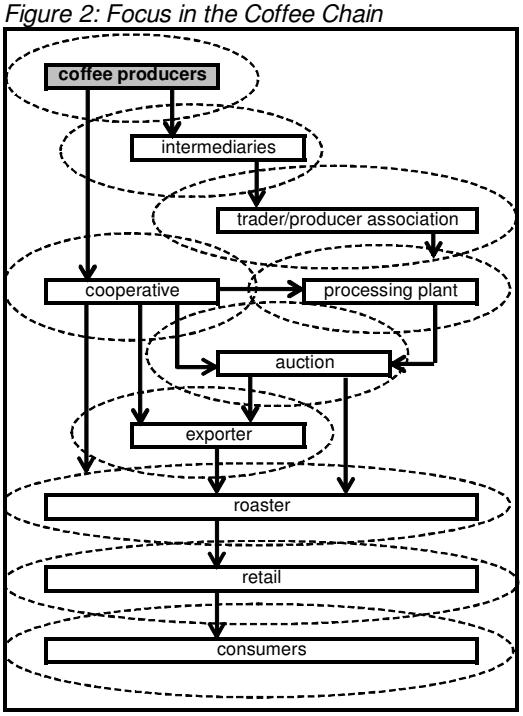
1.5 Research Focus

Considering the scope of the topic and the range of activities of the project, several decisions were made with respect to the focus of research. As will become clear below, this study focuses on the first level of the coffee chain, only on those farmers participating in the FFS and finally on the socio-economic impact of the project. It is important to realize that this impact is therefore only a small part of the potential overall potential impact.

First Level of the Coffee Chain

In the figure below an overview of the general coffee chain is given. Each link in the supply chain is surrounded by a circle that overlaps with the circle of the next link. This represents the environment in which every chain member is embedded and where a direct and/or indirect impact could be expected. The impact study could focus on any or all of these chain members, the linkages between them or the environment in which they are embedded. This thesis focuses on the first link in the coffee chain, being the producers, and although the external environment is taken into account, it is not analysed what the impact of the project is on this environment.

Figure 2: Focus in the Coffee Chain

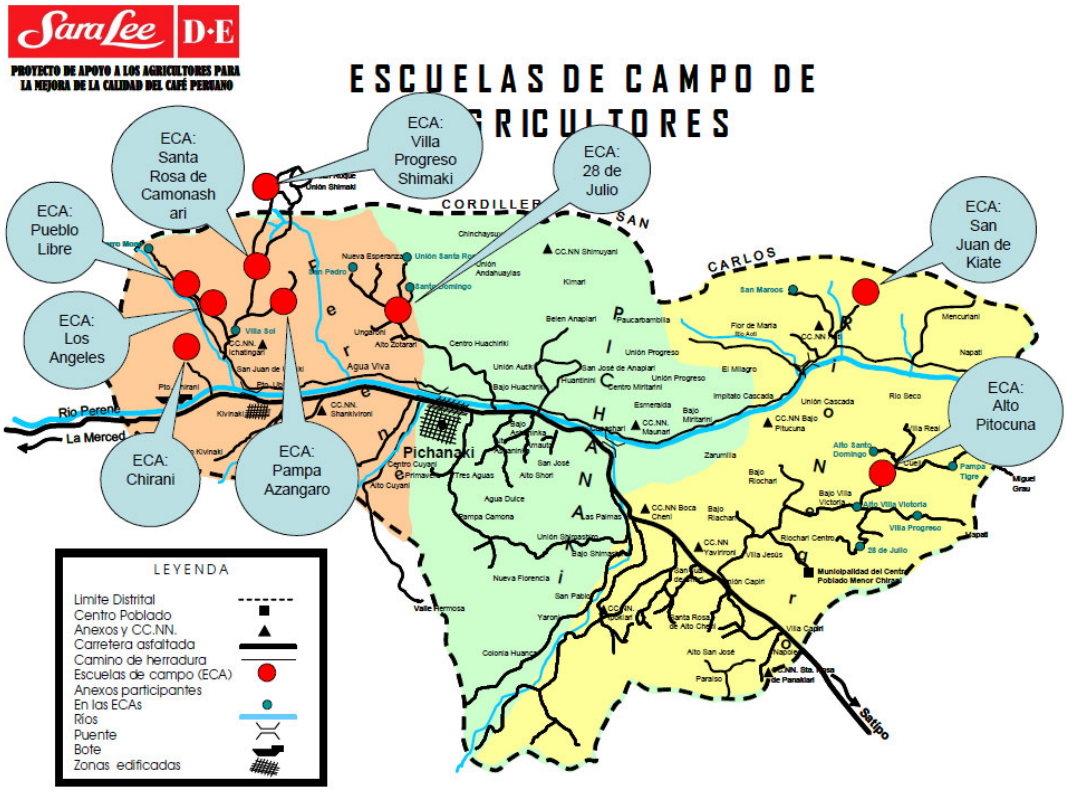


Source: partly based on the figure 'general coffee structure' (Slob and Oldenziel 2003, p.6)

Participating Farmer Households

By 2008 twelve Farmer Field Schools had been introduced in the project region and, as will become clear in chapter six, the FFS have been de departure point for the definition of the 'treatment' group, i.e. the group which will be used to determine the socio-economic impact of the project. The first three FFS were introduced in 2003, followed by another six in 2004. Considering the short laps of time from the implementation of the last three FFS, in 2005, they were not included in the study. In figure 11 the location of the nine FFS that were included in the sample are depicted.

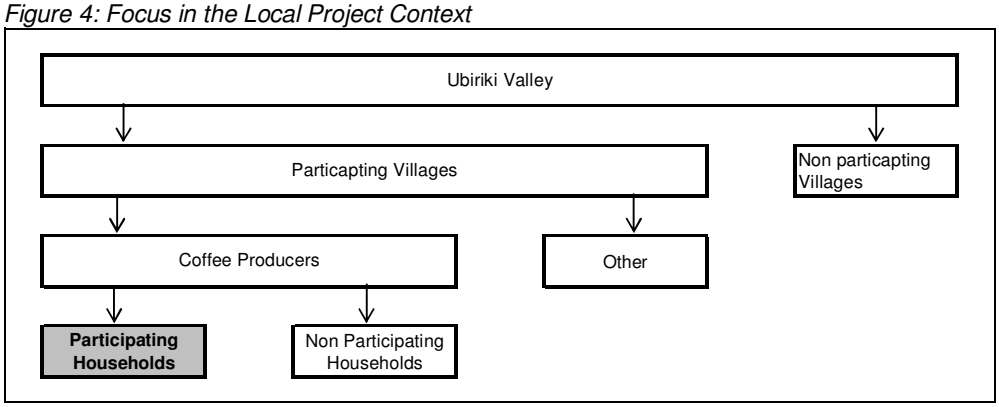
Figure 3: Overview of the Farmer Field Schools



Source: project proposal 2005 (den Belder 2005, p.2)

In the next figure the chain link of coffee producers and their environment is illustrated schematically. In this study only the impact on those households that participated in the FFS depicted above will be analysed.

Figure 4: Focus in the Local Project Context



Socio-Economic Impact

Besides focusing on households, this study was also narrowed down by focusing on the socio-economic impacts of the project. Choosing an economic focus was a logical choice since a large part of the project activities were developed with the goal of increasing the income of coffee farmers. Furthermore, it was a logical choice considering the background in which this study was conducted, namely as a master thesis within the department of Development Economics of Wageningen University. However, as will be discussed in the literature review (chapter 2), research on similar projects reveals a much broader impact. Also taken into account the background of the researcher, a choice was made to focus on socio-economic issues instead. Hereby a much broader impact is captured and a better understanding of the potential contribution to the livelihoods of coffee farmers in developing countries is developed.

The term socio-economics is however still very broad and needs some more explanation. The definition from the Society of Advanced Economic (Society of Advanced Economics Retrieved October 1st) describes socio economics as 'an emerging meta-discipline which begins with the assumption that economics is not a self-contained system, but is embedded in society, policy, and culture'. It further assumes that 'interests are not necessarily or automatically complementary and harmonious and that societal sources of order are necessary for markets to function efficiently. Socio economics further assumes that individual choices are shaped by values, emotions, social bonds, and moral judgments rather than by narrow self-interest.' Although this definition gives a general idea of the discipline, it does not provide a clear definition of what socio-economic data consists of or how it is measured.

Whereas other concepts such as age or gender are clear-cut, socio-economic data is more complex. In the US socio-economic status is for example measured using one variable being household income. In Latin America however household income is difficult to measure due to a variety of reasons, such as non-cash and barter activities, unsteady cash flows and absence of household financial bookkeeping as well as differences in costs of goods and services (Soong 1997). Moreover, even if household income could be measured, it might not provide a complete or realistic image of the socio-economic standard. Instead concepts such as education, profession or assets could be used to provide an indication of socio-economic standard. However, there are many more concepts used to measure socio-economic standards varying from country to country and study to study. These could include everything related to population, human development, land, water, labour costs, livestock, production, and markets (Bonfiglioli 1995).

The concept of socio economics is thus very broad and choices will be made on how it is measured. The Sustainable Livelihood Framework elaborated in paragraph 3.2 provides a good starting point for ordering the socio-economic impacts that emerge from this study. Furthermore, since there are many possibilities of socio-economic impact indicators to measure the activities of the project, qualitative research was conducted to identify the most important ones (see 4.2)

1.6 Research Questions

Based on the preceding paragraphs the main research question can be formulated as follows:

What has been the socio-economic impact of the DE Foundation Coffee Project in Peru on the livelihoods of the households in the Ubiriki valley?

Assessing the socio-economic impact of the project involves two basic steps; tracking changes since the implementation of the project and establishing the causes of these changes and how they are linked to the project. Moreover, three different aspects should be considered when analysing the impact of a development project: i) outputs, or the immediate products of a project, ii) outcomes, or consequences of the outputs and iii) impacts, the broader and longer-term goals(Gottret and White 2002). Although this investigation concerns itself with the third aspect, the first two will need to be identified in order to determine the third.

The main research question can be subdivided into three sub-questions:

A. *What have been the changes for the households in the Ubiriki valley as a result of the implementation of the DE Foundation Coffee Project in Peru?*
B. *What has been the socio-economic impact of these changes on the households in the Ubiriki valley?*
C. *How do these changes relate to the overall livelihoods of the households in the Ubiriki valley?*

Obviously, these sub-questions are very broad and it will not be possible to answer them in full detail. However, the methodology applied to this research (see chapter 4) and the output-outcome-impact framework (see CH3.1) allows for prioritizing. The choice of indicators, discussed in chapter 5, can consequently be analysed in a structured way using the sustainable livelihood framework (see 3.2) which implies that the broad and realistic view of the project's impact can be preserved.

1.7 Outline of the Thesis

In chapter two an overview of the literature will be given in relation to the coffee market; the development of certification and codes of conduct in the coffee market; and the impact and limitations of comparable projects. In chapter three, two analytical frameworks will be discussed; the output-outcome-impact framework and the sustainable livelihood framework. In chapter four the methodology of this thesis will be provided. This methodology includes information on the research approach, the data collection techniques and an extensive discussion on the data analysis. In chapter five the results of the research will be discussed. After giving an overview of the impact areas in the output-outcome-impact framework, each sub-paragraph will outline the choice of indicators in a specific area, provide a description of the data, use several methodologies to analyse this data and draw conclusions on the impact of the project on those indicators. In chapter six, the discussion chapter, these results will be integrated in - and discussed with reference to, the sustainable livelihood framework. In the final chapter, chapter seven, the research questions will be answered, the limitations of the thesis will be discussed and some suggestions are made for future research.

2 Literature Review

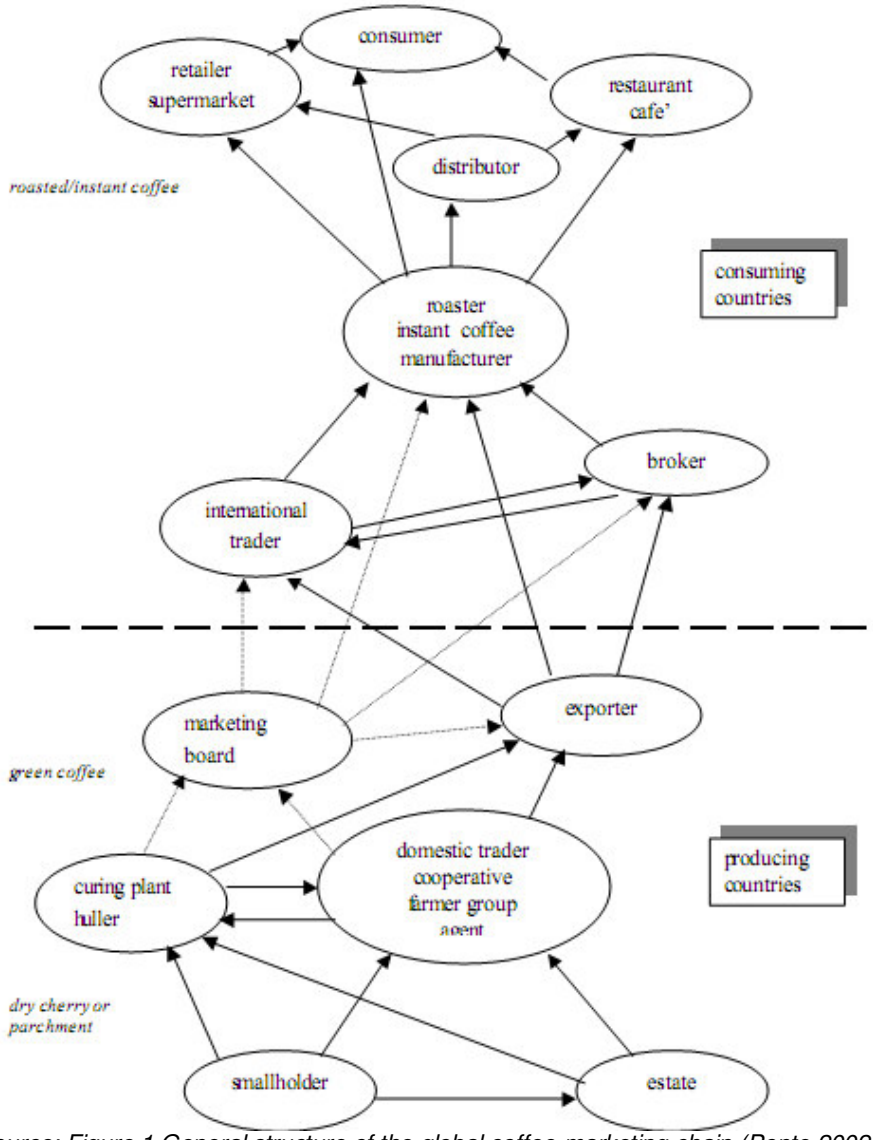
In paragraph 2.1 the coffee market will be introduced to give the reader an idea of the context in which the DE Foundation Coffee Project was implemented. Moreover, the information will be useful to understand the importance of the project and its impact as a potential means to improve the living conditions of small-scale farmers. In paragraph 2.2 some background information on the development of certifications and codes of conduct in the coffee market will be given, being an important background incentive for the development of the project, and also being an important element the project. In paragraph 2.3 the socio-economic impact of comparable projects will be discussed followed by a discussion of the limitations of such project in paragraph 2.4. The project will finalised with a short chapter conclusion in paragraph 2.5.

2.1 The Coffee Market

In the introduction it was already mentioned that 8% of the farmers in the Chanchamayo region depend on coffee and that within the Ubiriki valley this number is much higher at around 80%. The fact that coffee is not only important for Peru becomes apparent from the trade statistics, since coffee is the second most traded commodity after petroleum, providing Latin America, Asia and Africa with an important source of income involving more than 25 million poor families (Gresser & Tickell 2002, cited Utting-Chamorro 2005).

Trade in coffee was regulated from 1962 until 1989 by the International Coffee Agreements (ICA) which regulated a set of production and consumption quotas and governed quality standards (Bacon 2005). The most important results of the ICAs were that supply was restricted and prices were kept at a high level and stable. Due to the domination of the free-market economy in many producing countries and the end of the Cold War the ICAs disappeared by the 1990s. (Zehner 2002) As a consequence of this market liberalization and under influence of globalization in general, the coffee supply chain was reorganized and the marketing boards indicated in figure 5 disappeared. Nowadays the supply chain is dominated by five multinationals who control almost 70% of processing and commercialisation of coffee (D'Haese, Vannoppen et al. 2007).

Figure 5: General Structure of the Coffee Marketing Chain

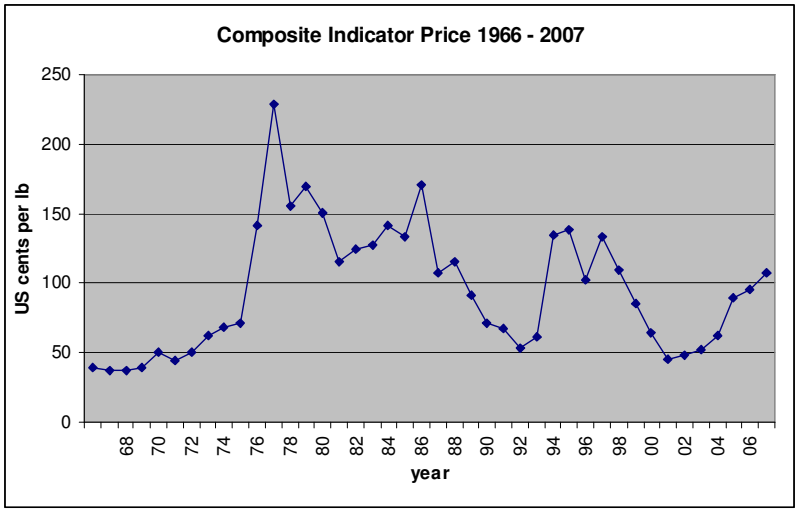


Source: Figure 1 General structure of the global coffee-marketing chain (Ponte 2002 p.1102)

After the collapse of the ICAs a crisis emerged in the coffee sector. As can be seen in figure 6 the indicator price[3] of the International Coffee Organization (ICO[4]) fell by more than 50% between 1997 and 2001, and the price in 2001 was the lowest since 1971 (Zehner 2002 p.1). After 2002 the ICO indicator price slightly increased and is the highest since 1998.

[3] The price calculated based on the market share of exports of each group of coffee weighted in accordance with Annex I of document EB-3776/01 Rev. 1. (see http://dev.ico.org/about_statistics.asp, retrieved 14-10-2008)
[4] The International Coffee Organization (ICO) is the main intergovernmental organization for coffee, bringing together producing and consuming countries to tackle the challenges facing the world coffee sector through international cooperation.

Figure 6: Composite Indicator Price 1966 – 2007

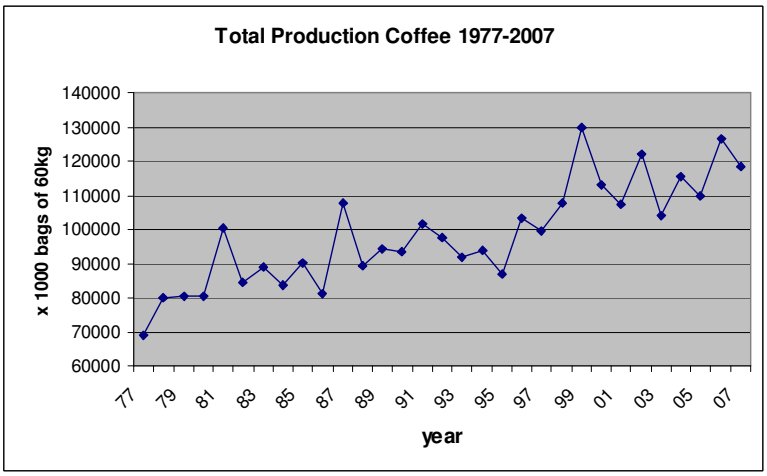


Source: based on (ICO 2007-b)[5]

In addition, Ponte (2002) illustrates that monthly price volatility has increased considerably, being almost twice as variable in the period of 1990 to 1997 compared to the decade before. The price volatility increased even more from 1997 to 2000. Finally, the author illustrates that the power shift in the coffee supply chain to roasters and other major actors resulted in a decrease in the producers' share from 20% in 1989 to 13% in 1995.

This coffee crisis has become even more critical as a consequence of oversupply; since 1990 coffee production worldwide has increased by 15 percent, whereas consumption has only increased by seven percent (Linton 2005). Three main factors are identified for the increase in coffee supply (D'Haese, Vannoppen et al. 2007) illustrated in figure 7 including the change in coffee production techniques in Brazil, the entrance of low cost coffee from Vietnam and the increasing production and consumption of Robusta coffee. Being a permanent crop that only starts producing after a number of years, it is difficult to adapt the production to changes in demand and supply, causing problems especially for small scale producers (D'Haese et al. 2007)

Figure 7: Total Production Coffee 1977 – 2007



Source: based on (ICO 2007)

[5] From March 1965 to September 1976, refers to the Composite Indicator Price 1968; From October 1976 to September 1981, refers to the Composite Indicator Price 1976; From October 1981, refers to the Composite Indicator Price 1979; From October 2001, refers to the Composite Indicator Price 2001

Farmers' income has decreased to such an extent that many receive prices for their coffee below the production cost (Brown et al. 2001, cited in Utting-Chamorro 2005, p.584). The crisis has also severely decreased the social sustainability of many farmers and their communities, leaving them in poverty which decreased their health, worsened the educational prospects of their children and encouraged migration to overcrowded urban areas (Linton 2005, p.601). As Utting-Chamorro (2005, p.584) noticed, these trends also affect environmental sustainability since it increases threats to the land and wildlife where coffee is grown. The decrease in coffee prices thus affected all three pillars of sustainable development; economic, social and environmental sustainability (UNCTAD 2003, cited in Golding and Peattie 2005, p.156)

2.2 Codes of Conduct in the Coffee Sector

As a result of the poor living conditions of coffee farmers worldwide, the effectiveness of conventional aid activities, the impact of coffee production on the environment, and the character of the conventional trading system, several certifications schemes and codes of conducts have been developed in the coffee sector. The movement of 'fair trade' was developed in the Netherlands in 1959 by missionaries and catholic youth. During the 1960s, UNCTAD (United Nations Conference on Trade and Development) developed the concept "trade not aid" which consequently led to the development of the 'world shops' in which products of disadvantaged producers in third world countries were sold at a fair price. The world shops were in fact developed out of an ideology against the mainstream market, but the outreach of this niche market was only marginal and it was thus necessary to sell the product in the mainstream market. In order to introduce the fair-trade products in this market, labelling organizations were developed of which the Max Havelaar Foundation was the first.

The idea of fair-trade spread rapidly to other Western European countries and new labelling initiatives were developed and joined together in the umbrella group known as the Fairtrade Labelling Organization (FLO) (Rice 2001; Tollens 2003), which is also the first certification discussed in this paragraph. As a result of the mainstreaming of Fair Trade in the end of the 80's, the increasing awareness of consumers in general and the resulting increase in corporate social responsibility (CSR) initiatives of multinationals, several alternative codes and certifications have been developed in the coffee sector. Three of those initiatives, Utz Certified, Rainforest Alliance and C.A.F.E practice will be discussed below since they are also relevant for the project that is evaluated in this study. In appendix 9.1 an overview can be found of the norms of each certification. From this overview it becomes clear that there is significant overlap between the different certifications and codes of conduct. However, it needs to be taken into account that there are also differences next to the criteria used, for example at cooperative level or with regards to pricing or inspection.

2.2.1 Fair Trade

Although the Fair Trade network was originally meant to function as the groundwork for an alternative trading system, the goals changed in the late 1980s as the movement sought to gain a larger market share by transforming the mainstream market (Fridell 2006). Taylor (2005) describes this as Fair Trade's 'mainstreaming strategy' which aims to reach this increase in market share by incorporating large retailers and multinationals in its network. Fair Trade is engaged with the mainstream market in two ways. On the one hand it is encouraging conventional companies to adopt fair-trade practices and on the other hand it markets its products through mainstream outlets such as supermarkets (Tallontire 2002).

The most widely used definition of Fair Trade is the one used by FINE[6]: "Fair Trade is a trading partnership, based on dialogue, transparency and respect, which seeks greater equity in international trade. It contributes to sustainable development by offering better trading conditions to, and securing the rights of, marginalized producers and workers - especially in the South. Fair Trade organizations (backed by consumers) are engaged actively in supporting producers, awareness raising and in campaigning for changes in the rules and practice of conventional international trade" (EFTA 2007).

The standards are divided into generic Fair Trade standards and product specific standards, resulting from the wide range of food and non-food products covered by Fair Trade certification. Standards are subdivided into social, economic and environmental development (FLO 2008). Especially the social standards are very complex and detailed in comparison to other certification schemes. A difference is made between the minimum requirements that should be met by each producer organisation and the progress requirements, where the producers must show continuous improvement. In order to obtain the Fair Trade certification, farmers must be organized in a producer organization that is able to contribute to the social and economic development of the farmers and their communities. As opposed to other certification schemes and codes of conduct, Fair Trade is specifically targeted at small scale farmers. Nowadays, Fair Trade certification is run by an autonomous organization, which coordinates the inspection of producers to see if the norms are met. (FLO 2008-b)

When selling coffee that is Fair Trade certified, a fixed price premium is guaranteed over the world index price. The idea behind this is that small farmers should be able to afford basic health care, education and housing and that they should be able to sustainably develop their farms. Besides the fixed price premium Fair Trade also offer a pre-financing agreement, making up to 60% of the contract value available to the producer organization to pay at harvest. Capacity building and the further development of a reliable and responsible producer organization are also important pillars of the Fair Trade project. FLO further encourages producers to work towards organic certification, which is also rewarded with an extra price premium. (Slob and Oldenziel 2003)

2.2.2 Utz Certified

The vision of Utz Certified is 'to achieve sustainable agricultural supply chains where farmers are professionals implementing good practices which lead to better businesses, where the food industry takes responsibility by demanding and rewarding sustainably grown products, and where consumers buy products which meet their standard for social and environmental responsibility'. The Utz Certified Code of Conduct was developed in 1999 by a consortium of Guatemalan grower-exporters together with the Ahold Coffee Company. It is based on the EurepGAP Protocol for Fruits and Vegetables, developed by various European retailers in order to provide basic assurance for food safety and environmentally and socially appropriate growing practices. Utz Certified transferred those generic norms to the production of coffee. (Slob and Oldenziel 2003)

The Code of Conduct contains 204 control points, of which 71 major points (to comply with for 100%), 98 minor (of which 95% needs to be fulfilled) and 34 recommendations. The norms are subdivided into issues related to traceability, product identification and separation; management system, record keeping and self-inspection; varieties and rootstocks; soil management; fertilizer use; irrigation; crop protection products; harvesting; post-harvest product handling; worker health, safety and welfare; environment; and access to a complaint form. The certification of Utz can be obtained by an individual farmer or by a producer organization, which is the case for the project in Peru. The producer organization in this case is responsible for implementing and monitoring the requirements. This is first of all done through the development of an Internal Control System (ICS) that should include an annual inspection against the Code of Conduct. Next to the ICS an annual external inspection is conducted in which a representative group of farmers is inspected and the ICS system itself is evaluated. (UtzCertified 2006)

[6] FLO, IFAT, NEWS and EFTA started to meet in 1998 and, when they work together, are known by their acronym, FINE. The aim of FINE is to enable these networks and their members to cooperate on important areas of work, such as advocacy and campaigning, standards and monitoring of Fair Trade (Retrieved 17 June 2007 from http://www.ifat.org

Unlike Fair Trade, no fixed price premium is determined by Utz Certified. Instead, a 'sustainability differential' is used to determine the added value of the norms with which the producer or the cooperative complies. In times of a high index price, this sustainability differential is determined in a negotiation process between the buyers and sellers of the coffee, without interference of Utz Certified. In times of low coffee prices, Utz Certified offers guidelines in terms of the minimal height of the differential, although these guidelines are not binding and ultimately the price depends on the negotiation process. (Slob and Oldenziel 2003)

2.2.3 Rain Forest Alliance Certification

Rainforest Alliance is an international conservation organisation. It works 'to conserve biodiversity and ensure sustainable livelihoods by transforming land-use practices, business practices and consumer behaviour'. One of its main programs, the agricultural program, supports the Sustainable Agriculture Network (SAN), a group of conservation organizations that intends to link responsible farmers with conscious consumers by means of the rainforest alliance certification. Since 1991, SAN has developed guidelines for the responsible management of export agriculture, certifying amongst others bananas, cocoa, flowers and coffee. (Rainforest Alliance 2008a)

The Sustainable Agricultural standard incorporates norms in relation to the social and environmental management system, ecosystem conservation, wildlife protection, water conservation, fair treatment and good working conditions for workers, occupational health and safety, community relations, integrated crop management, soil management and conservation, and integrated waste management. In total 94 criteria are included in the 2008 Standard, of which 14 are critical and binding. Of the remainder, at least 80% of the criteria should be met. (RainForestAlliance 2008) Although the certification process runs through the cooperative in Peru, the certifications are obtained individually. Producers who seek to be certified by Rainforest Alliance can do so through an independent certification body. Once a year an audit is done by SAN evaluators. (RainForestAlliance 2008-b)

As opposed to Fair Trade and Utz Certified, Rainforest Alliance is not designed as an alternative marketing system as such, but rather as a way to promote sustainable farm management. Rainforest Alliance or SAN are therefore not involved in the negotiation process. However, as with the other certifications, economic benefits can be expected in terms of sustainability, efficiency, market access or labour rights. (Slob and Oldenziel 2003)

2.2.4 C.A.F.E Practice

A third 'certification' the project in Peru deals with is the C.A.F.E Practice initiative. The initiative is an outcome of the Preferred Supplier Program, launched by the Starbucks Coffee Company in 2001. Its goal is related to evaluating, recognizing and rewarding producers for high quality and sustainable coffee. Evaluation criteria are related to product quality, economic accountability, social responsibility, and environmental leadership in coffee growing and coffee processing. C.A.F.E. Practices requires that each component of the supply chain meets the minimum economic, social, and environmental requirements of the C.A.F.E. Practices Guidelines. As with Utz Certified not every individual farmer has its own score, which in this case is it's 'certification'. Within this group of farmers an annual stratified random sample will therefore be made to verify if the criteria are indeed met. (CAFEpractice)

Based on a point system, suppliers or producer associations are listed on the approved supplier list and will be awarded 'first consideration' when purchasing decisions are made, that is if the product specifications meet the norms with respect to quality and taste. Three different supplier statuses are acknowledges being strategic, preferred or verified. This consequently results in preferred pricing and contract terms based upon a minimal number of points, and the improvement with respect to the number of points obtained in the previous year. (CAFEpractice 2004)

2.3 Impact of Comparable Projects

This paragraph is mainly related to Fair Trade 'projects' because the DE Foundation Coffee Project in Peru is probably most comparable to these types of 'projects'. The idea of Fair Trade as a development 'project' is elaborated by Paul (2005) . In her article a project is defined as a 'process of providing services limited in time: by using resources allocated for the purpose, activities are carried out and services (outcomes) are provided with the intention of producing a pre-defined effect (the objective of the project)' (p.135). Fair-trade movements as well as (international) aid agencies use an integrated and interventionist project approach in attempting to effect (socio-economic) change, as is also a characteristic of the project approach of the DE Foundation. This comparison is actually another reason why the DE Foundation Coffee Project in Peru can be compared to Fair Trade projects. This implies that a limited number of farmers are aided in certain processes and this outcome in effect corresponds to that of a 'development project', as is the case with the project of interest. For the purpose of this research Fair Trade and the DE Foundation Coffee Project will be perceived as such.

The project is furthermore comparable to Fair Trade since the project is build around the same three pillars of development, being capacity building (in FFS), organization of small scale coffee farmers in a producer organization and certification (including amongst others, Fair Trade). Moreover, taking Fair Trade as starting point is important since these types of projects can be interpreted as a result of the increased awareness among consumers and the resulting Corporate Social Responsibility (CSR) policy of large multinationals. As part of this CSR policy currently the four biggest coffee companies have all started to certify a small proportion of their production (IIED 2005, p.30). The DE Foundation Coffee Project in Peru can also be interpreted within this context. Finally, coffee represents 60% of all Fair Trade sales (Golding and Peattie 2005, p.156) and consequently much research has been conducted on this topic. In this paragraph the socio-economic impact of Fair Trade projects will therefore be discussed to be used as potential impact indicators for this project. Moreover, results of this review can be used to explain certain relationships between the data during the statistical analysis.

The majority of the studies upon which this paragraph is based are qualitative in nature and, as was argued in the introduction, there is still a general lack of quantitative research that makes a comparison with comparable non participating farmers. In chapter 4 (methodology) more arguments are given on the need for this type of quantitative analysis.

Based upon the literature review ten socio-economic impact areas at household level are identified. It should be noted that Fair Trade certification, just like any intervention, should be considered within its context where it is re-interpreted by a range of actors (Pirotte, Pleyers et al. 2006, p.449). FAO (Danker 2003, p.63) summarises what will become apparent from the impact areas, namely that these types of projects seems to be successful both in terms of its marketing approach as well as additional aid activities. Both activities are considered to be mutually supportive and highly interlinked.

Next to these impacts at household level, it also needs to be taken into account that since the introduction of Fair Trade the different needs of small holders in terms of ethical standards are increasingly being considered, not only by consumers, but also by large market actors (Tallontire 2002, p.16). This consequence is in fact one of the reasons why it is important to analyse the DE Foundation Coffee Project in Peru in the context of Fair Trade projects.

2.3.1 Price Impact

One of the first and most obvious impacts of Fair Trade to be considered is that of the 'fair price' and the Fair Trade premium paid to the cooperative. One needs to divide the Fair Trade price premium in an extra coffee price and a premium for development. Evidence on the size of Fair Trade impact on price is mixed and, as Calo & Wise (2005, p.43) argue, it depends on the height of the conventional coffee prices. This is further demonstrated in a report of FAO (Danker 2003, p.59) in which the Fair Trade coffee prices in Bolivia are compared to the conventional prices. In the years 1994 and 1995 the Fair Trade price was similar or only slightly higher than the conventional market price, but in 2000 and 2001 the Fair Trade premium was almost twice the market price. That Fair Trade premiums can indeed positively influence the price for coffee received by farmers is

supported by Bacon (2005, p.504) who found that certification has a greater influence on price than quality and was thereby the greatest differentiating factor.

Besides higher farm gate prices and community investments, Fair Trade can also reduce price volatility by guaranteeing a stable price. Price stability might induce producers to make investments they might not make otherwise (Zehner 2002, p.10). But the risk does not only depend on the price stability but also on the stability of its demand and most Fair Trade cooperatives sell only part of their output to Fair Trade buyers and on an irregular basis (James 2000, cited in Zehner 2002, p.10). Parrish et al. (2005, p.182), confirm this finding in Tanzania, where Fair Trade products were bought from whichever farmer who is able to fill the contracts at that time. Furthermore, given the small portion of coffee sold as Fair Trade, the average price received by individual farmers is hardly affected (Danker 2003, p.63). This issue, being considered as one of the major limitations of Fair Trade, will be further discussed in 2.4.1.

Despite of these arguments, Bacon (2005, p. 506) found that Nicaraguan coffee producers only linked to conventional markets considered it to be four times as likely to lose their farm due to low coffee prices than farmers belonging to the Fair Trade network. This conclusion is supported by the work of Utting-Chamorro (2005, p.591) who found that all farmers referred to greater economic stability and security since their involvement in the Fair Trade network. Besides this, rural Nicaraguans were able to maintain their plantations, plant more coffee and even buy new land despite of the fact that living conditions of coffee producers elsewhere deteriorated due to the coffee crisis (Pirotte et al. 2006, p.445). Although not discussed here extensively, it should be mentioned that in Nicaragua it was also found that, although reducing risk of coffee farmers, no difference in quality of life was found, thus pointing at the many other conditions which are causing the perception of decreasing quality of life (Bacon 2002, p.506).

2.3.2 Costs

Zehner (2002, p.10) argues that, unless the market prices are extremely low, Fair Trade is “an inefficient method of transferring income from consumers to growers”. Instead, he argues it would be more efficient if socially conscious consumers would write a check of $1.50. The main reason for this limited impact on coffee prices according to Zehner are the high retail price premiums on Fair Trade products and high administrative cost involved in these programmes.

Utting & Chamorro (2005, p.588) further found that in Nicaragua debts held by cooperatives, fixed expenses for processing equipment, export cost and funds for capitalisation and producers cause the lower than expected farm gate prices. Furthermore, hidden costs of marketing and coordination can decrease the benefits of Fair Trade certification (Giovannucci and Ponte 2005, p.297).

Renard (2005, p.426) also brings under attention the recent decision of FLO to charge farmers for third party certification, which of course further decreases it’s premium. Although producer organizations do not question the need of third party certification in terms of label credibility, they do doubt the lack of transparency with which FLO determined the rates. However, it is also argued that as more in-country certification agencies develop, third-party certification should become cheaper and not form a significant problem for Fair Trade producers (Rice 2001, p.59).

Although Fair Trade initiatives can increase certain costs which were described above, economies of scale of Fair Trade initiatives can also be identified in the use of indivisible inputs such as managerial abilities and physical infrastructure (Dhaese et al. 2007, p.173)

2.3.3 Market Access

Increasing market access for small and marginalised producers is often seen as a significant impact of Fair Trade. Fair Trade does not only give farmers access to the Fair Trade market but also provides openings to the conventional market. This is due to implicit incentives in Fair Trade certification for organic production and quality improvement (Paul 2005, p.148). This will be further discussed under the heading quality improvement.

This finding is supported by Parrish et al. (2005) in illustrating that Tanzanian cooperatives attributed their ability to sell to the conventional market to participation in Fair Trade. The cooperation benefited from name recognition in consumer countries, long-term relationships with partners and access to market information. This increased market access evidently contributes to the reduced risk mentioned before.

2.3.4 Local Capacities

Because fair-trade initiatives started with a clear development perspective, many producer groups received technical assistance in addition to previously mentioned benefits of price premiums and market access (Danker 2003, p.54). This technical assistance has lead to a variety of positive impacts. Pirotte et al. (2006, p.446) for example explain how training and mutual support encourages and enables the farmers to meet market demand. This finding is also supported by other authors stressing issues such as the importance of knowledge, experience and skills management gains (Parrish et al. 2005, p.183) and improved production methods (Paul 2005, p.148).

Another important benefit of Fair Trade projects is the strengthening organizational capacity by strengthening their producer organizations (Taylor 2005, p.137). Nevertheless, the evidence on this issue is mixed. Giovannucci & Ponte (2005, p.297) argue that with the right dynamics, the efforts needed to meet sustainability standards can indeed create local empowerment and organizational straightening. However, in other cases producer organizations might find it difficult to maintain cohesion if the expected benefits do not materialize as expected. They further argue that the hidden costs of marketing, coordination, uncertainty and the limitations of collective action may decrease overall net benefits of certification efforts and threaten existing governance structures in cooperatives or associations.

Apart from the technical and organizational capacities, it is also argued that Fair Trade farmers have attached greater value to their children's education due to recommendations of international and national Fair Trade actors (Pirotte et. al, p. 445)

2.3.5 Access to Credit

Several aspects have led to better access to credit as a result of Fair Trade. To begin with, it increased due to FLO's pre-financing requirements and on the other hand due to the fact that certification lends "a certain prestige since it is assumed that the organization is subject to external monitoring and also demonstrates initiative and a capacity to enter new market niches" (Aranda & Morales 2003 cited in Taylor 2005, p.137). Finally, as was brought to the attention by Dhaese et al. (2007, p.173), credibility is increased because better internal social control can increase reliability of compliance to the codes of practice. Besides the most obvious consequences of this benefit, among them being the possibility to make better investments, access to credit also contributes to the reduction of risk of small-scale farmers.

2.3.6 Community Development

The Fair Trade standard requires producer organisations to retain a premium of US$5/100kg for community development. Examples of the usage of such premiums in Nicaragua are the construction of new health care centres; renovation of secondary schools and eco-tourism projects (Utting-Chamorro 2005, p.594-figure 5); the diversification of economic activities, such as the construction of a juice factory; the creation of a cash reserve for the purchase of coffee at auction (Pirotte et al. 2006, p.448); and putting electricity in a government-run dispensary to refrigerate medicines (Parrish, et al. 2005, p.184). However, premiums are also used to cover technical support to producers (Taylor 2005, p.137); partly or fully distributed to co-operative producers; or reinvested in the cooperative's commercial activities (Pirrote et al. 2006, p.448 & Parrish et al. 2005, p.184).

Although the impact at community level can thus be considered positive there are some doubts raised in the literature. Parrish et al. (2005, p.184) for example argues that utilizing this premium for ad-hoc projects may not have optimized the potential benefit of such funds. Nonetheless, they also argue that accountability to producers was maintained in this way since its allocation was determined democratically. Other concerns are related to the fact that in some cases producers do not report improvements in their communities at all (Utting-Chamorro 2005, p.594), although problems of communication and the relative small size of these changes are seen as the causes of these findings. It is not easy to promote changes when only a small part of the coffee is exported Fair Trade. As was mentioned before, the problem of limited demand will be discussed in the next section.

Besides the impact on communities involved in the Fair Trade network Giovannucci & Ponte (2005, p.297) also argue that the process of Fair Trade certification may have spill over effects on neighbouring communities. Moreover, they argue that the process also stimulates farm incomes outside the coffee economy by stimulating traceability and process management standards which prepares farmers to meet demands of modern agricultural export.

2.3.7 Gender Equity

The impact on gender equity is of interest because it is included explicitly in FLO objectives for Fair Trade (Utting-Chamorro 2005, p.595) and because of its importance to development in general. It is argued that gender equity is promoted by building women's self-confidence, management capabilities, active participation in cooperative activities, and their ability to speak out and give their opinions in meetings and workshops, as was the case in Nicaragua. Nevertheless, the same author also admits that machismo still prevails in many communities which are restricting the participation of women in Fair Trade. An example of improving gender equity is given by a Nicaraguan cooperative, Soppexcca, where a specific cooperative was developed for woman. This cooperative includes 184 women owning their own coffee plots and commercializing their produce international. (FLO 2007)

2.3.8 Quality Improvement

Quality improvement as a consequence of Fair Trade is very important since it represents a commitment of the Fair Trade producer to the consumer who is paying a higher price for the coffee (de Cenival 1998, cited in Pirotte et al., p. 447). Besides this, improved quality is important from a business perspective since it increases competitiveness of Fair Trade coffee and gives access to profitable niche markets. Furthermore, quality is important to reduce the feeling of marginalisation of the farmers, thereby giving them a greater sense of ownership of the Fair Trade project (Pirotte et al. 2006, p.447). That Fair Trade indeed affects the quality of coffee was already mentioned under the heading market access and capacity building. Another example is given in the paper of FAO (Danker 2003, p.60) in which quality improvements are seen as the most important effect in a Fair Trade project in Bolivia. The best quality is now also sold to conventional markets, thereby overcoming the negative perception of Bolivian coffee and further increasing market access.

2.3.9 Ownership

Ownership is one of the major differentiating impacts Fair Trade is said to have in comparison to other development initiatives. Due to their collective achievements, e.g. improvement in living conditions despite the local context, development of export-related activities and communal investments, cooperative members have become very proud. Another contribution is the quality improvement discussed above, which reduces the feeling of marginalisation. These successes and others have given the cooperative members a sense of ownership over the Fair Trade 'project'. This feeling of belonging and ownership is underpinned by the capital investments required by the members and trainings that aim to build a sense of ownership. (Pirotte et al. 2006).

2.4 Limitations of Comparable Projects

It is important to discuss some of the limitations of Fair Trade projects since they also might apply to the DE Foundation Coffee Project in Peru and should therefore be considered as potentially negative impacts. Secondly, the limitations of Fair Trade are part of the explanation why alternative coffee certifications have been developed, such as the ones used by the farmers in the Ubiriki valley.

2.4.1 Supply and Demand

An issue often raised in the discussion of Fair Trade is that of demand and supply. Tollens (2003, p.9) explains this by arguing that an economist will state that nobody "has a (divine) right to produce whatever he likes and request a decent living standard in doing so". To place this in the context of the coffee market, in which overproduction is one of the causes for low coffee prices (see 2.1), the low coffee prices should function as a coordination mechanism which induces coffee producer to produce less coffee. If prices thus perform their function well, there should be price efficiency in the market, however this can only happen in free liberalized markets in which free market information is available. Moreover, coffee is considered as a difficult crop to adjust according to these economic principles, since planting of the crop requires major investments and maintenance and production cost are relatively low. Because of this, coffee prices have to become very low before discouraging farmers to stop producing coffee.

Tollens (2003, p.11) consequently argues that by guaranteeing higher prices to farmers, overproduction and thus low coffee prices will persist for the majority of the farmers. However, the author also argues that this effect will only take place when Fair Trade would obtain a significant market share, which it currently does not have. Moreover, as was already mentioned in the second section of this paper, numerous studies conclude that the share of overall revenue from coffee absorbed by producers has declined over the last 15 years, hence pointing at other causes of low coffee prices besides overproduction (IIED 2005, p.7).

2.4.2 Efficiency

Another economic argument opposing the logic of Fair Trade concerns the idea that a fixed price does not induce efficiency in terms of costs and market adjustments (Tollens 2003, p10-11). A fixed price retains inefficient farmers in the market while they should be replaced by more efficient producers. However, here we touch upon the essence of Fair Trade, as also raised in the same article of Tollens, relating to the question if it is correct to apply notions of efficiency upon marginalised producers in third world countries.

Another argument against Fair Trade is presented by Pirotte et al. (2006, p.446). He argues that a strong co-operative culture could prevent members from leaving and making it difficult for them to return once they have, thereby making farmers less flexible and efficient.

2.4.3 Dependence on Fair Trade

Although the subject of limited demand for Fair Trade coffee has already been touched upon in relation to some other issues, it deserves some more attention in relation to dependency on Fair Trade coffee. Even after more than a decade of Fair Trade coffee in Europe, the Fair Trade market remains limited, with a market share of 5 percent in Switzerland (Zehner 2002, p.14) being the highest market share recorded. FLO estimated that Fair Trade export capacity in Latin America, Africa and Asia is roughly seven times greater than demand (Taylor 2005, p.137).

As was already mentioned before, the minimum price of Fair Trade coffee could remove incentives for producers to upgrade production or switch crops. Considering the market situation with the limited demand, this is problematic since farmers cannot become dependent on Fair Trade coffee on the long term (Zehner 2002, p.14). This problem is already being considered by TransFair[7] USA who report that coffee producer organizations only sell an average of 15 percent of their monthly output to Fair Trade buyers (Zehner 2002, p. 15). In the future it might thus occur that farmers will sell very little or none of their Fair Trade coffee to Fair Trade buyers. Zehner concludes that no matter if rationing occurs or premiums fall, the economics of growers will become less favourable and they should not rely on future Fair Trade income.

Although Fair Trade proponents acknowledge these arguments theoretically, they argue that in practice they are not valid. One of their arguments relates specifically to the issue raised by TransFair USA, namely that cooperatives only sell a small portion of their coffee to Fair Trade channels and therefore cannot become dependent on Fair Trade coffee. Secondly they argue that Fair Trade should be "used as a temporary income-support mechanism during the transition to higher-return activities" (Leclair 2002, cited in Zehner 2002, p.15). However, other authors argue that the first argument is not always valid. This was the result of a recent study of Hopkins (2002, p.23 cited in Tallontire 2002, p.14) who concluded that 44 percent of the groups studied sold at least half their produce to Oxfam and where groups did became less dependent on Oxfam, it was usually through diversification to other Fair Trade buyers.

2.4.4 Inclusion & Exclusion

Partly as consequence of the limited demand of Fair Trade the problem of exclusion of some farmers is raised as a limitation of Fair Trade. Utting-Chamorro (2005, p.597) demonstrated this by a quote from one of the members of a Nicaraguan cooperative member who says that "the capacity to broaden the membership base of the cooperative is determined by the nature of demand in the North". In this way inequalities can be produced between different communities and between smallholders and landless coffee workers. This last issue is also raised by other authors who argue that Fair Trade fails to reach the poorest part of the population (Pirotte et al., p.441 & Utting-Chamorro 2005, p.587).

Besides the exclusion of farmers due to limited demand, another concern is being raised with regards to the barriers which are 'developed' due to Fair Trade certification in terms of learning curves, extension services and extra costs. Hereby Fair Trade certification excludes exactly those farmers which should be targeted by Fair Trade, the poorest (Giovannucci & Ponte 2005, p.297). Moreover, the recent decision of FLO to charge producer organizations an annual fee is considered as another barrier to Fair Trade for the most disadvantaged-producers (Parrish et al. 2005, p.188). Taylor (2005, p137) supports this argument by showing data of interviews in several well-established cooperatives who expressed their concerns that "the initiative may be serving the strongest and most established producer organizations rather than addressing the most marginalized".

2.4.5 Addressing the Causes of the Problem

Next to the limitations just discussed, an entirely different 'limitation' of Fair Trade is given by Zehner (2002, p21-22). In his paper he argues that Fair Trade is unlikely to achieve its long term goal of improving the standard of living of coffee producers in third world countries because it does not address the cause of the problem. The author argues that the absence of competitive markets and intermediaries in coffee-producing countries are the cause of the low returns on primary commodities. Producers, NGOs and governments need to look for other opportunities to enhance profits. Although this discussion is outside the scope of research it is important to consider when drawing conclusions on the contribution of the project under study to poverty alleviation in the region.

[7] TransFair USA, a nonprofit organization, is one of twenty members of Fair Trade Labeling Organizations International (FLO), and the only third-party certifier of Fair Trade products in the United States (Retrieved June 22 2007 from http://transfairusa.org/content/about/aboutus.php

2.5 Chapter Conclusion

Resulting from the liberalization of the coffee market and the increase in supply, the coffee price index has decreased significantly in the last decades. Combined with the overall poor economic and institutional environment of farmers in developing countries, this resulted in a decrease in the social, economic and environmental sustainability of the livelihoods of small scale coffee farmers. Within this context, and within the context of corporate social responsibility of large multinationals in the coffee sector, several certifications schemes and codes of conducts were developed. These certifications and codes of conducts are often combined with some sort of capacity building and the organization of farmers in a producer organization, as is the case in the DE Foundation Coffee Project in Peru.

From a review of the literature it becomes clear that increased income is but one of the potential benefits of projects that incorporate both market-related as well as additional aid activities. Other impact areas which have been identified are for example related to production costs, market access, local capacities, access to credit, community development, gender equity, coffee quality and sense of ownership. It becomes apparent that the type of projects to which the DE Foundation project can be compared seem to be successful both in terms of the marketing approach as well as additional aid activities. Both activities are considered to be mutually supportive and highly interlinked. Besides the impacts, several limitations have been identified, including the lack of demand for certified coffee, exclusion of specific groups of farmers, the low efficiency of fixed pricing systems and whether the projects responds correctly to the problems at hand. These limitations will also be considered when evaluating the project under study.

The direction and size of the impact is however often ambiguous. This uncertainty is increased by the failure of many studies to construct a realistic counterfactual based on a control group and econometric testing, as is the objective of this study.

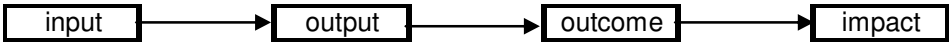
3 Analytical Framework

During this chapter two frameworks will be discussed, each one complementing and supporting the other. The first analytical framework is the 'input-output-outcomes-impacts' framework which stresses the need to identify the relationships between project activities and the impacts measured, and the measurement of impacts at different levels. Secondly, the Sustainable Livelihood Framework will be discussed, which will be used in order to identify the potential impact areas of the farmers in the Ubiriki valley and to present the results within a broader context.

3.1 'Input-Output-Outcomes-Impacts' Framework

One of the shortcomings of much research conducted on the impact of projects like the DE Foundation Coffee Project in Peru is that the relation between project activities and the impacts are not always clearly explained. This is partly due to the lack of a comparison to comparable non participating farmers. However, even if a good control group is used, the relation between project activities and changes will need to be clear to make the results convincing. The input-output-outcome-impact framework is a very basic yet clear framework which can be used to structure these relations (see for example Boerma, Pisani et al. 2002).

Figure 8: Input-Output-Outcome-Impact Framework



Although inputs are not discussed in this thesis, it can be shortly mentioned that they relate to the direct investments made in the project, such as funds, time or equipment. Outputs relate to actions taken as a result of the inputs made, in case of this project for example the development of the FFS. Outcomes refer to the immediate results of the output, in case of the FFS a change in production processes. Finally impacts refer to longer term changes as a result of the outcome, in this case for example an increase in yield resulting from changes in production process. (WorldBank 2007) It is important to realize that impacts can be identified at different levels, for example a first level being the increase in yield, resulting in an increase in income (2^{nd} level) and finally an increased investment in the education (3^{rd} level). In paragraph 5.1 an overview of the output-outcome-impact framework in the context of this study will be given.

As is discussed by Boerma et al. the framework underscores the need for selection of indicators at different levels (2002, p1). This implies that a distinction can be made between short term and long term impacts, which is especially important for this study since the project has only been implemented four years ago. By selecting indicators at different levels and connecting them to the framework a sequence of information can be produced which will provide more convincing evidence of the relation between the project activities (input/outputs) and ultimate outcomes or impacts (Boerma, Pisani et al. 2002, p5).

However, the relations in this framework can appear relatively simple when they are in fact complex real life issues and can only be simplified to a certain extent. Moreover, the use of this framework alone does not allow the representation of the results within the context of the livelihoods of the coffee producers, which is in fact the third research question.

3.2 Sustainable Livelihood Framework

In the past decades it has become apparent that poverty itself is a "complex, multi-dimensional experience that includes both material and non-material aspects of life" (Soussan and Lincklaen & UNDP 2003, cited in Reddy et al. 2004, p.299). Measuring the socio-economic impact of a development project thus requires a multi-dimensional perspective. As the goals of the project can be interpreted to have moved beyond an increase in yield and quality, to the broader aim of reducing poverty, measuring its impact thus becomes more complex. The reason is that, as became apparent in the introduction and literature review, the project in Peru with its broad scope of activities can have an impact on the livelihoods of the farmers in many different ways.

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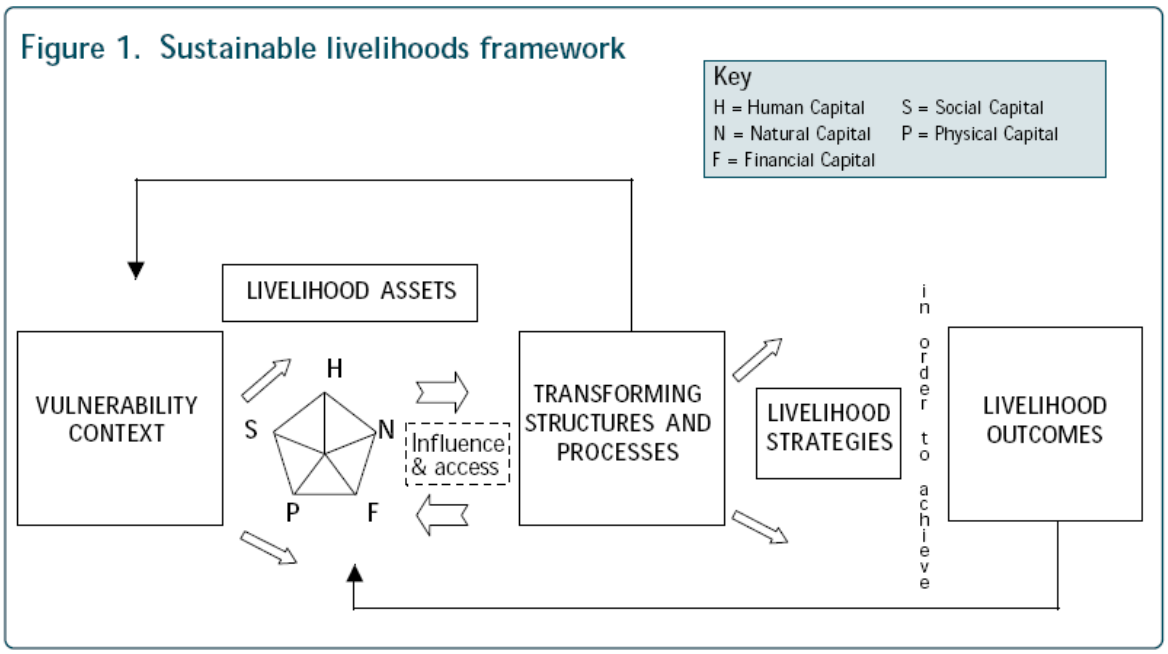
The topic under investigation is thus a complex issue which cannot be approached using merely the input-output-outcome-impact framework. Although various analytical frameworks exist which can be used to order this complexity, the Sustainable Livelihood Framework (SLF) is one of the more recent tools based on "many years of thought and study on how rural households construct their lives and income earning activities, the importance of the institutional structures that surround these household and their resulting poverty levels" (Jansen, Pender et al. 2006, p.21). The points of intervention and socio-economic impact of the DE Foundation Coffee Project in Peru can be mapped on the SLF (see 5.2), as was successfully done in other development projects (Scoones 1998; Ashley and Hussein 2000; Adato and Meinzen-Dick 2002; Gottret and White 2002; Parrish, Luzadis et al. 2005; Mancini, Van Bruggen et al. 2007).

In this research a livelihood is referred to "the capabilities, assets and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets both now and in the future, while undermining the natural resource base" (Scoones 1998). In the figure below the SLF is depicted and, although just like any other framework it is a simplification of reality, it provides a way of describing and visualizing the livelihoods of the coffee farmers in the Ubiriki valley. According to the Sustainable Livelihood Guidance Sheets of the UK Department of International Development (DFID 2007) the framework views people operating within a context of vulnerability in which they have access to certain assets. The influence over, and access to these assets is partly determined by the prevailing social, institutional and organizational environment, which in its turn also influences the livelihood strategies people can engage in to achieve certain livelihood outcomes. The SLF thus represents the main factors influencing the livelihoods of people and the relationship between them.

Figure 9: Sustainable Livelihood Framework



Source: Sustainable Livelihood Guidance Sheets 1.1 (DFID 2007)

In the figure above several categories can be identified:

- *Vulnerability Context.* The vulnerability context frames the external environment in which people exist. People's livelihoods and the wider availability of assets are affected by critical trends, shocks and seasonality, over which they have limited or no control. The discussion of the coffee crisis for example illustrates the vulnerable context in which small scale farmers operate. (DFID 2007, Sheet 2.2)

- *Livelihood Assets.* At the heart of the framework is the asset pentagon including human capital (skills, knowledge, ability to labour, health), social capital (networks, memberships, relationships), natural capital (natural resource stock), physical capital (basic infrastructure, producer goods) and financial capital (available stocks, regular flows of money). Assets can be destroyed or created by trends, shocks and seasonality. Transforming structures and processes partly determine access to the assets and those with more assets are able to switch between different livelihood strategies to secure their livelihoods. Finally, research has found that different assets lead to different livelihood outcomes and that people with greater access to assets are better able to escape poverty. (DFID 2007, Sheet 2.3)
- *Transforming Structures and Processes*. The institutions, organizations, policies and legislation that shape livelihoods by determining access to assets, the terms of exchange and the returns on livelihood strategies. Furthermore, the structures influence the vulnerability context and can cushion external shocks such as droughts or economic crisis. (DFID 2007, Sheet 2.4)
- *Livelihood Strategies*. Livelihood strategies refer to the range and combination of activities and choices that people make in order to achieve their livelihood goals. (DFID 2007, Sheet 2.5)
- *Livelihood Outcomes.* The livelihood outcomes are the achievements or outputs of the livelihood strategies, such as income, increase well-being, reduced vulnerability, improved food security or more sustainable use of the natural resource base. (DFID 2007, Sheet 2.6)

Using the SLF for investigating the socio-economic impact of the DE Foundation Coffee Project in Peru makes it possible to highlight the most important, i.e. from the point of view of the stakeholders, socio-economic changes or impacts while explicitly depicting and interpreting these results into the 'big picture' (Adato & Meinzen-Dick 2002 p. 11). The SLF thus facilitates research design and analysis of the complexities involved in investigating socio-economic impact of the project. Furthermore, the framework can assist in identifying impacts which are either too far outside the domain of the research to be a focus of study, e.g. in this case non socio-economic issues or while relevant to the study are impossible to include, but important for understanding the causality between certain activities and their outcomes (Adato & Meinzen-Dick 2002, p.11).

3.3 Chapter Conclusion

One of the shortcomings of many impact studies is that the relation between project activities and the impacts are not always clearly explained. The input-output-outcome-impact framework is a very basic yet clear framework which can be used to structure these relations. The framework underscores the need for differentiation between short and long term impacts which is especially important for this study since the project has only been implemented four years ago. However, the relations in this framework can appear relatively simple when they are in fact complex real life issues and can only be simplified to a certain extent. Moreover, the use of this framework alone does not allow the representation of the results within the context of the livelihoods of the coffee producers, which is in fact the second research question.

The framework will therefore be combined with the Sustainable Livelihood Framework (SLF). The SLF views people operating within a context of vulnerability in which they have access to certain assets. The influence over, and access to these assets is partly determined by the prevailing social, institutional and organizational environment, which in its turn also influences the livelihood strategies people can engage in to achieve certain livelihood outcomes. The SLF makes it possible to highlight the most important socio-economic impacts at household level while explicitly depicting and interpreting these results into the 'big picture'.

4 Methodology

In this chapter the methodology for answering the research questions will be discussed. In paragraph 4.1 the evaluation problem will be examined which is the foundation of the remainder of this chapter. In paragraph 4.2 the research strategy will be explained, being formed by the case study approach on the hand and the semi-experimental approach on the other hand. In paragraph 4.3 the data collection techniques belonging to this approach will be discussed including qualitative and quantitative research instruments. In paragraph 4.4 the data analysis will be explained, including data preparation and the statistical analysis of data using various methods. The final paragraph, paragraph 4.5, will summarize and conclude this chapter.

4.1 The Evaluation Problem

When evaluating the impact of the DE Foundation Coffee Project in Peru, it needs to be formulated what the situation of participating farmers (or the treatment group) would have been, had they not participated in the project. This is referred to in the literature as the Roy-Rubin model, or the potential outcome model (Roy 1951, Rubin 1974, from Caliendo and Kopeinig 2008). The model can be denoted as follows:

$$Ti = Yi(1) - Yi(0)$$

Where *Ti* is the treatment effect for individual *i*, *Yi(1)* is the potential outcome for individual *i* when treated (the actual outcome) and *Yi(0)* is the potential outcome for individual *i* when he or she would not have participated (the counterfactual). Clearly, there is a problem of missing data since only one of the potential outcomes can be observed for each individual. The missing data problem needs to be solved by constructing a realistic counterfactual, i.e. the potential outcome if this person would not have participated.

For constructing a realistic counterfactual two steps need to be considered when evaluating the impact of projects such as the DE Foundation Coffee Project in Peru. First of all, the decision to participate in the project and secondly the processes and aspects influencing the socio-economic outcome indicators (Bryson, Dorsett et al. 2002, p.5). Since participation in the project is voluntary, one cannot simply compare participants with non participants, as it is expected that they are different with respect to various observable and unobservable characteristics, which can influence the outcome indicators irrespective of project participation.

To arrive at a valid estimate of project impact, the effect of selection (based on observed as well as unobserved characteristics) must thus be accounted for. As will become clear in the remainder of this chapter, a good control group will be formed by conducting qualitative research at an early stage of fieldwork (4.2.1 & 4.3.2-4.3.7), by taking into account unobservable differences, e.g. motivation, during the sampling method of the survey (4.2.8) and by using econometric data analysis to control for observable differences such as family size, age or size of farm before start of the project (4.4).

4.2 Research Strategy

Two research approaches are used to answer the research questions specified in the first chapter of this paper: a case study approach and a semi-experimental approach. These two approaches roughly correspond to the two phases of research, namely the qualitative phase (see 4.3.1-4.3.7) and the quantitative phase (see 4.3.8). By combining these two approaches a realistic counterfactual can be constructed.

4.2.1 Case Study Approach

Considering the fact that the causal links between the outputs and outcomes of the project and the socio-economic well-being of the communities are complex, *a case study approach* is useful in answering part of the research questions. In this article a case study approach is defined as "an empirical inquiry that investigates a contemporary phenomenon within its real-life context, when the boundaries between phenomenon and context are not clearly evident, and in which multiple sources of evidence are used" (Yin 1984). This definition clearly states the importance of taking into consideration the context in which the project was implemented and the importance of involving multiple stakeholders, hereby obtaining a broad insight into the impact of the project on the socio-economic well-being.

Partly based on the outcomes of this case-study, a survey was constructed in order to quantitatively measure the most important impacts. Furthermore, the case-study approach is used to support and explain the result of the quantitative analysis. Finally, the case study material enables the presentation of the quantitative results within the Sustainable Livelihood Framework.

4.2.2 Semi-Experimental Approach

Becchetti & Costantino (cited in Adato & Meinzen-Dick 2002, p.2) note that the literature on fair-trade initiatives is scarce. Only a few studies have tested the statistical significance of such projects, which leaves grounds for scepticism with regards to the size of the impacts. The lack of quantitative impact assessment using a good control group is further acknowledged by Nelson & Galvez (2002) and DFID (2000), cited in Adato & Meinzen-Dick (2002, p.3). By quantifying the impact of the DE Foundation Coffee Project in Peru this study will contribute to the understanding of the role of Fair-trade initiatives in poverty alleviation of small-scale coffee farmers in the Ubiriki valley.

The quantitative answer to the research question is approached using a quasi-experimental design, meaning that comparison is possible because of naturally occurring 'treatment groups', i.e. participating coffee-farmers in the project areas versus non-participating coffee farmers outside the project area. Apart for their participation in the project, the participating coffee-farmers and the non-participating farmers need to be as homogenous as possible, as was explained in the first paragraph of this chapter. Besides constructing the counter-factual based on the comparison of the socio-economic situation of these two groups, a before-and-after counterfactual will be constructed using the results of the baseline study conducted before the start of the project in 2004.

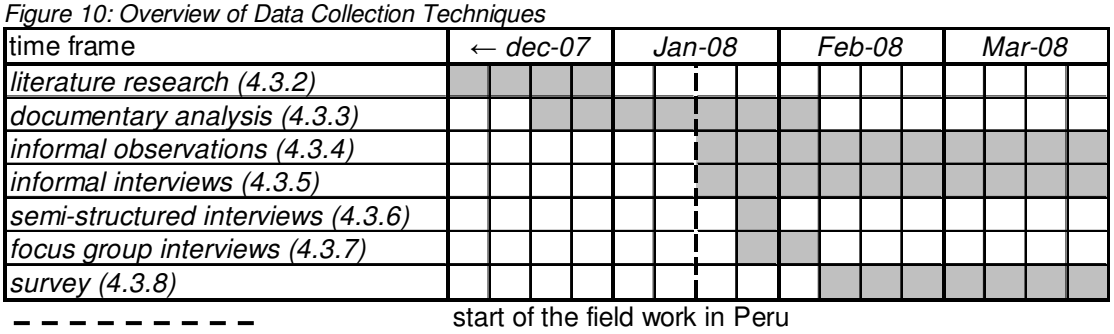
4.3 Data Collection Techniques

In the first paragraph an overview of the different methods and their time-frame will be given. In paragraphs 4.3.2 until 4.3.7 the data collection instruments corresponding to the case-study approach will be discussed followed by the survey, related to the semi-experimental approach.

4.3.1 Overview

As a result of the research approach and the use of the Sustainable Livelihood Framework as an analytical tool (see 3.2) a variety of data collection techniques will be used. Below an overview is provided with a reference to the paragraph in which the specific technique will be discussed.

Figure 10: Overview of Data Collection Techniques



4.3.2 Literature Research

The literature research in this study has several purposes. To start with, the literature related to comparable development projects gave an insight into the potential answers to research question B and C. The outcomes of literature research were, to a certain extent, also used to structure the research instruments used during the field work. Finally the literature will be used to support or explain the outcomes of the quantitative analysis. The majority of this literature research is based on scientific literature. However, reports from governments and development organizations and relevant magazines were also consulted to complement the information from the scientific literature.

4.3.3 Documentary Analysis

The goal of the documentary analysis was to gain insight into the changes which occurred as a result of the Project (RQ A) and explore which information is documented with regards to the other research questions. Besides project proposals, progress reports, documents of the local project team, the cooperative and the local government, several documents are described below since they are used intensively in the development of the impact indicators and the discussion of results.

a Sustainability Indicator (SI) Study (projectteam-peru 2004)

In 2004 a study was conducted among 45 participating farmers in which open questions were asked on what sustainability means to them. The concept was approached from a social, economic and environmental point of view and resulted in a list of the main problems in each dimension. Based on these problems, sustainability indicators were developed. This study will not only be used for the development of indicators but also for the discussion of results, since they are an indication of which changes are specifically important from the point of view of the participants.

b Most Significant Change (MSC) Study (Pineros 2006)

The MSC study is a study conducted in 2006 by Renan Eduardo Pineros, as part of his master for the department of communication science of Wageningen University. The most significant change technique is a form of participatory monitoring and evaluation, applied to this project and evaluated as a method in rural project assessment. In order to answer the research questions in the MSC study, many different stories were collected and documented. Combined with the information from the SI study and the first phase of the field work, this information will be used to develop the indicators in the next chapter.

c Baseline Study (projectteam-peru 2003)

The base-line study was conducted before the start of the project in 2003. The goal of this study was to evaluate the present state of the households, actual extension and training, local participation and organization, livelihood security, quality of the coffee and current farming practices (den Belder 2002) 150. Considering the diversity of the sample and the fact that many of the farmers joined the FFS after the base line study was performed, the population is considered more or less comparable to the current FFS population. Although the analysis will be based on a comparison of data on the current situation of the farmers, the report of the baseline study can thus be used as a reference for the situation before the start of the project. The sub-conclusion for each indicator in the results chapter (part e of each subparagraph) will use this data as additional proof of the fact that more change has taken place within the group of farmers that participated in the project. Alternatively, this data will be used to illustrate that although no impact of the project is measured, significant differences have taken place since 2003 in general.

4.3.4 Informal Observations and Interviews

Informal observations and interviews were used in order to gain insight into the project activities and the link to livelihoods of the farmers in the Ubiriki valley. Especially the informal interviews were used to obtain more local knowledge and ideas, expressed in their own terms. Moreover, the information enabled the development of the more structured data collection instruments and the comparison of these results with the observations, i.e. triangulation. Units of study were the project team, the cooperative, coffee farmers and their communities. Regular records were made in a note book which was revised during the development of the indicators.

4.3.5 Semi-Structured Interviews

The purpose of the semi-structured interviews was to gain a preliminary knowledge of the research questions from the point of view of key informants such as the project team, the farmer representatives of FFS and executive members of the cooperative. During the interviews, notes were made according to the different topics specified in the Sustainable Livelihood Framework (see appendix 9.2 for an example of the interview structure in Spanish).

4.3.6 Focus Group Interviews

The goal of the focus groups was to obtain an idea about research questions B & C, i.e. the most important outcomes and socio-economic impacts of the project from the point of view of the farmers and the communities in general. Besides this, the focus groups were used to cross check the outputs of the project (RQ A). The units of study of these focus groups were FFS participants and relatives or neighbours living in the project zone. The focus groups with relatives and neighbours were initially meant to get insight into the indirect impact of the project. However, due to other constraints this group was excluded from the analysis, although the insights from these focus groups were still useful.

Due to time-constraints only one focus group could be done in each FFS that was visited at this stage, leading to diverse groups of farmers. To prevent that people did not feel free to speak their mind for one reason or another, small papers were used on which people could write down their answers to our questions. The responses were anonymously written down and discussed. These notes and the overview of the group discussion were transferred to a word document and revised during the development of the indicators.

4.3.7 Survey

The goal of the survey is to measure the size and direction of the impact areas identified in the first phase of research. Part of the questionnaire was based on the qualitative research phase and part of it was based upon the request of certain stakeholders. By posing the same set of questions to the treatment group and the control group, a statistical analysis can be performed in order to construct a realistic counterfactual (see paragraph 4.4).

a Target Population

Whereas the qualitative research instruments were targeted at various levels of analysis, the survey was specifically focused on individual coffee farmers, divided into a treatment group and a control group. As will be described in more detail in the second paragraph of the next chapter (5.2), the treatment group refers primarily to farmers participating in the FFS.

The control group refers to ‘comparable’ farmers that neither participate in the FFS nor are a member of the producer organization that was developed as a result of this project (see 4.4 for further discussion on what is comparable). The control farmers were purposefully selected outside the project area in order to control for possible indirect impact, such as knowledge exchange between neighbours. Furthermore, conducting the interviews outside the project area was necessary to be able to select an equally motivated group of non-participating farmers. Within the project area it can namely be argued that the non participating farmers are by definition different from the project participants, since the FFS are free and open to everyone.

b Sampling Method

First of all, it should be mentioned that no sampling has been done in the treatment group since all participants that joined the FFS in the end of February or in March 2008 were interviewed. The organization of the interviews for the treatment group was thus rather straightforward since they organise themselves each month in the FFS and it was not feasible to go to their farms to conduct the interviews. About 90% of the entire population of the FFS was interviewed and since there is no reason for assuming that the missing 10% is a specific subgroup, the treatment group can be considered as representative. Based on the surveys conducted with FFS participants, which were conducted before the surveys within the control group, it was concluded that the character of FFS participants is very diverse in terms of basic demographic characteristics such as average age, family size, level of basic education, farm size before project participation or origin. This facilitated the formation of a comparable control group.

Correct sampling of the control group is critical for solving 'the evaluation problem' explained in the first paragraph of this chapter. Part of this control group will be constructed using econometric data analysis (see 4.4 data analysis) hereby especially controlling for observable characteristics such as level of pre-project 'status', origin or geographic characteristics. However, part of this problem can and should already be solved during the field work. The sampling method was thus designed in such a way as to minimize the differences in observable and unobservable differences between the project participants (the treatment group) and the control group.

In order to accomplish this, the sampling of control units was divided into two levels; first of all control regions were selected outside the project area and secondly control farmers were selected within these areas. For the first step a matrix was developed to select areas which are as similar as possible to the project area except for the presence of the project (see appendix 9.3). The producer in charge of the organization of the FFS (the promoter) needed to fill in this matrix for his or her own area and propose comparable areas, based on a sum of points awarded for comparability. This method thus supported the construction of similar control groups with respect to observable and unobservable area specific characteristics.

The next step was to select farmers within these areas that are comparable to the treatment group. Unobservable characteristics were taken into account by attracting equally interested and motivated farmers through the organization of workshops on coffee in the areas selected by the FFS promoters. Furthermore, taking into account the size of the research area and the time available, it was most efficient to organize for the farmers to get to a central location to conduct the interviews. Since it is not possible to control for who would participate, additional requirements were added whenever there were too many farmers for us to interview in order to form a group as diverse as in the FFS. In total 107 interviews were collected in this group.

c Sample Size

Before the start of the project a target was set to conduct at least 100 interviews within each group. The total sample size after eliminating some invalid interviews is 93 in the treatment group and 107 in the control group. These numbers are supported by mathematical calculation based on estimated population size, precision levels and confidence levels. For example, considering a large population size, a precision level of 10% and a confidence level of 95%, the required sample would be 99 respondents. However, an adjustment needs to be made since it concerns two independent samples which need to be compared. Sudman (1976) suggest that at least 100 observations are needed of each major group in the sample. This implies that the total of 200 surveys adequately responds to the need for quantitative impact studies for this type of projects.

d Data Recording

To be able to analyze the data as efficient as possible and with the least bias, a structured pre-coded questionnaire was developed on which enumerators could fill in the relevant codes directly (see appendix 9.4 for an example of the questionnaire).

e Survey Structure

The questionnaire consists of eight parts, but, as will become clear in the next chapter, only part of the data will be analysed in this study.

part 0: Introduction: including date, name of interviewer, interviewee.
part 1: General data: socio-demographic data of the individual household members.
part 2: Education: including information on the education level of each household member, the enrolment in current educational institutes and the educational facilities in the village.
part 3: Wellbeing: including information on health facilities in the villages, consults in clinics, food diversity and general self esteem.
part 4: Assets: including information on the farm and the different plots, housing and coffee machinery and equipment.
part 5: Production process: including information on the most important production processes, costs of coffee production and waste management.
part 6: Financial data: including data on occupation, household expenditures, yield of coffee, coffee sales in 2006 and 2007 and income from other activities.
part 7: Capacity building: including information on sources and frequency of capacity building.
part 8: Level of organization: membership of producer organizations, other formal and informal organizations and communication about coffee.

f Implementation

In total ten interviewers were selected. Four of the interviewers were already involved in the first phase of the field work and were trained before the first pilot phase. The other interviewers were trained before the second pilot phase to assure everyone has the same interpretations of the questions, concepts and codes. The interviewers were mainly students or recent graduates in agricultural sciences who were born in farmer households in the region. This facilitated the understanding of the students, and thereby of the researchers, of the local situation.

4.4 Data Analysis

In this paragraph the analysis of results will be discussed. In subparagraph 4.5.1 a short description of the data preparation will be given, including how data was validated and how missing values were handled. In the remainder of this paragraph the analysis of results will be described and it will become clear that for each indicator a fixed sequence of analyses will be performed, starting with a direct comparison between the treatment and the control group (4.5.2) and two types of statistical analysis to refine those results by controlling for pre treatment variables (4.5.3 & 4.5.4). As was already mentioned, the survey data is the basis for this analysis, although the qualitative data will be used to develop the indicators (see part ' a' of the sub-paragraphs in chapter 5) and to present and possibly explain the outcomes within the local context.

4.4.1 Data Preparation

It needs to be stressed that data quality is very important since it has been demonstrated, amongst others by Heckman (1998, from Bryson et al. 2002, p23) that the quality of data can be responsible for introducing at least as much bias as the choice of the evaluation technique. Because of this, extensive data verification was performed before doing any further analysis.

The first step in verifying the data quality was already done during the field work. After each interview, a rapid revision of the interview was done, including a quick cross check between different answers and discussing strange outcomes with the interviewer and if possible with the interviewee. A second step was the revision of the data sheet, hereby both checking if information was correctly inserted and if values are realistic when comparing them to other questions. Depending on the quality of the person who inserted the data either the entire questionnaire was revised or several random checks were made. The cross checks for example relate to whether the size of cultivated land corresponds to the sum of separate plots, or whether the use of plots corresponds to the sources of income from other crops.

In general there are few missing values, which is why no overall replacement of missing values was done. Rather the few missing values that existed were reconstructed using a combination of other questions whenever possible, for example in the case of a missing value of one plot size when the total plot size can be used. When this was not possible, the missing value was not replaced, except for those variables included in the propensity score model (see 4.3.1). For those variables it was necessary to eliminate all missing values to calculate the propensity score. In those cases the missing value was replaced by the average value within the specific subgroup (depending on the variable). An example is the replacement of missing values for the average weighted altitude of plots, by the average of plots from farmers in the same village.

4.4.2 Direct Comparison

The direct comparison refers to the comparison of the mean outcomes of the treatment group with those of the control group. This direct comparison will consist of two steps, a description of the outcome indicator without any further statistical testing and comparing the two sample means using an independent sample T-test.

a Data Description

As a first step in the analysis of the survey data a direct comparison between the treatment group and the control group is made, since the sampling method was already developed in such a way as to target comparable farmers in the control group (see paragraph 4.3.7a). This comparison will first of all be made by describing the differences in the survey data without any further analysis. Besides giving an indication of the potential impact, this analysis will provide insight into the current situation of the farmers in the region.

b Independent Sample T-test

A second step in the direct comparison is the performance of an independent sample T-test to assess if the means of the two groups are statistically different from each other. Whether or not a difference is statistically significant depends not only on the differences between the means as such (as was discussed above) but also on the relative spread of the variability of those means (Trochim 2006). When there is high level of variability, it is harder to determine if two means differ.

The null hypothesis which is tested under the independent sample T-test is that the two mean values are not statistically different ($H_0 : \mu_{treatment\ group} = \mu_{control\ group}$). The test value is calculated using the following formula:

$$t = \frac{\bar{X}_T - \bar{X}_C}{\sqrt{\frac{var_T}{n_T} + \frac{var_C}{n_C}}}$$

Where a t-value with a significance of 0.1 or lower means that there is a statistically significant difference between the mean values of the treatment group and the control group. Results will be presented as follows:

Table 1: Example of Presentation T-test Results

t-test	*df*	*t*	*sig.*	*mean diff.*	*se diff.*
socio-economic indicator					
* significant at 10%; **significant at 5%; ***significant at 1%					

- *df* - Refers to *degrees of freedom*, i.e. the number of values in the final calculation that are free to vary.
- *t* - Refers to the *test statistics* used for determining whether there is a statistically significant difference between the two mean values.

- *sig.* - Refers to *significance value* of the test statistic, where a low value indicates that there is a significant difference between the two means. Three levels of significance are indicated; significant at 1%, where sig < 0.01; significant at 5%, where sig < 0.05; and significant at 10%, where sig < 0.1.
- *mean diff.* - Refers to the difference between the mean value of the outcome indicator of the treatment and control group.
- *se diff.* - Refers to the standard error of the differences between the mean value of the outcome indicator of the treatment and control group.

4.4.3 Propensity Score Matching

As was explained in paragraph 4.1, it is important to control for potential pre-treatment differences between the control group and the treatment group, which was already done partly during the sampling of the farmers in the control group. Based on this argumentation a first comparison was done based on descriptive data and an independent sample T-test. However, it is expected that there is still some bias left. A number of different methods exist that try to tackle the 'evaluation problem' statistically in non experimental studies (Ravallion 2001; Bryson, Dorsett et al. 2002). In this impact study two will be applied, one of them being propensity score matching, discussed in this paragraph, and the other being regression analysis, discussed in the paragraph 4.4.4.

Propensity Score Matching (PSM) is the answer to the main constraint of traditional matching of participants with non participants based on one or more characteristics, where the outcomes of program participants are compared with the outcomes of "comparable" nonparticipants (the control group). Differences in the outcomes between the two groups are attributed to the program. However, the more characteristics included, the more difficult if not impossible it becomes to find a control group, since the same combination of characteristics (e.g. the same age, household size, origin etc.) might be difficult to observe in the control group.

Rosenbaum and Rubin (1938, from Bryson et al. 2002, p12) showed that matching on a single index reflecting all relevant co-variables achieved consistent results compared to matching on all covariates separately. The application of this type of matching is most widely known in labour programme impact studies (see for example Rajeev and Sadek 1998; Bryson, Dorsett et al. 2002) or in biostatistics (see for example D'Agostino Jr 1998; Hirano and Imbens 2001) where a large pool of individuals is reduced to a suitable control group based on PSM.

In order construct this counterfactual, the propensity score is calculated which reflects the 'probability' that an observation would have been in either the control group or the treatment group, based on pre-treatment characteristics. Using these probabilities, a control group is selected using one or several of the matching methods identified in part 'f' hereby explicitly identifying the need to have a comparable control group in terms of pre-treatment or fixed variables. This is also referred to as the common support across the treated and non-treated individual (Bryson et al. 2002, p12), since the same characteristics can be identified in both groups.

After the matching, the sample means of the treatment and the matched control group are compared, hereby relying on two important assumptions (Becker and Inchino 2002, p.395). The first assumption is that balancing will take place of pre-treatment or fixed variables given the propensity score, meaning that treatment and control group must have the same distribution of observable and unobservable characteristics independent of participation in the project. The second assumption is that assignment to treatment is unconfounded given the propensity score, meaning that an individual could have been in any of the two groups given the propensity score.

In this study the PSM is applied in a slightly different way because of several reasons. First of all, differences between the control group and the treatment group were already partially eliminated during the sampling method (see 4.3.7b). Secondly, the final control group was approximately the same size as the sample of the treatment group, hereby making it impossible to select from a large set of potential control farmers. A third reason why PSM is not applied to this study in the same way as in the labour or biostatistics studies, is that there is only a limited set of pre-treatment or fixed variables available from the survey to match the treatment and control units. As a result of these issues the two assumptions cannot be fully met. Furthermore, PSM faces, like any data analysis method, several drawbacks and is for example very sensitive to the specification of the propensity score model.

The goal of this PSM is therefore foremost to be able to further scrutinize the results of descriptive data and the independent sample T-test and, as will become clear in the next paragraph, to develop a weighting variable for the regression analysis.

Nevertheless, some drawbacks can also be identified in relation to PSM as a means of controlling for pre-treatment differences and selection bias. The first problem with matching is that there are usually only a limited number of exact matched pairs of treatment and control units with identical values of pre-treatment or fixed variables, and consequently the matching does not perfectly control for the differences between the groups (Rubin 1979, p.318). A second problem in relation to PSM is that the bias is not as explicitly recognized as in regression analysis. Since the impact is essentially the difference between two sample means and the variance is calculated using standard methods for differences in means, the remaining bias is typically ignored in these studies (Imbens 2004, p.15).

A final note which should be made is that although matching may substantially improve the results, a careful choice of the matching variables is central for the quality of the estimates (Lalonde study 1986, from Blundell and Costa Dias 2002, p.91). Finally, PSM is very demanding when it comes to data quality and especially the amount of variables required. Considering the data at hand and the fact that PSM was not considered as a method of analysis before the fieldwork, the quality of the estimation fully relying on PSM cannot be assured. After discussing the details of the propensity score matching, it will therefore be argued in paragraph 4.4.4 that a combination with regression analysis will result in a more reliable impact assessment.

a The Model

The model used for calculating the propensity score is specified as follows:

$$P_i = a + \sum_{j=1}^{n} b_j \cdot X_j + \varepsilon_i$$

Where P_i is the probability of being within either the treatment or control group; X_i stands for control variables such as sex, age, experience of farmers, geographical zone, education level; a, b stand for parameters; and ε is a residual that includes all the other determinants of the indicator in question. In order to estimate the propensity score, i.e. the probability of being in the treatment group, one can use either a logit or probit model (1998, from Bryson et al. 2002, p23). Caliendo & Kopeinig (2005, p5) demonstrate that the result of logit or probit models usually do no differ in case of a binary treatment model.

In the estimation of the model, data of the treatment group as well as the control group will be included. This might sound counterintuitive since the control group did not a have the choice to participate. However, the model is not in itself used to estimate the chance for participation, but to ensure that both groups are comparable in certain covariates. The same method is also applied in other studies with a control group that did not have the option to participate (a.o. D'Agostino Jr 1998; Lissenburgh 2001). However, location specific variables do need to be included in this case to capture differences between control units and treatment units stemming from their different geographic locations.

b Choosing Variables

Only variables which influence the outcome variable alone or outcome variable and 'participation' simultaneously should be included in the propensity score model (Bryson et al. 2002, Caliendo & Kopeinig 2005). Since the same set of control variables can be used for each impact indicator, only one propensity score needs to be calculated. The choice of such variables is based on basic economic theory and prior research. It needs to be taken into account that all variables should be either fixed over time or measured before participation to prevent that the variables are influenced by the participation in the project, and the treatment effect is under or over estimated. Variables that are considered important but perfectly predict participation could be replaced by proxies. In case of the DE Foundation Coffee Project in Peru this is for example the case for area, since people in the control group are de facto outside the area, since they simply did not have the option to participate. Therefore proxies can be used to capture area specific characteristics, for example altitude of plots, as was also successfully done in a study by Lissenburgh (2001, from Bryson et al. 2002, 24-25).

Based on these requirements and the data available the following variables were initially considered (see appendix 9.5 for more information on those variables):

- Average household age
- Composition of household
- Household size
- Origin (district and/or province)
- Time residence in Chanchamayo
- Household religion
- Level of household education
- Income/labour besides farming[8]
- Years coffee production
- Inheritance of farm
- Farm size (cultivated four years ago)
- Second house longer than four years (proxy status)
- Own vehicle longer than four years (proxy status)
- Average elevation plots above sea level (proxy village cha.)
- Distance farm to road (proxy village characteristics)
- Village to Pichanaki (proxy village characteristics)
- Secondary school (proxy village characteristics)
- Health care centre (proxy village characteristics)
- Inheritance of house

Since the main goal of the PSM will be to balance the participants and non participants with respect to certain pre-treatment variables, a T-test will be used to identify whether there are significant differences between both groups (see appendix 9.6 for mean values and T-tests). Based on the T-tests the following variables should at least be included in the propensity score model to reach the goal of balancing the pre-treatment variables:

- Composition of household
- Farm size cultivated 4 years ago
- Origin (district and/or province)
- Years coffee production
- Size of farm cultivated four years ago
- Income/labour besides farming
- Average elevation of plots above sea level (proxy village characteristics)

Besides looking at the differences in pre-treatment variables, several tests exist to decide whether or not variables should be included or excluded (Caliendo & Kopeinig 2005 p7-8). In this study, the decision on whether or not to include variables was based on the statistical significance of the variable in explaining the 'treatment', which is in fact an indication of the difference between the groups with respect to that variable This significance level was chosen so as to include at least those variables which demonstrated significant differences in the T-tests. A 'backward selection' method is used with a 15% significance level (P > |t| = at least 0.15), meaning that the first model includes all variables and variables will be deleted one by one if not significant at 15%.

[8] It might be argued that the project has an influence on whether farmers have or seek other sources of income as a result of an increase in income from coffee and/or an increase in time and money invested in the coffee production process. This would consequently bias the outcomes of the analysis. However, no significant relation is identified between 'income/labour besides farming' and 'income from coffee' or 'coffee price'.

Table 2: The Propensity Score Model

treatment	*β*	*se*	*t/z*	*P > |t|*		
hh6till18	0.201	0.120	1.67**	0.094		
hh0till5	-0.519	0.236	-2.2**	0.028		
altitudeplots	0.003	0.001	3.29*	0.001		
incother	-0.687	0.339	-2.03**	0.043	*Nr. of osbervations*	*200*
distr_junin	0.659	0.387	1.71*	0.088	*Pseudo R^2*	*0.21*
distr_other	1.919	0.587	3.27***	0.001		
experience	0.064	0.023	2.79***	0.005		
villagetopich	0.004	0.002	2.01**	0.044		
cultsize_4	0.064	0.034	1.87**	0.061		
_cons	-4.964	1.153	-4.3	0.000		
* significant at 10%; **significant at 5%; ***significant at 1%						

The pseudo R^2 of the model is 0.2162, meaning that 21.62% of the treatment can be explained by the model. Although this can be considered as relatively low, it should be taken into account that the goal of the model is not to predict the treatment but rather to balance the pre-treatment variables. The quality of the model can therefore be better judged by its final outcome, i.e. in providing correct matches for the treatment group and hereby diminishing the differences between both groups, as is proven in part 'd'.

c Quality of the Propensity Score Model

Several diagnostics were used to check if the model is correctly specified. This is important since the model needs to correctly balance the characteristics of the treatment and control group. Based on several tests to check the independence between the different variables included in the model and the normality of the error of the predicted propensity score, it can be concluded that the quality of the model is sufficient. Although several outliers and influential observations are identified, the goal of the PSM is to balance the variables between the treatment and the control group, not to have a model that perfectly predicts. Based on the fact that the variables included in the model are balanced when comparing the five categories (see -e- matching methods – stratification method)), those outliers will be ignored.

d Common Support

Alternatively, the treatment effect can be determined after eliminating those observations which do not have a propensity score within the range of the opposite group (i.e. the common support). If survey data of farmers would be used that have a propensity score outside this common support, the quantification of the impact would also be based on those observations that do not have a realistic counterpart or control farmer (i.e. extrapolation), thereby making the results less reliable. The common support for the treatment group is however very broad ranging from .072 to .980. Imposing this common support would result in the elimination of five observations with a propensity score between 0.027 and 0.059. Since these propensity scores are very close to the border, imposing a common support region is not considered necessary and/or efficient.

e Matching Methods

Based on the data availability and the goal of the PSM three matching methods will be considered. In theory these different methods should of course lead to similar results since they will establish their conclusions on similar matches, that is to say a similar control group. However, in small samples the choice of a matching can be important and usually a trade-off is made between bias and efficiency (Caliendo & Kopeinig 2005, p12). By using all three methods in this study conclusions are more robust and an interesting conclusion can also be made on the PSM method as such.

Nearest Neighbour Matching

The first method is nearest neighbour matching where the observation in the control group with the closest propensity score is matched to the treated observation. Considering the sample size of the control group in this study, a control observation can be used several times, i.e. nearest neighbour matching with replacement. (see Caliendo & Kopeinig 2005, p.9-11; Bryson et. al 2002, p.27). Although nearest neighbour matching ensures a good method in terms of bias, it does not perform well in terms of efficiency since only around 39 of 93 observations are selected.

Kernel Matching

The second method is kernel matching that uses the weighted average of the entire control group, and therefore performs better in terms of efficiency. It does this by giving more weight to control observations that are more comparable to the treated individuals (Bryson et. al 2002, p26). The weight depends on the distance between each individual from the control group and the participant for which the counterfactual is estimated.

Stratification

The final matching method which is considered is stratification matching. This method calculates the impact by taking the mean difference in outcome between treated and control observations within several blocks. This is necessary to identify if it is possible to balance the variables among both groups based on the propensity score model given above. The results of the procedure indicate that five groups are needed to balance the pre-treatment variables specified in the model.

Table 3: Number of Categories in the Sample based on PSM

	control	*treatment*	*total*
0.0 0.2	33	6	39
0.2 - 0.4	40	11	51
0.4 - 0.6	22	25	47
0.6 - 0.8	7	31	38
0.8 - 1.0	5	20	25
Total	107	93	200

Cochrane and Chamber (1965, from Caliendo & Kopeinig) also show that five subclasses are often enough to remove 95% of the bias associated with one variable, in this case the propensity score. In terms of efficiency this method is also preferred since it uses all observations in the common support (see part 'e' above); in this study all farmers in the control group.

f Presentation of Results

As was mentioned before the statistical software package 'Stata' will be used to perform the calculations. Below an example is given of how the results will be presented in chapter 5.

Table 4: Example of Presentation Propensity Score Matching Results

PSM Results	*Nearest neighbour matching*					*Kernel matching*			*Stratification matching*		
	T	*C*	*ATT*	*se* [1]	*t-stat*	*ATT*	*se* [1]	*t-stat*	*ATT*	*se* [1]	*t-stat*
socio-economic indicator											
* significant at 10%; **significant at 5%; ***significant at 1%											

- *T* - The number of observations from the treatment group.
- *C* -The number of observations from the control group.
- *ATT* - *ATT* stands for average treatment effect.

- *se* – Refers to the *standard error* of the average treatment effect. Since the estimated variance of the treatment effect should also include the variance due to estimation of the propensity score, it is not possible to calculate the standard errors directly. Instead, the standard error is calculated using bootstrapping as suggested by e.g. Lechner (2002) Each bootstrap includes a re-estimation of the results and repeating the bootstrapping N times leads to N bootstrap samples and to N average treatment effects. The distribution of those mean approximate the sampling distribution of the population mean, and hereby the standard error. (Caliendo & Kopeinig 2008) This method is part of the Stata procedure developed by Becker & Inchino (2000).
- *t-stat* – the *t-stat* belongs to the hypothesis that there is no significant difference between the treatment group and the control group. A significant impact will be indicated with an asterisk.

4.4.4 Regression Analysis

Although little quantitative impact analysis has been performed on comparable projects, simple regression analysis is probably the most widely used method for controlling differences in pre-treatment variables or selection bias. Considering the drawbacks identified for the PSM, regression analysis will be used as an additional method for controlling for pre-treatment variables and selection bias when measuring the impact of the project on outcome indicators. Moreover, regression analysis will be used to identify the source of the impact, using the output-outcome-impact model.

By combining both methods the estimator neither relies on the correct specification of the regression function or the propensity score for consistency (Abadie and Imbens 2002, p.2). Rubin (1979, p. 318) also empirically demonstrated that the combination of regression adjustment on matched samples is usually superior to either method alone.

a Simple Regression Analysis

Regression analysis is a technique used for constructing a counterfactual by modelling the relation between a dependent outcome variable and several independent variables, including pre treatment and/or fixed demographic, geographic and economic control variables and the participation of a farmer in the project. This can be illustrated as follows:

$$Y_i = a + b \cdot P_i + \sum_{j=1}^{n} c_j \cdot X_j + \varepsilon_i$$

where Yi is the dependent outcome variable for farmer; X i stands for control variables; Pi stands for treatment (1=treatment, 0=no treatment); a, b and c stand for parameters; and ε is a residual that includes all the other determinants of the indicator in question. Depending on the indicator either a linear regression model is used (in case of scale variables) or a logistic model (in case of a categorical variable). The basic model which is used for the regression analysis is a backward selection model with a 10% significance level, meaning that variables will be deleted from the model on by one when not significant at 10%. The control variables included in the model are the same variables identified as potential variables for the propensity score model described in part 'b' of paragraph 4.4.3 (see appendix 9.5 for more information on those variables) and an additional variable for the average history of the coffee plots in case of costs and yield.

Regression analysis allows for the identification of the relation between the outcome variables and the different independent variables, which for example makes it possible to differentiate between the impact of certification, FFS participation or membership of a cooperative. Moreover, the importance of project participation in relation to other determining variables can be identified.

However, some problems are identified in relation to regression analyses which apply to this research. The first problem is referred to as *nonparallel response surfaces* (Rubin D 1979, p. 318-320). In order to estimate the expected treatment effect in the treatment group, regression analysis extrapolates the data of the control group into the data of the treatment group. When the values of pre-treatment or fixed variables which influence either participation or outcome variables are not identical in both groups, regression analysis can result in biased results.

The second problem with regression adjustment is that the linear model relating Y and X may be wrong, and consequently the adjustment which is applied leads to biased results. Especially when the characteristics of both groups are not equal, this problem becomes significant, i.e. the prediction based on a linear regression function can become very sensitive to changes in the specification (Imbens 2004, p 13).

b Weighted Regression Analysis

In order to solve the problem of nonparallel response surfaces, the treatment group and control group would need to be comparable with respect to the same variables as identified in the PSM. One of the ways to do this, proposed by Hirano and Imbens (2002) is in fact by using the propensity score calculated, which was calculated for this study with the model described in table 2.

As a first step the mean value of the propensity score in the treatment group was calculated. The distance of the propensity score to this value of each farmer in the untreated group is calculated. The closer the propensity score to the mean of the treatment group, the more typical or comparable an observation is to the farmers participating in the project. The observation will consequently have a bigger influence on the calculation of the treatment effect when it is more comparable to the treatment group. Besides the weighted sample, the model will be equal to that of the simple regression model.

c Regression Analysis in Output-Outcome-Impact Model

After the first regression analysis, a few more regression analysis will be performed replacing the treatment variable P_i by the outcome indicators preceding the one of interest in the output-outcome-impact model. For example instead of determining the relation between the overall 'treatment' and production processes, the relation between capacity building and production processes can be determined. The results will indicate whether the changes are a result of the project in specific, in case the relation between the treatment and production processes is stronger, or of the capacity building in general, in case the relation between capacity building and production processes is stronger. The control variables will be the same as for the models specified above.

d Presentation of Results

Considering the fact that it is impact of the treatment that has to be identified, the results of the other variables will not be presented. Again the calculations will be performed using the statistical software package 'Stata' and the results of the regression analysis will be presented as follows:

Table 5: Example of Regression Analysis Results

regression analysis	*Simple Regression Analysis where Pi = .. x...*					*Weighted Regression Analysis where Pi = .. x...*				
	R^2	*Exp(β)*	*se*	*t/z*	*P > |t|*	R^2	*Exp(β)*	*se*	*t/z*	*P > |t|*
socio-economic indicator										
* significant at 10%; **significant at 5%; ***significant at 1%										

- P*i* – P*i* refers to the treatment variable, being first of all the 'treatment' in general and when possible this will also be replaced by for example capacity building, production processes or certification in specific (see discussion in part 'c' on the previous page)
- R^2 – A measure of the quality of the model, indicating the percentage of the outcome indicator explained by the model. The (Ps) refers to Pseudo R^2 which is a comparable measure for models with a binominal independent variable, such as yes/no questions.
- *β* – The β refers to the size of the impact, where (Exp) refers to the odd ratio in case of a binominal independent variable.
- *se* – The se refers to the standard error of the size of the parameter, i.e. the size of the impact
- *t/z* – The t or z statistic belongs to the null hypothesis that the variable does not influence the outcome indicator.
- P > (t) refers to the value at which the null hypothesis is rejected, where $p < 0.1$ leads to a rejection of the null hypothesis, thereby arguing that there is a significant impact.

4.5 Chapter Conclusion

For evaluating the impact of the DE Foundation Coffee Project in Peru, a counterfactual is constructed to estimate what the situation of participating farmers would have been, had they not participated in the project. Clearly, there is a problem of missing data since only one of the potential outcomes can be observed for each individual. However, one cannot simply compare participants with non participants, since participation in the project is voluntary and it is therefore expected that participants are different with respect to various observable and unobservable characteristics, which influences the outcome indicators irrespective of project participation. A good control group has been therefore formed by conducting qualitative research at an early stage of fieldwork, by taking into account both observable and unobservable variables during the sampling method of the survey and by using statistical data analysis to control for observable variables.

In the first month of field research qualitative data collection techniques were used including documentary review, informal observations, focus group discussion and informal and semi-structured interviews, together referred to as 'the case study approach'. Partly based on this case study approach, socio-economic indicators were developed and a structured questionnaire was constructed in order to measure those impacts. Furthermore, the case-study approach is used to support and further explain the result of the quantitative analysis. The outcomes of these research instruments also enabled the presentation of the quantitative results within the analytical framework, i.e. the 'output-outcome-impact' framework and sustainable livelihood framework.

In the second phase of the fieldwork, and corresponding to the semi-experimental research approach, more than 200 structured surveys were conducted, divided into a treatment group and a control group. The treatment group refers to the Farmer Field School (FFS) participants and their households of which approximately 90% is also member of the producer cooperative. The control group refers to 'comparable' households outside the project area that did not participate in the FFS. Correct sampling of the control group was critical for creating a good counterfactual. The sampling method was thus designed in such a way as to minimize the differences in observable and unobservable variables between the treatment group and the control group. This was done, amongst others, by organising coffee workshops in areas comparable to the project areas, so as to enable a self-selection mechanism of equally motivated or interested farmers as those participating in the FFS.

After the data preparation, including quality and validity checks, the survey data for each impact indicator will be described and a test is performed to see if there is a significant difference between the treatment group and the control group. This enables the reader to get a general insight into the situation and to identify at a later stage the bias due to pre-treatment differences between the two groups. The first method to control for the pre-treatment differences is propensity score matching (PSM), which matches the FFS participants to control farmers who have similar fixed or pre-treatment characteristics. After the matching procedure, outcome indicators are compared and differences are ascribed to the project.

The second method is regression analysis, which is a technique used for constructing a counterfactual by modelling the relation between a dependent outcome variable and several independent variables, including control variables and the participation of a farmer in the project. The regression analysis also allows for the identification of the exact source of the impact, and not merely identifying the total impact due to the project as a whole. By applying and partly combining both methods the bias due to pre-treatment variables can be identified with more certainty resulting in a more reliable determination of the direct on indirect impact of the project.

5 Results

As was explained in chapter 3 the output-outcome-impact mode will be used to structure the relations between the project activities and the socio-economic indicators at household level. The framework will also enable the reader to identify the different levels at which socio economic indicators are selected. In paragraph 5.1 an overview of the indicators in the output-outcome-impact model will be given, with a reference to the paragraph in which those indicators will be discussed and analysed.

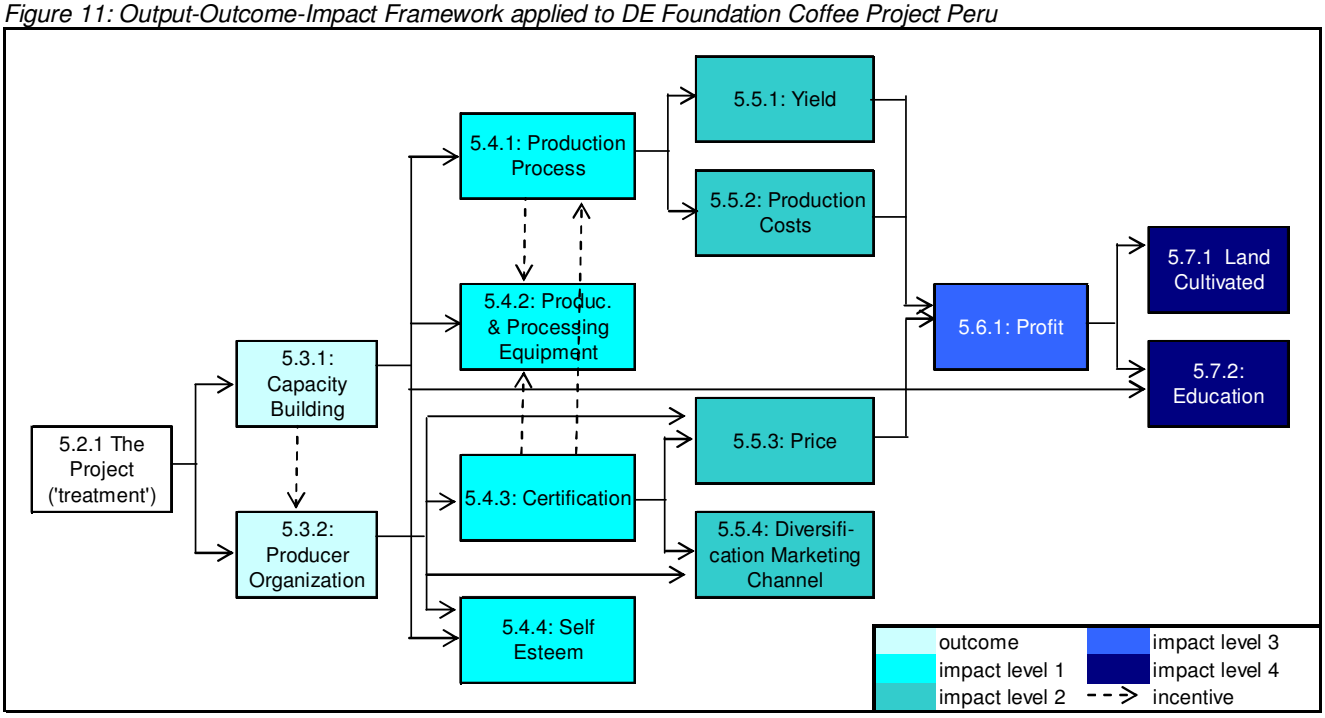
As was explained in the methodology a fixed sequence of analyses will be performed for each indicator. After discussing the choice of indicators in part a of each paragraph, a direct comparison between the treatment group and the control group will be made in part b. As part of this direct comparison a description of the outcome indicator will be given using a graph of the mean values or frequencies. Furthermore, a statistical test will be done to see if there is a significant difference between the two sample means. (see 4.4.2) However, it is expected that these results are partly biased due to differences between project participants and farmers in the control group before the start of the project. Because of this, the results of the direct comparison will be further scrutinized using propensity score matching (PSM) (see 4.43) in part c. Besides controlling for pre-treatment differences, the goal of PSM is to identify the size of the bias which can be expected when directly comparing the treatment and the control group. Another purpose of the propensity score is to eliminate the bias due to pre-treatment variables from the regression analysis in part d, which is the third method used for analysing the survey data. This regression analysis (see 4.4.4) will be done with and without a weighting of the sample using the propensity score. Furthermore, the regression analysis will be used to identify the source of impact within the output-outcome-impact framework whenever possible. Following the discussion in part a until d, a summary will be given on the results of the different methodologies and of course the impact of the project (see part e). In paragraph 5.8 an overall conclusion will be given.

5.1 Indicators in the output-outcome-impact framework

On the next page an overview of the output-outcome-impact framework is given. As was already described in the methodology several sources of information have been used to develop the socio-economic indicators and their relationship with the project activities. The starting point of the choice of indicators has been the literature review in chapter 2 in which the socio-economic impacts of comparable projects have been reviewed. These outcomes were taken into account while performing the first phase of fieldwork, i.e. the semi structured interviews (4.3.5), focus groups (4.3.6) and informal observations and interviews (4.3.4). Another source of information was project documentation and previous research including the baseline study from 2003, the survey on sustainability indicators from 2004 and the study on most significant changes from 2006 (4.3.3).

In the framework only the direct relations between the outputs, outcomes and impacts are identified so as to simplify the figure. In reality, the situation is of course much more complex and arrows would go back and forth between many of the impact areas. However, the goal of the framework is not to build a correct model as such, but rather to illustrate some of the potential relationships and to be able to convey these results in a consistent and convincing way. Furthermore, it should be mentioned that as a result of time and data constraints, various socio-economic indicators could not be analysed within the time frame of this study. It should therefore be taken into account that the framework below only provides a limited overview of the socio-economic impact areas. In the discussion chapter (chapter 6), the other impact areas will be discussed in relation to the sustainable livelihood framework.

Figure 11: Output-Outcome-Impact Framework applied to DE Foundation Coffee Project Peru



As can be seen in the figure above the DE Foundation Coffee Project in Peru has resulted in various changes at household level. In this study the two most important outcomes that were identified are capacity building in the farmer field schools (FFS) and the development of the Cooperativa Agraria Cafetalera Sostenible Valle de Ubiriki (CACSVU).

As a result of the FFS or the capacity building in general several changes are expected in the production process. Another impact of the FFS, and partly stimulated by the change in production processes, is the extension of the coffee production and processing equipment. Both changes in production processes as well as production and processing equipment are reinforced by the coffee certifications which have been obtained as a result of the project. These certifications are considered as the main impact of the development of the CACSVU or the membership of producer cooperative in general. However, the development of the cooperative in itself could also be seen as a result of the desire of the participating farmers to gain from the increased investment in the production process. Certification, being one way to reach this goal, required the development of a reliable producer organization. A final impact which is considered at this stage, resulting from the capacity building and producer organization, is the increase in self-esteem.

The production processes, resulting from the capacity building in general and/or the FFS approach in specific are expected to lead to an increase in yield. Besides an increase in yield, it is expected that, at least on the short term, there will be an increase in production costs resulting from the increase in production processes. On the longer term however, there might actually be a decrease in costs due to for example more efficient production, less diseases etc. Another goal of the project was to increase the benefits from coffee production, i.e. the price of coffee. This increase in price is expected to be a result of the membership of the producer organization through which farmers can bypass the local intermediaries and through which farmers have the possibility to obtain coffee certification. Besides the increase in price, the membership of the producer organization and the coffee certifications can result in a diversification of marketing channels.

Resulting from the expected increase in coffee yield and coffee price, the profit from coffee per kg and hectare is expected to increase. This increase in profit could however partly be offset by the increase in production costs. Although many potential impacts of an increase in profit from coffee can be identified, being the main source of income of many farmers in the Ubiriki valley, at this stage only investment in land cultivation and investment in education of both children and adults are analysed. The extra investment in education is not only expected to be a result of an increase in income, but also of the increase in awareness on the benefits of education resulting from capacity building.

5.2 Outputs

5.2.1 The Project (the treatment)

In the introduction it was already explained that of the many activities that can be seen as part of the project, only those that relate to the focus of this study, i.e. the socio-economic impact at household level of the participating farmers, will be investigated. In figure 11 on the previous page, the project or the 'treatment' as a whole is depicted as the main output.

Although two of the main project activities are specified under outcomes, capacity building and producer organization, the treatment in fact comprises to a large extent both of them. The FFS are considered as the first outcome at household level resulting from the project and has therefore been taken as the point of departure during the sampling, meaning that 100% of the treatment is FFS participant. The average number of years ago participants joined the FFS is 2.6 years. Of the 93 FFS participants in the sample, six participants joined half a year ago, 13 participants one year ago, 17 participants two years ago, 40 participants three years ago, 12 participants four years ago and 5 participants five years ago. The average number of capacity building sessions the FFS participants joined in the last five years is almost 30. Of the treatment group 12 producers received less than 12 session of FFS capacity building, 30 producers received between 12 and 35 times capacity building and 51 received more than 50 times capacity building from the FFS.

Besides the participation in the FFS, about 80% of the participants are also member of the CACSVU which is reflected in the sample. On average the participants have been a member of the CACSVU for about 3,5 years of which 2 are member since six months, 13 since one year, 16 since two years, 31 since three years and 17 since four years.

Besides the FFS and the CACSVU, the treatment also compromises the project outcomes such as changes in production processes and certification. The treatment therefore refers to the combination of those activities, and although for some indicators a difference can for example be made between the impacts of capacity building, the producer organization or the coffee certification, it is not possible to disentangle the impact for other indicators.

5.3 Outcomes

As is indicated in figure 11, capacity building and the producer organization are considered as the main outcomes of the project.

5.3.1 Capacity Building

a Description of Indicators (capacity building)

From the project proposals and project progress reports it can be concluded that the FFS's were the initial focus of the project, at least at household level. As was mentioned before, this has also been taken as a point of departure during sampling since 100% of the treatment group is FFS participant.

The FFS is a group-based learning process used by a number of governments, NGOs and international agencies. FFS were originally designed by the United Nations Food and Agriculture Organisation in Indonesia in 1989. During these FFS, participants carried out experiential learning activities such as experiments, field observations and group analysis. The knowledge gained from these activities enabled the participants to 'make their own locally-specific decisions about crop management practices' (Bartlett 2004). This approach represented a radical departure from earlier extension programmes in which farmers were expected to adopt generalized recommendations that had been formulated by specialists from outside the community (Bartlett 2005).

The FFS approach is also central to the project in Peru. The FFS are generally organized every month and all farmers are free to participate, including those from outside the region and those who are member of other producer organizations. The two main tools used to stimulate the 'learning by doing' philosophy (Pineros 2006) are the experimental plots, where the different practices learned are implemented by the participants. Another tool is the field book, in which farmers are expected to report about their production process which is analysed and discussed during the FFS. Topics that are covered in the FFS relate to all aspects of the production and processing process, from preparing the field for new coffee plants to storage of dried coffee. Other issues are also discussed in the FFS related to certification, commercialization of coffee, breeding guinea pigs (for manure) and occasionally topics such as human values or health issues.

Besides the FFS, the farmers in the treatment as well as the control group receive capacity building from other sources. However, those capacity building sessions are generally less frequent and the approach is more conventional. It is therefore not only the impact of capacity building in general that will be measured, but also the impact of the FFS approach. This effect is however not captured by the indicators at this stage (see table below) but rather by the effect of the treatment as a whole (see 5.2.1).

The first two indicators measured at this stage, indicated in table 6, are whether farmers receive capacity building and if they do, the number of times capacity building was received over the last five years. The choice of these indicators relate directly too many of the indicators mentioned in the Sustainability Indicator Study (SI study, paragraph 4.3.3) and the changes indicated by the farmers in the Most Significant Change Study (MSC study, paragraph 4.3.3). In this study 75% of the stories of the farmers related to technical training. The importance of measuring those indicators is also illustrated by the results of the baseline study, in which 81% of the farmers indicated to never have received capacity building and at the same time 87% indicated to be interested in receiving capacity building. Another indicator is the participation of women in capacity building for those households that receive capacity building. This is considered important since the FFS were initially developed in such a way as to have an equal participation of men and women.

Table 6: Outcome Indicators – Capacity Building Coffee

Indicator	Survey	Hypothesis
hhcapa: receiving capacity building	7.1	↑ capacity building
hhcapa_freq: nr. ca-bui. last 5 years (if hhcapa)	7.4 - 7.6	↑ nr. capacity building sessions last 5 years
hhcapa_wom: particaption women (if hhcapa)	1.3 / 7.1	↑ participation rate of women

b Direct Comparison (capacity building)

From figure 12 below it can already be seen that in the control group only 36% of the farmers received capacity building. Moreover, of those farmers that received capacity building in the control group, the number of times capacity building was received in the last five years is much lower (6.7 versus 30.5). Finally, the participation of women in capacity building for those households that received capacity building is about 10% lower in the control group. From the T-tests in table 7 it can be concluded that the difference between receiving capacity building and the frequency of capacity building is significant. The difference in relation to participation of women in those households that receive capacity building is however not statistically significant.

Figure 12: Descriptive Data Outcomes - Capacity Building Coffee

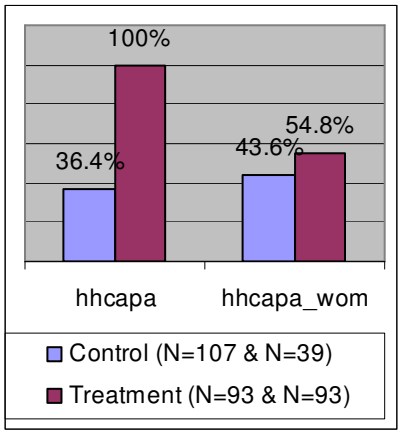


Table 7: T-test Outcomes - Capacity Building Coffee

t-test	*df*	*t*	*sig.*	*mean diff.*	*se diff.*
hhcapa	198	12.670***	0.000	0.636	0.050
hhcapa_wom (ifcapa)	130	1.177	0.241	0.112	0.096
hhcapa_freq (ifcapa)	128	8.669***	0.000	23.212	2.678

* significant at 10%; **significant at 5%; ***significant at 1%

c Propensity Score Matching (capacity building)

The results of the PSM in table 8 confirm the results of the T-tests, namely that there is a significant impact on receiving capacity building and, if they receive capacity building, on the frequency of this capacity building. A significant impact on the participation of women in capacity building is only proven at a 10% significance level and only with nearest neighbour matching.

Table 8: PSM Outcomes - Capacity Building Coffee

psm	Nearest neighbour matching					Kernel matching			Stratification matching		
	T	C	ATT	se [1]	t-stat	ATT	se [1]	t-stat	ATT	se [1]	t-stat
hhcapa	93	38	0.559	0.125	4.461***	0.455	0.081	5.636***	0.455	0.073	6.248***
hhcapa_freq (if cap)	93	13	21.359	2.581	8.277***	24.95	1.905	13.096***	24.947	2.267	11.004***
hhcapa_wom (if cap)	93	13	0.329	0.188	1.75*	0.156	0.102	1.530	0.156	0.120	1.296

* significant at 10%; **significant at 5%; ***significant at 1% [1]Bootstrapped errors

d Regression Analysis (capacity building)

Considering the fact that 100% of the treatment group receives capacity building in the FFS, no regression analysis can be performed, as indicated in the table below. The results of the regression analysis do confirm the conclusions made with respect to the frequency of capacity building and the participation of women.

Table 9: Regression Analysis Outcomes - Capacity Building Coffee

regression analysis	Simple Regression Analysis where Pi = treatment					Weighted Regression Analysis where Pi = treatment				
	R^2	Exp(β)	se	t/z	P > |t|	R^2	Exp(β)	se	t/z	P > |t|
hhcapa	not possible					not possible				
hhcapa_freq (if cap)	0.457	21.975	2.917	7.53***	0.000	0.468	21.034	2.573	8,17***	0.000
hhcapa_wom (if cap)					0.756					0.870

* significant at 10%; **significant at 5%; ***significant at 1%

e Overview Results (capacity building)

Capacity building

When directly comparing the treatment group and the control group, the probability of receiving capacity building increases by 63.6%. Considering the fact that the baseline study indicated that only 7% of the farmers received capacity building in 2003, this is a large difference. When controlling for the differences due to pre-treatment differences, this impact is reduced to somewhere between 45.9% and 49.5%. It can therefore be said that no matter which method is used, the project results in almost twice as much participation of households in capacity building.

Frequency of capacity building

The number of times capacity building is received every year is about 23 times more in the treatment group, including both capacity building from FFS and from other sources. When controlling for the bias due to pre-treatment differences using PSM, this number increases to about 26. However, when further scrutinizing this data using the regression analysis the number decreases slightly to between 21.8 and 22.3. It can therefore be said that there is a large impact on the frequency of capacity building. Considering the fact that farmers indicated they would like to receive capacity building at least once a month In the baseline study, this is an important progress.

Participation of women in capacity building

In the treatment group 10% more women participate in capacity building than in those households that receive capacity building in the control group. However, this difference is not statistically significant. This result is confirmed by the PSM and regression analysis.

5.3.2 Producer Organization Coffee Farmers

a Description of Indicators (producer organization coffee farmers)

Although various producer organizations for coffee farmers exist in the region only a small part of the coffee farmer households are member of such an organization. This is supported by the fact that only 17% of the control group is member of a coffee producer organization. From the informal conversations with the project team and several farmers it became apparent that this is mainly because of the lack of trust in producer organisations. This lack of trust was also explicitly mentioned in the Sustainability Indicator (SI) study where 'a lack of organisations due to a lack of trust among farmers and bad experiences in the past' was indicated by participating farmers as one of the main problems in the social dimension.

Nevertheless, the development of a trustworthy producer organization can be considered as one of the main outcomes of the project. That is to say, the project resulted in a search for new marketing channels for coffee since there were few incentives to offset the extra effort invested in the coffee production and processing by participating farmers. Resulting from the cooperation with Sara Lee, an Utz Certified program was initiated almost simultaneously with the start of the FFS. To access this certification, and at a later stage also other certification schemes, a reliable producer organization was required. Consequently the project team started to look for possibilities to develop a strong cooperative through which they could obtain other certifications. Unfortunately no measures were included in this study on the satisfaction with or trust in the producer organization. Neither was it possible to include realistic measures of the differences between the producer organizations, which should be taken into account when interpreting the results related to the impact of the organization.

The producer organization that was developed in 2005, the Cooperativa Agraria Cafetalera Sostenible Valle de Ubiriki (CACSVU) currently has about 280 members. Of those members only a certain part participates in the FFS, which are the farmers included in the sample. However, not all of the producers in the sample are member of the cooperative since the FFS are open to all farmers. In total 80 farmers in the treatment sample are member of the CACSVU, 1 farmer is member of another cooperative and 13 farmers are not member of any producer organization. This is a realistic reflection of the total treatment group.

An important sub-indicator mentioned in table 10 is the participation of women in the producer organization for those households that are member of a producer organization in the first place. Although in case of the CACSVU the entire household is officially member, this is not always perceived as such by the individual household members. Taking into account the initial focus on the role of women in the project, it is therefore expected that FFS participants demonstrate a different attitude towards participation of women in producer organizations.

Table 10: Outcome Indicators – Producer Organization Coffee Farmers

Indicator	Survey	Hypothesis
hhcoop: membership of a coffee cooperative	8.1.1-2	↑ membership
hhcoop_wom: membership women (if hhcoop)	1.3/8.1.1-2	↑ participation rate of women

b Direct Comparison (producer organization coffee farmers)

In figure 13 it can be seen that in the control group less than 20% of the farmers are member of a producer organization, whereas this is 86% in the treatment group. However, of those households that are member of a cooperative, there is only a very small difference in the participation of women in both groups, which is confirmed by the non significant difference of the T-test in table 11.

Figure 13: Descriptive Data Outcomes – Producer Organization Coffee Farmers

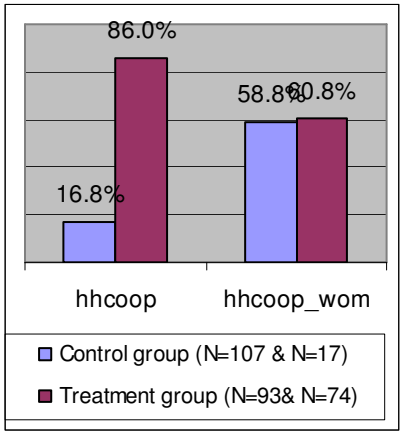


Table 11: T-test Outcomes – Producer Organization Coffee Farmers

t-test	df	t	sig.	mean diff.	se diff.
hhcoop	198	13.430**	0,000	0,692	0,052
hhcoop_wom (ifcoop)	89	0,149	0,882	0,020	0,133
* significant at 10%; **significant at 5%; ***significant at 1%					

c Propensity Score Matching (producer organization coffee farmers)

The results of the PSM in table 12 confirm the significant impact of the project on participation in producer organizations and the lack of impact on membership of women.

Table 12: PSM Outcomes – Producer Organization Coffee Farmers

psm	Nearest neighbour matching					Kernel matching			Stratification matching		
	T	C	ATT	se [1]	t-stat	ATT	se [1]	t-stat	ATT	se [1]	t-stat
hhcoop	93	38	0.656	0.088	7.475***	0.700	0.071	9.912***	0.660	0.067	9.79***
hhcoop_wom (ifcoop)	93	5	0.082	0.311	0.263	-0.110	0.176	-0.623	not possible		
* significant at 10%; **significant at 5%; ***significant at 1%									[1]Bootstrapped errors		

d Regression Analysis (producer organization coffee farmers)

The results from the regression analysis in the table below confirm the conclusions from the PSM.

Table 13: Regression Analysis – Producer Organization Coffee Farmers

regression analysis	Simple Regression Analysis where Pi = treatment					Weighted Regression Analysiswhere Pi = treatment				
	R^2	Exp(β)	se	t/z	P > |t|	R^2	Exp(β)	se	t/z	P > |t|
hhcoop	0.510	185.54	143.2	6.77***	0.000	0.509	181.63	139.4	6.78***	0.000
hhcoop_wom (ifcoop)					0.511					0.587
* significant at 10%; **significant at 5%; ***significant at 1%										

e Overview Results (producer organization coffee farmers)

Producer organizations
From the baseline study it can be concluded that five years ago almost 60% of the farmers in the region sold their coffee to middlemen. Only 16% of the farmers sold coffee to a producer organization, which is an indication of the membership of producer organizations five years ago. That the project indeed changed this level of membership is demonstrated by the fact that 86% of the farmers in the treatment group are member of a producer organization, whereas it has remained at a same level in the control group. These differences are confirmed when controlling for pre-treatment differences by either PSM or regression analysis.

Membership of women in producer organizations
Although the absolute number of women that participate in producer organizations is higher in the treatment group, this effect is no longer significant when comparing the participants only to those households in the control group that are member of a producer organization. The impact remains insignificant when controlling for pre-treatment variables with either PSM or regression analysis.

5.4 Impact Level One

As was indicated in figure 11 the impact directly resulting from the outcomes are changes in the coffee production process, the production and processing equipment, coffee certifications and self-esteem.

5.4.1 Coffee Production Process

a Description of Indicators (coffee production process)

The changes in production processes would result from the knowledge from the FFS, being one of the main instruments increase yield and coffee quality. When discussing the impact of the project on the lives of the farmers during the focus group sessions, changes in production processes were among the first issues mentioned. These results were also confirmed by the SI study in which a 'lack of knowledge in the coffee culture' was indicated as a problem in all three dimensions, that is, it was considered a problem from a social economic and environmental point of view.

The survey included sufficient questions to develop an impression of the production process (see part 5 in appendix 9.4). The choices of these topics were based on the most important (measurable) production activities related to the FFS, as defined by the local project team. The first part of each question relates to the fact whether a production process is performed or not and is the starting point of analysis, as is indicated in table 14. The relevance of measuring the impact on production processes is highlighted by the results of the baseline study. With respect to most activities, it can be said that few farmers performed them five years ago, for example only 9% of the farmers applied organic material to their coffee fields, 6% of the farmers did some sort of shade management, 5% of the farmers planted new coffee plants adequately, 30% of the farmers performed an activity in relation to pruning and 5% of the farmers harvested selectively.

However, it needs to be taken into account that the production process of coffee is very complex and due to time constraints no detailed questions were asked on each separate production activity or the answers to the questions were not considered reliable enough. The results will thus need to be interpreted with care since they are no indication of the quality of the activity, merely whether the producers performed them or not. Also, certain aspects of the production process that are dealt with in the FFS are not explicitly mentioned, such as quality management or disease control. However, these issues are incorporated in other indicators since they are a central part of the production process.

Table 14: Impact Level One Indicators – Production Process Coffee

Indicator	Survey	Hypothesis
pr_matorg: application of organic material[1]	5.2.5.1	↑ application of organic material
pr_shade: shade management	5.2.8.1	↑ shade management
pr_chem: use of chemicals[2]	5.5.1-5.5.8	↓ chemicals
pr_orgafung: use of organic fungicides	5.5.1	↑ organic fungicides
pr_orgfert: use of organic fertilization[3]	5.5.4	↑ organic fertilization
pr_orgpes: use of organic pesticides	5.5.2	↑ organic pesticides
pr_sproinbag: correct use of sprouts	5.6.1.1/5.6.1.5	↑ correct sprouts
pr_sproman: selection of sprouts after planting	5.6.2.1	↑ sprout management
pr_prun: pruning	5.6.3	↑ pruning
pr_desc: aftercare of pruning	5.6.2	↑ aftercare pruning
pr_harv: selective harvest	5.6.5.1/5.6.5.2	↑ selective harvest

[1]is interpreted as the application of any type of organic material in general
[2]including use of chemical pesticides, fungicides, and fertilizers
[3]is interpreted as the application of organic material based on specific soil and plot characteristics

b Direct Comparison (coffee production process)

Based on figure 14 it can be seen that there is a positive difference between the production process of the farmers in the treatment group and the control group. The biggest difference relates to adding organic material to the plots, shade management, using organic fertilization, selecting seedlings after planting, pruning, aftercare pruning and harvesting selectively. From the T-tests in table 15 it can be concluded that for these production processes the differences are statistically significant. Furthermore, the decrease in the use of chemicals and selection of seedlings after planting is also statistically significant.

Figure 14: Descriptive Data Impact Level One – Production Process Coffee

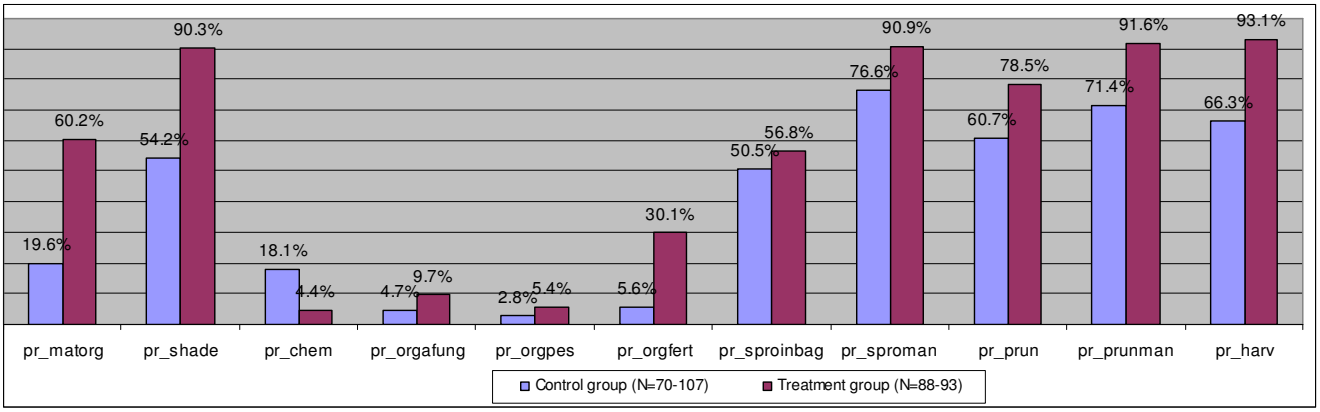


Table 15: T-test Impact Level One – Production Process Coffee

t-test	df	t	sig.	mean diff.	se diff.
pr_matorg	177	6.345***	0.000	0.406	0.064
pr_shade	198	6.086***	0.000	0.361	0.059
pr_chem	194	-3.026***	0.003	-0.137	0.045
pr_orgafung	198	1.383	0.168	0.050	0.036
pr_orgpes	198	0.206	0.837	0.007	0.034
pr_orgfert	198	4.841***	0.000	0.245	0.051
pr_sproinbag	179	0.690	0.491	0.051	0.075
pr_sproman	180	2.767***	0.006	0.177	0.064
pr_prun	198	2.744***	0.007	0.177	0.065
pr_prunman	151	3.352***	0.001	0.201	0.060
pr_harv	171	4.632***	0.000	0.268	0.058

* significant at 10%; **significant at 5%; ***significant at 1%

c Propensity Score Matching (coffee production process)

The results from the PSM is table 16 confirm the significant positive impact of the project on applying organic material, shade management, use of chemicals, use of fertilization, aftercare pruning and selective harvesting. The difference in relation to seedlings and pruning do not remain significant once pre-treatment characteristics have been controlled for.

Table 16: PSM Impact Level One – Production Process Coffee

psm	Nearest neighbour matching					Kernel matching			Stratification matching		
	T	C	ATT	se[1]	t-stat	ATT	se[1]	t-stat	ATT	se[1]	t-stat
pr_matorg	93	38	0.323	0.109	2.948***	0.356	0.093	3.82***	0.321	0.105	3.044***
pr_shade	93	38	0.387	0.113	3.417***	0.421	0.091	4.625***	0.384	0.09	4.26***
pr_chem	93	37	-0.121	0.097	-1.246	-0.108	0.062	-1.726*	-0.13	0.079	-1.65
pr_orgafung	93	38	0.075	0.057	1.313	0.039	0.049	0.787	0.033	0.053	0.626
pr_orgpes	93	38	0.054	0.035	1.543	0.035	0.029	1.208	0.037	0.026	1.419
pr_orgfert	93	38	0.269	0.060	4.476***	0.229	0.055	4.203***	0.216	0.071	3.047***
pr_sproinbag	93	32	0.211	0.158	1.334	0.133	0.102	1.31	0.119	0.088	1.358
pr_sproman	93	32	0.066	0.107	0.619	0.13	0.128	1.014	0.111	0.079	1.415
pr_prun	93	38	0.022	0.123	0.175	0.036	0.074	0.492	0.028	0.08	0.344
pr_prunman	93	27	0.507	0.167	3.036***	0.31	0.073	4.225***	0.328	0.108	3.043***
pr_harv	93	35	0.268	0.124	2.165***	0.236	0.078	3.009***	0.201	0.075	2.658***

* significant at 10%; **significant at 5%; ***significant at 1% [1]Bootstrapped errors

d Regression Analysis (coffee production process)

The results of both regression analyses in the table below confirm the positive impact of the FFS on the application of organic material, use of organic fertilization, aftercare of pruning and harvesting selectively. The decrease in use of chemicals is also confirmed. The impact on management of seedlings after planting is significant at a 10% significance level, but only when no weighting has been applied. The impact on the use of organic fungicides and use of organic pesticides cannot be determined with the regression analysis due to the small number of observations.

Table 17: Regression Analysis Impact Level One– Production Process Coffee

regression analysis	*Simple Regression Analysis where Pi = treatment*					*Weighted Regression Analysiswhere Pi = treatment*				
	R^2	*Exp(β)*	*se*	*t/z*	*P > |t|*	R^2	*Exp(β)*	*se*	*t/z*	*P > |t|*
pr_matorg	0.229	8.983	3.838	5.14***	0.000	0.193	7.206	3.123	4.56***	0.000
pr_shade	0.332	25.443	15.74	5.23***	0.000	0.356	28.998	18.44	5.3***	0.000
pr_chem	0.164	0.167	0.111	-2.69***	0.007	0.136	0.168	0.111	-2.7***	0.007
pr_orgafung	not possible					not possible				
pr_orgpes	not possible					not possible				
pr_orgfert	0.182	6.188	3.134	3.6***	0.000	0.166	5.746	3.254	3.09***	0.002
pr_sproinbag	0.205	2.013	0.821	1.71*	0.086					0.269
pr_sproman	0.105	4.869	2.674	2.88***	0.004	0.174	3.883	2.278	2.31**	0.021
pr_prun	not possible					not possible				
pr_prunman	0.193	5.512	3.064	3.07***	0.002	0.213	5.539	3.239	2.93***	0.003
pr_harv	0.243	14.164	8.177	4.59***	0.000	0.219	11.951	6.658	4.45***	0.000
* significant at 10%; **significant at 5%; ***significant at 1%										

It should be noted that the regression analysis above only demonstrates the differences due to treatment, but does for example not control for capacity building in general, since 34.6% of the farmers in the control group also receive capacity building from other sources. Furthermore, there is no control for the frequency of capacity building although 65.8% of the control group received capacity building less than four times whereas this is only 6.5% in the treatment group, mostly caused by the fact that they only started to participate recently.

From the analysis in table 18 it becomes clear that the impact of the FFS on the application of organic material, the use of organic fertilization, use of proper seedlings and selective harvest is a result of capacity building in general irrespective of the source of capacity building. This can be concluded since the impact remains at the same level, increases or even becomes significant when replacing the treatment by capacity building and/or frequency of capacity building.

On the other hand, it is interesting to note that the impact of the FFS on shade management and selection of seedlings after planting decreases or even becomes insignificant when replaced by capacity building in general, indicating that those impacts are mainly due to the FFS approach.

There is also a significant impact of capacity building on the use of chemicals, where the decrease in use of chemicals is stronger as a result of capacity building, irrespective of the source, than that of the treatment in general. The use of chemicals, being a norm of most certification schemes, is probably also an important explanatory variable in the decrease in use of chemicals. This is however very difficult to identify with the statistical analysis since only five farmers in the control group are certified. However, of those farmers 40% (two farmers) indicated to use chemicals for some crops, whereas this is only 2.9% (two farmers) in the treatment group.

Table 18: Regression Analysis (b) Impact Level One– Production Process Coffee

regression analysis	*Weighted Regression Analysis where Pi = capacity building*					*Weighted Regression Analysis where Pi = nr. capacity building last 5 years*				
	R^2	*Exp(β)*	*se*	*t/z*	*P > |t|*	R^2	*Exp(β)*	*se*	*t/z*	*P > |t|*
pr_matorg	0.153	8.630	4.650	4***	0.000	0.128	1.030	0.011	2,14**	0.032
pr_shade	0.235	9.908	5.07	4.49**	0.000	0.360	1.122	0.03	2,87***	0.004
pr_chem	0.108	0.258	0.133	-2.63***	0.009					0.270
pr_orgafung	not possible					not possible				
pr_orgpes	not possible					not possible				
pr_orgfert	0.155	10.30	8.380	2.87***	0.004	0.101	1.024	0.014	3.71*	0.088
pr_sproinbag	0.253	4.032	2.106	2.67***	0.008					0.391
pr_sproman					0.918					0.143
pr_prun	not possible					not possible				
pr_prunman	0.212	6.720	3.979	3.22***	0.001					0.441
pr_harv	0.188	11.86	5.741	5.11***	0.000					0.179
* significant at 10%; **significant at 5%; ***significant at 1%										

e Overview Results (coffee production process)

Application of organic material

Whereas 60.6% of the treatment group applies organic material only 10% of the control group applies it, a difference which is proven significant with the T-test. Considering the result of the baseline study that only 9% of the farmers applied organic material in 2003, this change is very significant. Depending on the method used for controlling for pre treatment characteristics with PSM, this impact is reduced to an increase between 35,5 % and 42.6%. The effects remain significant with the regression analysis, where it is slightly reduced when applying the weighting to the sample. When doing a more in-depth regression analysis, it becomes apparent that the change in application of organic material is caused by the capacity building in general, irrespective of the source, and frequency of capacity building, rather than the FFS approach in specific. The impact is therefore indirect through capacity building and the frequency of capacity building.

Shade management

In the treatment group 85% of the farmers does shade management whereas in the control group this is only 57%, a significant difference. Placing this within the context of 2003, when only 6% of the farmers indicated to do shade management, this is a large change. The difference between non-participating and participating farmers only becomes stronger when controlling for pre treatment differences using PSM, being between 39.9% and 54.3%. The regression analysis confirms this result since the impact gets larger when using weighted sampling. The effect on shade management can be especially ascribed to the FFS approach since the size of the impact reduces when looking at the relation between shade management and capacity building in general.

Use of chemicals

Although in general very few farmers use chemicals (18% in the control group versus 4.4% in the treatment group), it can be said that the reduction as a result of the project is significant. Comparing this to the situation five years ago, it can be said that the project has been able to retain the low level of chemical use, whereas it has significantly increased for those farmers not participating in the project (from approximately 2% in 2003). This impact is however not consistent when controlling for pre-treatment variables, since some of the methods confirm the impact whereas others reject it. A possible explanation for this weak relation could be that the use of chemicals is in fact explained by certification. From this analysis, it can be said that it is probably a combination of the FFS with certification that leads to the low use of chemicals, being only 2% for the certified farmers participating in the project, while this is 40% for the certified farmers in the control group.

Organic fungicides
In general very few farmers apply organic fungicides, being 9.6% in the treatment group versus 4.7% in the control group. This small difference is confirmed by the non-significant difference from the T-test and the PSM. Since no regression analysis is possible due to the small number of observations, it is not possible to determine with certainty that there is no impact or to further investigate the lack of impact.

Organic fertilization
29.8% of the farmers in the treatment group indicate to use organic fertilization, including the use of 'green' chemicals, whereas this is only 5.7% in the control group. From the baseline study it can be concluded that five years ago only 8% used compost, which is an important component of organic fertilization, so a significant development has taken place. The impact is confirmed by the results from the PSM, although the difference is slightly reduced to between 20.4% and 24.5%. This decrease in impact when controlling for pre-treatment differences is confirmed by the regression analysis. When replacing treatment by capacity building, the impact becomes stronger and it can therefore be said that the impacts runs mainly through capacity building in general.

Organic pesticides
Overall, very few farmers use organic pesticides, being 5.3% in the treatment group versus 2.8% in the control group. This small difference is confirmed by the non-significant difference from the T-test and the PSM.

Growing seedlings in a bag
According to the baseline study only 5% of the farmers used bags to plant their seedlings in 2004, which is considered as the right way to make seedlings. From the survey it can at least be concluded that within both groups more farmers started planting seedlings in bags, being 56.5% in the treatment group versus 50.5% in the control group. This small difference is not significant and remains insignificant when controlling for pre treatment differences with PSM. The weighted regression analysis confirms this result. Replacement of the FFS with capacity building however does make the impact significant and it can therefore be said that there is an (indirect) impact via capacity building.

Management of seedlings
The management of seedlings was already quite common five years ago, as can be concluded from the 68% of the farmers who performed such activities five years ago according to the baseline study. However, nowadays 90% of the farmers in the treatment group replace seedlings after planting, versus 76% in the control group. This difference is confirmed by the stratification matching and the regression analysis. When doing a more in-depth analysis it becomes clear that it is the FFS approach that causes this impact, rather than the capacity building in general, since the relation between capacity building and management of sprouts after planting is not significant.

Pruning
More than 75% of the treatment group does pruning whereas in the control group this is 60.7%. Although this difference is significant it does not hold when controlling for pre treatment variables with PSM. Since no regression analysis is possible, it is not possible to confirm the lack of impact or to identify a possible indirect impact. However, it can be said that there have been significant changes in general, since only 30% of the farmers in the region did pruning five years ago according to the baseline study.

Management after pruning
Of those farmers that do pruning, 71.4% in the control group does aftercare of pruning whereas this is 91.6 % in the treatment group. This difference is confirmed and increases when controlling for pre treatment differences with PSM to 31% until 50.7%. The regression analysis confirms these results and when replacing FFS with capacity building, the impact increases even more. The impact on aftercare of pruning of the FFS therefore runs mainly through capacity building in general.

Selective harvesting
From the baseline study it can be concluded that five years ago only very few farmers did selective harvest, about 5%. Nowadays this percentage has increased significantly to 93.2% in the treatment group versus 65.9% in the control group. This difference is statistically significant and, depending on the matching method used, is between 19.8% and 30.4%. The regression analysis indicates that there is a small decrease in the impact when doing an additional control for pre-treatment variables using the weighted sample. The impact of the FFS runs through capacity building and frequency of capacity building, rather than through the FFS approach in specific.

5.4.2 Coffee Production and Processing Equipment

a Description of Indicators (coffee production and processing equipment)

As a result of the capacity building it is expected that farmers increased their coffee production and processing equipment in relation to the indicators mentioned in table 19. This process is further strengthened by the certification process, since this obligates farmers to for example purchase certain safety equipments or dry coffee in a certain way. The changes in production processes is another incentive since farmers need certain equipment to conduct the newly taught production processes.

These investments are also from the farmers' point of view investments from which certain results should become visible, in terms of quality, yield or price. The link between appropriate use of technology, yield and income is also made in SI study in which farmer indicate that 'low production, because of lack of technology' is one of the main economic problems. The investment in coffee production was also highlighted in the MSC study in which 63% of the farmers indicated that they want to increase their investment in coffee production.

That the production equipment was still very basic five years ago becomes apparent from the baseline study in which only 8% of the farmers had a place to make compost, 58% had a pruning saw, 21% had pruning scissors, 5% had a pruning knife, 15% had a separate fermentation tank and only 12% dried their coffee above the ground which is considered better for the quality of coffee.

Table 19: Impact Level One Indicators –Production and Processing Equipment Coffee

Indicator		Survey	Hypothesis
inv_comp: compost		4.3.1r	↑ compost
pruning equipment	inv_prunsaw: pruning saw	4.3.4d	↑ pruning serrucho
	inv_prunscis: pruning scissors	4.3.4e	↑ pruning scissors
	inv_pruknife: pruning instrument (small knife)	4.3.4f	↑ deschuponador
safety equipment	inv_helm: helmets	4.3.4h	↑ helmets
	inv_masks: masks	4.3.4i	↑ masks
	inv_glove: gloves	4.3.4j	↑ gloves
	inv_poncho: poncho	4.3.4k	↑ poncho
processing tanks	inv_washtan: separate washing tanque	4.3.1d-e	↑ washing tanque
	inv_ferttan: separate fermentation tanque	4.3.1f-g	↑ fermentation tanque
	inv_certtan: separate cherry receptacle	4.3.1m-n	↑ cerecero tanque
inv_wastw: management of waste water		4.3.1q	↑ equip. management of waste water
inv_caldep: maintenance depulping machine		4.3.1b	↑ maintenance depulping machine
inv_dryabogr: drying area above the ground		4.3.1h-t	↑ drying area above the ground
inv_storage: storage room		4.3.1o	↑ storage room

b Direct Comparison (coffee production and processing equipment)

From the figure below it can be concluded that farmers in the treatment group have a more equipment for coffee production and processing. The largest differences are related to the inventory for the management of waste water, a place for compost, masks and drying equipment above the ground. From table 20 it can be concluded that all the differences are statistically significant except for the washing tank.

Figure 15: Descriptive Data Impact Level One – Production and Processing Equipment Coffee

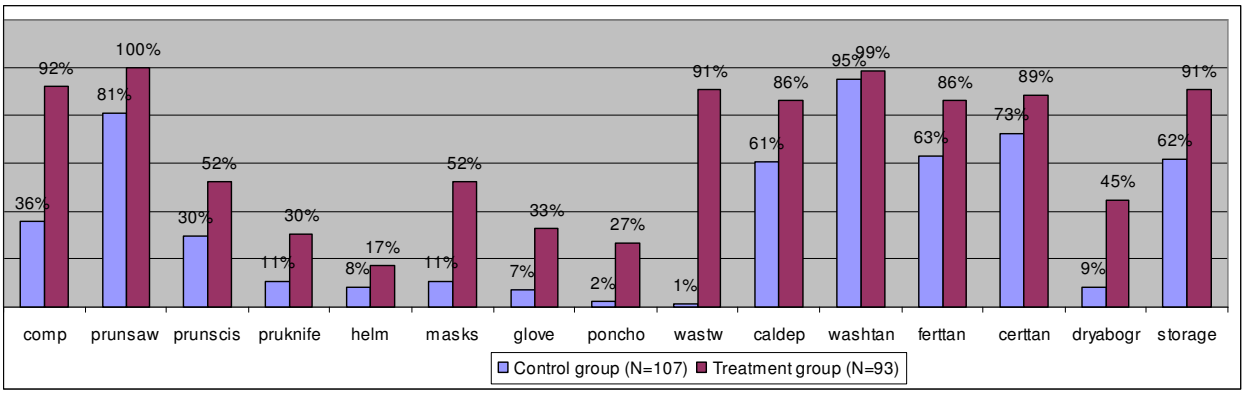


Table 20: T-test Impact Level One – Production and Processing Equipment Coffee

t-test	*df*	*t*	*sig.*	*mean diff.*	*se diff.*
inv_comp	169	9.424***	0.000	0.562	0.060
inv_prunsaw	168	1.832*	0.069	0.097	0.053
inv_prunscis	168	3.052***	0.003	0.226	0.074
inv_pruknife	168	3.223***	0.002	0.195	0.061
inv_helm	168	1.775*	0.078	0.091	0.051
inv_masks	168	6.474***	0.000	0.416	0.064
inv_glove	168	4.343***	0.000	0.254	0.059
inv_poncho	168	4.7475***	0.000	0.244	0.051
inv_wastw	169	26.511***	0.000	0.896	0.034
inv_caldep	167	3.838***	0.000	0.252	0.066
inv_washtan	169	1.402	0.163	0.036	0.026
inv_ferttan	169	3.591***	0.000	0.231	0.064
inv_certtan	169	2.671***	0.008	0.159	0.059
inv_dryabogr	167	5.767***	0.000	0.363	0.063
inv_storage	169	4.720***	0.000	0.289	0.061
* significant at 10%; **significant at 5%; ***significant at 1%					

c Propensity Score Matching (coffee production and processing equipment)

The PSM in table 21 indicates that the small but significant difference with regards to having a pruning saw measured with the T-test is not significant when controlling for pre-treatment differences. The positive impact on equipment for the management of waste water, pruning knife, masks, gloves and poncho is confirmed and are on average the same size as the difference indicated by the direct comparison. The positive impact on drying equipment, storage room, and compost are still significant but on average a bit lower when controlling for pre treatment variables with PSM. Impact on having a cherry receptacle is however higher when controlling for pre treatment variables. The significance of the impact on having a washing tank, a fermentation tank, pruning scissors or helmets differs depending on the method used.

Table 21: Propensity Score Matching Impact Level One – Production and Processing Equipment Coffee

PSM Results	Nearest neighbour matching					Kernel matching			Stratification matching		
	T	C	ATT	se[1]	t	ATT	se[1]	t-stat	ATT	se[1]	t-stat
inv_comp	93	35	0.515	0.142	3.639***	0.501	0.092	5.467**	0.428	0.097	4.399***
inv_prunsaw	93	35	0.008	0.073	0.112	0.037	0.060	0.615	0.033	0.072	0.452
inv_prunscis	93	35	0.141	0.108	1.312	0.204	0.086	2.364**	0.171	0.102	1.68*
inv_pruknife	93	35	0.190	0.076	2.489**	0.229	0.067	3.403***	0.197	0.070	2.809***
inv_helm	93	35	0.163	0.073	2.23***	0.091	0.071	1.278	0.082	0.069	1.181
inv_masks	93	35	0.456	0.093	4.916***	0.386	0.088	4.384***	0.359	0.080	4.504***
inv_glove	93	35	0.281	0.083	3.397***	0.257	0.062	4.166***	0.239	0.059	4.035***
inv_poncho	93	35	0.267	0.061	4.386***	0.226	0.059	3.845***	0.207	0.095	2.182**
inv_wastw	93	35	0.886	0.035	25.219***	0.899	0.034	26.216***	0.858	0.031	27.297***
inv_caldep	93	35	0.297	0.149	1.992**	0.266	0.111	2.396**	0.237	0.087	2.709***
inv_washtan	93	35	0.135	0.070	1.923*	0.064	0.050	1.278	0.063	0.066	0.953
inv_ferttan	93	35	0.177	0.130	1.364	0.201	0.103	1.952**	0.176	0.094	1.869*
inv_certtan	93	35	0.245	0.111	2.206**	0.204	0.087	2.36**	0.194	0.085	2.27**
inv_dryabogr	93	35	0.269	0.103	2.613***	0.310	0.069	4.513***	0.281	0.099	2.838***
inv_storage	93	35	0.279	0.148	1.883*	0.286	0.079	3.622***	0.211	0.112	1.89*

* significant at 10%; **significant at 5%; ***significant at 1% [1]Bootstrapped errors

d Regression Analysis (coffee production and processing equipment)

Based on the table below the insignificant or disputable impact of the project on having a pruning saw or helmets is confirmed. The lack of impact measured by the nearest neighbour matching on having a fermentation tank and pruning scissors is however not confirmed.

Table 22: Regression Analysis Impact Level One – Production and Processing Equipment Coffee

regression analysis	Simple Regression Analysis where y = treatment					Weighted Regression Analysiswhere y = treatment				
	R^2	Exp(β)	se	t/z	P > |t|	R^2	Exp(β)	se	t/z	P > |t|
inv_comp	0.425	31.014	17.46	6.10***	0.000	0.434	37.744	19.66	6.97***	0.000
inv_prunsaw					0.200					0.141
inv_prunscis	0.195	3.256	1.315	2.92***	0.003	0.211	3.248	1.325	2.89***	0.004
inv_pruknife	0.131	4.436	2.085	3.17***	0.002	0.123	4.359	1.977	3.25***	0.001
inv_helm					0.226					0.256
inv_masks	0.196	7.840	3.309	4.88***	0.000	0.229	9.715	4.207	5.25***	0.000
inv_glove	0.196	5.571	2.724	3.51***	0.000	0.125	7.841	4.173	3.87***	0.000
inv_poncho	0.196	17.505	13.44	3.73***	0.000	0.182	15.392	11.71	3.59***	0.000
inv_wastw	not possible					0.74	1127.1	1316	6.02***	0.000
inv_caldep	0.148	4.554	1.875	3.68***	0.000	0.16	4.839	2.061	3.70***	0.000
inv_washtan	not possible					not possible				
inv_ferttan	0.173	3.484	1.471	2.96***	0.003	0.166	3.747	1.535	3.22***	0.001
inv_certtan	0.118	3.206	1.443	2.59***	0.010	0.174	3.024	1.392	2.40**	0.016
inv_dryabogr	0.21	7.756	3.613	4.40***	0.000	0.189	6.875	3.183	4.16***	0.000
inv_storage	0.199	5.805	2.625	3.89***	0.000	0.233	8.132	4.107	4.15***	0.000

* significant at 10%; **significant at 5%; ***significant at 1%

As a next step an analysis is conducted to identify the origin of the changes or lack of changes in production and processing equipment. As could be seen in figure 11 the changes in production and processing equipment are mainly considered as a result of the capacity building, since they provide the information and knowledge on this equipment.

From the results in table 23 on the next page it can be concluded that this is indeed the case for the ponchos, fermentation tank and cherry receptacle tank. The effect of capacity building in general on having equipment for the management of wastewater becomes smaller, indicating that it is the treatment as a whole causing this impact, being the combination of the FFS with the CACSVU.

Finally, the lack of impact on having a pruning saw and helmets remain insignificant when replacing treatment by capacity building in general. Certification could also be an important explanatory variable here but due to the small number of observations in the control group, it is hard to perform a statistical analysis with reliable outcomes.

Table 23: Regression Analysis (b) Impact Level One – Production and Processing Equipment Coffee

regression analysis	*Weighted Regression Analysis where y = capacity building*				
	R^2	*Exp(β)*	*se*	*t/z*	*P > |t|*
inv_comp	0.327	27.81	14.07	6.58***	0.000
inv_prunsaw					0.717
inv_prunscis	0.181	3.219	1.571	2.40**	0.017
inv_pruknife	0.111	4.151	2.338	2.53**	0.011
inv_helm					0.610
inv_masks	0.134	5.996	3.151	3.41***	0.001
inv_glove	0.074	3.269	1.939	2.00**	0.046
inv_poncho	0.185	20.88	23.94	2.65**	0.008
inv_wastw	0.382	133.6	155.3	4.21***	0.000
inv_caldep	0.110	2.868	1.118	2.70***	0.007
inv_washtan	not possible				
inv_ferttan	0.179	6.269	2.941	3.91***	0.000
inv_certtan	0.158	4.143	1.869	3.15***	0.002
inv_dryabogr	not possible				
inv_storage	0.220	6.290	2.856	4.05***	0.000
* significant at 10%; **significant at 5%; ***significant at 1%					

e Overview Results (coffee production and processing equipment)

Compost

More than 90% of the treatment group has a place for compost, whereas this is not even 40% in the control group. Considering the result from the baseline study that only 8% of the farmers had a place for compost, much change has in fact taken place in both groups. This significant difference decreases slightly when controlling for pre-treatment differences with PSM, ranging from 42.8% to 51.5%. The significant positive impact is confirmed by the regression analysis and it becomes apparent that it mainly results from the capacity building in general.

Pruning equipment

Pruning saw - The baseline study indicated that in 2003 about 58% of all farmers had a pruning saw and from the direct comparison an overall increase can be observed, being about 20% in the control group while all farmers in the treatment group now have a pruning saw. This difference is only significant at 10% and is eliminated when controlling for pre-treatment variables with either PSM or regression analysis. Furthermore, when replacing treatment in general by capacity building, still no impact is measured, indicating that it is generally acceptable to have a pruning saw.

Pruning scissors - From the baseline study it already becomes apparent that it is less normal to have pruning scissor (21%). From the survey it can be concluded that this has only slightly increased in the control group to 30% whereas this has increased to 52% in the treatment group, a statistically significant difference. The PSM reduces both the size and significance of the difference, ranging from an insignificant difference to a significant difference of 20.4%. The regression analysis however confirms that there is a significant though small impact and illustrates that the impact is a result of the treatment in specific rather than capacity building in general.
Pruning knife - Even less likely than having a pruning scissor was the chance of having a pruning knife, used for the aftercare of pruning, being only 5% in 2003 as concluded from the baseline study. This has increased by 6% in the control group and almost by 20% in the treatment group. This size and significance of the impact is confirmed by the PSM, independent of the matching method used. The regression analysis confirms this result and illustrates that the impact is bigger on the pruning knife than on pruning scissors. Finally, when replacing treatment by capacity building, the impact is much bigger, indicating again that the impact results from the treatment in specific rather than capacity building in general.

Safety equipment
Helmets - In general few farmers have all safety equipment covered in the survey, especially in relation to helmets, being 8% in the control group and 17% in the treatment group. This difference is only significant at a 10% significance level. Two of the PSM methods as well as both regression analyses fail to illustrate a significant impact. This lack of impact is not changed when replacing treatment by capacity building in general.
Masks - In the treatment group more than 50% of the farmers have masks, being almost 42% more than in the control group. This statistically significant difference is confirmed by the PSM and although it increases with one method to 45.6% it decreases with another to 35.9%. The regression analysis confirms the positive impact of the treatment on having masks and it can be said that this impact runs mainly through the project as a whole rather than capacity building in general.
Gloves - Whereas only 7% of the farmers in the control have gloves, this is significantly higher at 33% in the treatment group. The impact is confirmed by the PSM and with a difference of around 26% remains at the same level. Both regression analyses confirm these results and again it can be said that this impact is a result of the project as a whole rather than capacity building in general.
Poncho - The results on the impact of the project on having ponchos is comparable to that of the impact on having gloves, being almost 25% difference when directly comparing both groups. This difference remains more or less the same when using PSM for controlling pre-treatment differences. Nevertheless, from the regression analysis the impact of the treatment appears to be bigger than the impact on having gloves and this conclusion is strengthened even more in relation to capacity building in general.

Equipment for management of waste water
From the direct comparison it can already be concluded that there is a large impact on having equipment for the management of waste water since only 1% in the control group has such equipment whereas this is more than 90% in the treatment group. That this impact is confirmed by the PSM is therefore no surprise. With one of the matching methods the impact is slightly reduced to 85.8% although this is contradicted by the outcomes of another matching method which indicates the same size of impact as for the direct comparison, being 89.9%. It should also be noted that the impact increases even further when controlling for pre-treatment variables by weighting the sample according to the propensity score. Finally, the impact on equipment for management of waste water is a direct impact of the project, since it reduces when replacing treatment by capacity building in general.

Processing tanks
Washing tank - In general all farmers have at least a washing tank, being 95% in the control and 99% in the treatment group. This difference is very small and two matching methods confirm this lack of impact. No regression analyses are possible due to the fact that almost all farmers have a washing tank.

Fermentation tank - Whereas a washing tank is quite common in both groups, a fermentation tank is less common since some farmers use the washing tank for fermenting as well. This was also the case five years ago when about 85% of the farmers used one single tank. Nowadays, in the treatment group 86% of the farmers have a fermentation tank whilst this is 63% in the control group. This difference reduces when controlling for pre-treatment differences with PSM to somewhere between 20.1% and 17.6%. The impact of the treatment is confirmed by both regression analysis and increases significantly when looking at the impact of capacity building in general. This indicates that the impact of the project is mainly through the increase in capacity building.
Cherry receptacle tank - Almost comparable to the fermentation tank, about 89% of the farmers in the treatment group have a cherry receptacle tank, while 73% of the farmers in the control group have such a tank. The difference of 15.9% increases when controlling for pre-treatment differences with PSM ranging form 19.4 % to 24.5%. The positive impact of the treatment is confirmed by the regression analysis and it can be said that it is a bit smaller than the impact on having fermentation tank. This difference becomes even larger when looking at the impact of capacity building in general, indicating that the impact is an indirect impact of the project through capacity building.

Drying equipment
The impact on having a drying area above the ground, which is considered better for coffee quality, already comes forth when directly comparing both groups. In the control group only 9% has a drying area above the ground which is comparable to the 12% resulting from the baseline study before the start of the project. In the treatment group this percentage is now 45%. This difference is reduced when controlling for pre-treatment variables to between 31% (kernel matching) and 26.9% (nearest neighbour matching). Both regression analyses confirm a positive impact of the treatment, while it is not possible to identify whether this impact originates from the treatment in specific or the capacity building in general.

Storage
In general a lot of farmers have a storage room for their coffee, being 62% in the control group and 91% in the treatment group. This significant difference is reduced to between 21.1% (kernel matching) and 28.6% (stratification matching). The regression analysis confirms the positive impact of the treatment on having a storage room for coffee. When replacing the treatment by capacity building in general, it can be concluded that the impact becomes even smaller, indicating that the impact is a result of the project as a whole rather than capacity building in general.

5.4.3 Certification

a Description of Indicators (certification)

As was already mentioned under the heading producer organization, the project initiated with an Utz Certified programme in the first period of the project. Considering the market price at the time and the price offered for Utz Certified coffee this was however not sufficient for the producers to offset their extra effort in the production process. Between 2003 and 2007 the cooperative has obtained four more certifications or standards for which their members can apply.

The first impact indicators in this category, as indicated in table 24, are therefore related to whether farmers have obtained any coffee certification and the number of certifications obtained by each farmer. The fact that farmers have the option to obtain various certification at the CACSVU gives farmers a wider range of possible marketing channels, which is considered as an impact at the next level (see figure 11).

As was discussed in paragraph 2.2, the five certification schemes are partly overlapping although there are differences with respect to norms, price setting, auditing and implementation (see appendix 9.1 overview certification schemes at household level). Separate indicators are therefore mentioned in table 24 for each certification. These certifications by themselves of course already represent a much broader impact since those farmers comply with a certain set of rules and regulations. The differences between certifications might be important at a later stage when explaining the results of the quantitative analysis, especially in relation to coffee price.

When interpreting the results it should be taken into account that some farmers in the control group appeared to be unaware of the fact that they sold certified coffee. However, this is not considered as a problem since the impact of certification will be reduced significantly in these cases; both in terms of the price impact as well as the incentive for changes in the production process. That is, for those farmers that sell certified coffee and are well aware of it, it is expected that coffee certification functions as an incentive and a verification for changes in the production processes enabled by the capacity building.

Table 24: Impact Level One Indicators – Certification Coffee

Indicator	Survey	Hypothesis
cert: certificated	6.4.1	↑ certification
cert_num: number of different certifications	6.4.2	↑ number of certifications
cert_utz: utz certified	6.4.2	↑ utz certification
cert_flo: FLO certified	6.4.2	↑ FLO certification
cert_org: organic certified	6.4.2	↑ organic certification
cert_cafpr: certified café practices	6.4.2	↑ café practice certification
cert_rfa: certified rainforest alliance	6.4.2	↑ rainforest alliance certification

b Direct Comparison (certification)

From figure 16 below it can already be seen that very few farmers in the control group have a coffee certification, whereas 80.5% of the farmers in the treatment group have obtained at least one certification. From the T-tests in table 25 it can be concluded that this difference is statistically significant. Moreover, the average number of certifications is 0.1 in the control group and 2.1 in the treatment group which is a statistical significant difference of two certifications.

Figure 16: Descriptive Data Impact Level One – Certification Coffee

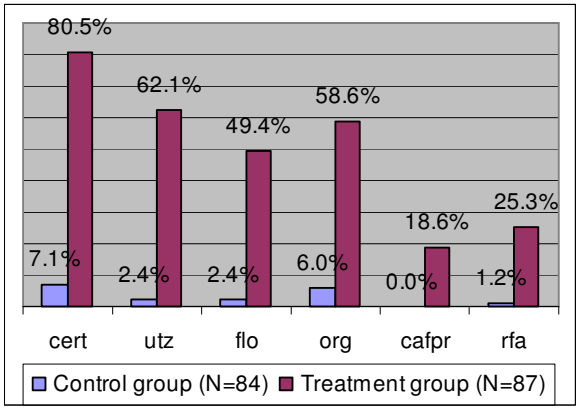


Table 25: T-test Impact Level One – Certification Coffee

t-test	*df*	*t*	*sig.*	*mean diff.*	*se diff.*
cert	170	14.300***	0.000	0.734	0.051
cert_utz	169	10.709***	0.000	0.597	0.056
cert_flo	169	8.213***	0.000	0.470	0.057
cert_org	168	8.747***	0.000	0.526	0.060
cert_cafpr	168	4.356***	0.000	0.186	0.043
cert_rfa	169	4.906***	0.000	0.241	0.049
cert_nr	170	10.578***	0.000	2.020	0.192
* significant at 10%; **significant at 5%; ***significant at 1%					

c Propensity Score Matching (certification)

The results of the PSM in the table below confirm the results of the T-tests, namely that there is a significant impact on obtaining a certification and the possibility of obtaining various coffee certifications.

Table 26: Propensity Score Matching Impact Level One – Certification Coffee

psm	Nearest neighbour matching					Kernel matching			Stratification matching		
	T	C	ATT	se [1]	t-stat	ATT	se [1]	t-stat	ATT	se [1]	t-stat
cert	93	35	0.625	0.103	6.042***	0.686	0.078	8.806***	0.639	0.083	7.748***
cert_utz	93	35	0.621	0.062	10.078***	0.609	0.052	11.82***	0.604	0.044	13.706***
cert_flo	93	35	0.393	0.073	5.419***	0.46	0.054	8.485***	0.429	0.063	6.788***
cert_org	93	35	0.406	0.090	4.505***	0.471	0.079	5.985***	0.422	0.103	4.083***
cert_cafpr	93	35	0.186	0.042	4.465***	0.186	0.039	4.753***	0.181	0.038	4.779***
cert_rfa	93	35	0.253	0.054	4.668***	0.246	0.044	5.532***	0.252	0.045	5.606***
cert_nr	93	35	1.857	0.162	11.492***	1.971	0.21	9.38***	1.888	0.227	8.307***

* significant at 10%; **significant at 5%; ***significant at 1% [1]Bootstrapped errors

d Regression Analysis (certification)

The results from both regression analyses in table 27 roughly correspond to the results of the PSM and no large differences are identified between the normal regression and the weighted sample regression analysis. However, the impact on Utz certified is almost doubled when applying a weighted sample, explained by the fact that almost 90% of the farmers in the treatment group are member of the CACSVU and thereby automatically obtain an Utz certification.

Table 27: Regression Analysis Impact Level One – Certification Coffee

regression analysis	Simple Regression Analysis where Pi = treatment					Weighted Regression Analysiswhere Pi = treatment				
	R^2	Exp(β)	se	t/z	P > |t|	R^2	Exp(β)	se	t/z	P > |t|
cert	0.511	108.53	72.61	7.01***	0.000	0.506	101.65	68.78	6.83***	0.000
cert_utz	0.434	90.94	73.11	5.61***	0.000	0.479	201.52	271.3	3.94***	0.000
cert_flo	0.405	64.661	54.07	4.99***	0.000	0.381	54.490	50.14	4.34***	0.000
cert_org	0.431	61.790	45.44	5.61***	0.000	0.432	73.677	62.92	5.03***	0.000
cert_cafpr	not possible					not possible				
cert_rfa	not possible					not possible				
cert_nr	0.460	1.864	0.190	9.81***	0.000	0.467	1.860	0.184	10.1***	0.000

* significant at 10%; **significant at 5%; ***significant at 1%

In paragraph 5.1 it was already discussed that the certification resulted from the development of a producer organization. From the results in the table 28 below it can be concluded that only the impact on having certification increases when replacing treatment by membership of producer organization in general, hereby confirming that the impact runs through the membership of a producer organization in general. This is logical considering the fact that membership of a producer cooperative is essential for small scale coffee farmers to obtain a coffee certification. The impact on Utz certified, FLO, organic and the number of certifications however decreases, indicating that the impact on this certification stems specifically from the combination of FFS and the CACSVU.

Table 28: Regression Analysis Impact Level One – Certification Coffee

regression analysis	*Weighted Regression Analysis where Pi = producer organization*				
	R^2	*Exp(β)*	*se*	*t/z*	*P > |t|*
cert	0.482	114.0	74.57	7.24***	0.000
cert_utz	0.467	154.7	166.6	2.00***	0.000
cert_flo	0.353	27.43	15.66	5.80***	0.000
cert_org	0.411	52.55	42.83	4.86***	0.000
cert_cafpr	not possible				
cert_rfa	not possible				
cert_nr	0.472	1.78	0.18	10.06***	0.000
* significant at 10%; **significant at 5%; ***significant at 1%					

e Overview Results (certification)

Coffee certification

When directly comparing both groups it can be seen that the differences with respect to obtaining certifications in general (80.5% versus 7.1%), the number of certifications (2 certifications difference) and the individual certifications all show large differences. Especially the chance of obtaining Utz certification increases significantly which can be explained by the fact that every farmer that joins the CACSVU automatically obtains this certificate. Also the organic certification and Fair Trade certification are significantly bigger. These impacts are confirmed by the PSM and the regression analysis, where a weighted regression analysis generally results in even larger impacts. Although no regression analysis is possible for C.A.F.E Practice and Rain Forest Alliance, it can be said that there is a significant impact since both certifications are almost non existent in the control group. This is also confirmed by the PSM. When replacing treatment by membership of a producer organization it becomes clear that for obtaining coffee certification membership of a producer organization is essential, whereas the impact on the individual coffee certifications and the number of certifications is a result of the combination of FFS and membership of the CACSVU rather than membership of a producer organization in general.

5.4.4 Changes in Self Esteem

a Description of Indicators (changes in self esteem)

During the qualitative phase of the research, participating farmers often indicated that one of the changes resulting from the project was their sense of ownership, respect in the community, confidence when working in the field etc. All these issues are very hard to quantify. However, being such an important social indicator, several questions were asked with respect to self esteem (see part 3.3 of appendix 9.4). From these questions the three indicators in table 29 are considered reliable enough to analyse, that is, farmers responded to those questions in a more honest way since they were not so personal. These issues related to changes in feeling capable in the solving problems in the field, giving opinions, and participation in the community. As can be seen in figure 11 self-esteem is linked to both the capacity building and the producer organization, since those two outcomes probably capture the most important source of this increase in self-esteem.

Table 29: Impact Level One Indicators – Changes in Self Esteem

Indicator	Survey	Hypothesis
se_probfield: solve problems in the field	3.3.1	↑ solve problems in the field
se_givopin: give opinion	3.3.2	↑ giving opinion
se_partcomm: particaption in community	3.3.3	↑ particaption in community

b Direct Comparison (changes in self esteem)

From figure 17 it can be concluded that farmers in the treatment group indicate to have gone through more changes in the last three years with respect to solving problems in the field, giving their opinion and participation in the community. From table 30 it can be concluded that these differences are statistically significant.

Figure 17: Descriptive Data Impact Level One – Changes in Self Esteem

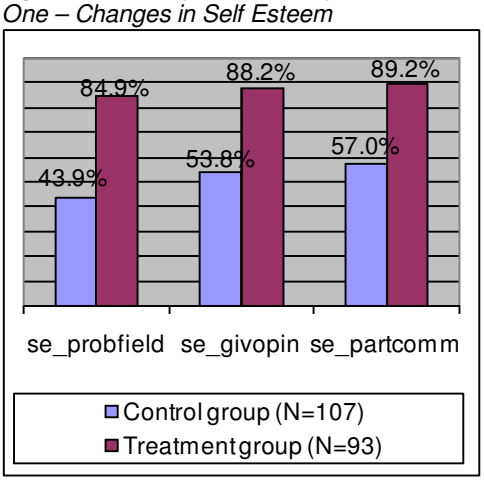


Table 30: T-test Impact Level One – Changes in Self Esteem

t-test	df	t	sig.	mean diff.	se diff.
se_probfield	198	6.583***	0.000	0.410	0.062
se_givopin	197	5.660***	0.000	0.344	0.061
se_partcom	198	5.397***	0.000	0.322	0.060

* significant at 10%; **significant at 5%; ***significant at 1%

c Propensity Score Matching (changes in self esteem)

From table 31 it can be concluded that after controlling for pre-treatment variables with PSM the impact on 'change in solving problems in the field' is confirmed and increases to an impact of between 50.1% and 64.5%. The increase in impact on 'giving their opinion' is even larger when controlling for pre-treatment differences, being between 46.7% and 61.3%. The final change, 'participation in community' is also confirmed and increases between to an impact of 34.7% to 51.6%.

Table 31: PSM Impact Level One – Changes in Self Esteem

PSM Results	Nearest neighbour matching					Kernel matching			Stratification matching		
	T	C	ATT	se[1]	t-stat	ATT	se[1]	t-stat	ATT	se[1]	t-stat
se_probfield	93	38	0.645	0.096	6.705***	0.513	0.088	5.826***	0.501	0.095	5.284***
se_givopin	93	38	0.613	0.135	4.537***	0.485	0.088	5.521***	0.467	0.094	4.967***
se_partcomm	93	38	0.516	0.124	4.161***	0.388	0.1	4.383***	0.347	0.091	3.806***

* significant at 10%; **significant at 5%; ***significant at 1% [1]Bootstrapped errors

d Regression Analysis (changes in self esteem)

The result from the regression analysis as illustrated in the table below confirm that there is a significant positive impact of the project on all three indicators.

Table 32: Regression Analysis Impact Level One – Changes in Self Esteem

regression analysis	*Simple Regression Analysis where Pi = treatment*					*Weighted Regression Analysis where Pi = treatment*				
	R^2	*Exp(β)*	*se*	*t/z*	*P > |t|*	R^2	*Exp(β)*	*se*	*t/z*	*P > |t|*
se_probfield	0.220	12.212	5.710	5.35***	0.000	0.242	14.173	6.441	5.83***	0.000
se_givopin	0.210	11.275	5.219	5.23***	0.000	0.227	12.630	6.220	5.15***	0.000
se_partcom	0.172	8.975	4.305	4.57***	0.000	0.178	8.744	4.479	4.23***	0.000
* significant at 10%; **significant at 5%; ***significant at 1%										

From the table below it can be concluded that it is the combination of the FFS and the CACSVU that results in a change of 'solving problems in field', 'giving opinion' and 'participation in the community'. This is because the effect of capacity building or membership of a producer organization does not yield a relationship as strong as that of the treatment.

Table 33: Regression Analysis (a) Impact Level One – Changes in Self Esteem

regression analysis	*Simple Regression Analysis where Pi = producer organization*					*Weighted Regression Analysis where Pi = capacity building*				
	R^2	*Exp(β)*	*se*	*t/z*	*P > |t|*	R^2	*Exp(β)*	*se*	*t/z*	*P > |t|*
se_probfield	0.117	3.2677	1.161	3.33***	0.001	0.146	9.142	4.323	4.68***	0.000
se_givopin	0.068	3.0659	1.120	3.07***	0.002	0.141	8.278	3.716	4.71***	0.000
se_partcom	0.112	2.7426	1.085	2.55***	0.011	0.161	4.817	2.006	3.78***	0.000
* significant at 10%; **significant at 5%; ***significant at 1%										

e Overview Results (changes in self esteem)

Changes in self esteem

Whereas in the control group only around 50% of the farmers perceive changes in solving problems in the field, giving their opinion or participation in the community over the last three years, this percentage increases to more than 80% in the treatment group. These results are confirmed and increase slightly when controlling for pre-treatment variables using PSM, where nearest neighbour matching yield the highest results, from an increase of 19.4% for 'participation in community' to an increase of 26.9% for 'giving opinion'. Controlling for pre-treatment variables using weighted instead of simple regression analysis do not result in such a large increase in relation to the direct comparison. When replacing the treatment variable by either membership of producer organization or household cooperative, it becomes clear that the impact is not a consequence of those aspects as such, but more specifically of the capacity building from the FFS and the membership of the CACSVU.

5.5 Impact Level Two

Although many potential impacts were identified resulting from the changes in production processes and certification, only four will be analysed in this study as was indicated in figure 11. These impact areas are related to yield, production costs, coffee price and marketing channels.

5.5.1 Coffee Yield

a Description of Indicators (coffee yield)

An increase in yield was one the main goals of the project and considering the fact that a low yield was raised as one of the main problems in the SI study, it is important to measure if any progress has been made (see table 34). However, the project only started five years ago and the impact of most production processes are expected to be on the longer term.

Besides this, there has been a significant overall decrease in yield in the year 2007, which might overshadow the impact when compared to the general yield of coffee production . The average size of production in the sample for example decreased by 18.200 kg to 10.300 kg, hereby not even controlling for a possible increase in cultivation size. Nevertheless, some impact might already be measured, especially taken into account the fact that farmers themselves already indicated 'improved production' as one of the most significant changes in 2006.

When interpreting these results it should be taken into account that several assumptions have been made with respect to the size of the coffee fields. In order to calculate the yield per hectare, the size of the producing plots in 2007 needed to be estimated. Since this was not asked in the survey, it was determined based on combining several questions. First of all, it was concluded that most farmers started producing coffee on a plot around three years ago. Consequently all plots with coffee production older than three years were used to determine the size of the plots on which coffee was produced in 2007. However, some farmers were also identified that started producing after four or five years, which could give some bias in the results. Besides this, the yield after three years is generally still very low due to the life cycle of the plant. Because of this, the average weighted age of the plots will be included in the regression analysis to eliminate such bias. Although these assumptions should not bias the results with respect to differences between the treatment and the control group, since the bias will be equal for both groups, it could bias the results of the size of the yield in comparison to actual yield. Finally, during data preparation two observations were discarded since those values were too high to be realistic (values above 2000 kg/hec) and thereby too influential. Both observations were from the non-participating farmers.

Table 34: Impact Level Two Indicators – Coffee Yield

Indicator	Survey	Hypothesis
yield07: kg per hectare in 2007	6.3.2-4/4.1.4-5-13	↑ yield per hectare 2007

b Direct Comparison (coffee yield)

As can be seen in figure 18 the estimated yield in the control group is currently higher than in the treatment group. However, due to a large standard deviation, this difference is not statistically significant as can be concluded from table 35.

Figure 18: Descriptive Data Impact Level Two – Coffee Yield

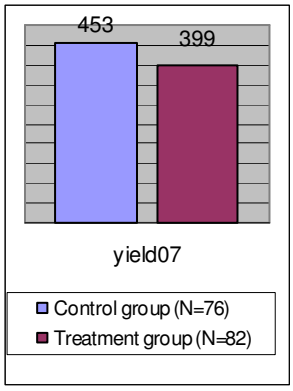


Table 35: T-test Impact Level Two – Coffee Yield

t-test	df	t	sig.	mean diff.	se diff.
yield07	167	-1.073	0.285	-54.230	-50.556
* significant at 10%; **significant at 5%; ***significant at 1%					

c Propensity Score Matching (coffee yield)

When controlling for pre-treatment differences with PSM, as is indicated in the below, the lack of impact is confirmed.

Table 36: PSM Impact Level Two – Coffee Yield

PSM Results	Nearest neighbour matching					Kernel matching			Stratification matching		
	T	C	ATT	se[1]	t-stat	ATT	se[1]	t-stat	ATT	se[1]	t-stat
yield07	93	35	-121.4	122.0	-0.995	-63.7	69.1	-0.922	-43.2	81.13	-0.532
* significant at 10%; **significant at 5%; ***significant at 1%									[1]Bootstrapped errors		

d Regression Analysis (coffee yield)

The regression analysis in table 37 also confirms the lack of impact which was concluded based the direct comparison and the PSM.

Table 37: Regression Analysis Impact Level Two – Coffee Yield

regression analysis	Simple Regression Analysis where Pi = treatment					Weighted Regression Analysis where y = treatment				
	R^2	Exp(β)	se	t/z	P > |t|	R^2	Exp(β)	se	t/z	P > |t|
yield07					0,198					0,367
* significant at 10%; **significant at 5%; ***significant at 1%										

When replacing the treatment by the production processes in table 38 and 39, a significant positive impact is identified as a result of applying organic material and pruning, processes which were positively influenced by the project.

Table 38: Regression Analysis (b) Impact Level Two – Coffee Yield

regression analysis	Weighted Regression Analysis where Pi = production processes				
	R^2	Exp(β)	se	t/z	P > |t|
pr_matorg	0,18	136,28	62,64	2.18**	0,031
pr_shade					0,160
pr_chem					0,846
pr_orgafung					0,747
pr_orgpes					0,763
pr_orgfert					0,942
* significant at 10%; **significant at 5%; ***significant at 1%					

Table 39: Regression Analysis (b) Impact Level Two – Coffee Yield

regression analysis	Weighted Regression Analysis where Pi = production processes				
	R^2	Exp(β)	se	t/z	P > |t|
pr_sproinbag	0,18				0,599
pr_sproman					0,862
pr_prun		181,6	102,2	1.78*	0,078
pr_prunman					0,518
pr_desc					0,673
pr_harv					0,924
* significant at 10%; **significant at 5%; ***significant at 1%					

e Overview Results (coffee yield)

Coffee yield

From a direct comparison it can be seen that the yield in the treatment group is an average of 399 kg per hectare whereas this is 453 kg per hectare in the control group. However, as a result of large variances, this difference is not statistically significant. Using either the PSM or the regression analysis to control for pre-treatment differences, the lack of a direct impact of the project is confirmed. Nevertheless, when replacing treatment by the production processes, a significant impact is measured on yield resulting from the application of organic material. Since the project positively influenced this process, it can thus be said that the project has had an indirect impact on an increase in yield.

5.5.2 Coffee Production Expenditures

a Description of Indicators (coffee production expenditures)

As is indicated in table 40, the expenditures can be measured in terms of time and money. On the one hand it is expected that farmers from the treatment group have less expenditures in the production process, since they can produce more efficiently. On the other hand, they are expected to invest more in coffee production since they perform more production processes. Based on the interviews with the farmers in the initial phase of fieldwork and based on the fact that farmers felt unrewarded when no increased price was received after the first year of the FFS, it is expected that farmers of the treatment group spent more time and money in the production process.

Expenditures in coffee is not only measured in terms of money, but an analysis is also made of the number of days a household spent on a certain activity, except for weeding and harvesting where it is not possible to retrace the number of days spent on a each activity. Since the costs and time spent on coffee production is based on the yield previously calculated, the same remarks should be taken into account here (see 5.5.1).

Table 40: Impact Level Two Indicators – Production Expenditures Coffee

Indicator	Survey	Hypothesis
cost07_kg: average cost/kg 2007 (in soles)	5.7	↑ cost per kg 2007
cost07_hec: average cost/hec. 2007 (in soles)	5.7	↑ cost per hectare 2007
time07_kg: average time/kg 2007 (in days)	5.1-7	↑ time per kg 2007
time07_hec: average time/hec. 2007 (in days)	5.1-7	↑ time per hectare 2007

b Direct Comparison (coffee production expenditures)

From the figure 19 it becomes clear that the farmers that participated in the project on average have less costs per hectare and per kg coffee when compared to the control group directly. Based on the T-tests in table 41 it can be said that these differences are however not statistically significant. The difference with respect to time is only significant for the time invested per kg, being 0.030 higher in the treatment group.

Figure 19: Descriptive Data Impact Level Two – Production Expenditures Coffee

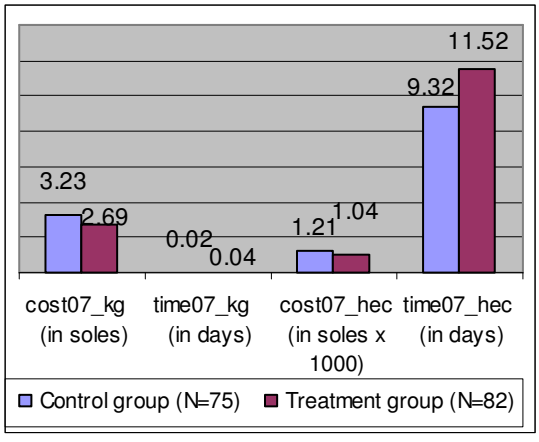


Table 41: T-test Impact Level Two – Production Expenditures Coffee

t-test	*df*	*t*	*sig.*	*mean diff.*	*se diff.*
cost07_kg	166	-1.096	0.275	-0.528	0.482
time07_kg	156	2.193**	0.030	0.016	0.007
cost07_hec	166	0.974	0.331	-175.489	180.132
time07_hec	156	1.034	0.303	2.201	2.128
* significant at 10%; **significant at 5%; ***significant at 1%					

c Propensity Score Matching (coffee production expenditures)

When controlling for pre-treatment variables using PSM in table 42, the increase in average time per kilogram is confirmed by two of the three matching methods, whereas an increase in average time per hectare is also identified, using the stratification matching.

Table 42: PSM Impact Level Two – Production Expenditures Coffee

PSM Results	Nearest neighbour matching					Kernel matching			Stratification matching		
	T	C	ATT	se [1]	t-stat	ATT	se [1]	t-stat	ATT	se [1]	t-stat
cost07_kg (in soles)	93	35	0.624	1.269	0.492	-0.379	0.756	-0.502	-0.570	0.941	-0.605
time07_kg (in days)	93	32	0.017	0.009	1.917*	0.017	0.012	1.423	0.017	0.008	2.141**
cost07_hec (in soles)	93	35	30.748	283.9	0.108	-64.9	210.0	-0.309	-67.44	202.6	-0.333
time07_hec (in days)	93	32	1.983	3.383	0.586	2.841	2.753	1.032	3.821	2.207	1.731*
* significant at 10%; **significant at 5%; ***significant at 1%									[1]Bootstrapped errors		

d Regression Analysis (coffee production expenditures)

The regression analysis in table 43 confirms that there is an impact of the project on the increase in average time spent on the production of coffee per kg. The impact on average time per hectare is not significant.

Table 43: Regression Analysis Impact Level Two – Production Expenditures Coffee

regression analysis	Simple Regression Analysis where Pi = treatment					Weighted Regression Analysiswhere Pi = treatment				
	R^2	Exp(β)	se	t/z	P > |t|	R^2	Exp(β)	se	t/z	P > |t|
cost07_kg (in soles)					0.609					0.509
time07_kg (in days)	0.111	0.017	0.008	2.18**	0.031	0.123	0.017	0.008	2.23**	0.028
cost07_hec (in soles)					0.497					0.574
time07_hec (in days)					0.158					0.380
* significant at 10%; **significant at 5%; ***significant at 1%										

In table 44 the treatment variable for measuring the impact of the project is replaced by the production processes. Only those production processes that illustrate a significant impact on average expenditures are mentioned. Whereas no direct significant impact of the treatment was measured on the average cost of coffee, an indirect impact is measured through application of organic material. Since the project illustrated an impact on this production process, it can be said that the project results in a decrease in the average cost per kg of coffee production through the impact on production processes. The lack of impact on average costs per hectare remains the same.

The effect on average time per kg coffee seems to go mainly via the application organic material since the size of the impact does not change when replacing treatment by the production processes. This thus means that at this moment especially extra time was invested in this production process when comparing the treatment group to the control group. The impact on average time per hectare is also highlighted in this analysis and runs through an increase in application of organic material, shade management and aftercare of pruning. This increase is partly offset by the decrease in use of chemicals as a result of the project.

Table 44: Regression Analysis (b) Impact Level Two – Production Expenditures Coffee

regression analysis	Weighted Regression Analysis where Pi = production processes					
	R^2		Exp(β)	se	t/z	P > |t|
cost/kg 07 (in soles)	0.253	app.of organic material	-1.072	0.572	-1.87***	0.064
time/kg 07 (in days)	0.170	app.of organic material	0.017	0.010	1.77***	0.079
cost/hec 07 (in soles)		none				
time/hec 07 (in days)	0.180	app.of organic material	5.487	2.971	1.85***	0.067
		shade management	4.500	1.968	2.29***	0.024
		use of chemicals	7.101	3.670	1.93***	0.056
		aftercare of pruning	4.608	1.726	2.67***	0.009
* significant at 10%; **significant at 5%; ***significant at 1%						

e Overview Results (coffee production expenditures)

Production costs
Both the average cost per kg as well as the average costs per hectare are lower in the treatment group. However, based on the T-test it can be concluded that those differences are not statistically significant. When controlling for pre-treatment variables for coffee per kg using either PSM or regression analysis no different conclusion is reached. However, the project appears to indirectly decrease the costs per kg, as a result of an increase in the application of organic material. Apparently this increase in use of organic material results in a decrease in costs in other areas, thereby decreasing the overall costs per kg coffee.

Production time
A small but significant difference in average time invested in coffee production, excluding weeding, harvesting and processing, is identified (0.02/kg versus 0.04/kg). The difference remains significant using either nearest neighbour or kernel matching and is also confirmed using the regression analysis. It can be said that this impact mainly stems from the application of organic material. The difference in average time is also observed with respect to time per hectare, although this difference is not statistically significant and is only confirmed using stratification matching. However, there is a significant impact of the production process on the average time spent per hectare in relation to the application of organic material, shade management, use of chemicals and aftercare of pruning. Since those processes were influenced by the project, the project has had an indirect impact on the increase in average time per hectare.

5.5.3 Coffee Price

a Description of Indicators (coffee price)

Considering the goal of the project of increasing the income of coffee production, the impact on coffee prices can be considered as one of the most important impact indicators in this study. This is also exemplified by the fact that coffee is usually the biggest, if not the only, source of income. This is illustrated by quotes from the MSC study in which a better price and better financial benefit were mentioned various times. Also the economic dimension in the SI study included several problems associated with low coffee prices as a result of low coffee quality, low paying intermediaries and the lack of organisation among farmers.

As was indicated in figure 11 and the impact on price is expected to run through two channels, mainly through the membership of a producer organization and through coffee certifications. Furthermore, the price of certified coffee is expected to be higher in the treatment group as a result of their membership of the CACSVU. An indirect result of the certifications and the membership of the producer organizations could also be that there is an increased awareness of the price farmers can demand from intermediaries on the street. Another argument why the project could have a positive impact on the price for coffee sold to intermediaries is through an increase in coffee quality. However this is unlikely in this case since the local market hardly checks and/or reward quality.

Together the increase in price of certified and non-certified coffee is expected to result in an increase the average coffee price, as is indicated by the final two indicators in table below.

Table 45: Impact Level Two Indicators - Price Coffee

Indicator	Survey	Hypothesis
price06_cert: price sold cerified in 2006 (S/. per kg)	6.5.3-9	↑ price certified coffee 2006
price07_cert: price sold cerified in 2007 (S/. per kg)	6.6.3-10	↑ price certified coffee 2007
price06_int: price sold to intermediairs in 2006 (S/. per kg)	6.5.3-9	↑ price intermediairs coffee 2006
price07_int: price sold to intermediairs in 2007 (S/. per kg)	6.6.3-10	↑ price intermediairs coffee 2007
price06: average sales price in 2006 (S/. per kg)	6.5.3-9	↑ averag coffee price 2006
price07: average sales price in 2007 (S/. per kg)	6.6.3-10	↑ average coffee price 2007

b Direct Comparison (coffee price)

In figure 20 it can be seen that the price of certified coffee sold to producer organization, the price of coffee sold to intermediaries, and the average coffee price is higher in the treatment group, both in 2006 as well as in 2007. Except for the difference in relation to price for certified coffee in 2006, it can be concluded from table 46 that all differences are statistically significant. Furthermore, the differences have become even larger in 2007.

Figure 20: Descriptive Data Impact Level Two – Price Coffee

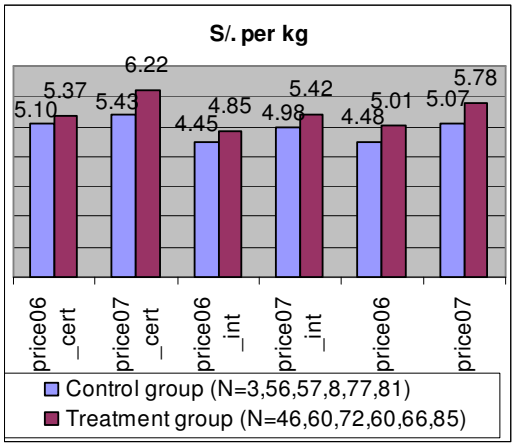


Table 46: T-test Impact Level Two – Price Coffee

t-test	df	t	sig.	mean diff.	se diff.
price06_cert (S/. per kg)	47	-0.658	0.514	-0.267	0.407
price07_cert (S/. per kg)	64	-4.977***	0.000	-0.782	0.157
price06_int (S/. per kg)	114	-3.307***	0.001	-0.395	0.119
price07_int (S/. per kg)	141	-3.836***	0.000	-0.445	0.116
price06 (S/. per kg)	127	-4.476***	0.000	-0.524	0.117
price07 (S/. per kg)	164	-8.091***	0.000	-0.710	0.088
* significant at 10%; **significant at 5%; ***significant at 1%					

c Propensity Score Matching (coffee price)

When controlling for pre-treatment differences, the lack of impact on price for certified coffee in 2006 is confirmed, and the impact on the price for certified coffee in 2007 becomes disputable due to the small number of observations. The observation made in the direct comparison that the price paid for coffee sold to intermediaries and the average coffee price is higher in the treatment group is confirmed by the results in table 47. Moreover, the impact increases for all these indicators when controlling for pre-treatment differences. This impact ranges from S/ .48 ($.16[9]) until S/ 1.10 ($.36[9]) for the coffee sold to intermediaries and from S/ .64 ($.21[9]) until S/ .95 ($.31[9]) for the average price of coffee.

Table 47: PSM Impact Level Two – Price Coffee

PSM Results	Nearest neigbour matching					Kernel matching			Stratification matching		
	T	C	ATT	se[1]	t-stat	ATT	se[1]	t-stat	ATT	se[1]	t-stat
price06_cert (S/. per kg)	93	1	0.567	0.367	1.546	0.429	0.337	1.275	not possible		
price07_cert (S/. per kg)	93	3	0.565	0.398	1.421	0.633	0.294	2.148**	not possible		
price06_int (S/. per kg)	93	24	0.587	0.302	1.943*	0.494	0.182	2.708***	0.478	0.228	2.095**
price07_int (S/. per kg)	93	30	0.803	0.338	2.375**	0.893	0.247	3.619***	1.110	0.640	1.736*
price06 (S/. per kg)	93	24	0.785	0.227	3.46***	0.650	0.174	3.738***	0.636	0.208	3.058***
price07 (S/. per kg)	93	33	0.954	0.213	4.483***	0.807	0.144	5.619***	0.762	0.140	5.434***
* significant at 10%; **significant at 5%; ***significant at 1%									[1]Bootstrapped errors		

[9] Average Exchange Rate of 0,32710 Nuevo Peruvian Sol – US Dollar in 2007 (from http://www.oanda.com/convert/ fxaverage_result)

d Regression Analysis (coffee price)

The results from both regression analyses in table 48 more or less confirm the impact of the treatment on the coffee price indicators measured with the direct comparison and when controlling for pre-treatment differences with PSM. The disputable impact on price for coffee sold as certified in 2007 is clarified by both regression analyses, measuring a positive impact of S/ .72 ($.24[9]) in the weighted regression analysis. The positive impact on the coffee price reduces slightly with the weighted regression analysis to between S/ .41 ($.13[9]) and S/ .57 ($.19[9]) with respect to the coffee sold to intermediaries and between S/ .52 ($.17[9]) and S/ .70 ($.07[9]) with respect to the average coffee price.

Table 48: Regression Analysis Impact Level Two – Price Coffee in soles per kilo

regression analysis	*Simple Regression Analysis where Pi = treatment*					*Weighted Regression Analysis where y = treatment*				
	R^2	*Exp(β)*	*se*	*t/z*	*P > |t|*	R^2	*Exp(β)*	*se*	*t/z*	*P > |t|*
price06_cert (S/. per kg)					0.907					0.87
price07_cert (S/. per kg)	0.415	0.745	0.152	4.92***	0.000	0.417	0.722	0.237	3.05***	0.003
price06_int (S/. per kg)	0.192	0.408	0.117	3.5***	0.001	0.182	0.413	0.118	3.51***	0.001
price07_int (S/. per kg)	0.219	0.541	0.116	4.67***	0.000	0.162	0.570	0.131	4.36***	0.000
price06 (S/. per kg)	0.186	0.538	0.115	4.68***	0.000	0.210	0.520	0.120	4.34***	0.000
price07 (S/. per kg)	0.317	0.708	0.087	8.13***	0.000	0.313	0.696	0.092	7.55***	0.000
* significant at 10%; **significant at 5%; ***significant at 1%										

As a next step in the analysis some additional weighted regression analyses will be made to see whether the impact on price originates from the project in specific, or from the certification or membership of producer organizations in general. In table 49 it can be seen that the impact of certification, being between S/ .58 ($.19[9]) and S/ .92 ($.30[9]), is larger than the impact of the treatment identified in table 28, It can also be seen that the impact of FLO and/or organic certification is about S/ .15 ($.05[9]) to S/. 27 ($.09[9]) above that of Utz certified.

Moreover, from table 50 it can be concluded that the impact of having obtained at least one certification on the price of coffee sold to intermediaries is higher than that of the treatment indicated in table 48, in 2006 as well as in 2007. Both tables therefore indicate the importance of having obtained coffee certification; first of all through the direct impact on the price of certified coffee sold to the producer organization and secondly through the increase in awareness or knowledge when selling coffee on the street to intermediaries.

Table 49: Regression Analysis (b) Impact Level Two – Price Coffee

regres. analysis	*Weighted Regression Analysis where Pi = floorg & utz*					
		R^2	*Exp(β)*	*se*	*t/z*	*P > |t|*
price06 (S/. per kg)	floorg06	0.31	0.849	0.151	5.61***	0.000
	utz06		0.582	0.137	4.26***	0.000
price07 (S/. per kg)	floorg07	0.42	0.919	0.088	10.44***	0.000
	utz07		0.767	0.113	6.78***	0.000
* significant at 10%; **significant at 5%; ***significant at 1%						

Table 50: Regression Analysis (b) Impact Level Two – Price Coffee

regression analysis	*Weighted Regression Analysis where Pi = cert*				
	R^2	*Exp(β)*	*se*	*t/z*	*P > |t|*
price06_int (S/. per kg)	0.624	0.440	0.117	3.74***	0.000
price07_int (S/. per kg)	0.196	0.628	0.123	5.10**	0.000
* significant at 10%; **significant at 5%; ***significant at 1%					

In table 51 an additional analysis is made to see whether the membership of a producer cooperative in general has a larger influence on the average price and the price of coffee sold to intermediaries than the treatment in general, as was illustrated in table 48. In this case the treatment especially refers to the membership of the CACSVU. From the analysis it can be concluded that the impact of the treatment is bigger than that of the membership of any producer organization in general.

Table 51: Regression Analysis (b) Impact Level Two – Price Coffee

regression analysis	*Weighted Regression Analysis where Pi = hhcoop*				
	R^2	*Exp(β)*	*se*	*t/z*	*P > |t|*
price06 (S/. per kg)	0.124	0.376	0.128	2.95***	0.004
price07 (S/. per kg)	0.242	0.625	0.096	6.5***	0.000
price06_int (S/. per kg)	0.147	0.236	0.122	1.93*	0.056
price07_int (S/. per kg)	0.171	0.539	0.142	3.8***	0.000
* significant at 10%; **significant at 5%; ***significant at 1%					

e Overview Results (coffee price)

Certified coffee price
In 2006 the price for certified coffee in the treatment group was S/ 5.37 ($1.76[9]) versus S/ 5.10 ($1.67[9]) in the control group, a difference which is not statistically significant. The PSM and regression analysis confirm these results. In 2007 the price for certified coffee was almost S/ .79 ($.26[9]) higher in the treatment group at S/ 6.22 ($2.03[9]), a difference which is statistically significant. Controlling for pre-treatment differences with either PSM or regression analysis the impact remains significant at between S/ .56 ($.18[9]) and S/ .74 ($.24[9]).

Intermediary coffee price
Whereas the impact on the price of certified coffee was rather uncertain, the impact on the price of coffee sold to intermediaries is significant and much stronger. The impact increase when controlling for pre-treatment differences with PSM to between S/ .48 ($.16[9]) and S/ .59 ($.19[9]) in 2006 and to between S/ .80 ($.26[9]) and S/ 1.11 ($.36[9]) in 2007. Also when controlling for pre-treatment differences with a weighted regression analysis the impact becomes higher, being S/ .41 ($.13[9]) in 2006 and S/ .57 ($.19[9]) in 2007. Finally, it was concluded that the impact of the project on the price of coffee sold to intermediaries mainly runs via certification which gives farmers better knowledge of what they can demand for their coffee. Another explanation would be that an increase in quality results in higher prices. However, this is not very likely since the local market hardly checks and/or reward quality.

Average coffee price
The impact of the project on the average coffee price is comparable to the impact on the price of coffee sold to intermediaries. When controlling for pre-treatment variables with PSM, the impact on average coffee price in 2006 increases to an impact of between S/ .64 ($.21[9]) and S/ .76 ($.25[9]). In 2007 the impact also increases when controlling for pre-treatment differences to an impact of between S/ .76 ($.25[9]) and S/ .95 ($.31[9]). The weighted regression analysis also confirms that there is a significant positive impact although it is slightly smaller at S/ .51 ($.17[9]) in 2006 and S/ .70 ($.23[9]) in 2007. Furthermore, it was again concluded that the impact of the project on the price of coffee sold to intermediaries mainly runs via certification, and thereby through the CACSVU. Finally, the impact of FLO and/or organic certification on the average coffee price is about .15 ($.05[9]) to S/ .27 ($.09[9]) above that of Utz certification.

5.5.4 Coffee Marketing Channels

a Description of Indicators (coffee marketing channels)

In the literature review it was already mentioned that having obtained a certification in itself does not guarantee sales of certified coffee due to limitations of demand. However, during informal interviews with members of the CACSVU it already became apparent that until now they have been able to sell all their coffee certified. It is therefore expected that the project has a large impact on the sales of certified coffee, as already became visible in the previous paragraph.

Considering the increase in membership of producer organizations through which farmers sell their coffee, it is also put forward that the project should lead to a diversification of marketing channels, as is indicated by the last two indicators in table 52. This is considered important since farmers are able to be independent of local intermediaries, who are generally perceived to be paying prices below the market price. This is also confirmed by the SI study where farmers indicated that there is a lack of a (reliable) market and that intermediaries pay low prices. Besides this farmers indicated that they want to be 'less dependent on intermediaries to obtain better prices'.

Table 52: Impact Level Two Indicators – Marketing Channel Coffee

Indicator	Survey	Hypothesis
mc06_cert: sales of certified coffee 2006	6.5.1-7	↑ sales certified coffee 2006
mc07_cert: sales of certified coffee 2007	6.6.1-8	↑ sales certified coffee 2007
mc06_cointer: > 1 market channel 2006	6.5.1-7	↑ marketing channels 2006
mc07_cointer: > 1 market channel 2007	6.6.1-8	↑ marketing channels 2007

b Direct Comparison (coffee marketing channels)

From figure 21 it can be concluded that more farmers in the treatment group have a more diversified marketing channel. Almost 50% sold their coffee to a cooperative as well as to one or several intermediaries, whereas this is less than 5% in the control group. Furthermore, many more farmers in the treatment group sold certified coffee. From the T-test it can be concluded that the differences are all statistically significant.

Figure 21: Descriptive Data Impact Level Two – Marketing Channel Coffee

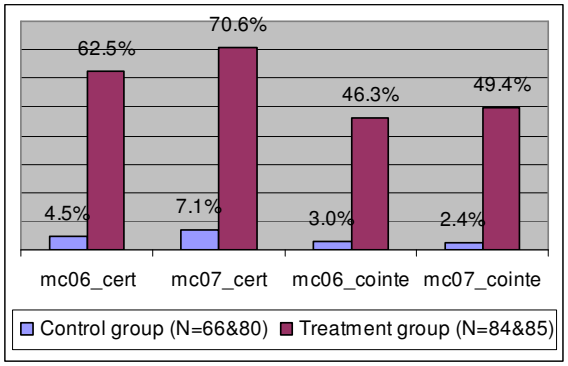


Table 53: T-test Impact Level Two – Marketing Channel Coffee

t-test	df	t	sig.	mean diff.	se diff.
mc06_cert	144	8.996***	0.000	0.580	0.064
mc07_cert	167	11.06***	0.000	0.634	0.057
mc06_cointe	144	6.676***	0.000	0.432	0.065
mc07_cointe	167	8.202***	0.000	0.470	0.057

* significant at 10%; **significant at 5%; ***significant at 1%

c Propensity Score Matching (coffee marketing channels)

The results of the PSM in tabl4 54, although in general slightly lower, confirm the significant impact of the project on the diversification of the marketing channels of coffee.

Table 54: Propensity Score Matching Impact Level Two – Marketing Channel Coffee

psm	Nearest neighbour matching					Kernel matching			Stratification matching		
	T	C	ATT	se [1]	t-stat	ATT	se [1]	t-stat	ATT	se [1]	t-stat
mc06_cert	93	29	0.495	0.067	7.331***	0.569	0.060	9.414***	0.509	0.122	4.186***
mc07_cert	93	35	0.526	0.098	5.366***	0.586	0.082	7.138***	0.525	0.083	6.316***
mc06_cointe	93	29	0.332	0.094	3.526***	0.415	0.062	6.665***	0.358	0.128	2.799***
mc07_cointe	93	35	0.494	0.054	9.187***	0.484	0.067	7.274***	0.465	0.050	9.315***

* significant at 10%; **significant at 5%; ***significant at 1% [1]Bootstrapped errors

d Regression Analysis (coffee marketing channels)

The results from both regression analyses confirm the results from the PSM. That is, it can be concluded that there is still a significant positive difference after controlling for pre-treatment differences.

Table 55: Regression Analysis Impact Level Two – Marketing Channel Coffee

regression analysis	*Simple Regression Analysis where Pi = treatment*					*Weighted Regression Analysis where Pi = treatment*				
	R^2	*Exp(β)*	*se*	*t/z*	*P > |t|*	R^2	*Exp(β)*	*se*	*t/z*	*P > |t|*
mc06_cert	0.333	45.76	30.62	5.71***	0.000	0.341	66.21	56.50	4.91****	0.000
mc07_cert	0.412	48.01	28.25	6.58***	0.000	0.383	36.53	18.68	7.04****	0.000
mc06_cointe	0.375	159.99	181.41	4.48***	0.000	0.363	160.90	196.61	4.16****	0.000
mc07_cointe	0.394	102.79	88.57	5.38***	0.000	0.437	331.06	436.65	4.40***	0.000
* significant at 10%; **significant at 5%; ***significant at 1%										

In order to determine through which channel the diversification of marketing channels is influenced by the project, another regression analysis is performed including the membership of a producer organization in case of sales to various marketing channels (see table 57). It can be concluded that the relation between membership of a producer organization in general and selling through various marketing channels is smaller. This indicates that it is the treatment in general, or more specifically the membership of the CACSVU, that causes the impact on the diversification of marketing channels.

Table 56: Regression Analysis (c) Impact Level Two – Marketing Channel Coffee

regression analysis	*Weighted Regression Analysis where Pi = producer organization*				
	R^2	*Exp(β)*	*se*	*t/z*	*P > |t|*
mc06_cointe	0.314	72.30	60.51	5.11***	0.000
mc07_cointe	0.314	33.38	23.20	5.05***	0.000
* significant at 10%; **significant at 5%; ***significant at 1%					

e Overview Results (coffee marketing channels)

Sales of certified coffee

In the control group only 4.5% sold their coffee certified in 2006 which increased slightly to 7.1% in 2007. This is significantly less than within the treatment where the sales of certified in those same years were 62.5% and 70.6%. This difference is reduced to at most 49.5% when controlling for pre-treatment variables using PSM. The effect remains when controlling for pre-treatment variables using normal and weighted regression analysis. The certification of coffee previously mentioned thus results in a significant increase in sales of certified coffee and this effect increases slightly in 2007.

Diversification of marketing channels

As was noted earlier, project members have the possibility to diversify since they are member of a cooperative through which they sell (part of) their coffee. From the survey it can be concluded that 46.3% and 49.4% (in 2006 and 2007) indeed sell to the cooperative and to at least one intermediary. The difference in those years with the control group, 43.2% and 47% respectively, is significant. The effect in 2006 reduced to between 33.2% and 41.5%. In 2007 the effect remains similar when controlling for pre-treatment differences with PSM with some methods above and some methods below the 47% difference resulting from a direct comparison. It is also interesting to note that weighted regression almost doubles the odds that the treatment results in a diversification of marketing channels and that it is the treatment causing the effect rather than membership of a producer organization in general.

5.6 Impact Level Three

5.6.1 Coffee Profit

a Description of Indicators (coffee profit)

At this stage the most important socio-economic indicator which can be identified is an increase in profit from coffee, as is indicated in table 58. Depending on the outcomes of the price, yield and production cost indicators, there will be an impact on the income from coffee. Being the basis of the livelihoods of many farmers, this result is of course one of the key goals since it is the link to many future impacts. In the SI study, the project management also indicated that many farmers do not have a positive net profit. Besides this, 63% of the farmers indicated in the MSC study they would like to reinvest in the farm, improve housing (4%) and increase children education (4%), all of which require financial resources. When interpreting the results of profit per hectare one should again take into account the assumptions made with regards to coffee plots and the overall decrease in yield in 2007, as explained in paragraph 5.5.1a.

Table 57: Impact Level Three Indicators – Profit Coffee

Indicator	Survey	Hypothesis
prof07_hec: prof/hec. 2007 (in soles)	4.1/5.7/6.3/6.6	↑ profit per hectare 2007
prof07_kg: prof/kg 2007 (in soles)	5.7/6.3/6.6	↑ profit per kg 2007

b Direct Comparison (coffee profit)

When directly comparing the treatment with the control group it can be said that there is a large difference in income per kg and per hectare, as is illustrated in figure 22. However, from the T-test in table 59 it becomes apparent that only the difference in income per kg is statistically significant.

Figure 22: Descriptive Data Impact Level Three – Profit Coffee

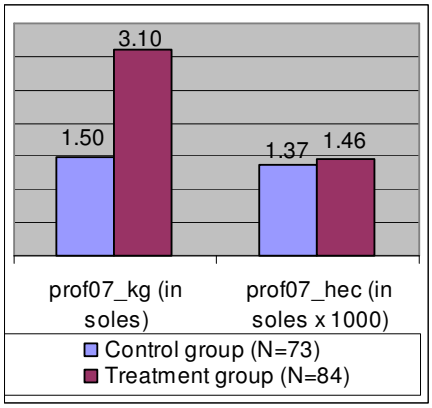


Table 58: T-test Impact Level Three – Profit Coffee

t-test	df	t	sig.	mean diff.	se diff.
prof07_kg (in soles)	161	2.926***	0.004	1.599	0.546
prof07_hec (in soles)	161	1.462	0.146	337.0	230.6
* significant at 10%; **significant at 5%; ***significant at 1%					

c Propensity Score Matching (coffee profit)

In the table below it can be seen that when controlling for pre-treatment differences with PSM, the difference on profit per kg coffee is confirmed with two of the three matching methods.

Table 59: PSM Impact Level Three – Profit Coffee

PSM Results	Nearest neighbour matching					Kernel matching			Stratification matching		
	T	C	ATT	se [1]	t-stat	ATT	se [1]	t-stat	ATT	se [1]	t-stat
prof07_kg (in soles)	93	33	0.508	0.950	0.535	1.552	0.769	2.019**	1.685	0.895	1.882*
prof07_hec (in soles)	93	33	-274.8	541.6	-0.507	156.53	359.1	0.436	214.73	529.9	0.405
* significant at 10%; **significant at 5%; ***significant at 1%									[1]Bootstrapped errors		

d Regression Analysis (coffee profit)

The increase in profit per kg coffee is confirmed for the third time when controlling for pre-treatment differences with the regression analysis, as is indicated in table 61. Moreover, the average impact on profit of coffee increases slightly to S/ 1.9 ($.62[9]) when applying weighted sampling.

Table 60: Regression Analysis Impact Level Three – Profit Coffee

regression analysis	*Simple Regression Analysis where Pi = treatment*					*Weighted Regression Analysis where Pi = treatment*				
	R^2	*Exp(β)*	*se*	*t/z*	*P > |t|*	R^2	*Exp(β)*	*se*	*t/z*	*P > |t|*
prof07_kg (in soles)	0.233	2.008	0.536	3.75***	0.000	0.239	2.067	0.594	3.48***	0.001
prof07_hec (in soles)					0.151					0.166
* significant at 10%; **significant at 5%; ***significant at 1%										

To identify what causes the positive impact on profit per kg and the lack of impact on profit per hectare, a regression analysis will be made in which treatment will be replaced by price, total costs and yield. From table 62 it can be concluded that the profit per kg seems to be especially influenced by the price of coffee. However, the combined impact of price, yield and costs are smaller than the impact of the treatment identified in the regression analysis in table 61. This could indicate that there is an additional impact of the treatment on profit per kg coffee, probably due to the fact that the majority of the farmers in the treatment group have certifications due to their membership of the CACSVU. Whereas the impact of the project on profit per hectare seemed insignificant in table 61, table 63 indicates a significant direct impact through price, for which it was proven earlier that it is influenced by the project.

Table 61 Regression Analysis (b) Impact Level Three – Profit Coffee

regres. analysis	*Weighted Regression Analysis where Pi = price, yield, costs*					
	R^2		*Exp(β)*	*se*	*t/z*	*P > |t|*
prof07_kg (in soles)	0.45	price	1.19	0.19	6.4***	0.000
		yield	0.0009	0.0002	3.76***	0.000
		cost	-0.0004	0.0001	-4.43***	0.000
* significant at 10%; **significant at 5%; ***significant at 1%						

Table 62 Regression Analysis (b) Impact Level Three – Profit Coffee

regres. analysis	*Weighted Regression Analysis where Pi = price, yield, costs*					
	R^2		*Exp(β)*	*se*	*t/z*	*P > |t|*
prof07_hec (in soles)	0.65	price	369.69	105.16	3.52***	0.001
		yield	0.6303	0.0738	8.54***	0.000
		cost	-0.1613	0.0237	-6.8***	0.000
* significant at 10%; **significant at 5%; ***significant at 1%						

e Overview Results (coffee profit)

Profit coffee

The difference in profit per kg coffee of S/ 1.59 ($.52[9]) when directly comparing both groups is statistically significant and with all methods used for controlling for pre-treatment differences, except nearest neighbour matching, this impact is confirmed being between S/ 1.55 ($.51[9]) and S/ 2.07 ($.68[9]). The difference in profit per hectare is not statistically significant and remains insignificant when controlling for pre-treatment differences. Nevertheless, it can be concluded that price of coffee, for which a large significant impact of the project was measured before, influences both the profit per kg as well as the profit per hectare.

5.7 Impact Level Four

The final indicators that will be analysed are the impact of the project on percentage land cultivated and education of children and adults.

5.7.1 Land cultivation

a Description of Indicators (land cultivation)

In the MSC study many farmers indicated they would like to reinvest their extra income in cultivating more land for coffee. Considering the hypothesis of an increase in income, one possible investment of the farmers could be cultivating extra land. This potential impact was also confirmed by the project team. As is indicated in table 64 two indicators will be used to measure this impact, the investment in land cultivation since 2004 and the percentage of land cultivated in 2008. The impact on an increase in coffee cultivation could also run through the increase in profit or price since farmers see more direct benefits of their coffee production. This might be an extra incentive to invest more in this cultivation.

Table 63: Impact Level Four Indicators – Land Cultivation

Indicator	Survey	Hypothesis
land_inv: investment new land from 04	4.1.1-2	↑ investment land cultivation since 04
land_percult: percentage land cultivated 08	4.1.1-2	↑ percentage land cultivated

b Direct comparison (land cultivation)

The differences indicated in figure 65 between the treatment group and control group with respect to the investment in new land since 2004 or with respect to the total percentage of land cultivated in 2008 are not large or consistent enough to conclude that there is an impact of the project, i.e. the differences are not statistically significant.

Table 64: Descriptive Data Impact Level Four – Percentage Land Cultivated

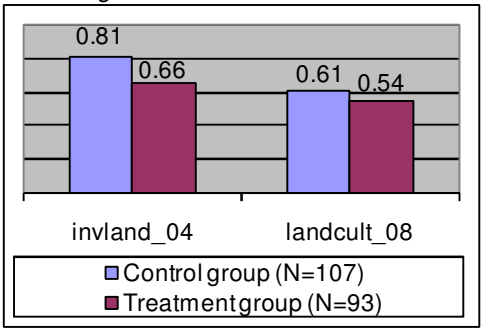


Table 65: T-test Impact Level Four – Percentage Land Cultivated

t-test	df	t	sig.	mean diff.	se diff.
invland_04	198	-0.774	0.440	-0.154	0.199
landcult_08	198	-1.578	0.116	-6.461	4.095
* significant at 10%; **significant at 5%; ***significant at 1%					

c Propensity Score Matching (land cultivation)

When controlling for pre-treatment differences with PSM, the results in table 67 confirm the lack of impact of the project on percentage land cultivated.

Table 66: PSM Impact Level Four – Percentage Land Cultivated

PSM Results	Nearest neighbour matching					Kernel matching			Stratification matching		
	T	C	ATT	se [1]	t-stat	ATT	se [1]	t-stat	ATT	se [1]	t-stat
invland_04	93	38	0.352	0.257	1.369	0.086	0.191	0.451	0.070	0.186	0.378
landcult_08	93	38	-8.8	6.390	-1.375	-5.67	6.822	-0.831	-6.023	5.876	-1.025
* significant at 10%; **significant at 5%; ***significant at 1%									[1]Bootstrapped errors		

d Regression Analysis (land cultivation)

The results in table 68 again confirm the lack of impact of the treatment on cultivation of new land, both through the investment in new land since 2004 as well as the total percentage of land cultivated in 2008.

Table 67: Regression Analysis Impact Level Four – Percentage Land Cultivated

regression analysis	Simple Regression Analysis where Pi = treatment					Weighted Regression Analysis where Pi = treatment				
	R^2	Exp(β)	se	t/z	P > |t|	R^2	Exp(β)	se	t/z	P > |t|
invland_04					0.655					0.833
landcult_08					0.256					0.283
* significant at 10%; **significant at 5%; ***significant at 1%										

To identify whether there is possibly an indirect impact of the project through the increase in profit from coffee, the treatment variable is replaced by profit from coffee per kg in table 69 and per hectare in table 70. However, there is no significant impact of profit from coffee on the investment in cultivation of land or the percentage land cultivated in 2008..

Table 68: Regression Analysis (b) Impact Level Four – Percentage Land Cultivated

weighted regression analysis	Weighted Regression Analysis where Pi = profit coffee per kg				
	R^2	β	se	t/z	P > |t|
invland_04					0.289
landcult_08					0.853
* significant at 10%; **significant at 5%; ***significant at 1%					

Table 69: Regression Analysis (b) Impact Level Four – Percentage Land Cultivated

weighted regression analysis	Weighted Regression Analysis where Pi = profit coffee per hectare				
	R^2	β	se	t/z	P > |t|
invland_04					0.841
landcult_08					0.928
* significant at 10%; **significant at 5%; ***significant at 1%					

e Overview Results (land cultivation)

Percentage land cultivated

Although there appears to be a negative impact of the project when directly comparing the control group with the treatment group, this result is not statistically significant. This result is confirmed when controlling for pre-treatment differences with either PSM or regression analysis. Finally, it can also be concluded that there is no indirect impact of the project on the land cultivated through the increase in coffee profit.

5.7.2 Education

a Description of Indicators (education)

The investment in education is considered as an important indicator since many farmers indicated this as one of the most important impacts as a result of the project during the initial phase of fieldwork. Also in the MSC study and the SI study, investment in education of children was mentioned several times. Finally, it is of course an important indicator since it can be considered as the investment in the future development of the family and the region in general. Since primary education is free, investment in education will be especially visible after primary school.

Table 70: Impact Level Four Indicators – Education

Indicator	Survey	Hypothesis
educ_18plus	2.5	↑ investment in education
educ_6till18	2.5	↑ investment in education

b Direct Comparison (education)

As can be seen in figure 23, the enrolment of adults in general is very low, although the percentage of adults enrolled in the treatment group is 3% higher than in the control group at 6.3%. Among children the difference is even smaller and it can be said that in general almost all children are enrolled in education. From table 72 it can be concluded that both differences are not significant.

Figure 23: Descriptive Data Impact Level Four – Education

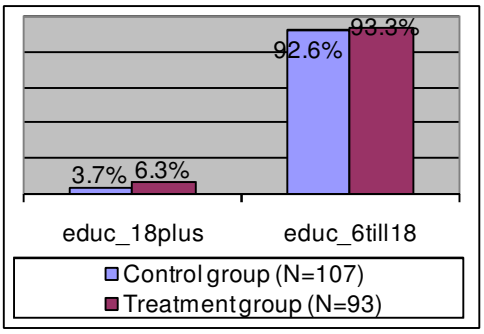


Table 71: T-test Impact Level Four – Education

t-test	df	t	sig.	mean diff.	se diff.
educ_18plus	196	1.198	0.232	2.556	2.133
educ_6till18	138	0.191	0.849	0.717	3.762
* significant at 10%; **significant at 5%; ***significant at 1%					

c Propensity Score Matching (education)

From the table below it can be concluded that when controlling for pre-treatment variables the conclusions based on the direct comparison do not change.

Table 72: PSM Impact Level Four – Education

PSM Results	Nearest neighbour matching					Kernel matching			Stratification matching		
	T	C	ATT	se [1]	t-stat	ATT	se [1]	t-stat	ATT	se [1]	t-stat
educ_18plus	93	38	5.753	3.868	1.487	1.401	4.062	0.345	0.070	0.229	0.308
educ_6till18	93	38	-8.8	8.213	-1.070	-5.67	6.896	-0.822	-6.023	5.595	-1.076
* significant at 10%; **significant at 5%; ***significant at 1%									[1]Bootstrapped errors		

d Regression Analysis (education)

The lack of a direct impact of the project on either education of 6 to 18 years old or of 18 plus is confirmed by the results of regression analyses in table 74.

Table 73: Regression Analysis Impact Level Four – Education

regression analysis	Simple Regression Analysis where Pi = treatment					Weighted Regression Analysis where Pi = treatment				
	R^2	Exp(β)	se	t/z	P > |t|	R^2	Exp(β)	se	t/z	P > |t|
educ_18plus					0.162					0.556
educ_6till18					0.896					0.853
* significant at 10%; **significant at 5%; ***significant at 1%										

In table 75 and 76, the treatment is replaced by profit from coffee which might have led to an increase in investment in education. However, from the results it can be concluded that there is actually a negative relation between education of adults and income. The negative impact on education of 18 plus is quite large at -1.1%, considering that the average percentage of adults participating in education is only between 3% to 6%. This could be explained by the fact that if income per kg increases, an increase in future income might make it more interesting to invest time and money in coffee production instead of in education.

Table 74: Regression Analysis (b) Impact Level Four – Education

weighted regression analysis	Weighted Regression Analysis where Pi = profit per hectare				
	R^2	β	se	t/z	P > |t|
educ_18plus					0.763
educ_6till18					0.521
* significant at 10%; **significant at 5%; ***significant at 1%					

Table 75: Regression Analysis (b) Impact Level Four – Education

weighted regression analysis	Weighted Regression Analysis where Pi = profit per kilo				
	R^2	β	se	t/z	P > |t|
educ_18plus	0.222	-1.103	0.663	-1.74*	0.084
educ_6till18					0.987
* significant at 10%; **significant at 5%; ***significant at 1%					

As was explained before, strong signals were also given during the fieldwork that it is the change in mindset towards education as a result of capacity building, rather than the additional income, that would influence the investment in education of adults. This is confirmed when looking at the relation between capacity building and education of adults in table 77. It can therefore be argued that there is an indirect positive impact on investment in education through the increase in awareness of the benefits of education as a result of capacity building.

Table 76: Regression Analysis (c) Impact Level Four – Education

weighted regression analysis	Weighted Regression Analysis where Pi = capacity building				
	R^2	β	se	t/z	P > |t|
educ_18plus	0.202	6.627	1.961	3.38***	0.001
educ_6till18					0.241
* significant at 10%; **significant at 5%; ***significant at 1%					

e Overview Results (education)

Investment in education 6 until 18

Overall more than 90% of the children between 6 and 18 participate in education, being only 0.7% higher in the treatment group at 93.3%. This difference is not statistically significant and neither controlling for pre-treatment differences with PSM nor regression analysis changes this conclusion. A further analysis does not illustrate any indirect impact of the project on the investment in education since neither profit from coffee nor receiving capacity building have a significant impact.

Investment in education of 18 plus

As opposed to the high level of participation of children, the participation of 18 plus is very low, being 3.7% in the control group versus 6.3% in the treatment group. The lack of impact is confirmed by both PSM as well as the regression analysis. When going into more depth with the analysis it appears that the increase in profit per kg coffee has a slightly negative impact on education of adults. On the other hand, capacity building in general has a larger and positive impact on participation of adults, probably through an increased awareness on the importance of education.

5.8 Chapter Conclusion

The DE Foundation Coffee Project in Peru has resulted in various changes at household level. In this study the two most important outcomes that were identified are capacity building in the Farmer Field Schools (FFS) and the establishment of the Cooperativa Agraria Cafetalera Sostenible Valle de Ubiriki (CACSVU). From the analysis, it can be concluded that there is a significant impact on capacity building, frequency of capacity building and membership of producer organizations. Although both impacts increase the absolute number of women that participate in capacity building or the number of women that are member of a producer organization, no significant relative increase can be observed.

As a result of the capacity building in general, irrespective of the source, or of the FFS approach in combination with the CACSVU (i.e. the project), several changes are expected in the production process. After analysing the survey data it can be concluded that for almost all the production processes analysed there is either a direct impact, resulting from the FFS approach in combination with the CACSVU, or an indirect impact, resulting from capacity building in general. The impact of the project is the largest with respect to shade management, application of organic material, use of

organic fertilization, selective harvest and aftercare of pruning. The impact on shade management, the decrease in use of chemicals and management of seedlings is mainly a result of the project in general whereas the impact on the application of organic material, use of organic fertilization, aftercare of pruning and selective harvest is a result of capacity building in general, irrespective of the source.

Another impact of the FFS, and partly stimulated by the change in production processes, is the extension of the coffee production and processing equipment, especially in relation to equipment for management of waste water and compost. Except for the impact on equipment for waste water management, pruning equipment, masks and gloves, it can be said that the impact on safety equipment, various processing tanks, drying equipment and storage runs mainly through capacity building in general.

Both changes in production processes as well as production and processing equipment are reinforced by the coffee certifications which have been obtained. These certifications are considered as the main impact of the development of the CACSVU, or the membership of a producer cooperative in general. Certification, being one way to reach the desire of participating farmers to obtain better rewards for their coffee, required the development of a reliable producer organization. The participating farmers have not only obtained coffee certification in general, but have obtained various certifications at the same time, of which Utz Certified, Fair Trade and Organic are the most common.

A final impact which is considered at this level is the increase in feeling capable of solving problems in the field, feeling comfortable in giving an opinion and participation in the community. The project results in at least half as much more farmers that indicate a positive change in this area. These changes as well as the impact on certification mainly result from the combination of the FFS and CACSVU rather than capacity building or membership of producer organizations in general.

The change in production processes are expected to lead to an increase in yield and an increase in production costs on the short term. The impact on both yield and costs are however more disputable than the impacts measured directly resulting from the capacity building and the producer organization. A direct positive impact of the project on yield for example is not confirmed, although the yield increases as a result of adding organic material, a process for which an impact was measured before. However, it should be taken into account that the data with respect to yield is based on several assumptions and it is also argued that an impact on yield might only be observed on the longer term.

The impact on production costs in terms of time, although rather small, is confirmed and appears to be an indirect result of the project via the impact on application of organic material, shade management and aftercare of pruning. The impact on production costs in terms of money is however disputable since there appears to be a small indirect decrease in costs through application of organic material. Apparently this increase in use of organic material results in a decrease in costs in other areas, thereby decreasing the overall costs per kg coffee.

The changes resulting from the increase in membership of producer organizations and the coffee certifications are much stronger than those resulting from the changes in production processes. There is an impact on the price paid for certified coffee and on the price paid by intermediaries. Considering the fact that this last impact is mainly caused by having obtained coffee certifications rather than membership of a producer organization in general, it is proven that certification has an indirect impact on price, probably through an increase in awareness and knowledge of a suitable price when selling coffee on the street. The direct impact of certification is proven when looking at the significant large impact on average coffee price. Finally, the impact of FLO and/or organic on the average coffee is larger than that of Utz certified.

As a result of the impact on the average coffee price the profit per kg and per hectare increased significantly. The increase of profit from coffee, being the main source of income of many farmers in the Ubiriki valley, is expected to lead to an increase in land cultivation and education of both children and adults. The result on land cultivation is however not confirmed whereas the impact on education is only visible for adults, and only as an indirect impact through capacity building in general.

In conclusion it can thus be said that the project has had a significant socio-economic impact within its five years of existence mainly in relation to an increase in capacity building, membership of producer organizations, a broader and more intensive coffee production process, an increase in production and processing equipment, coffee certifications, self esteem, price and diversification of marketing channels. Furthermore, there is a small impact on an increase in yield, time spent in the production process and a decrease in costs.

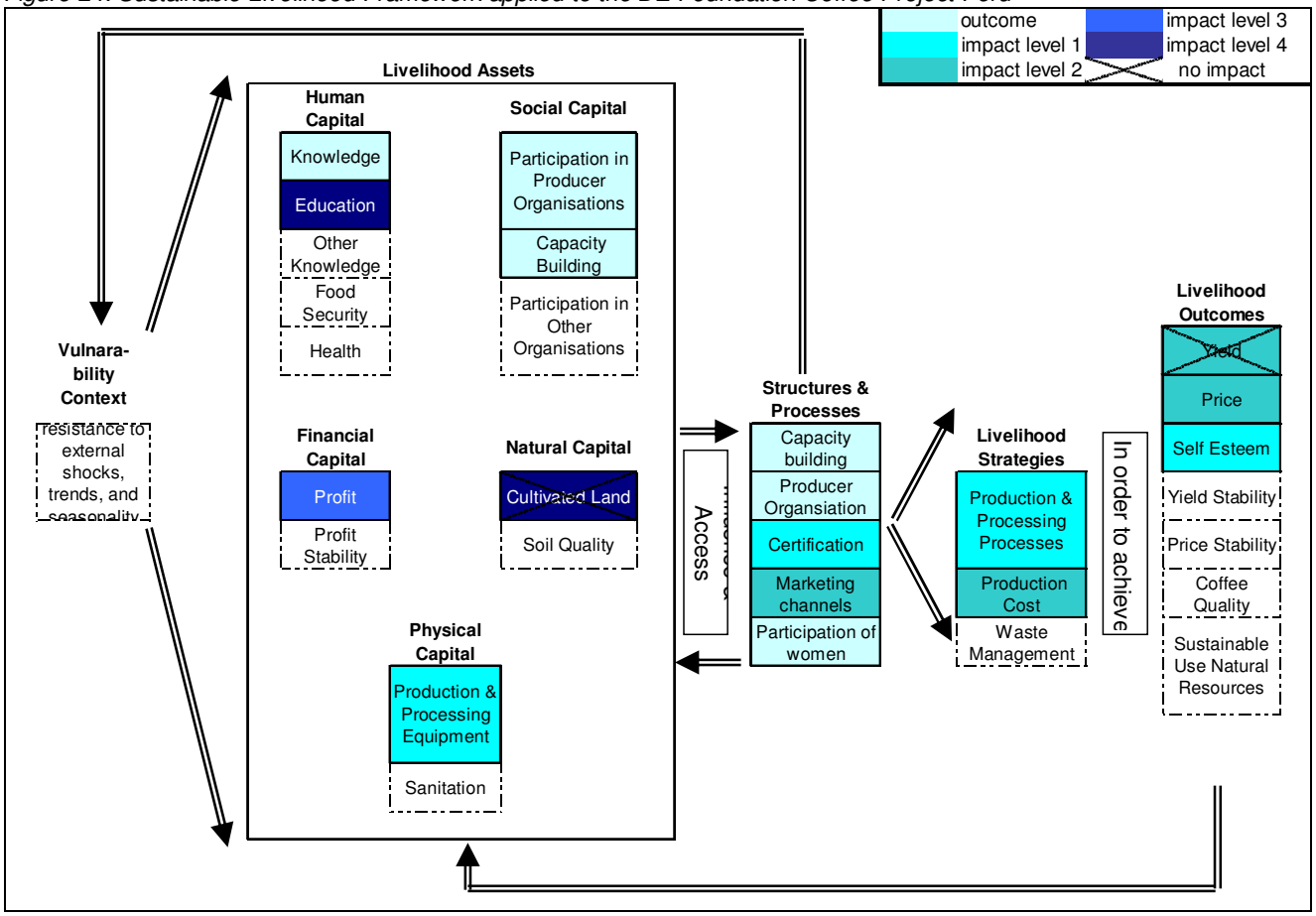
6 Discussion

In this chapter the socio-economic impact of the project discussed in the previous chapter will be discussed in relation to the sustainable livelihood framework (see 3.2). In paragraph 6.1, an overview of the SLF framework will be given, including those impact areas which have been analysed and those which have been identified during this study but of which no data has been collected and/or analysed. For each area in the framework the results of the previous chapter will be discussed and linked to the other impact areas, and some additional impact areas that were identified during this study will be mentioned. In paragraph 6.2 the vulnerability context will be described, followed by the livelihood assets in paragraph 6.3, the structures and processes shaping the livelihoods of the farmers in paragraph 6.4 and the livelihood strategies in paragraph 6.5. In the end of this chapter a short chapter conclusion will be given (paragraph 6.6).

6.1 Impact Indicators in the Sustainable Livelihood Framework

In the figure below all the impact areas that were identified during this study are depicted. As was discussed in paragraph 4.2 and 5.1, the choice of which indicators to include was based on research conducted on the project at an earlier stage, the first phase of field research for this study or because it was explicitly put forward by one of the project stakeholders. The indicators that were analysed in the previous chapter are coloured, each colour corresponding the to level at which the impact was identified in the output-outcome-impact framework (see figure 11). The indicators that were not analysed are surrounded by the dotted line.

Figure 24: Sustainable Livelihood Framework applied to the DE Foundation Coffee Project Peru



6.2 Vulnerability Context

The vulnerability context frames the external environment in which people live. People's livelihoods and the wider availability of assets are affected by critical trends, shocks and seasonality, over which they have limited or no control (sheet 2.2 DFID 2007). The discussion of the coffee crisis in chapter two for example illustrated the vulnerable context in which small scale farmers operate.

Although no indicators are placed in the figure, since the (external) vulnerability context in itself is not changed by the project, or at least not at this stage, it is expected that there is a significant indirect impact. This is the result of the increase in assets, the development of various structures and processes that shaped the livelihoods of the farmer, positive changes in livelihood strategies and the increase in certain livelihood outcomes. Those changes make farmers more resistant to external shocks, trends and seasonality.

6.3 Livelihood Assets

As was explained in chapter three, the heart of the framework consists of the assets pentagon, including human, social, natural, physical and financial capital. Assets can be destroyed or created by trends, shocks and seasonality. Transforming structures and processes partly determine access to the assets and those with more assets are able to switch between different livelihood strategies to secure their livelihoods. Finally, research has found that different assets lead to different livelihood outcomes and that people with greater access to assets are better able to escape poverty. (sheet 2.3 DFID 2007)

Human Capital

The first impact area, knowledge, is measured indirectly through capacity building and changes in production processes. In both areas a significant impact was measured and it can therefore be said that the project has increased human capital through an increase in coffee production knowledge.

Another impact that was analysed in the previous chapter was the potential increase in the education of children and adults besides capacity building. The results illustrated that no significant impact can be ascribed to the project with respect to the enrolment of children. There is however a small negative impact of the increase in coffee profit per kg on adult education. This can possibly be explained by the increase in incentives to invest time and money in coffee production instead of in coffee cultivation. This impact is however overshadowed by the larger positive impact of capacity building on the percentage of adults of a household that receive education. Based on informal interviews and the focus group interviews, it can be said that this impact is probably explained by increase in awareness of the benefits of education. The human capital is therefore influenced positively by the capacity building both directly as well as indirectly.

The increase in human capital through knowledge and education enables farmers to pursue more efficient livelihood strategies by using their other assets in the most appropriate way. Furthermore, human capital is distinct from other assets since it is something that cannot be taken away once obtained, it is in a way a very sustainable asset. During the first phase of fieldwork it became clear that this is indeed also perceived as such by FFS participants and human capital thereby thus contributes to an overall increase in quality of life (see livelihood outcomes).

Besides knowledge and education three other impact areas are indicated under human capital. The first area, other knowledge, refers to a wide variety of issues such as working in a team, problem identification skills, learning skills, knowledge on the coffee market or knowledge on organization. This type of knowledge and skills can be considered as a direct result of the FFS approach, although no data was collected during this study.

Food diversity is another important impact area since the initial base line study indicated a high rate of malnutrition. The positive impact of the project on coffee profit could be used to buy more, and more diversified food. Although the survey includes some data on food diversity (part 3.2 of appendix 9.4) this data has not yet been analysed.

Another impact area that has been identified in relation to human capital is health. The project could result in an increase in health through an increase in income; an increase in hygiene and production safety awareness through education and capacity building; and certification norms with regards to labour conditions, waste management and use of chemicals. Although some data was collected with respect to investment in health, more complex data should be collected to analyse the impact of the project on health.

Social Capital

The development of the producer cooperative CACSVU, being one of the main outcomes of the project, resulted in a significant increase in membership of coffee producer organizations. Moreover, the relations and connectedness (i.e. the social capital) is further stimulated by the capacity building sessions, especially the capacity building in the FFS with their frequent gatherings and interactive training character. The project has therefore increased social capital both through an increase in membership in coffee producer organizations and frequent gatherings in the FFS.

This increase in social capital, thus in connectedness and relations among participants, can result in an increase in trust among the farmers, something already observed during the fieldwork. Taking into account the turbulent guerrilla battle in this region in the nineties and the dramatic decrease in trust and relationships among farmers as a result, this is especially vital. The connectedness and relations further 'facilitate cooperation, reduce transaction costs and could provide the basis for safety nets' (DFID 2007, p.9).

Besides an increase in social capital through the membership in the producer organization CACSVU and the FFS, an indirect impact of the project can be identified with regards to the membership of other organizations This impact could result from an increased trust in organizations in general and an increase in perceived benefits of being member of an organization or group of people. Although data was gathered on the participation in other formal and informal organizations this data has not yet been analysed.

Financial Capital

Probably one of the impacts that most closely relates to the objective of the project is the increase in profit from coffee. This increase in profit is measured when looking at profit per kg as well as profit per hectare and mainly results from the increase in coffee price through coffee certification. Through this impact, the project contributes to the financial capital available to the farmers.

The impact on financial capital directly influences the livelihoods of the coffee producers, since this capital can be converted to other capital, for example an investment in food, health, production equipment, education, housing or more land cultivation.

Besides the increase in profit from coffee, another impact area that was identified is the stability of profit from coffee, resulting from the membership of a producer organization, certification and yield stability. This is especially important to coffee farmers considering the volatile market in which they operate. Although the survey included questions on the income of coffee over several years, it was not possible to analyse this data since especially farmers in the control group often do not record nor remember what their yield has been over the last years.

Natural Capital

In the previous chapter the impact on percentage of land cultivated was analysed since this would give an indication of the use and the potential benefits of the land. However, no significant impact was measured on investment in land cultivation. The lack of impact therefore illustrates that the project has not yet resulted in an increase in coffee production either through an increase in income or through the increase in expected future returns. However, this lack of impact could also be interpreted as a positive result, since the project does not lead to more forests and nature being converted for cultivation.

Another important indicator that was identified during the fieldwork is the impact of the project on soil quality as a result of capacity building and certification, and the resulting changes in production processes and waste management. Although data was collected that could enable an identification of the soil quality according to its colour and the percentage of nutrient rich top soil, this has not yet been analysed. Nevertheless, it might be very difficult to identify whether the observed differences are a result of the project, since differences in soil quality can only be expected on the longer term and are also determined by previous use and geo-physical characteristics.

Physical Capital

Several impacts were measured in the previous chapter on the equipment for coffee production and processing. This is mainly a result of an increase in knowledge from the capacity building and further stimulated and sometimes even obligated by the coffee certification.

The increase in physical capital as a result of the project enables farmers to be more productive. Furthermore, part of this equipment enables farmers to produce more safely, thereby contributing to human capital. Finally, the increase in physical capital enables farmers to produce higher quality coffee which again contributes to their livelihood outcomes.

Another potential impact of the project on physical capital is through sanitation. Sanitation, often a norm of certification, can for example result in better health and less pollution. However, nowadays almost all farmers have basic sanitation and it is no longer possible to identify the direct or indirect impact of the project on this development.

6.4 Transforming Structures and Processes

The institutions, organizations, policies and legislations, referred to as the transforming structures and processes, shape the livelihoods of the farmers by determining access to assets, the terms of exchange and the returns on livelihood strategies. Furthermore, the structures influence the vulnerability context and can cushion external shocks such as economic crisis. (sheet 2.4 DFID 2007)

The first impact area identified and analysed relating to these structures, capacity building, was the initial focus of the project. It is not the information on coffee production as such which matters here, but rather the structure which provides the FFS participants with regular capacity building. Being part of the FFS approach, regular capacity building is provided corresponding to the production cycle. Moreover, the FFS nowadays is imbedded in the producer organisation CACSVU.

The second impact in the area of structures and processes is the development of a producer organization. Besides providing farmers with the opportunity to be a member of such a group (see social capital), the existence of the CACSVU in itself is perceived as an important outcome of the project since the CACSVU was developed as a response to the lack of a reliable producer organization.

The third impact is the certification of coffee. It is not the impact of the certification norms as such, but rather that there is a structure to ensure and further stimulate the changes in production processes, environmental management and the increase in market access. The impact on certification, mainly resulting from the development of the CACSVU, was significant not only in terms of the individual certification schemes but also because the CACSVU was able to obtain five different certifications or standards in a period of four years.

The fourth impact area which is illustrated under structures & processes is the increase in marketing channels. This increase in marketing channels runs through the membership of producer organizations that provides farmers with an alternative marketing channel besides the intermediaries.

Finally, the participation of women was analysed. Although there is an impact on the absolute number of women that participate in the producer organization or capacity building, this impact is not significant in relative terms that is when only comparing the participation of women for those households that receive capacity building or are member of a producer organization in the first place. However, the mere fact that the project is stressing the importance of participation of women can be considered as a positive impact.

6.5 Livelihood Strategies

Livelihood strategies refer to the range and combination of activities and choices that people make in order to achieve their livelihood goals. (sheet 2.5 DFID 2007). One of the main impacts identified in this area, and closely related to the main strategy of the project to achieve its goals, are the changes in the production and processing of coffee. In the previous chapter it was concluded there is a significant impact of the project on various production processes; application of organic material, shade management, use of organic fungicides or fertilization, correct planting of seedlings, aftercare of seedlings, aftercare of pruning and selective harvest. The impacts are either a result of the capacity building in general, irrespective of the source of capacity building, or of the FFS approach in specific.

The second impact area, closely related to the production processes is the cost of production, both in terms of time and money. A small direct impact was measured on the time spent in the production process, resulting from the increase in certain production processes. Besides this, a small indirect impact was identified on a decrease in costs of production.

The increase in time invested in the coffee production process could be perceived as a negative impact since the time can no longer be invested in other activities. However, by improving the production process, the project has positively contributed to the livelihood strategy on which a majority of the farmers in the region depend to achieve their livelihood objectives. It should also be stressed that the lack of impact on an increase in coffee cultivation (as discussed under natural capital), counteracts the potential limitation that farmers become more dependent on coffee production (see 2.4.3).

Another area where an impact is expected is with respect to waste management. Although data has been collected on waste management, no analysis has been made in this study considering the socio-economic focus and the time constraints faced during the analysis.

6.6 Livelihood Outcomes

The livelihood outcomes are the achievements or outputs of the livelihood strategies. (Sheet 2.6 DFID 2007) The first livelihood outcome which is discussed is the increase in yield, being an important goal of the project. An indirect impact was identified through the impact of the project on applying organic material. Taking into account the impact of the project on the other production process and the quality of the FFS capacity building, it is expected that this impact will increase even more in the future.

Another livelihood outcome, and probably the most important one in this study, relates to the price of coffee. A significant impact is measured on the price paid for certified coffee, the price paid for coffee by intermediaries and the average coffee price. It is especially interesting to note that coffee certification does not only influence the average coffee price directly, through the price premiums, but also indirectly through an increase in awareness or knowledge since certified farmers sell their coffee against higher prices to intermediaries. Although it could also be argued that this is the result of an increase in quality, this is not realistic in this context since it is generally known that quality is not checked or rewarded by local intermediaries. The limitations mentioned with regards to a lack of demand for certified coffee and dependency on Fair Trade (see 2.4.1 and 2.4.3) are thereby rejected since the positive impact of certification does not entirely depend on the availability of a market for certified coffee.

A final impact area which was identified and partly analysed is changes in self esteem. Although a significant impact was measured with respect to changes in capability of solving problems in the field, participation in the community and giving opinion, self esteem is of course a much broader concept. However, in order to obtain reliable data much more questions would need to be asked and considering the limited time available during the fieldwork, self esteem was not measured in detail in this study.

Several additional impacts were identified in the livelihood outcomes, amongst others yield stability. This yield stability should mainly result from the change in production processes. However, it was not possible to collect reliable data on the yield size of the last couple of years. Furthermore, it is expected that this impact, as was the case for yield size, is especially a longer term impact.

Price stability is another potential impact area, resulting from the membership of a producer cooperative and the coffee certifications. However, only the price data of two consecutive years were collected, providing insufficient data to draw a conclusion with respect to price stability.

Coffee quality has been an important focus of the project since the start because it is expected that through an increase in coffee quality, market access is provided to the international coffee market. Changes in quality are mainly a result of production and processing processes and therefore an impact can be expected. However, it is difficult to measure changes in coffee quality as such, and again considering the socio-economic focus of this study, this was not measured in this study. The results of this quality increase, being the increased market access and selling certified coffee, was already discussed.

A final livelihood outcome, and probably one of the most important areas which has not been analysed yet, is a more sustainable management of the environment. This increase would result from an increase in waste management and certain production processes and would eventually result in overall more sustainable livelihoods, for example by making the farmers more resistant to external impacts such as changing weather patterns.

6.7 Chapter Conclusion

As was discussed in this chapter, one of main outcomes of the project is the impact on social capital through an increase in connectedness and relations as a result of membership of the producer organization and regular participation the farmer field schools (FFS). Another direct impact is the increase in human capital through the knowledge resulting from the FFS. The impact on human capital is also confirmed by the impact of the capacity building on education of adults. Besides the impact on social and human capital, the project has also resulted in an increase in financial capital, through the increase in profit from coffee. Finally, the project resulted in an increase in physical capital since participating farmers acquired more production and processing equipment.

Next to the impact on livelihood assets, it can be concluded that the project has had a significant impact on the structures and processes that shape the livelihoods of the project participants. Capacity building has not only had an impact on human capital, but also provides a fixed structure for regular capacity building, especially now that it is imbedded in the newly developed producer organization CACSVU. The existence of the CACSVU in itself is perceived as an important outcome of the project since it was developed as a response to the lack of a reliable producer organization. Within both structures there is a lack of impact on the relative participation of women, although there is an impact on the absolute number of women that participate. A fourth impact is the coffee certification that provides a structure to ensure and further stimulate the changes in production processes and environmental management. As a consequence of the impact on the structures mentioned above, the project resulted in an increase of marketing channels. Together the impacts on the structures and processes will make the impact of the project more sustainable.

The third area of the livelihoods in which the project has had an impact relates to the livelihood strategies of the coffee farmers. The results indicate an increase in time invested, which could be seen as a negative impact since this time can no longer be invested in other activities. However, by positively changing the production process, the project has contributed to the livelihood strategy on which a majority of the farmers in the region depend. Finally, it can be said that the project has not resulted in an increase in dependency on coffee production.

Also in the area of livelihood outcomes the project has had a significant impact. This impact is especially large in relation to the price paid for certified coffee, the price paid for coffee by intermediaries and the average coffee price. It is interesting to note that coffee certification does not only influence the average coffee price directly, through the price premiums, but also indirectly through an increase in awareness or knowledge since certified farmers sell their coffee against higher prices to intermediaries. The positive impact of certification therefore does not entirely depend on the availability of a market for certified coffee. Another impact area which was identified and partly analysed is changes in self esteem. A significant impact was measured with respect to

changes in capability of solving problems in the field, participation in the community and giving opinion, although it should be realized that self esteem is of course a much broader concept.

Combined the above impacts, are expected to have an impact on the resistance to external shocks, seasonality and crisis, shaping the vulnerability context of the farmers. This is the result of the increase in assets, the development of various structures and processes that shape the livelihoods of the farmer, positive changes in livelihood strategies and the increase in certain livelihood outcomes.

Finally, various impact areas have been discussed that were identified during this study as potential impact areas. In relation to the livelihoods assets those impact areas are mainly food security, health, participation in other organizations, profit stability, sanitation and soil quality. The most important impact area in livelihood strategies is waste management and in relation to the livelihood outcomes yield stability, price stability, coffee quality and sustainable use of natural resources. However, apart from these impact areas, it can already be said that the socio-economic impact reflects the broad scope of the project. Moreover, the fact that the impact is visible in many different areas of the livelihoods of the participating farmers increases the sustainability of the measured socio-economic impact and increases the likelihood of an expansion of those impacts into an even larger positive future impact.

7 Conclusion

In paragraph 7.1 an answer will be provided to the main research question: what has been the socio-economic impact of the DE Foundation Coffee Project in Peru on the livelihoods of the households in the Ubiriki valley? After answering the main research question the thesis will be completed with some recommendations for future research Ii paragraph 7.2.

7.1 The Socio-Economic Impact

Outcomes

The DE Foundation Coffee Project in Peru has resulted in various changes at household level. In this study the two most important outcomes that were identified are capacity building in the Farmer Field Schools (FFS) and the development of the Cooperativa Agraria Cafetalera Sostenible de Valle Ubiriki (CACSVU). These outcomes are already related to various potential changes or impact areas being the participation of households in capacity building, the frequency of capacity building, the membership of producer organisations and the participation of women in both capacity building and producer organizations.

Based on extensive analysis of the survey data it can be concluded that the chance of receiving capacity building almost doubled by the development of the project. Besides this, there is a significant impact on the frequency of capacity building of those households, being at least 20 times more sessions in the last five years. There is also a large impact on the membership of farmers in producer organizations, the percentage of membership among the treatment group being more than four times as high. Finally, it can be said that there is no impact on the relative participation of women, although there is an impact on participation of women in absolute terms.

The impact on capacity building is important for the livelihoods of the farmers by contributing to their livelihood assets through human capital. The membership of the CACSVU and regular participation in the FFS has also contributed to an increase in relations and connectedness among participants, being social capital. In addition, the CACSVU and the FFS which is nowadays embedded in the CACSVU, contribute to the structures shaping the livelihoods of the farmers and ensure the longer term knowledge exchange and a further increase in human and social capital.

Impact Level One

As a result of the FFS or the capacity building in general several changes were expected in the production process. After analysing the results it can be concluded that there is either a direct or an indirect impact on the all the production processes indicators. The impact of the project is most significant with respect to shade management, application of organic material, use of organic fertilization, harvesting selectively and aftercare of pruning. The participating farmers perform these activities at least 20% to 50% more than their non-participating counterparts. Of those five production processes shade management is a direct impact of the FFS approach, whereas the others are an indirect impact through the capacity building in general. This is also the case for the use of bags for seedlings. The impact on the management of seedlings after planting is however a result of this specific project and not of capacity building in general. Lastly the analysis of the survey data indicates a positive impact on the use of chemicals.

Another potential impact of the FFS, and partly stimulated by the changes in the production process, is the more extensive use of coffee production and processing equipment, such as pruning equipment, safety equipment, equipment for the management of waste water, various processing tanks, drying equipment and storage. The impact in this area is very strong, especially in relation to equipment for the management of waste water and compost, where the chance of having those items in the production equipment is more than doubled by the project. The impact on pruning equipment is limited to a small but positive impact on having a pruning scissors and a slightly bigger impact on having a pruning knife. There is also an impact on three of the four safety equipment indicators, especially in relation to masks, but also in relation to having ponchos and gloves. The impact of the project on processing tanks is most notably with respect to having a separate tank for fermentation and the impact on a cherry receptacle is significant although twice as small. Finally, the project has had a positive impact on the drying equipment and storage for coffee. The impacts on pruning equipment, masks, gloves and equipment for the management of waste water are a result of the project in general whereas the impact on the remaining production and processing equipment runs through capacity building in general.

Both changes in production processes as well as production and processing equipment are reinforced by the coffee certifications which have been obtained. These certifications are considered the main impact of the development of the CACSVU. However, the development of the cooperative itself could also be seen as a result of the desire of the participating farmers to gain from the increased investment in the production process. Certification, being one way to reach this goal, required the development of a reliable producer organization, which was the initial reason why the CACSVU was developed. From the analysis of the survey data it becomes clear that more than 90% of the comparable non-participating farmers have not obtained any certification, whereas this is only around 30% in the treatment group. The participating farmers have not only obtained coffee certification in general, but have obtained various certifications at the same time, of which Utz Certified, Fair Trade and Organic are the most common.

A final impact resulting directly from the outcomes of the project is the increase in the self-esteem, in this study measured by three indicators; 'feeling capable of solving problems in the field', 'feeling comfortable in giving their opinion' and 'participation in the community'. In the treatment group at least half as many farmers indicated a positive change in these areas. These changes, as well as coffee certification, mainly result from the combination of the FFS and CACSVU rather than capacity building or membership of producer organizations in general.

The impact mentioned above contribute to the livelihoods of the coffee farmers in various ways. First of all, the changes in production processes contribute to the livelihoods of the household through a significant change in their most important livelihood strategy being coffee production. The increase in production equipment results in an increase in physical assets that farmers have at hand. Both impacts are further stimulated and institutionalized by the certifications which have been obtained. The coffee certification therefore ensures the sustainability of these impacts. Finally, the indicators measured with respect to self-esteem can be seen as an impact on the livelihood outcomes of participants by giving them more satisfaction in their lives.

Impact Level Two

The impact of the project on the production process is expected to result in an increase in yield, also being one of the main goals of the project. From the analysis it can be concluded that at this stage there is an indirect impact of the project through the application of organic material. Taking into account the impact of the project on the other production processes and the quality of the FFS capacity building, it is expected that this impact will increase in the future.

Besides an increase in yield, it is expected that there will be an increase in production costs. On the longer term however, there might actually be a decrease in costs due to a more efficient production process, less diseases etc. The impact on production costs in terms of time is, although rather small, confirmed and appears to be an indirect impact of the application of organic material, shade management and aftercare of pruning. The impact on an increase in costs is not confirmed, but rather a small decrease in production costs is measured.

Another goal of the project is to increase the benefits from coffee production by selling the coffee against higher prices. This increase in price is expected to be a result of the membership of the producer organization through which farmers can bypass the local intermediaries and through which farmers have the possibility to obtain one or more coffee certification. From the analysis it becomes clear that the changes resulting from the increase in membership of producer organizations and the coffee certifications are very strong. First of all, there is an impact on the price received for certified coffee in 2007, being about S/ .65 ($.210[9]) higher for the participating households. However, these results are based on very few observations in the control group and are therefore not very strong. The impact on prices paid for coffee by intermediaries is however based on many observations and results in a difference of between S/ .41 ($.13[9]) and S/ .59 ($.19[9]) in 2006 and between S/ .57 ($.19[9]) and S/ 1.11 ($.36[9]) in 2007. Considering the fact that this impact is mainly caused by having obtained coffee certifications rather than membership of a producer organization in general, it is proven that coffee certification has an indirect impact on price, probably through an increase in awareness and knowledge when selling coffee on the street. The direct impact of certification is proven when looking at the average coffee price since the impact, which is between S/ .52 ($.17[9]) and S/ .79 ($.26[9]) in 2006 and S/ .70 ($.23[9]) and S/ .95 ($.31[9]) in 2007, an impact which runs mainly through the sales of certified coffee.

Besides the increase in price, the membership of the producer organization and the coffee certifications would result in a diversification of marketing channels. The first diversification of marketing channels runs through the coffee certification discussed before. Besides this, the project has increased the amount of farmers that sell to more than one marketing channel by between 30% and 50%, hereby decreasing the dependency on one single buyer.

The impacts discussed influence the livelihoods of the farmers in various ways. By increasing the time invested in production and slightly decreasing the production costs, the project influences the main livelihood strategy of participating farmers. Furthermore, there is an impact on the structures shaping the livelihoods of the farmers by extending the marketing channels available to tem. This increase in market access results in an impact on the coffee price, an important livelihood outcome for the coffee farmers.

Impact Level Three

Resulting from the expected increase in coffee yield and coffee price, it was suggested that the profit from coffee per kg and hectare would increase. This increase in profit could partly be offset by the increase in production costs. From the analysis it can be concluded that the project has influenced the profit of coffee per kg significantly with an increase between 1.33 ($.44[9]) and S/ 1.91 ($.62[9]). There is also a significant impact on profit per hectare which runs entirely through the impact on coffee price. The increase in profit from coffee is of course central in the livelihoods of the coffee farmers by providing cash flows into their financial assets.

Impact Level Four

Many potential impacts of an increase in profit from coffee can be identified, since coffee is the main source of income of many farmers in the Ubiriki valley. One of the potential areas is investment in education of children and adults. The results illustrated that no significant impact can be ascribed to the project with respect to enrolment of children of 6 until 18. There is however an overall positive impact of the project through capacity building, as a result of the increasing awareness of the benefits of education. The human capital is therefore influenced positively by the capacity building both directly as well as indirectly

Another potential result of the increase in profit from coffee was the increase in coffee cultivation. This would result from the fact that farmers have more money to invest and have a larger incentive to invest in coffee cultivation considering the increase in expected future returns. However, from the analysis of the survey data no impact is observed. It should however be stressed that the lack of impact in this area is also something that could be considered as positive since it counteracts the potential limitation that farmers become more dependent on coffee production.

Overall Conclusion

In conclusion it can thus be said that the project has had a significant socio-economic impact within its five years of existence mainly in relation to capacity building, membership of producer organizations, a broader and more intensive coffee production process, an increase in production and processing equipment, coffee certification, self esteem, price and the diversification of marketing channels. The capacity building corresponds to one of the main problems indicated by the farmers at the start the project (projectteam-peru 2004), being a lack of knowledge of coffee cultivation. The second most important problem as perceived from a social dimension, being a lack of organization, is also influenced by the project. Also from an the economic perspective it can be said the project has had a valuable impact since participants indicated that low prices and a lack of markets were two of the main economic problems. Finally, despite the fact that the environmental impact is not explicitly analysed in this study, some of the main problems in this area have been addressed including the lack of soil management, pest and disease control and management of organic waste.

Finally, it can be mentioned that the broad socio-economic impact relates to the livelihoods of farmers in many different ways; through different types of assets, through structures and processes that shape the livelihoods of the farmers, the livelihood strategies to achieve certain livelihood outcomes, and the livelihood outcomes. This broad impact corresponds to the broad scope of the project and will increase the sustainability of the measured socio-economic impact and assures the expansion of those impacts into an even larger positive future impact.

7.2 Recommendations for Further Research

A first area of recommendations for further research relates to the methodology used or more specifically to the analysis of the data. Although the analysis in this study is already very extensive, some further steps could be considered. One of those steps relates to the division of the analysis on several groups, for example making a distinction between the impacts on high-educated versus low-educated farmers, or experienced versus non experienced farmers. Another step in the analysis could be to consider the possibility of non-linear impact models (for example that the first capacity building session has a higher impact than the ones following, or visa versa) or an interaction between the variables in the model (for example that the combination of a lower level of education combined with capacity building results in higher impact, or visa versa). Finally, the analysis could take into account more explicitly the differences in reliability of the survey data of the participating farmers versus the non participating farmers.

The other areas of recommendations relate to the focus of this research, or rather the area on which this research did not focus. In the introduction of this thesis an overview was given of the coffee supply chain (see figure 2) and it was explained that only the impact on the first link of the coffee supply chain will be analysed, i.e. the coffee producers. However, an impact could also be expected on the other supply chain links and their surroundings. The intermediaries are for example influenced by the changing supply chain structure as a result of the development of the producer organization and the coffee certification. Likewise, traders and producer associations can be excluded from the supply chain. However, both chain links could also benefit from the project as a result of the increase in quality, especially considering the fact that participants are still selling a significant part of their production to intermediaries. Another chain member where a large impact can be expected is the producer cooperative. As was discussed in this study, there is a general lack of trust in producer organizations in the region. However, in order to obtain more benefits from the coffee production, a reliable producer organization needed to be developed. The increase in trust of the new producer organization is obtained by the extent to which farmers are involved in the organization and receive the benefits from their membership, for example through capacity building in FFS. During the fieldwork various stakeholders indicated that there is not only a direct impact of the project at this level in the supply chain, but that there is also an indirect impact of the project since it influenced the approach of other producer organizations in the region. There has for example been an active interest of various producer organizations in the FFS approach. Also in the remaining part of the supply chain, including exporters, roasters, retailers and consumers, the project can have an impact in terms of organization, responsibilities or quality of coffee.

All these impacts are interesting for evaluating the impact of this project. Furthermore, considering the overall picture of vertical and horizontal chain integration as a result of globalization, urbanization and agro-industrialization (Ruben, Boekel et al. 2007), a broader impact study is relevant from a scientific as well as practical point of view.

Besides the focus on the first link in the supply chain, a choice was made to focus only on the households participating in the FFS (see figure 4). However, it was already identified at an early stage that there might be an indirect influence on non-participating coffee farmers living in the project area. This impact could run through the communication between the participating farmers and their neighbours, but for example also through the result of the increase in disease control of participating farmers. This is a rewarding area for future research since the original FFS approach is based on the assumption that there is a high diffusion of knowledge from participating to non-participating farmers. The project could also have an impact on farmers producing other crops since certain impact areas are more widely applicable, for example the application of organic material or waste management. The majority of the impact on other farmers in the project area is however based on the assumption that farmers share their knowhow and from the observations made during the fieldwork and conversations with several stakeholders, it can be said that this assumption is not entirely met. The impact on coffee farmers and other farmers could also be extended to other areas, assuming that there is sufficient communication or contact between those regions. Due to the low level of communication, those impacts are however something which could be better analysed on the longer term.

Finally, this study focused on the socio-economic impact of the project and although this corresponds to one of the main objectives of the project, many other impact areas can be identified. Probably the most important area which has not been analysed explicitly in this paper relates to the environmental impact of the project. It is important to identify this impact taking into account the overall pressure on natural resources in the Amazon basin and its consequences for biodiversity, the future livelihoods of farmers and climate change in general. Considering the topics that were discussed in the FFS and as a result of the coffee certification, a large impact is expected in this area. Some data was already collected and partly analysed with respect to certain production processes or waste management, but to obtain a realistic insight into the environmental impact more technical data would need to be collected, for example with regards to groundwater pollution or erosion. Besides environmental impact there are also many other impact areas, including the ones identified in figure 23 in the discussion chapter, on which future impact research can be worthwhile. But for now, the impact discussed in this thesis can already be very valuable for the project management, for the management of comparable projects, for science and ultimately for the coffee producers themselves.

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9 Appendices

9.1 Overview of Coffee Certifications

INSPECCION INTERNA 2008

COD	NORMAS Y CRITERIOS DE CUMPLIMIENTO	CERTIFICACION					SI	NO	OBSERVACIONES
		R.F	ORG	UTZ	C.P.	FLO			
1	Tiene su libro de campo bien actualizado								
2	Tiene croquis de su finca actualizado								
3	Se mantienen los cafetales con árboles de sombra (pacae) y se diversifica con especies nativas?	cs	o	m	4.00	rm			
4	Mantiene la cobertura vegetal del suelo con plantas leguminosas o malezas nobles?	cs	o	m	rc	rm			
5	Ha plantado árboles de sombra(recalce), y especies maderables(reforestacion)en su parcela y está registrado?	cs	0	m	rc	rm			
6	Ha realizado practicas de conservación de suelo? ejemplo:barreras muertas, siembra curvas a nivel y hace manejo de sombra,etc?	cs	o	m	7.00	rm			
7	Los trabajadores se agrupan independientemente para negociar con el empleador?	cs	n/a	m	4.00	rm			
8	El productor usa solamente abonos orgánicos para mantener la fertilidad del suelo?	cs	o	r	5.00	rp			
9	realiza análisis de suelo por lo menos cada 3 años?	cs	o	r	rc	rp			
10	para reducir la acidez del suelo, solo usa cal, roca fosforica y compost?	cs	o	m	ro	rm			
11	A utilizado productos prohibidos? (docena sucia) Existe evidencia de uso y aplicación de productos prohibidos?	cc	o	M	rc	rm			
12	Reclica todo los desperdicios vegetales de la finca	cs	o	m	rc	rp			
13	Tiene registro de semillas y viveros actualizados?	cs	o	m					
14	Hace germinaderos y viveros con variedades adaptadas a la zona?	cc	r	M	rc	rp			
15	Se realiza un control integrado de malezas evitando la erosión del suelo?ejm: no usar lampa.	cs	o	m	rc	rm			
16	Se ha fomentado el control biologico para el control de plagas? Ejemplo: bauberia basiana(para broca)	cs	o	m	5.00	rp			
17	Los productos fitosanitarios y fertilizantes , el productor solo utiliza productos permitidos por la certificadora?	cs	o	M	rc	rm			
18	Todos los trabajadores que aplican o tienen contacto con fitosanitarios permitidos, usan equipos de protección personal?	cc	o	M	rc	rm			
19	El productor toma medidas preventivas para el control de plagas y enf.?ejm:selecciona plantas sanas y resistentes, densidad adecuada y otros.	cs	o	m	ro	rp			
20	Existen cultivos sin sombra y suelos erosionados?	cs	o	m	rc	rm			
21	El productor realiza cosecha selectiva? y el despulpado se hace el mismo dia?	cs	o	m	rc	rpo			
22	La pulpa así como los residuos vegetales se compostan y la compostera tiene techo?	cs	o	m	3.00	rm			
23	Tienen pozas de tratamiento de aguas mieles? Y estos funcionan correctamente?	cc	o	M	5.00	rm			
24	Los cuerpos de agua natural se encuentra libre de cualquier sólido orgánico o inorgánico tal como desechos domésticos , basura y otros?	cc	o	m	rc	rm			
25	El productor realiza el secado de manera adecuada? ejemplo:parihuelas, secador solar y tarimas	cs	o	m	ro	rp			
26	Tienen almacenes adecuados para café, herramientas, e insumos?	cs	o	M	rm	rm			
27	Las zonas de recarga de cuencas hidrológicas(ojos de agua, nacientes de quebradas)están identificadas y conservadas?	cs	o	m	5.00	rp			
28	Existen areas de conservacion con bosques, purmas, lagunas y están protegidos, conservados e identificados con letreros?	cc	o	m	2.00	rm			
29	Se a reforestado en áreas degradadas, al borde de riachuelos, quebradas, y en terrenos de mucha pendiente?	cs	r	r	rc	rp			

30	Mantienen zonas de vegetacion al borde de caminos y carreteras para prevenir erosiones y la contaminación de fincas vecinas no certificadas?	cs	o	M	rc	rm			
31	¿Existe evidencia de haber convertido un bosque natural a producción agrícola? Ejemplo: rozo y quema?	cs	o	M	rc	rp			
32	El productor discrimina a sus trabajadores por razones de raza ,color, sexo, religión,idioma y cultura(ropas tipicas, musica, danza, comida y artesania?	cc	o	M	ro	rm			
33	Existen evidencias de trabajo forzado, obligatorio e involuntario?ejm: retención de sueldo, DNI y alguna propiedad.	cc	o	M	7.00	rm			
34	El productor demuestra que paga el mismo salario por igual trabajo realizado por mujeres y niños?	cs	o	M	rc	rp			
35	El empleador realiza la contratación de trabajos forzados a personas menores de 15 años?	cc	o	M	ro	rm			
36	Los menores en edad escolar que hubieran en la finca asisten con normalidad a clases?	cs	o	M	4.00	rm			
37	Se brinda a los trabajadores servicios básicos como:agua potable, alimentación y vivienda en condiciones adecuadas?	cs	o	M	6.00	n/a			
38	Existen contratos de trabajo firmados con su personal y los empleados que laboran en la finca?	cs	o	m	ro	rm			
39	Los t rabajadores conocen la existencia de hoja de reclamos, existe en un lugar visible los derechos del trabajador?	cs	n/a	m	n/a	rp			
40	El productor demuestra que los trabajadores reciben el pago de base en dinero por una suma igual o superior a la media de la región? ejm:contratos boletas de pago y/o recibos de pago	cc	o	M	7.00	ro			
41	Se demuestra que el pago mínimo de cosecha por dia es igual o mayor al monto que se paga por un jornal?	cs	o	M	ro	rm			
42	En la finca se prohíbe la caza y recolecclón de especies silvestres en peligro de extinción?	cc	o	m	2.00	rp			
43	Se realiza evaluaciones periódicas en la finca para detectar problemas de plagas y enfermedades? (monitoreo)	cs	o	m	3.00	n/a			
44	El productor conoce las normas y procedimientos sobre el MIP, Conmservacion de ecosistemas, control de erosion y otros	cs	o	m	n/a	rc			
45	Tiene su cronograma de actividades y plan de mejora sobre buenas prácticas agrícolas?	cs	o	r	rm	rm			
46	El responsable de la finca tiene firmado un contrato de compromiso	cs	o	n/a	rc	rp			
47	El productor cuenta con una ficha de información básica de la unidad productiva? (fólder)	cc	o	M	rc	rp			
48	Los registros de cosecha y ventas de café están bien rellenados y actualizados?	cs	r	M	n/a	rp			
49	Las nuevas áreas de producción estan ubicadas solamente en aquellas tierras que presentan condiciones de clima, suelos y topografía adecuadas para el cultivo?	cc	o	m	rc	rp			
50	La finca mantiene la integridad de los ecosistemas acuáticos o terrestres dentro o fuera de la finca? existe evidencia de deforestación o el relleno o drenaje de humedales	cc	o	m	4.00	n/a			
51	Tiene mapa de su finca,en el cual se muesra todo sus parcelas y campos de cultivo Y estan identificadas con letreros?	cs	n/a	m	n/a	rp			
52	Si es que tiene dos fincas,estan registradas por separado?(dos folders)	cs	o	M	rc	n/a			
53	Tiene todo los registros bien rellenados y actualizados?	cs	o	M	n/a	n/a			

54	El uso de fertilizantes es previa consulta con un asesor, y su empleo está basado en los análisis de suelo?	cs	o	M	rc	rp			
55	Existe un registro o inventario actualizado de fertilizantes e insumos que se usa y almacena?	cs	r	M	rc	rm			
56	Existe evidencia que se prosesa y almacena estiercoles de animal cerca de corrientes de agua?	cs	o	M	rc	n/a			
57	El productor tiene una lista actualizado de todo los productos fitosanitarios que utiliza y están identificados respecto al cultivo para el cual se utilizan?	cs	o	M	rc	rm			
58	Los caños y piletas tienen llaves?	cs	n/a	M	rm	rp			
59	El productor cuenta con registro de uso de agua ?	cs	n/a	M	5.00	rm			
60	La aplicación de productos fitosanitarios (caldo bordalés) se prepara y efectúa de manera apropiada?	cs	o	M	rc	n/a			
61	tiene letrinas	cs	O	M	rc	rp			
62	tiene botiquines	cs	o	M	4.00	rm			
63	tiene poza de residuos organicos?	cs	o	m		rp			
64	Los residuos lnorgánicos domiciliaros(latas, bolsas plasticas, vidrios,y descartables) asi como los residios peligrosos(baterías, pllas,pinturas,med. Vacíos etc.)se eliminan de acuerdo a lo establecidoen el manual de RESIDUOS SOLIDOS?	cs	o	M	2.00	rm			
65	El productor cuenta con un permiso por parte de la autoridad competente para el uso de agua?	cs	n/a	n/a	rc	n/a			
66	Tiene pozas de aguas negras?	cs	o	m	rc	n/a			
67	El trabajo de horas extras es voluntario o previo acuerdo de los trabajadores?ejm: en cosecha	cs	r	M	4.00	rp			
68	Las zonas de riesgo y areas de seguridad estan claramente identificados?	cs	n/a	m	4.00	n/a			
69	Si es que existe sitios arqueologicos y de importancia cultural estas se conservan?	cs	n/a	n/a	n/a	n/a			
70	Se contrata personal de la zona?	cs	n/a	n/a	n/a	n/a			
71	Existe persencia de animales en las areas de prosezamiento y secado?	cs	n/a	m	rc	n/a			
72	Para el despulpado asi como para el lavado y fermentacion de café solo utiliza agua limpia?	cs	o	M	rc	rp			
	TOTALES: CC/O/M/PTOS/RM								
	TOTALES: cs/na/m/rc/rp								

LEYENDA:
CC= CRITERIO CRITICO O=OBLIGATORIO M= REQUISITO MAYOR PTOS= PUNTAJE RM=REQUISITO MÍNIMO
cs= CRITERIO n/a=NO APLICA m= REQUISITO MENOR rc= REQUERIMIENTO DE CRITERIO rp=REQUISITO DE PROGRESO

..... **Lugar y fecha**

..... **Firma del auditor interno**

..... **Firma del agricultor**

Nombre y Apellidos.....

9.2 Example Semi-Structured Interview

ENTREVISTA SEMI-ESTRUCTURADA

Fecha de entrevista: *Hora:*

Nombre:
Ocupación: Edad:
Número de teléfono: Dirección:

Parte A: el Proyecto (10 min)

1. ¿Qué, en breves palabras, abarca el proyecto según Vd.?

Parte B: la Cooperación (20 min)

1. ¿Qué es la función principal de la cooperativa?
2. ¿Cuántos miembros tiene?
3. ¿Qué es el proceso de registrarse?
4. ¿Qué son las obligaciones de los socios?
5. ¿Piensa Vd. que si no hubiera sido implementado el proyecto, no habría establecido la cooperativa?

Parte C: los cambios socio económico (directo e indirecto) (45 min)

1. ¿Cuál han sido los impactos socio-económicos al nivel del productor?
2. ¿Cuál han sido los cambios socio-económicos al nivel de las familias de los productores?
3. ¿Cuál han sido los cambios socio-económicos al nivel de las comunidades?
4. ¿Cuál han sido los cambios socio-económicos para las organizaciones en que participan los productores?

Parte D: los cambios medioambinetales (directo e indirecto) (20 min)

1. ¿Cuál han sido los impactos medioambientales al nivel del productor?
2. ¿Cuál han sido los cambios medioambientales al nivel de las familias de los productores?
3. ¿Cuál han sido los cambios medioambientales al nivel de las comunidades?
4. ¿Cuál han sido los cambios medioambientales para las organizaciones en que participan los productores?

9.3 Matrix Selection Villages Control Group

Nombre ECA
Nombre Promotor

Lugar Central — *El anexo mas importante de la comunidad*
Comunidad A — *Centros Poblados o Grupo de Anexos que participan en los ECA y donde viven socios de Valle Ubirki*
Comunidad C — *Centros Poblados o Grupo de Anexos que no participan en los ECA y donde no viven socios de Valle Ubirki*

Grupo C no puede ser de la misma comunidad que el grupo A o Grupo B

Grupo C no puede tener la oportunidad de comunicar con personas de Grupo A ni B, ni observar los chacras de Grupo A ni Grupo B

Grupo C no puede ser en un regio de Cooperativa Valle Ubiriki!

Grupo C no puede tener mas que 3 criterios malos!

Grupo C no puede tener menos que 28 puntos!

Comunidad C 1:
Comunidad C 2:
Comunidad C 4:
Comunidad C 5:

	Criterios	Grupo A	Zonas Potenciales Grupo C		C1	C2	C3	C4	C5
1	Cuantas familias/viviendas tiene la comunidad (mira definicion) aproximadamente?		bueno: lo mismo regular: >25% diferencia malo: >50% diferencia	4 2 0					
2	Cual es es la distancia en promedio de las viviendas hasta el lugar central (mira definicion)?	caminando: en vehiculo:	bueno: lo mismo regular: >25% diferencia malo: >50% diferencia	4 2 0					
3	Cuantas horas es desde el lugar central (mira definicion) hasta Pichanaki?	caminando hasta la carretera (solo Shimaki): en vehiculo hasta Pichanaki (todos):	bueno: lo mismo regular: >25% diferencia malo: >50% diferencia	4 2 0					
4	Cuantas horas es desde el lugar central (mira definicion) hasta un puesto de salud mas cercana?	caminando: en vehiculo:	bueno: lo mismo regular: >25% diferencia malo: >50% diferencia	4 2 0					
5	Cuales servicios tiene el puesto de salud? (abierto todo semana?)	bueno (con primeros auxilios): si/no regular (con consultas): si/no malo (solo medicinas): si/no	bueno: con primeros auxilios regular: con consultas malo: solo medicinas	4 2 0					
6	Cuantas horas es caminando hasta la escuela secundario del lugar central (mira definicion) ?		bueno: lo mismo regular: >25% diferencia malo: >50% diferencia	4 2 0					

	Criterios	Grupo A	Zonas Potenciales Grupo C		C1	C2	C3	C4	C5
7	Cual es el nivel de los servicios de educación	bueno (1 profesor por <20 estudiantes): si/no regular (1 profesor por 20-30 estudiantes): si/no malo (1 profesor por >30 estudiantes): si/no	bueno: el mismo nivel regular: un nivel diferencia malo: dos niveles diferencia	4 2 0					
8	Que otras cooperativas existen en su comunidad (mira definicion) ? (sus nombres)		bueno: la(s) misma(s) regular: +/- 1 diferencia malo: +/- 2 diferencia	4 2 0					
9	Cuantas otras organizaciones existen capacitando en café o que han capacitado en café en el pasado en su comunidad (mira definicion)?	Florida: si/no Prisma: si/no Aprodes: si/no Café Mujer: si/no Caritas: si/no Senasa: si/no Otros ONGs o municipio local: si/no	bueno: la(s) misma(s) regular: +/- 2 diferencia malo: +/- 3 diferencia	4 2 0					
10	Cuantos m.s.n.m. es el altitud promedio (o entre el minimo y el maximo) de las fincas en la comunidad (mira definicion)?		bueno: lo mismo regular: >10% diferencia malo: >25% diferencia	4 2 0					
11	Cuantos años se dedica la comunidad (mira definicion) al café?	<5 años: si/no 5-10 años: si/no >10 años: si/no	bueno: el mismo nivel regular: un nivel diferencia malo: dos niveles diferencia	4 2 0					
12	Cual es la calidad de los suelos en general en la comunidad (mira definicion) ?	amarillo: si/no rojo: si/no negro: si/no	bueno: el mismo nivel regular: un nivel diferencia malo: dos niveles diferencia	4 2 0					
		Total de Puntajes Acumulados	Total Bueno						
			Total Regular						
			Total Malo						
			Total Puntaje						

9.4 Survey

0.1.1	**Fecha de la entrevista (día/mes/año):**	0.1.1	
0.1.2	**Hora de inició de la entrevista:**	0.1.2	
0.1.3	**Hora final de la entrevista:**	0.1.3	
0.1.4	**Nombres y Apellidos del entrevistador:**	0.1.4	
0.1.5	**Nombres y Apellidos del entrevistado:**	0.1.5	
0.1.6	**Nombre de anexo o comunidad donde se encuentra la entrevista**	0.1.6	
0.1.7	**Grupo de Investigación** *1 = Grupo A (participante ECA)* *2 = Grupo B (vecino/familia/conocido de la participante)* *3 = Grupo C (no tiene relación con el participante de la ECA)*	0.1.7	

Pagina 1

INTRODUCCIÓN

*Primero introducirle

Quisiera invitarle a contestar un cuestionario sobre el impacto socioeconómico y medioambiental del proyecto Sara-Lee.
El cuestionario tarda entre dos y tres horas.
Como estudiantes de la universidad, espero poder usar los resultados para entender mejor las cambios en su vida, su finca, y en las vidas de las personas de su vivienda.
Su participación es voluntaria. Si usted está de acuerdo en participar, la información que usted nos proporciona será completamente confidencial.
Es muy importante que usted conteste con la verdad, para si conocer su verdadera condición.
La información recibida de usted no tiene consecuencias negativas para su persona o familia mas adelante.
Los datos recogidos a través de esta encuesta serán utilizados sólo para fines estadísticos para cumplir los objetivos de este estudio.
En caso de presentar o publicar los resultados, los datos serán presentados en forma agregada así que no será posible individualizar ni identificar ninguna casa o persona por sus respuestas.
Si tiene alguna duda en formular las respuestas por favor pregúntame.
Gracias por anticipado por su cooperación.

0.2 PREGUNTAS GENERALES (antes de empezar)

Solo para el grupo A:

0.2.1 ¿Es ud. participante de la ECA ahora? 0.2.1 ☐

1 = Si *2 = No (► 0.2.7 es grupo B?)*

0.2.2 ¿Cuántos personas trajo, con quienes habla Ud. de las ECAs? 0.2.2 ☐

0 = nadie (► empezar entrevista) *2 = dos personas* *4 = cuatro personas*
1 = una persona *3 = tres personas*

	0.2.3 ¿Cuáles son los nombres y apellidos de la(s) persona(s) que ha traído hoy día? *Primero, apunte todos nombres, después sigue con las preguntas de 0.2.4 hasta 0.2.6 por cada persona	0.2.4 ¿La persona que ud. trajo, es la persona con quien conversa mas sobre los temas de la ECA? 1=si 2=no	0.2.5 ¿Cuál es su relación con esta persona? Vecino 1=Si 2=No	2=familia 1=Si 2=No	99 = Otro, especificar	0.2.6 ¿A qué tiempo caminando de su finca vive esta persona? 1 = menos que 5 minutos 2 = entre 5 y 10 minutos 3 = entre 10 y 30 minutos 4 = entre 30 minutos y 1 hora 5 = mas que 1 hora
1						
2						
3						
4						

Solo para el grupo B:

0.2.7 **¿Has participado en una ECA en el pasado?** 0.2.7 ☐

1 = Si *2 = No*

0.2.8 **¿Cuales son las nombres y apellidos, de las persona que le ha invitado a esta entrevista?**

☐

0.2.9 **¿Cuál es tu relación con el participante de la ECA?** 0.2.9a ☐

*(más que una opción es posible, ponga los códigos en una celda)

1 = vecino *2 = familia* *99 = Otro, especificar* _____.

0.2.10 **¿A qué tiempo de su finca vive esta persona?**

0.2.10 a, en carro ☐

0.2.10 b, andando ☐

Solo para el grupo C:

0.2.11 ¿Usted, o su familia produce café? 0.2.11 ☐

1 = Si *2 = No (no seguir)*

Pagina 3

1. DATOS GENERALES

Quisiera hacer una lista completa de todas las personas con quien ud. comparte dinero y/o comida durante el ultimo año por al menos 4 meses.

1.1 ¿Cuantas personas son parte de su vivienda, según este definición? 1.1

* No necesita apuntar los nombres. Empieza con el entrevistado con pregunta 1.3 hasta 1.6 antes de seguir con la próxima persona.
Empieza con la persona mayor!

						Solo para los mayor de 18!
	Nombre *No es necesario es para escribirlo correcto, solo sirve como referencia en otros preguntas!	**1.2 ¿Cuáles son las relaciones que tiene ud. con estas personas?** *1 = padres* *2 = hijo(a)* *3 = hermano(a)* *4 = pareja* *5 = suegro(a)* *6 = yerno, nuera* *7 = ñieto(a), bisñieto(a)* *8 = otros parientes* *9 = empleada doméstica* *10 = peón (obrero)* *11 = sobrino(a)* *12 = primo(a)* *99 =otro, especifica:*	**1.3 ¿Qué sexo tiene esta persona?** *1 = varón* *2 = mujer*	**1.4 ¿Qué edad tiene ud. / esta persona?**	**1.5 ¿Cuál es el distrito de nacimiento o procedencia de ud. / esta persona?**	**1.6 ¿De que religión pertenece ud. / esta persona?** *1 = Católica* *2 = Evangélica* *3 = Adventista* *4 = Israelita* *5 = Mormon* *6 = Ateo / ninguno* *7 = Varios* *99 = otro, especificar:*
1	**entrevistado**	***no necesario***				
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						

Pagina 4

2 Educación

En esta parte, queremos preguntarle sobre el nivel de educación de los miembros de su vivienda. Nos tomará x minutos.

2.1 **¿Cuánto tiempo es caminando o en carro desde su vivienda hasta la escuela primaria?**
88 = no sabe

2.1.a) en carro
2.1.b) andando

2.2 **¿Cuánto tiempo es caminando o en carro desde su vivienda hasta la escuela secundaria/colegio?**
88 = no sabe

2.2.a) en carro
2.2.b) andando

		Solo para personas mas de 6 años						Solamente para los	
2.3 - 2.10	**Nombre y numero que le corresponde (usa primer cuadro)**	**2.3 ¿Sabe ud. / esta persona escribir y leer?** *1 = leer y escribir.* *2 = solo sabe leer.* *3 = ni sabe leer ni escribir.*	**2.4 ¿Cuál es el nivel de educación o estudio?** *1=ningún* *2=primaria incompleta* *3=terminan primaria* *4=secundaria incompleta* *5=terminan secundaria* *6 = preparatoria académica* *7=asistente técnico (1 año)* *8=técnico (3 años)* *9=técnico superior (4 años)* *10=universitario* *11=post grado* *12=educación de adultos*	**2.5 ¿Ud. / el asistirá a una institución educativa ?** *1 = si (►2.6-2.10)* *2 = no (►2.10)*	**2.6 ¿En qué centro educativo vas a estudiar Ud./esta persona? (lee estos alternativas)** *1 = público* *2 = privado* *3 =* CEGECOM	**2.7 ¿Qué numero de alumno hay por aulas en tu centro de estudio o institución?** *1 = menos que 25* *2 = entre 25 y 40* *3 = más que 40*	**2.8 ¿Tiene un docente para todo las clases o cursos?** 1 = si, uní docente 2 = no, poli docente	**2.9 ¿Cuál es la frecuencia en que Ud./esta persona asistía el año pasado a la escuela o al colegio?** *1 = siempre asistía (► próxima persona)* *2 = en días fijos/regularmente no asistía* *3 = en algunas días / eventualmente no asistía*	**2.10 ¿Por que no asistió el año pasado al colegio o institución?** ***!Mas que una opción posible!*** ***!No lee los códigos!*** *1=enfermedad* *2=labores domesticas* *3=trabajo del campo* *4=problemas de transporte* *5=falta de profesores* *6=falta de seguridad* *7=por cuidado de niños* *8=falta de dinero* *9=problemas familiares* *10=no tiene interés* *11 = por discapacidad* *99 = otro, especificar*
	entrevistado								

3. BIENESTAR

3.1 ATENCIÓN MEDICO

Aquí quisiera hacerle algunas preguntas sobre aspectos con referencia a atención medico. Nos tomara unos 10 minutos.

3.1.1 ¿A que tiempo es caminando, o en carro de la vivienda hasta la posta de salud mas cerca?

3.1.1 a, en carro
3.1.1 b, andando

3.1.2 ¿Ofrece esta posta de salud:

a = programas de nutrición	*88=no sabe*	*1 = si*	*2 = no*	3.1.2a
b = programas para la planificación familiar	*88=no sabe*	*1 = si*	*2 = no*	3.1.2b
c = programas de malaria	*88=no sabe*	*1 = si*	*2 = no*	3.1.2c
d = primeros auxilios	*88=no sabe*	*1 = si*	*2 = no*	3.1.2d

3.1.3 Cuantos enfermeros tiene este posta de salud 3.1.3

3.1.4 Cuantos doctores tiene este posta de salud *0.5=de vez en cuando, algunas veces* 3.1.4

3.1.5-3.1.8 **Solo para los hijos menos de 5 años!**

Nombre de hijo y numero que le corresponde (usa primer cuadro) *Contesta pregunta 3.1.5 - 3.1.9 antes de seguir con el próximo hijo	**3.1.5 Su hijo ….. recibió vacunas?** *88 = no sabe* *1 = si* *2 = no*	**3.1.6 ¿En que lugar nació hijo x?** *88=no sabe* *1=puesto de salud público* *2=puesto de salud privado* *3=centro de salud público* *4=centro de salud privado* *5=hospital público* *6=clínica* *7=casa del curandero* *8=en la casa sin ayuda* *9=en la casa con ayuda familiar* *99=otro, especificar:*	**3.1.7 Durante el embarazo *el madre* ha tenido controles prenatales?** 88 *= no sabe* *1 = si* *2 = no (► 3.1.9)*	**3.1.8 ¿Cuantos controles prenatales con un medico ha tenido la madre durante el embaraza?** *88 = no sabe*

3.1.9 ¿Cuantos hijos fallecidos tiene, menores de 5 años? 3.1.9
0 = ninguno

3.1.9 A ¿En que año fallecidos? 3.1.9 A

3.1.10-3.1.13	**Nombre y numero que le corresponde (usa primer cuadro)** *Empieza con el entrevistado. Una persona podría tenido varias enfermedades accidentes, en este caso usa varias reglas y ponga el numero frente a cada regla!	**3.1.10** **¿El año pasado ud. / persona …….. .se accidentó o tuvo alguna enfermedad?** *1 = si (► 3.1.11 antes de seguir con la próxima persona/o enfermedad de este persona)* *2 = no (► próxima persona)* *88 = no sabe*		**3.1.11** **¿Consultó *ud. / persona* …….. por la enfermedad o accidente el año pasado?** * No leer los códigos *88 = no sabe* *si = 1 (► 3.1.12)* *no = 2 (► 3.1.13)*	**3.1.12** **¿Dónde atendieron a esta persona?** *No leer los códigos 88 = no sabe *1 = posta de salud público* *2 = posta de salud privado* *3 = centro de salud público* *4 = centro de salud privado* *5 = hospital público* *6 = clínica* *7 = farmacia* *8 = lugar de trabajo* *9 = casa del curandero* *10 = casa del paciente (el doctor fue a su vivienda)* *99 = otro, especificar*	**3.1.13** **¿Porqué no consultó esta *persona*?** ***Mas que una opción posible*** ***No lee los códigos*** 88 = no sabe *1 = enfermedad o accidente leve* *2 = centro de atención de salud queda lejos/ falta de movilidad* *3 = atención de mala calidad* *4 = no tenía dinero* *5 = conoce la enfermedad* *99 = otro, especificar*
	entrevistado					

3.2 ALIMENTACIÓN

3.2.1 - 3.2.7	Categoría de alimentación	3.2.1 Usted consuma *producto x*? *1 = Si (► 3.2.3 - 3.2.7)* *2 = No (► 3.2.2)*	3.2.2 Porque Ud. no lo come? 1 = Por religión 2 = No tengo dinero para comprarlo 3 = No lo se (no tiene conocimiento de este producto) 4 = No es saludable 99 = otro, especificar	3.2.3 ¿Cual es la frecuencia con que usted come *producto x*? ***No leer códigos!*** *1 = Varias veces por día* *3 = Mas que 4 veces por semana* *5 = Mas que 4 veces por mes* *6 = Mas que 6 veces por año* *7 = Todos los días, pero solo durante algunos meses por año* *8 = Menos que una vez por año*	3.2.4 Ud. tiene que comprar este producto? *1 = Si* *2 = No*	3.2.5 Usted lo produce, cría o caza? *1 = Si* *2 = No*	3.2.6 A Ud. lo dieron como pago por el trabajo y/o negocio? *1 = Si* *2 = No*	3.2.7 A Ud. se lo regalaron? *1 = Si* *2 = No*
	a) Arroz							
	b) Verduras							
	c) Frutas							
	d) Menestras							
	e) Carne							
	f) Fideos (pasta)							
	g) Gallina							
	h) Golosinas							
	i) Conservas							
	k) Productos con leche							

3.3 AUTOESTIMA

**** Pregunta sí el entrevistado puede dar ejemplos, cuando piensas que no entiendes completamente.***

3.3.1 ¿Había un cambio en sentirse capaz para solucionar sus problemas en el campo, en los últimos 3 años? 3.3.1 ☐
1 = si *2 = no* *3 = un poco*

3.3.2 ¿Había un cambio en sentirse mas seguro para dar su opinión, en los últimos 3 años? 3.3.2 ☐
1 = si *2 = no* *3 = un poco*

3.3.3 ¿Había un cambio en sentirse mas capaz para participar en la comunidad, en los últimos 3 años? 3.3.3 ☐
1 = si *2 = no* *3 = un poco*

3.3.4 ¿Había un cambio en sentirse mas capaz para participar en la familia, en los últimos 3 años? 3.3.4 ☐
1 = si *2 = no* *3 = un poco*

3.3.5 ¿Se siente mas respetado en la familia, que hace tres años? 3.3.5 ☐
1 = si *2 = no* *3 = un poco*

3.3.6 ¿Se siente mas respetado en la comunidad, que hace tres años? 3.3.6 ☐
1 = si *2 = no* *3 = un poco*

4. BIENES Y PROPIEDADES

Aquí queremos obtener una idea de sus bienes y propiedades que tiene usted. Nos tomara unos 15 minutos.

4.1 LA FINCA

4.1.13 ¿Su finca o parte de su chacra viene por herencia? 4.1.13 ☐

si = 1 no = 2

4.1.1 ¿Cuál es la área total de su finca(s) en hectáreas? *Si tiene varios fincas, queremos los datos de su área total! 4.1.1 ☐

4.1.2 ¿Cuál es la área total cultivada de su finca(s)? 4.1.2 ☐

4.1.3-4.1.12	**4.1.3 ¿Cuantas diferentes parcelas tiene su finca(s)?** *Ponga la cantidad de parcelas	**4.1.4 ¿Para que se esta usada parcela x?** *Una parcela puede tener mas productos, ponga los códigos de *1=Café 2=Yuca 3=Plátano 4=Maíz 5=Papaya 6=Kion 7=Piña 8=Huerto 9=Palta 10=Mango 11=Anona 12=Yacon 13 = Mixto 14 = Mayor parte café, con otros cultivos 99= otro, especificar*	**4.1.5 ¿Cuantos hectáreas tiene esta parcela?** *Si el total cantidad es diferente que la cantidad en pregunta 4.1.2, volver ratificar	**4.1.6 ¿Cuál es la altitud en que se encuentra esta parcela (en m.s.n.m.)?** *88 = no sabe*	**4.1.7 ¿Como es la mayor parte de su suelo en este parcela?** *1 = pegajoso / arcilloso 2 = pegajoso y suelto 3 = suelto*	**4.1.8 ¿Qué color tiene la mayor parte de las suelos en esta parcela?** *1 = negro 2 = amarillo 3 = rojo 4 = anaranjado 5 = marrón 6 = mixto*	**4.1.9 ¿Cuál es la pendiente de esta parcela (lee estos alternativas)** *1 = la mayor parte es pampa 2 = la mayor parte es faldeado 3 = todo es pampa 4 = todo es faldeado 5 = tiene la misma cantidad faldeado y pampa 88 = no sabe 99= otro, especificar*	**4.1.10 Cuantos centímetros en promedio de materia orgánica tiene en su parcela?**	**4.1.11 ¿Hace cuantos años atrás esta parcela era monte?** *Ponga el numero de años!	**4.1.12 ¿Hace cuantos años esta sembrando este producto en esta parcela?** *Ponga el numero de años!
	Parcela a									
	Parcela b									
	Parcela c									
	Parcela d									
	Parcela e									
	Parcela f									
	Parcela g									
	Parcela h									
	Parcela i									
	Parcela j									
			Total:							

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4.2 LA VIVIENDA

Definición vivienda: Un grupo de casas, que los integrantes de la vivienda comparten los servicios higiénicos, agua, cocina, etc.

4.2.1 ¿Cuantas viviendas, en diferentes lugares tiene usted? (Si tiene uno, va a pregunta 4.2.3) 4.2.1 ☐

4.2.2 ¿Hace cuantos años tiene usted su segundo y/o tercera vivienda ? 4.2.2 ☐

4.2.3 ¿Su vivienda o vivienda anterior viene por herencia? 4.2.3 ☐

si = 1 no = 2

4.2.4 ¿A que tiempo se encuentra desde su finca hasta la carretera (caminando)? 4.2.4 ☐

4.2.5 ¿A que tiempo se encuentra desde la carretera la ciudad de pichanaki (en carro)? 4.2.5 ☐

4.2.6 ¿Cuál es la distancia desde su finca hasta aquí (el lugar donde se encuentra la entrevista)? 4.2.6 a, en carro ☐

4.2.6 b, andando ☐

Vivienda mayor: la vivienda donde viven los miembros de su vivienda el mayor parte del año.

4.2.11 Cuantas casas tiene su vivienda mayor? 4.2.11 ☐

4.2.7 ¿Que material predomina en las paredes exteriores de su vivienda mayor? 4.2.7 ☐

1 = Ladrillo o bloque de cemento | 5 = Cemento | 8 = Camona

2 = Adobe o tapia / piedra con barro | *6 = Madera* | *99 = Otro (cual)* _____ .

3 = Quicha (caña o barro) | *7 = Estera*

4.2.8 ¿Qué material predomina en los pisos de su vivienda mayor? 4.2.8 ☐

1 = Parquet o madera pulida | *4 = Madera (entablados)* | 7 = Cemento

2 = Laminas asfálticas, vinílicos o similares | *6 = Tierra* | *99 = Otro (cual)* _____ .

3 = Losetas, terrazos etc.

4.2.9 ¿Qué material predomina el techos de su vivienda? 4.2.9 ☐

1 = Concreto armado | *4 = Planchas de calamina, fibra etc.* | *6 = Paja, hojas de palmera etc.*

2 = Madera | *5 = Caña o estera con torta de barro* | *99 = Otro (cual)* _____ .

3 = Tejas

4.2.10 ¿Usted tiene letrina? 4.2.10 ☐

si = 1 no = 2

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4.3 OTROS BIENES

4.3.1-4.3.3	**4.3.1 ¿En 2007, ha <u>usado</u> ud. ….. ? (tambien ponga codigo 1 (sí) si es alquilado o prestado!)**	1 = si (►4.3.2, 4.3.3) 2 = no (► sigue con el próximo parte de beneficio)	**4.3.2 ¿Hace cuanto tiempo fue construido o comprado los equipo o los materiales (en meses o años ?** 111 = prestado o alquilado	**4.3.3 Cuanto le ha costado este parte de su planta de beneficio (o actividad) aproximadamente?** 0=sin ningún gasto 88=no sabe *!No olvidas gastos si es alquilado!
a	**despulpadora**			
b	**Realizas la calibración de su despulpadora cada campaña?**		no necesario	
c	**motor**			
d	**tanque de lavado de cemento**			
e	**tanque de lavado de madera**			
f	**tanque de fermentación de cemento**			
g	**tanque de fermentación de madera**			
h	**secadora de poza (electrificada)**			
i	**secadora vertical (electrificada)**			
s	**parihuela**			
t	**secadora solar**			
j	**área de secado mantada sobre suelo**			
k	**área de secado de cemento**			
l	**área de secado de madera**			
m	**tanque cerecero de cemento**			
n	**tanque cerecero de madera**			
o	**almacén**			
p	**solo un solo pozo para aguas mieles (pozo de oxidación)**			
q	**pozo de aguas mieles completo (tres pozos)**			
r	**compostera**			

4.3.4-4.3.6	4.3.4 ¿Cuantas de las siguientes herramientas o equipos ha usado en 2007 para la producción del café?		si es 0 = sigue con el próximo parte de beneficio	4.3.5 Hace cuantos años (o meses) ud. lo compraste? *111 = prestado o alquilado*	4.3.6 Cuanto lo ha costado **en total** aproximadamente, también cuando es alquilado? *0=sin ningún gasto 88=no sabe* *!No olvidas gastos si es alquilado!
a	**machete/chafle**			*no necesario*	*no necesario*
b	**picos**			*no necesario*	*no necesario*
c	**lampas**			*no necesario*	*no necesario*
d	**serrucho de podar**				
e	**tijera de podar**				
f	**deschuponador**				
g	**aspersores de producto/mochillas fumigadoras**				
h	**cascos**				
i	**mascaras**				
j	**guantes**				
k	**poncho**				
l	**sacos de polipropileno**				
m	**sacos de yuta**				
n	**canastas**				
o	**hacha**				
p	**carretas**				

4.3.7 ¿Usted tiene su propio vehiculo? 4.3.7 ____

si = 1 *no = 2*

4.3.8 ¿Hace cuantos años compro este vehiculo? 4.3.8 ____

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5. GERENCIA DE RECURSOS NATURALES

*Importante: tienes que ser neutral, estos datos no influyen el futuro del productor

5.1 Agua

5.1.1 ¿Dónde lo tiras el agua utilizada después del lavado del café? 5.1.1

1 = al patio *3 = a los cafetales* *5 = a los pozos de aguas mieles*
2 = a las quebrada *4 = a los riachuelos*

5.1.2 ¿Dónde lo tiras la pulpa del café? 5.1.2

1 = al patio *3 = a los cafetales* *5 = a la compostera*
2 = a las quebrada *4 = a los riachuelos*

5.1.3 ¿Dónde lo tiras las aguas sucias usadas en la casa? 5.1.3

*incluyendo el agua usado por la lavaza de las ropas

1 = al patio *3 = a los cafetales* *5 = a los riachuelos*
2 = a las quebrada *4 = al costado de la cocina* *6 = al pozo de aguas negras*

5.1.4 ¿Ha usado ud. detergentes, jabon, o otros productos inorganicos en 2007 o 2008 para su limpieza de su casa o las ropas? 5.1.4

1 = Si *2 = No*

5.1.5 ¿De dónde saca el agua para que use? 5.1.5

1 = del río transportado con un balde *4 = del riachuelos y mediante la camona* *6 = de la pileta/caño comunal*
2 = del río y/o lluvia *5 = del subsuelo de las nacientes* *7 = de un ojo de agua*
3 = del río por medio de tuberías

5.2 Suelos

Solo para el cultivo del café, hasta el uso de quimicos.

5.2.5

5.2.5.1 **¿Añades materia orgánica, o algun producto natural al suelo?** *1 = si (► **todas preguntas menos 5.2.5.3)*** *2 = no (►**5.2.5.2)***	**5.2.5.2** **¿Quien ha dado la capacitación sobre este actividad?** ***Mas que una opcion posible!*** ***Si no lo hacen, ni reciben capacitacion ► 5.2.6**	**5.2.5.3** **¿Cual es la razon principal por lo que no realizas esta actividad? (1 respuesta)** ***No lee los códigos!*** *1 = desconocimiento 2 = falta de dinero 3 = no necisito 99 = otro,* ►5.2.6	**5.2.5.4** **¿Que productos añades al suelo?** **** No lee los códigos!*** *1 = abono 2 = compost 3 = guano de isla (aves del mar) 4 = guano de coral (animales) 5 = mulch / cobertura muerta 6 = humus 99 = otro, especificar*	**5.2.5.5** **¿En cuantas hectáreas lo has realizado esta actividad?**	**5.2.5.6** **En que plantación has añadido este material?** ***No lee los códigos!*** *1 = en café 2 = en café y otros 3 = en todos cultivos 99 = otro*	**5.2.5.7** **¿Cuantos días a invertido ud., u obreros, o su familia en total en este actividad en 2007?**	**5.2.5.8** **Cuantas personas han trabajado en este actividad en 2007?**	**5.2.5.9** **Cuantas de estas personas ha pagado por este actividad en 2007?** **5.2.5.9A** **Cuantos días han trabajado estos obreros?** *pone el total de estos dos preguntas	**5.2.5.10** **¿Cuanto cuesta por una de estas personas por un dia (incluyendo alimentación) por este actividad en 2007?**	**5.2.5.11** **¿Cuanto gasta ud. en los productos que se necesita para esta actividad, por 2007?**	**5.2.5.12** *Gastos total: *Ponga este numero en pregunta **5.7.2** en el cuadro en parte 5.7
									x	+	**=**
								total contrato:		+	**=**

5.2.6

5.2.6.1 **¿Realiza su familia la limpieza o el macheteo?** *1 = si (► **todas preguntas menos 5.2.6.3)*** *2 = no **(►5.2.6.2)***	**5.2.6.2** **¿Quien ha dado la capacitación sobre este actividad?** ***mas que una opcion posible!*** *Si no lo hacen, ni reciben capacitacion **►5.2.7**	**5.2.6.3** **¿Cual es la razon principal por lo que no realizas esta actividad? (1 respuesta)** ***No lee los códigos!*** *1 = desconocimiento 2 = falta de dinero 3 = no necisito 99 = otro, especifica* ►5.2.7	**5.2.6.4 ¿Con que realizan la limpieza?** ***Mas que una opcion posible!*** *1 = machete (►5.2.6.6) 2 = lampa (►5.2.6.6) 3 = herbicidas toxicidad verde 4 = herbicidas toxicidad amarillo 5 = herbicidas toxicidad azul 6 = herbicidas toxicidad rojo 7 = herbicidas químico, pero no sabe que nivel de toxidad 99 = otro, especificar (►5.2.6.6)*	**5.2.6.5** **Que cantidad de herbicida química estas usando en total, en un año?**	**5.2.6.6** **¿En cuantas hectáreas lo has realizado esta actividad?**	**5.2.6.7** **¿Cuantos días a invertido ud., u obreros, o su familia en total en este actividad en 2007?**	**5.2.6.8** **Cuantas personas han trabajado en este actividad en 2007?**	**5.2.6.9** **Cuantas de estas personas ha pagado por este actividad en 2007?** **5.2.6.9A** **Cuantas días han trabajado estos obreros?** *pone el total de estos dos preguntas	**5.2.6.10** **¿Cuanto cuesta por una de estas personas por un dia (incluyendo alimentación) por este actividad en 2007?**	**5.2.6.11** **¿Cuanto gasta ud. en los productos que se necesita para esta actividad, por 2007?**	**5.2.6.12** ***Gastos total:** *Ponga este numero en preguna **5.7.3** en el cuadro en parte 5.7
									x	+	=
								total contrato:		+	**=**

5.2.7 ¿Qué parte de su chacra esta bajo sombra? 5.2.7

1 = muy poco (menos que el 20%) *3 = en ciertos lugares (entre 30% y 40%)* *5 = en la mayor parte (entre 60 y 70%)*
2 = poco (entre 20% y 30%) *4 = casi la mitad (entre 40% y 60%)* *6 = mucho (entre 70% y 90%)*

5.2.8

5.2.8.1 ¿Realiza su familia el manejo de sombra? *1 = si* ***(► todas preguntas menos 5.2.8.3)*** *2 = no* ***(► 5.2.8.2)***	**5.2.8.2 ¿Quien ha dado la capacitación sobre este actividad?** ***mas que una opcion posible!*** *Si no lo hacen, ni reciben capacitacion ►* ***5.3***	**5.2.8.3 ¿Cual es la razon principal por lo que no realizas esta actividad? (1 respuesta)** ***No lee los códigos!*** *1 = desconocimiento* *2 = falta de dinero* *3 = no necesito* *99 = otro, especifica*	**5.2.8.4 ¿Que actividades hacen?** ***No lee los códigos!*** *1 = renovación de sombra con siembra directa* *3 = renovación de sombra con viveros* *4 = poda de sombra* *5 = anillado de sombra* *99 = otro, especificar*	**5.2.8.5 ¿Cuantos días a invertido ud., u obreros, o su familia en total en este actividad en 2007?**	**5.2.8.6 Cuantas personas han trabajado en este actividad en 2007?**	**5.2.8.7 Cuantas de estas personas ha pagado por este actividad en 2007?** **5.2.8.7A Cuantas días han trabajado estos obreros?** *pone el total de estos dos preguntas	**5.2.8.8 ¿Cuanto cuesta por una de estas personas por un día (incluyendo alimentación) por este actividad en 2007?**	**5.2.8.9 ¿Cuanto gasta ud. en los productos que se necesita para esta actividad, por 2007?**	**5.2.8.10 *Gastos total:** *Ponga este numero en preguna **5.7.3** en el cuadro en parte 5.7
		►5.3					x	+	=
						total contrato:		+	=

5.3 Manejo de residuos

5.3.1 ¿Donde votas ud. sus residuos inorgánicos? *puedes dar estos ejemplos: plásticos, pilas o metales 5.3.1

1 = al patio *3 = en cualquier sitio* *5 = al mismo pozo de las materiales organicas*
2 = a las quebrada *4 = a los riachuelos* *6 = al pozo inorgánicas, o siempre al mismo lugar*

5.3.2 ¿Donde votas ud. sus residuos orgánicos de la casa? 5.3.2

1 = al patio *3 = al campo* *5 = al pozo de materiales orgánicas, o siempre al mismo lugar*
2 = a las quebrada *4 = a los riachuelos* *6 = al mismo pozo / lugar que las materiales inorgánicos*

5.4 Bosques

5.4.1 ¿Cuantos hectáreas rozo en 2007? 5.4.1

1 = menos que una hectárea *3 = mas de una hectárea*
2 = una hectárea *4 = mas de 5 hectáreas*

5.4.2 ¿Cuantos hectáreas quemo en 2007? 5.4.2

1 = menos que una hectárea *3 = mas de una hectárea*
2 = una hectárea *4 = mas de 5 hectáreas*

5.4.3 ¿Hizo un selección de especies de sombra al momento de la instalación? 5.4.3

1 = Si *2 = No*

5.4.4 ¿Cuantas diferentes tipos de árboles de sombra tiene ud. en sus plantaciones de café? 5.4.4

5.4.5 ¿Cuantos árboles ha plantado en 2007? 5.4.5

0 = ninguna *2 = de 10 a 20* *4 = mas de 100*
1 = menos que 10 *3 = mas que 20*

5.5 Uso de otros químicos (además herbicidas)

Para toda la chacra, incluyendo el cultivo de café

5.5.1	**5.5.1.1 ¿Ud. uso fungicidas naturales o quimicos?** ** por: ojo de pollo, roya, arañero, cercospora.* *1 = si* ***(► todas preguntas menos 5.5.1.3)*** *2 = no* ***(► 5.5.1.2)***	**5.5.1.2 ¿Quien ha dado la capacitación?** ****No lee los códigos!*** *Si no lo hacen, ni reciben capacitacion ***► 5.5.2***	**5.5.1.3 ¿Cual es la razon principal por lo que no realizas esta actividad? (1 respuesta)** ****No lee los códigos!*** *1 = desconocimiento* *2 = falta de dinero* *3 = malo para medio-ambiente* *4 = norma de certificación* *5 = no necesario* *99 = otro, especifica*	**5.5.1.4 ¿En cuantas hectáreas lo ha usado este actividad?**	**5.5.1.5 ¿En que plantación has añadido este material?** ***No lee los códigos!** *1 = en café* *2 = en café y otros* *3 = en todos cultivos* *99 = otro, especificar*	**5.5.1.6 ¿Cuantos kilos o litros ha usado ud. en 2007?**	**5.5.1.7 ¿Que tipo de fungicidas ha usado?** *1=fungicidas orgánicos* *2 = fungicidas toxicidad verde* *3 = fungicidas toxicidad amarillo* *4 = fungicidas toxicidad azul* *5 = fungicidas toxicidad rojo* *6= fungicidas químico, pero no sabe el nivel de toxicidad*	**5.5.1.8 ¿Cuantos días a invertido ud., u obreros, o su familia en total en este actividad en 2007?**	**5.5.1.9 ¿Cuantas personas han trabajado en este actividad en 2007?**	**5.5.1.10 ¿Cuantas de estas personas ha pagado por este actividad en 2007?** **5.5.1.10A Cuantas días han trabajado estos obreros?** *pone el total de estos dos preguntas	**5.5.1.11 ¿Cuanto cuesta por una de estas personas por un dia (incluyendo alimentación) por este actividad en 2007?**	**5.5.1.12 ¿Cuanto gasta ud. en los productos que se necesita para esta actividad, por 2007?**	**5.5.1.13** *Gastos total: *Ponga este numero en pregunta **5.7.5** en el cuadro en parte 5.7
			►5.5.2								x	+	=
										total contrato:		+	=
5.5.2	**5.5.2.1 ¿Ud. uso insecticidas naturales o quimicos?** *1 = si* ***(► todas preguntas menos 5.5.2.3)*** *2 = no* ***(► 5.5.2.2)***	**5.5.2.2 ¿Quien ha dado la capacitación?** ****No lee los códigos!*** **Si no lo hacen, ni reciben capacitacion* ***► 5.5.3***	**5.5.2.3 ¿Cual es la razon principal por lo que no realizas esta actividad? (1 respuesta)** ****No lee los códigos!*** *1 = desconocimiento* *2 = falta de dinero* *3 = malo para medio-ambiente* *4 = norma de certificación* *99 = otro, especifica*	**5.5.2.4 ¿En cuantas hectáreas lo ha usado esta actividad?**	**5.5.2.5 ¿En que plantación has añadido este material?** ****No lee los códigos!*** *1 = en café* *2 = en café y otros* *3 = en todos cultivos* *99 = otro, especificar*	**5.5.2.6 ¿Cuantas kilos o litros ha usado ud. en 2007?**	**5.5.2.7 ¿Que tipo de insecticidas ha usado?** *1=insecticidas orgánicos* *2 = insecticidas toxicidad verde* *3 = insecticidas toxicidad amarillo* *4 = insecticidas toxicidad azul* *5 = insecticidas toxicidad rojo* *6= insecticidas químico, pero no sabe que nivel de toxicidad*	**5.5.2.8 ¿Cuantos días a invertido ud., u obreros, o su familia en total en este actividad en 2007?** *en días, semanas o meses	**5.5.2.9 ¿Cuantas personas han trabajado en este actividad en 2007?**	**5.5.2.10 ¿Cuantas de estas personas ha pagado por este actividad en 2007?** **5.5.2.10A Cuantas días han trabajado estos obreros?** *pone el total de estos dos preguntas	**5.5.2.11 ¿Cuanto cuesta por una de estas personas por un dia (incluyendo alimentación) por este actividad en 2007?**	**5.5.2.12 ¿Cuanto gasta ud. en los productos que se necesita para esta actividad, por 2007?**	**5.5.2.13** *Gastos total: *Ponga este numero en pregunta **5.7.6** en el cuadro en parte 5.7
			►5.3								x	+	=
										total contrato:		+	=

5.5.3	**5.5.3.1 ¿Ud. uso nematacidas naturales o quimicos?** *contra las bolitas en la raíz *1 = si* ***(► todas preguntas menos 5.5.3.3)*** *2 = no* ***(► 5.5.3.2)***	**5.5.3.2 ¿Quien ha dado la capacitación?** ***No lee los códigos!*** 0 = ***► 5.5.4*** 1-99 = ***► 5.5.3.3***	**5.5.3.3 ¿Cual es la razon principal por lo que no realizas esta actividad? (1 respuesta)** ****No lee los códigos!*** *1 = desconocimiento 2 = falta de dinero 3 = malo para medio-ambiente 4 = norma de certificación 99 = otro, especificar*	**5.5.3.4 ¿En cuantas hectáreas lo ha usado esta actividad?**	**5.5.3.5 ¿En que plantación has añadido este material?** ****No lee los códigos!*** *1 = en café 2 = en café y otros 3 = en todos cultivos 99 = otro, especificar*	**5.5.3.6 ¿Cuantos kilos o litros ha usado ud. en 2007?**	**5.5.3.7 ¿Que tipo de nematacidas ha usado?** ****No lee los códigos!*** *1= organicos 2 = toxicidad verde 3 = toxicidad amarillo 4 = toxicidad azul 5 = toxicidad rojo 6= químico, pero no sabe que nivel de toxidad*	**5.5.3.8 ¿Cuantos días a invertido ud., u obreros, o su familia en total en este actividad en 2007?** *en días, semanas o meses	**5.5.3.9 ¿Cuantas personas han trabajado en este actividad en 2007?**	**5.5.3.10 ¿Cuantas de estas personas ha pagado por este actividad en 2007?** **5.5.3.10A Cuantas días han trabajado estos obreros?** *pone el total de estos dos preguntas	**5.5.3.11 ¿Cuanto cuesta por una de estas personas por un dia (incluyendo alimentación) por este actividad en 2007?**	**5.5.3.12 ¿Cuanto gasta ud. en los productos que se necesita para esta actividad, por 2007?**	**5.5.3.13** *Gastos total: *Ponga este numero en pregunta **5.7.7** en el cuadro en parte 5.7
			►5.5.4								x	+	=
										total contrato:		+	=
5.5.4	**5.5.4.1 ¿Realiza su familia la fertilización naturales o quimicos?** *1 = si* ***(► todas preguntas menos 5.5.4.3)*** *2 = no* ***(► 5.5.4.2)***	**5.5.4.2 ¿Quien ha dado la capacitación?** ****No lee los códigos!*** *Si no lo hacen, ni reciben capacitacion ►5.5.6*	**5.5.4.3 ¿Cual es la razon principal por lo que no realizas esta actividad? (1 respuesta)** ****No lee los códigos!*** *1 = desconocimiento 2 = falta de dinero 3 = malo para medio-ambiente 4 = norma de certificación 99 = otro, especifica*	**5.5.4.4 ¿En cuantas hectáreas lo ha usado esta actividad?**	**5.5.4.5 ¿En que plantas ha usado la fertilización?** ****No lee los códigos!*** *1 = en café 2 = en café y otros 3 = en todos cultivos 99 = otro, especificar*	**5.5.4.6 ¿Cuantas kilos ha usado ud. En 2007?**	**5.5.4.7 ¿Que tipo de producto ha usado para la fertilización?** ****No lee los códigos!*** *1 = orgánico 2 = químico toxicidad verde 3 = químico toxicidad amarillo 4 = químico toxicidad azul 5 = químico toxicidad rojo 6= químico, pero no sabe que nivel de toxidad*	**5.5.4.8 ¿Cuantos días a invertido ud., u obreros, o su familia en total en este actividad en 2007?**	**5.5.4.9 ¿Cuantas personas han trabajado en este actividad en 2007?**	**5.5.4.10 ¿Cuantas de estas personas ha pagado por este actividad en 2007?** **5.5.4.10A Cuantas días han trabajado estos obreros?** *pone el total de estos dos preguntas	**5.5.4.11 ¿Cuanto cuesta por una de estas personas por un dia (incluyendo alimentación) por este actividad en 2007?**	**5.5.4.12 ¿Cuanto gasta ud. en los productos que se necesita para esta actividad, por 2007?**	**5.5.4.13** *Gastos total: *Ponga este numero en pregunta **5.7.8** en el cuadro en parte 5.7
			►5.5.6			`					x	+	=
										total contrato:		+	=

5.5.6 ¿Cuantos años ha usado ud. esto(s) químico(s)? 5.5.6 ☐

5.5.7 ¿Ha usado Ud. químicos antes 2007? 5.5.7 ☐

1 = Si *2 = No (►5.6)*

5.5.8 ¿Cuantos años estas trabajando sin usar químicos? 5.5.8 ☐

5.6 Proceso de producción

5.6.1

5.6.1.1 ¿Realiza su familia los viveros de café? *1 = si* ***(►todas preguntas menos 5.6.1.3)*** *2 = no* ***(►5.6.1.2)***	**5.6.1.2 ¿Quien ha dado la capacitación?** ****No lee los códigos!*** **Si no lo hacen, ni reciben capacitacion* ***►5.6.2***	**5.6.1.3 ¿Cual es la razon principal por lo que no realizas esta actividad? (1 respuesta)** ****No lee los códigos!*** *1 = desconocimiento 2 = falta de dinero 3 = malo para medio-ambiente 4 = norma de certificación 99 = otro, especifica*	**5.6.1.4 ¿Cuantos plantones has embolsado o raíz desnuda, o de otra manera empleas?**	**5.6.1.5 ¿Que tipo de plantones usa para la plantación?** ****No lee los códigos!*** *1 = embolsado 2 = raíz desnuda 3 = semilla directo a la bolsa 4 = recoge de cafetal 99 = otro, especificar*	**5.6.1.6 ¿Cuantos días a invertido ud., u obreros, o su familia en total en este actividad en 2007?**	**5.6.1.7 Cuantas personas han trabajado en este actividad en 2007?**	**5.6.1.8 Cuantas de estas personas ha pagado por este actividad en 2007?** **5.6.1.8A Cuantas días han trabajado estos obreros?** **pone el total de estos dos preguntas*	**5.6.1.9 ¿Cuanto cuesta por una de estas personas por un dia (incluyendo alimentación) por este actividad en 2007?**	**5.6.1.10 ¿Cuanto gasta ud. en los productos que se necesita para esta actividad, por 2007?**	**5.6.1.11** *Gastos total: *Ponga este numero en preguna **5.7.9** en el cuadro en parte 5.7
		►5.6.2						x	+	**=**
							total contrato:		+	**=**

5.6.2

5.6.2.1 ¿Realiza su familia el recalce de café? *1 = si* ***(► todas preguntas menos 5.6.2.3)*** *2 = no* ***(► 5.6.2.2)***	5.6.2.2 ¿Quien ha dado la capacitación? ****No lee los códigos!*** *0 =* ***► 5.6.3*** *1-99 =* ***► 5.6.1.3***	5.6.2.3 ¿Cual es la razon principal por lo que no realizas esta actividad? (1 respuesta) ****No lee los códigos!*** *1 = desconocimiento 2 = falta de dinero 3 = malo para medio-ambiente 4 = norma de certificación 99 = otro, especifica*	5.6.2.4 ¿Cuantos plantones ha recalzado en 2007?	5.6.2.5 ¿Que tipo de planta usa para recalce? ****No lee los códigos!*** *1 = raíz desnuda 2 = embolsada 3 = semilla directo a la bolsa 4 = recoge de cafetal 99 = otro, especificar*	5.6.2.6 ¿Cuantos días a invertido ud., u obreros, o su familia en total en este actividad en 2007? *en días, semanas o meses	5.6.2.7 ¿Cuantas personas han trabajado en este actividad en 2007?	5.6.2.8 ¿Cuantas de estas personas ha pagado por este actividad en 2007? **5.6.2.8A Cuantas días han trabajado estos obreros?** *pone el total de estos dos preguntas	5.6.2.9 ¿Cuanto cuesta por una de estas personas por un día (incluyendo alimentación) por este actividad en 2007?	5.6.2.10 ¿Cuanto gasta ud. en los productos que se necesita para esta actividad, por 2007?	5.6.2.11 *Gastos total: *Ponga este numero en pregunta **5.7.11** en el cuadro en parte 5.7
		►5.6.3						x	+	**=**
							total contrato:		+	**=**

5.6.3

5.6.3.1 ¿Realiza su familia la poda de café? *1 = si* ***(► todas preguntas menos 5.6.3.3)*** *2 = no* ***(► 5.6.3.2)***	5.6.3.2 ¿Quien ha dado la capacitación? ****No lee los códigos!*** **Si no lo hacen, ni reciben capacitación* ***► 5.6.4***	5.6.3.3 ¿Cual es la razón principal por lo que no realizas esta actividad? (1 respuesta) ****No lee los códigos!*** *1 = desconocimiento 2 = falta de dinero 3 = malo para medio-ambiente 4 = norma de certificación 99 = otro, especifica*	5.6.3.4 ¿En cuantas hectáreas lo has realizado esta actividad?	5.6.3.5 ¿Que tipo de poda usan? ****No lee los códigos!*** *1 = selectiva 2 = renovación 3 = total 4 = sistemática 99 = otro, especificar*	5.6.3.6 ¿Cuantos días a invertido ud., u obreros, o su familia en total en este actividad en 2007?	5.6.3.7 ¿Cuantas personas han trabajado en este actividad en 2007?	5.6.3.8 ¿Cuantas de estas personas ha pagado por este actividad en 2007? **5.6.3.8A Cuantas días han trabajado estos obreros?** *pone el total de estos dos preguntas	5.6.3.9 ¿Cuanto cuesta por una de estas personas por un día (incluyendo alimentación) por este actividad en 2007?	5.6.2.10 ¿Cuanto gasta ud. en los productos que se necesita para esta actividad, por 2007?	5.6.2.11 *Gastos total: *Ponga este numero en pregunta **5.7.11** en el cuadro en parte 5.7
		►5.6.4						x	+	**=**
							total contrato:		+	**=**

5.6.4	**5.6.4.1 ¿Realiza su familia el deschuponado?** *1 = si* ***(► todas preguntas menos 5.6.4.3)*** *2 = no* ***(► 5.6.4.2)***	**5.6.4.2 ¿Quien ha dado la capacitación?** ****No lee los códigos!*** **Si no lo hacen, ni reciben capacitacion* ***► 5.6.5***	**5.6.4.3 ¿Cual es la razon principal por lo que no realizas esta actividad? (1 respuesta)** ****No lee los códigos!*** *1 = desconocimiento* *2 = falta de dinero* *3 = malo para medio-ambiente* *4 = norma de certificación* *99 = otro, especifica*	**5.6.4.4 ¿En cuantas hectáreas lo has realizado esta actividad?**	**5.6.4.5 ¿Como deschupona ud. su café?** ****No lee los códigos!*** *1 = manual* *2 = con chafle/machete* *3 = con tijera deschuponador* *99 = otro, especificar*	**5.6.4.6 ¿Cuantos días a invertido ud., u obreros, o su familia en total en este actividad en 2007?**	**5.6.4.7 Cuantas personas han trabajado en este actividad en 2007?**	**5.6.4.8 Cuantas de estas personas ha pagado por este actividad en 2007?** **5.6.4.9A Cuantas días han trabajado estos obreros?** **pone el total de estos dos preguntas*	**5.6.4.9 ¿Cuanto cuesta por una de estas personas por un dia (incluyendo alimentación) por este actividad en 2007?**	**5.6.4.10 ¿Cuanto gasta ud. en los productos que se necesita para esta actividad, por 2007?**	**5.6.4.11** *Gastos total: *Ponga este numero en preguna **5.7.12** en el cuadro en parte 5.7
			►5.6.5						x	+	=
								total contrato:		+	=

5.6.5	**5.6.5.1 ¿Realiza su familia cosecha selectiva?** 1 = si ***(todas preguntas, menos 5.6.5.3)*** 2 = no ***(todas preguntas, menos***	**5.6.5.2 ¿Quien ha dado la capacitación?** ****No lee los códigos!***	**5.6.5.3 ¿Cual es la razon principal por lo que no realizas esta actividad? (1 respuesta)** ***No lee los códigos!** *1 = desconocimiento* *2 = falta de dinero* *3 = malo para medio-ambiente* *4 = norma de certificación* *99 = otro, especifica*	**5.6.5.4 ¿Cuales granos incluye en la cosecha selectiva?** ****No lee los códigos!*** *1 = solo granos maduros* *2 = granos maduros y verdes* *3 = granos pintones* *4 = granos muy maduros* *99 = otro, especificar*	**5.6.5.5 ¿Cuantos días a invertido ud., u obreros, o su familia en total en este actividad en 2007?**	**5.6.5.6 ¿Cuantas personas han trabajado en este actividad en 2007?**	**5.6.5.7 ¿Cuantas de estas personas ha pagado por este actividad en 2007?** **5.6.5.7A Cuantas días han trabajado estos obreros?** **pone el total de estos dos preguntas*	**5.6.5.8 ¿Cuanto cuesta por una de estas personas por un dia (incluyendo alimentación) por este actividad en 2007?**	**5.6.5.9 ¿Cuanto gasta ud. en los productos que se necesita para esta actividad, por 2007?**	**5.6.5.10** *Gastos total: *Ponga este numero en preguna **5.7.13** en el cuadro en parte 5.7
									x	+	=
								total contrato:		+	=

calculacion en latas:

Pago por lata	Total de latas	otros gastos	total

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5.7	**Vamos a calcular sus gastos total para la produccion de café por 2007:**	
5.7.1	**preperacion del terreno en 2007 *pregunte al entrevistado**	
5.7.2	**materia orgánica (de pregunta 5.2.5.12)**	
5.7.3	**limpieza (de pregunta 5.2.6.12)**	
5.7.4	**manejo de sombra (de pregunta 5.2.8.10)**	
5.7.5	**fungicidas (de pregunta 5.5.1.13)**	
5.7.6	**insecticidas (de pregunta 5.5.2.13)**	
5.7.7	**nematocidas (de pregunta 5.5.3.13)**	
5.7.8	**fertilización (de pregunta 5.5.4.13)**	
5.7.9	**realizar viveros (de pregunta 5.6.1.11)**	
5.7.10	**recalce (de pregunta 5.6.2.11)**	
5.7.11	**poda (de pregunta 5.6.3.12)**	
5.7.12	**deschuponado (de pregunta 5.6.4.12)**	
5.7.13	**cosecha (selectiva) (de pregunta 5.6.5.10)**	
5.7.14	**lavado *pregunte al entrevistado**	
5.7.15	**transporte *pregunte al entrevistado**	
5.7.17	**secado *pregunte al entrevistado**	
5.7.18	**Otros gastos?**	
5.7.16	**Total (calcula el total junto con el entrevistado para usar en parte 6.2.1)**	

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6 DATOS FINANCIEROS

Ahora quisiera hacerle algunas preguntas sobre los ocupaciones, gastos e ingresos de su familia. La información que usted nos proporciona será confidencial. Es muy importante que usted conteste con la verdad, para si conocer su verdadera condición. La información recibida de usted no tiene consecuencias negativas para su persona o familia mas adelante. Los datos recogidos a través de esta encuesta serán utilizados sólo para fines estadísticos para cumplir los objetivos de este estudio. En caso de presentar o publicar los resultados, los datos serán presentados en forma agregada así que no será posible individualizar ni identificar ninguna casa o persona por sus respuestas.

6.1.6 Cuantos años produce su familia café? 6.1.6 ____

6.1 Ocupacion de los miembros en la vivienda

		Solo para mayores de 6 añnos		
6.1.1-6.1.3	**Nombre y numero que le corresponde (usa primer cuadro)** *Empieza con el entrevistado. Una persona podría tener varias ocupaciones!	**6.1.1** **¿Cuál es su ocupación principal?** (► 6.1.2 antes de seguir con la proxima persona)	**6.1.2** **¿Además de esta ocupación, tuvo otro trabajo durante 2007?** (deje vacio cuando no tiene) (► si no tiene siguie con 6.1.1, si tiene siguie con 6.1.3 antes de seguir con la proxima persona)	**6.1.3** **¿Además de esta ocupación, tuvo otro trabajo durante 2007?** (deje vacio cuando no tiene)
		1 = agricultor de su propia finca *2 = ama de casa* *3 = obrero agricultor* *4 = empleado servicio domestico* *5 = aserrador* *6 = propio tienda* *7 = restaurante* *8 =otro tipo de propio negocio* *9 = intermediario* *10 = transportista* *11 = profesional* *12 = estudiante* *13 = desempleado* *99 = otro, especificar:*		
1	***entrevistado***			
2				
3				
4				
6				
6				
7				
8				
9				
10				
11				
12				
13				
14				

6.2	GASTOS TOTALES DE 2007 en nuevo soles				Gastos Totales	
6.2.1	**Producción de café** (incluye pago al peón, abonamiento, transporte, compra de herramientas) *De la ultima pregunta de parte 5, 5.7.17					6.2.1
6.2.2	**Producción de otros cultivos** (incluye pago al peón, abonamiento, transporte, compra de herramientas) *Asegure con el cuadro de pregunta 4.1.3-4.1.9 en parte 4, que coincida con los ingresos					6.2.2
6.2.3	**Gastos para otros negocios** *Asegure con el cuadro en pregunta 6.1.3-6.1.6 en parte 6, que coincida con los ocupaciones dicho					6.2.3
6.2.4	**Educación** (incluye matricula, libros, uniformes, movilidad, pensión, propina)					6.2.4
6.2.5	**Salud** (productos o plantas medicinales y farmacéuticos, servicios médicos, servicios dentales, hospitalarios, naturistas) *Asegure con el cuadro de pregunta 3.1.12 en parte 3, que coincida con los consultas dicho					6.2.5
6.2.6	**Productos personales** (productos personal, calzado y ropa, prendas de vestir, cigarrillos, tabaco, coca etc.)					6.2.6
6.2.7	**Alimentación** *Asegure con cuadro de pregunta 3.2. en parte 3, que coincida con los gastos de alimentación dicho					6.2.7
6.2.8	**Vivienda** (muebles y equipos del hogar, mantenimiento, humiro, construcción, detergentes, otros productos para el lavado y aseo del hogar, vajillas y artículos de cocina)					6.2.8
6.2.9	**Gastos excepcionales, familiares** (visita familiares, matrimonios, funerales, otras ceremoniales y tradicionales?, transporte para viaje)					6.2.9
6.2.10 a	**¿Ud. o un integrante de su vivienda tendría acceso a un préstamo?** (incluye adelanto antes entregar su café)					6.2.10a
	1 = si	*2 = no (► 6.2.11)*				
b	**¿Cuál es la fuente más importante del préstamo?**					6.2.10b
	1 = persona natural (no comerciante)	*5 = cooperativa*	*7 = de un ONG*			
	2 = caja rural particular	*6 = intermediario o comprador*	*8 = banco*			
	3 = asociación	*99 = otro, especificar .*				
c	**¿Ud. o integrantes de su vivienda tuvo un préstamo en 2007?**					6.2.10c
	1 = si (► d,e,f,g,h)	*2 = no (► 6.2.11)*				
d	**¿Cuantos meses en total ud. tuvo o tiene este préstamo?**	desde que mes *ya lo ha devuelto, en que mes?*				6.2.10d
e	**¿Ud todavía tenia este mismo préstamo al final de 2007?**					6.2.10e
	1 = si **(¡poner el monto de pregunta f en ingresos del 2007, en parte 6.7.3 donde dice ´ingresos ahorro´, ►f ,g, h!)**					
	2 = no **(¡no era un ingreso en 2007, porque ya lo ha devuelto. Seguir con ►f ,g, h!)**					
f	**¿Cuanto es/era el monto de este préstamo en el año 2007?** (incluye adelanto antes de entregar su café)					6.2.10f
g	**¿Cuanto paga o pagó por interés por este préstamo (en 2007) en soles? (poner en l columna de gastos totales!** →					6.2.10g
h	**¿Si no cobran interés, a que precio fijan el café en 2007?** (ponga el precio por kilo)					6.2.10h
6.2.11 a	**¿Ha usado Ud parte de un ahorro en 2007, incluyendo dinero ahorrado en años anteriores?**					6.2.11a
	1 = si	*2 = no* **(►c)**				
b	**¿Cuanto ha usado Ud en 2007 de este ahorro (*¡pone este cantidad en ´ingresos ahorro 2007´ 6.7.3n!)**					6.2.11b
c	**¿Ud todavía tenía una cantidad ahorrado al final del año 2007, incluyendo de años anteriores?**					6.2.11c
	1 = si	*2 = no* **(►6.2.12)**				
d	**¿Cual era el monto de su ahorro total al final de 2007 incluyendo dinero de años anteriores ?** **(¡aunque ya sea presupuestado o gastado en 2008!)**					6.2.11d
e	**¿A este ahorro de 2007, agregaste del ahorro de 2006 o años anteriores?** →					6.2.11e
	Si ► **¿Cuanto has aumentado Ud. en 2007 a su ahorro de años anteriores?**					
	No ► **(Poner la cantidad del ahorro 2007 total (pregunta ´d´)** →					
6.2.12	**¡Otros gastos, especificar:** (puede incluir gastos para vehiculo, verifica con pregunta 4.3.7)					6.2.12
6.2.13	**Total de Gastos** *Calcula el total de gastos junto con el entrevistador, para usar en parte 6.7)			**Pagina 23**		6.2.13

6.3 Cosecha café 2004-2007

6.3.1 ¿Cuanto peso un saco que ud. usa para vender café? 6.3.1 en Kg. ____

6.3.2-6.3.4		6.3.2 **¿Cuantos sacos de café a … Kg. ha producido en el año ….?** ***sigue con pregunta 6.3.3-6.3.4, antes de seguir con el próximo año**	6.3.3 **¿Cuantos sacos de café a … Kg. ha vendido en el año …. ?** **(*solamente para 2006 y 2007)**	6.3.4 *Total = Numero de sacos X Kg. por saco (*solamente para 2006 y 2007)
	a) 2004		no necesario	no necesario
	b) 2005		no necesario	no necesario
	c) 2006			
	d) 2007			

6.4 Venta de Café Certificados

6.4.1 ¿Usted tiene certificaciones de café? 6.4.1 ____

1 = si (► 6.4.2-6.4.3) 2 = no (► 6.5)

6.4.2-6.4.3	6.4.2 **¡Usted tiene certificación …. ?** **1 = si (► 6.4.3)** **2 = no (► siguiente certificación)**	6.4.3 **¿Desde que año ud. tiene esta certificación?**
a) Utz Kapeh		
b) FLO		
c) Organico		
d) Café Practice		
e) Rain Forest		

6.5 Venta de café 2006

6.5.1-6.5.14

6.5.1 ¿Usted ha vendido parte de su café certificado en 2006? (en una cooperativa)

1 = si (pregunta 6.5.2 - 6.5.6 por cada intermediario)
2 = no (► 6.5.8)

6.5.1A ¿A que cooperativa? _____.

*Responde a pregunta 6.5.2-6.5.7 por cada venta, antes de seguir con la próxima certificación

6.5.7 ¿Usted ha vendido parte de su café a un intermediario en 2006? (en la calle)

1 = si (pregunta 6.5.8 - 6.5.12 por cada intermediario)
2 = no (► 6.6)

6.5.7A ¿A quien (si es una cooperativa o empresa) o donde (si es en la calle), ha vendido?
._____.

*Responde a pregunta 6.5.9-6.5.14 por cada intermediario antes de seguir con el próxima intermediario

	6.5.2 ¿Cuántos kilos ha vendido con certificación ….. en 2006?	**6.5.3 ¿Cuanto era el precio por kilo de certificación …. ?**	**6.5.4 ¿Como le ha pagado la venta?** 1 = con adelanto 2 = al contado 3 = no pagaron	**6.5.5 ¿Cuantos meses tuvo que esperar?**	**6.5.6 ¿Este tiempo era según acuerdo?**		**6.5.8 ¿Cuántos kilos ha vendido a intermediario …?**	**6.5.9 ¿Cuanto era el precio por kilo de intermediario …?**	**6.5.10 ¿Como le ha pagado la venta?** 1= con adelanto 2= al contado 3= no pagaron	**6.5.11¿Cuantos meses tuvo que esperar?**	**6.5.12 ¿Este tiempo era según acuerdo?**
a - Utz Kapeh						a					
b - Organico						b					
c - FLO						c					
e - Café Practice						d					
f - Rain Forest						e					
						f					
						g					
total kilos vendido:						total kilos vendido:					

6.5.13 Total de kilos vendido en 2006: *verifica que es lo mismo que en pregunta 6.3.4 c!

6.5.13 ____

6.6 Venta de café 2007

6.6.1-6.6.14

6.6.1 ¿Usted ha vendido parte de su café certificado en 2007? (en una cooperativa)

1 = si (pregunta 6.6.2 - 6.6.7 por cada intermediario)
2 = no (► 6.6.8)

6.6.1A ¿A que cooperativa?_____.

*Responde a pregunta 6.6.2-6.6.7 por cada venta, antes de seguir con la próxima certificación

6.6.8 ¿Usted ha vendido parte de su café a un intermediario en 2007? (en la calle)

1 = si (pregunta 6.6.9 - 6.6.14 por cada intermediario)
2 = no (► 6.7)

6.6.8A ¿A quien (si es un cooperativa o empresa) o donde (si es en la calle), ha vendido?_____.

*Responde a pregunta 6.6.9-6.6.14 por cada intermediario antes de seguir con el próxima intermediario

	6.6.2 ¿Cuántos kilos ha vendido con certificación ….. en 2007?	**6.6.3 ¿Cuanto era el precio por kilo de certificación …. ?**	**6.6.4** Ingreso: kilos x precio	**6.6.5 ¿Como le ha pagado la venta?** 1 = con adelanto 2 = al contado 3 = no pagaron	**6.6.6 ¿Cuantos meses tuvo que esperar?**	**6.6.7 ¿Este tiempo era según acuerdo?**		**6.6.9 ¿Cuántos kilos ha vendido a intermediario …?**	**6.6.10 ¿Cuanto era el precio por kilo de intermediario …?**	**6.6.11** Ingreso: kilos x precio	**6.6.12 ¿Como le ha pagado la venta?** 1= con adelanto 2= al contado 3= no pagaron	**6.6.13 ¿Cuantos meses tuvo que esperar?**	**6.6.14 ¿Este tiempo era según acuerdo?**
a	a - Utz Kapeh						a						
b	b - Organico						b						
c	c - FLO						c						
d	e - Café Practice						d						
e	f - Rain Forest						e						
f							f						
g							g						
	total kilos vendido:		total ingresos:					total kilos vendido:					

6.6.16 Total de kilos vendido en 2007: *verifica que es lo mismo que en pregunta 6.3.4 d — 6.6.16 ☐

6.6.17 Total de ingresos en 2007: *para usar en pregunta 6.7.2 — 6.6.17 ☐

6.7 Otros Ingresos

6.7.1 Tiene ud.,en su familia o integrantes de su familia otros ingresos aparte de café y el crédito, préstamo. 6.7.1. ☐

*Asegure con parte 4.1 (datos de la finca) y 5.1 (ocupaciones) que coincida con los diferentes parcelas y ocupaciones dicho

1 = si (► 6.7.2-6.7.3) *2 = no (►part 6.7.4)*

6.7.2-6.7.3	**6.7.2 ¿Ud., su familia o integrantes de la familia tiene ingresos de:** *verifica con ocupaciones (4.1) *Verifica con datos de la finca (6.1)	*1 = si (► 6.7.3 antes de seguir con próximo ingreso)* *2 = no (► sigue con próximo ingreso)*	**6.7.3 ¿Cuanto era este ingresos en soles mas o menos en 2007?**
	Café (de pregunta 6.6.17)		
	a) Plátanos		
	b) Cítricos		
	c) Yuca		
	d) Maíz		
	e) Ganado		
	f) Gallinas		
	g) Cuyes		
	h) Obrero		
	i) Negocio		
	j) Giro		
	k) Transportista		
	l) Asserador		
	m) Venta de madera		
	n) Ahorro usado en 2007 (*de pregunta 6.2.11 b)		
	o) Préstamo al final de 2007 (*de pregunta 6.2.10 e/f)		**solo cuando no lo ha devuelto!**
	Otro, especificar		
	Otro, especificar		
	Otro, especificar		
	Otro, especificar		
6.7.4	**Total de ingresos: Verifica con gastos totales en 6.2.13 en pagina 23!**		6.7.4

Pagina 27

7. CAPACITACIÓN

Quisiera hacerle algunas preguntas sobre la capacitación que ha recibido ud. o su familia que **tienen mas de 15 años.**
capacitación refiere a una charla, el recibo de información en folleto, boletín o asistencia técnica.

7.1 - 7.6	**Nombre y numero que le corresponde (usa primer cuadro)** ** Usa varias reglas!*	**7.1** **¿Recibió *esta persona* capacitación sobre café u otros temas?** *1 = si (►7.2 - 7.6 antes de seguir con la próxima persona)* *2 = no (► sigue con la próxima persona)*	**7.2** **¿De cuales fuentes ha recibido *esta persona* capacitación?** ***Mas que una opción posible!** 1 = El municipio 2 = de La Florida 3 = Tahuantisuyu 4 = de la ECA 5 = de Aprodes 6 = Asociación Central de Pichanaqui 7 = de Caritas 8 = de Senasa 9 = Ministerio de Agricultura 10 = de Prisma 11 = Prona 12 = Del posta medico 13 = de Café Mujer 14 = INIA 15 = Inrena 88 = no sabe 99 = de otra, especifar	**7.3** **¿Sobre cuales temas recibió esta persona capacitación (de este fuente)?** *No lee los códigos! *Mas que un opción es posible 1 = temas de producción café (incluye control de plagas) 3 = comercialización (incluye certificación y organización) 6 = temas de salud (incluye sobre alimentación, salud) 8 = temas de crianza 88 = no sabe 99 = otro, especificar	**7.4** **¿Cuántos veces al año lo recibió sobre capacitación de este fuente?** *Si solo lo recibió esta capacitación una vez, ponga 1	**7.5** **¿Desde que ano lo recibió la capacitación?**	**7.6** **¿Hasta que ano lo recibió la capacitación?**
	entrevistado						

8 NIVEL DE ORGANIZACIÓN

8.1 Organización formal en relación a café y otros temas

Quisiera hacerle algunas preguntas sobre la participación en organizaciones formales de ud. o su familia que tienen **mas de 15 años.**
Organización formal significa que esta inscrito en el registro publico, quiere decir grupo que se reúne o que realiza actividades todo bajo un libro de acta etc. (cooperativas, cargos en la comunidad, etc.)

*Usa el primer cuadro en la primera hoja para apuntar las respuestas para cada persona con el mismo numero.
*Empieza con el/la entrevistado/a. Poner las respuestas escribiendo el número que le corresponde.

	Solo mas que 15 años									
8.1.1 - 8.1.10	**Nombre y numero que le corresponde (usa primer cuadro)** Una persona podría ser parte de varias grupos : en este caso **usa varias reglas y ponga el numero frente a cada regla!**	**8.1.1 ¿Es *ud.* / *esta persona* es parte de un organización formal?** 1 = si (►8.1.2 - 8.1.10 antes de seguir con la próxima persona / organización) 2 = no (► 8.1.7)	**8.1.2 ¿De cual organización formal es ud. o esta *persona* parte?** *1 = de Valle Ubiriki* *2 = de La Florida* *3 = coop. Tahuantinsuyo* *4 = CAC Pichanaqui* *5 = Cooperativa San Carlos* *6 = Ceproap* *7 = comité de gestión local* *8 = de junta directiva del anexo…* *9 = junta directiva del colegio / escuela* *99 = de una otra (apuntale)*	**8.1.3 ¿Desde que año es esta *persona* parte de este organización?**	**8.1.4 Cual es el rol de *persona x* en este organización?** *1= no tengo ningún rol* *2 = miembro de una directiva* *3 = directivo* *4 = socio activo*	**8.1.6 ¿Cuantos veces al año se reúnan con este grupo?** *1 = una vez* *2 = dos veces* *3 = tres veces* *4 = mas que tres veces* *5 = nunca*	**8.1.7 ¿Ha sido esta *persona* parte de un organización en el pasado?** 1 = si 2 = no (► sigue con próxima persona)	**8.1.8 ¿De que organización formal era esta persona parte?** *1 = de Valle Ubiriki* *2 = de La Florida* *3 = coop. Tahuantinsuyo* *4 = CAC Pichanaqui* *5 = Cooperativa San Carlos* *6 = Ceproap* *7 = comité de gestión local* *8 = de junta directiva del anexo…* *9 = junta directiva del colegio / escuela* *10 = comedor popular* *99 = de una otra (apuntale)*	**8.1.9 ¿Por cuántos años fue parte de la organización?**	**8.1.10 ¿Que era la razón de su retiro de este organización?** ***No lee los códigos!*** 1 = desconfianza 2 = quiebran 3 = no da buena servicios 4 = falta de tiempo 99 = otra (apuntale)
	entrevistado									

8.2 Otros grupos en relación a café y otros temas

Quisiera hacerle algunas preguntas sobre la participación en otros grupos de ud. o su familia que tienen **mas de 15 años.**
Un grupo quiere decir al menos 4 personas que se reúne o que realiza cualquier actividades, pero quien no están inscrito en el registro publico etc.)

8.2.1 - 8.2.4	**Nombre y numero que le corresponde (usa primer cuadro)** * **usa varias reglas!**	**8.2.1** **¿Ud. o esta persona esta parte de un grupo ?** 1 = si (►8.2.2- 8.2.4 antes de seguir con la próxima persona) 2 = no (► próxima persona)	**8.2.2** **¿Que grupo?** ***¡Da algunos ejemplos, pregunta bien!*** *1 = el grupo en que cocinan juntas las mujeres* *2 = para recibir ayuda asistencial* *3= clubs deportivos* *4= rondas campesinas* *5 = vaso de leche* *6 = grupo religioso* *7 = faena comunal* *99 = otro, especificar*	**8.2.3** **¿Cuántos personas conforman este grupo?**	**8.2.4** **¿Cuantos veces al año sus miembros se reúnan/hacen actividades?**
	entrevistado				

8.3 Comunicación sobre café

8.3.1 - 8.3.5	**8.3.1** **¿Ud. habla sobre la información o conocimiento adquirida en relación a la producción del café con otros productores?** *1 = si (►8.3.2- 8.3.5)* *2 = no (► fin de entrevista)*	**8.3.4** **¿Con cuántos diferentes productores de café habla ud. sobre su producción de café?** 1=una sola persona 2=dos personas 3=tres personas 4=mas que tres personas	**8.3.5** **¿Cuántos veces al año habla ud. sobre la producción de café con estos personas?** **Ponga un numero!**

9.5 Explanatory Variables PSM & Regression Analysis

label	name	survey question(s)	type	values
average household age	hhage	1.4	Scale	n/a
nr. of hh members > 18	hh18plus	1.4	Scale	n/a
nr. of hh members 6 - 18	hh6till18	1.4	Scale	n/a
nr. of hh members < 6	hh0till5	1.4	Scale	n/a
household size	hhsize	1.1	Scale	n/a
region code[1]	hhdistrict	1.5	Dummy	Distr. Dummy 1: Apurimac Distr. Dummy 2: Huancavelica Distr. Dummy 3: Junin Distr. Dummy 4: Other districts
province code[1]	hhprovince	1.5	Dummy	Prov. Dummy 1: Andahuaylas Prov. Dummy 2: Huancavellica Prov. Dummy 3: Chanchamayo Prov. Dummy 4: Huancayo Prov. Dummy 5: Other provinces
time in Chanchamayo[2]	hhyearsubi	1.4/1.5/4.1.11/4.1.12	Scale	n/a
household religion[3]	hhreligion	1.6	Dummy	Relig. Dummy 1: Catholic Relig. Dummy 2: Evangelist Relig. Dummy 3: Other
level of household education[4]	hheduc	2.4	Scale	n/a
income/labour besides farming[5]	incother	6.1.1-6.1.13	Dummy	0 = no / 1 = yes
number of harvests	experience	6.1.6	Scale	n/a
size of farm cultivated 4 years ago	culsize_4	4.1.2/4.1.11-12/6.1.6/1.5		
inherintance of farm	inherit_farm	4.1.13	Dummy	0 = no / 1 = yes
inheritance of house	inher_house	4.2.3	Dummy	0 = no / 1 = yes
2e house > 4 years	hous2_before4	4.2.2	Scale	n/a
vehicle > 4 years	vehicle_before4	4.3.8	Scale	n/a
average height all plots	altitudeplots	4.1.6	Scale	n/a
distance farm to road	farmtoroad	4.2.4	Scale	n/a
village to pichanki	villagetopichanak	4.2.5	Scale	n/a
secondary school	vill_educ	4.2.5	Dummy	0 = no / 1 = yes
health care centre	vill_healt	3.1.3/3.14	Dummy	0 = no / 1 = yes

[1] place of birth of parents and/or children (if parents are > 60). If different for both parents and not from Chanchamayo, the place of birth of the male will be used

[2] if one of the parents is born in the region, the age of this person will be used as a proxy. If residence of household is outside the region, the year in which the first child was born in the region will be used. This data was crosschecked with the numb

[3] the religion of the parents or children (if parent sare > 60)

[4] the highest level of education parents or children (if parents > 60)

[7] Size of farm cultivated four years ago. If plot history & cultivation history > 4 OR if plot history & experience & time in Chanchamayo = cultivated land four years ago same as now. If plot history & cultivation history < 5, cultivated plot not in usenfo

9.6 Ttests Propensity Score Matching Variables

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means				
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
average household age	Equal variances assumed	4.008	.047	-.490	205.000	.625	-.803	1.638
	Equal variances not assumed			-.493	193.793	.622	-.803	1.627
nr. of hh members > 18	Equal variances assumed	.746	.389	.652	205.000	.515	.116	.178
nr. of hh members 6 - 18	Equal variances assumed	.009	.925	-.480	205.000	.632	-.098	.204
nr. of hh members < 6**	Equal variances assumed	8.019	.005	3.027	205.000	.003	.310	.102
	Equal variances not assumed			3.045	197.569	.003	.310	.102
household size	Equal variances assumed	.480	.489	1.044	205.000	.298	.328	.314
Distr. Dummy 1: Apurimac	Equal variances assumed	2.829	.094	.836	205.000	.404	.048	.057
	Equal variances not assumed			.838	204.764	.403	.048	.057
Distr. Dummy 2: Huancavelica	Equal variances assumed	3.577	.060	.939	205.000	.349	.050	.053
	Equal variances not assumed			.941	204.136	.348	.050	.053
Distr. Dummy 3: Junin	Equal variances assumed	.033	.856	.091	205.000	.928	.006	.070
Distr. Dummy 4: Other districts**	Equal variances assumed	19.327	.000	-2.131	205.000	.034	-.104	.049
	Equal variances not assumed			-2.116	182.979	.036	-.104	.049
Prov. Dummy 1: Andahuaylas	Equal variances assumed	2.989	.085	.859	205.000	.391	.048	.056
	Equal variances not assumed			.861	204.663	.390	.048	.056
Prov. Dummy 2: Huancavellica	Equal variances assumed	5.671	.018	1.175	205.000	.241	.052	.045
	Equal variances not assumed			1.181	200.427	.239	.052	.044
Prov. Dummy 3: Chanchamayo	Equal variances assumed	.917	.339	.479	205.000	.632	.032	.066
Prov. Dummy 4: Huancayo	Equal variances assumed	2.116	.147	-.724	205.000	.470	-.022	.030
Prov. Dummy 5: Other provinces*	Equal variances assumed	12.104	.001	-1.759	205.000	.080	-.111	.063
	Equal variances not assumed			-1.754	199.751	.081	-.111	.063
Relig. Dummy 1: Catholic	Equal variances assumed	1.697	.194	-.679	205.000	.498	-.047	.069
Relig. Dummy 2: Evangelist	Equal variances assumed	1.877	.172	-.712	205.000	.478	-.049	.069
Relig. Dummy 3: Other	Equal variances assumed	7.817	.006	1.373	205.000	.171	.054	.039
	Equal variances not assumed			1.382	194.013	.168	.054	.039
time in chanchamayo	Equal variances assumed	.610	.436	-.221	205.000	.825	-.412	1.864
household religion	Equal variances assumed	2.585	.109	-.727	205.000	.468	-.188	.258
level of household education	Equal variances assumed	1.584	.210	-.818	205.000	.414	-.190	.232
income/labour besides farming**	Equal variances assumed	11.438	.001	2.286	205.000	.023	.155	.068
	Equal variances not assumed			2.283	202.853	.023	.155	.068
number of harvests***	Equal variances assumed	7.562	.006	-4.552	205.000	.000	-5.486	1.205
	Equal variances not assumed			-4.532	194.336	.000	-5.486	1.211
size of the farm in ha**	Equal variances assumed	.591	.443	-2.515	205.000	.013	-2.086	.829
size of cultivated farm 4 years ago*	Equal variances assumed	.360	.549	-1.765	205.000	.079	-4.634	2.626
inherintance of farm	Equal variances assumed	.011	.916	.053	205.000	.958	.003	.066
inheritance of house	Equal variances assumed	2.762	.098	.826	205.000	.410	.041	.050
	Equal variances not assumed			.828	204.127	.409	.041	.050
2e house > 4 years	Equal variances assumed	4.521	.035	-1.419	205.000	.157	-1.186	.836
	Equal variances not assumed			-1.411	191.303	.160	-1.186	.840
vehicle > 4 years	Equal variances assumed	.046	.831	-.096	205.000	.923	-.020	.205
	Equal variances not assumed			-.096	181.272	.924	-.020	.206
average height all plots***	Equal variances assumed	.007	.935	-3.622	205.000	.000	-121.244	33.476
	Equal variances not assumed			-3.615	201.609	.000	-121.244	33.542
distance farm to road	Equal variances assumed	1.832	.177	-.753	205.000	.452	-5.936	7.882
village to pichanki	Equal variances assumed	1.647	.201	-1.462	205.000	.145	-18.593	12.715
secondary school	Equal variances assumed	.088	.768	.148	205.000	.883	.010	.068
health care centre	Equal variances assumed	6.266	.013	1.237	205.000	.217	.068	.055
	Equal variances not assumed			1.241	203.452	.216	.068	.055

significant at 10%; significant at 5%, significant at 1%

9.7

9.8 Results Regression Anlaysis

Table Nr.	N	F / chi2	Prob > F / chi2	R2 / Pseudo R2	Outcome Indicator (=y)	Explanatory Variables (=x)	β / Odds Ratio	SE	t/z	P > [z/t]	95 % Confidence Interval	
9	120	15.83	0.0000	0.4568	hhcapa_freq (ifcapa)	treatment	21.034	2.573	8.170	0.000	15.936	26.132
						bil_educ	-4.716	2.545	-1.850	0.066	-9.758	0.325
						hheduc	-1.141	0.675	-1.690	0.094	-2.478	0.196
						villagetop~i	0.026	0.012	2.180	0.031	0.002	0.049
						distr_huan~a	6.533	3.758	1.740	0.085	-0.912	13.978
						distr_junin	4.656	2.623	1.770	0.079	-0.542	9.854
						hous2_befo~4	0.489	0.203	2.410	0.018	0.087	0.892
						_cons	7.000	4.135	1.690	0.093	-1.192	15.192
	120	13.19	0.0000	0.4680	hhcapa_freq (ifcapa) (weighted)	treatment	21.034	2.573	8.170	0.000	15.936	26.132
						vill_educ	-4.716	2.545	-1.850	0.066	-9.758	0.325
						hheduc	-1.141	0.675	-1.690	0.094	-2.478	0.196
						villagetop~i	0.026	0.012	2.180	0.031	0.002	0.049
						distr_huan~a	6.533	3.758	1.740	0.085	-0.912	13.978
						distr_junin	4.656	2.623	1.770	0.079	-0.542	9.854
						hous2_befo~4	0.489	0.203	2.410	0.018	0.087	0.892
						_cons	7.000	4.135	1.690	0.093	-1.192	15.192
	122	21.74	0.0000	0.1286	hhcapa_wom (ifcapa)	hh6till18 |	1.866	0.297	3.920	0.000	1.366	2.550
						vill_educ	0.331	0.143	-2.560	0.010	0.142	0.771
	122	22.59	0.0002	0.1621	hhcapa_wom (ifcapa) (weighted)	vill_educ |	0.285	0.130	-2.750	0.006	0.116	0.698
						hous2_befo~4	1.048	0.029	1.690	0.090	0.993	1.106
						hh6till18	1.982	0.379	3.580	0.000	1.362	2.884
						vehicle_be~4	1.045	0.020	2.230	0.025	1.005	1.085
13	169	118.90	0.0000	0.5104	hhcoop	treatment |	185.544	143.171	6.770	0.000	40.892	841.898
						incother	4.629	2.808	2.530	0.012	1.410	15.198
						hh6till18	0.723	0.140	-1.670	0.094	0.495	1.057
						inher_house	0.175	0.133	-2.300	0.022	0.039	0.774
						vill_healt	6.194	3.839	2.940	0.003	1.838	20.874
						farmtoroad	0.987	0.005	-2.840	0.005	0.978	0.996
	169	57.62	0.0000	0.5094	hhcoop (weighted)	treatment |	181.627	139.392	6.780	0.000	40.357	817.423
						incother	4.111	2.525	2.300	0.021	1.233	13.704
						hh6till18	0.673	0.145	-1.840	0.066	0.441	1.027
						vill_healt	5.496	3.120	3.000	0.003	1.807	16.719
						farmtoroad	0.987	0.004	-2.910	0.004	0.979	0.996
						inher_house	0.172	0.124	-2.440	0.015	0.042	0.709

Table Nr.	N	F / chi2	Prob > F / chi2	R2 / Pseudo R2	Outcome Indicator (=y)	Explanatory Variables (=x)	β / Odds Ratio	SE	t/z	P > [z/t]	95 % Confidence Interval	
13 (cont.)	88	13.97	0.0030	0.1181	hhcoop_wom (ifcoop)	inherit_farm	2.644	1.414	1.820	0.069	0.927	7.542
						villagetop~i	0.994	0.003	-1.710	0.087	0.988	1.001
						hous2_befo~4	1.084	0.047	1.830	0.067	0.995	1.181
	88	17.29	0.0006	0.1168	hhcoop_wom (ifcoop) (weighted)	hous2_befo~4	1.084	0.041	2.130	0.033	1.007	1.167
						inherit_farm	2.504	1.334	1.720	0.085	0.882	7.113
						villagetop~i	0.994	0.002	-2.630	0.009	0.990	0.999
17	169	52.99	0.0000	0.2292	pr_matorg	treatment |	8.983	3.838	5.140	0.000	3.888	20.755
						vill_healt	2.816	1.375	2.120	0.034	1.081	7.331
						incother	2.668	1.087	2.410	0.016	1.201	5.928
						experience	1.061	0.023	2.740	0.006	1.017	1.107
						distr_huan~a	2.658	1.405	1.850	0.064	0.943	7.489
						inherit_farm	0.377	0.161	-2.290	0.022	0.163	0.870
	169	27.29	0.0001	0.1929	pr_matorg (weighted)	treatment |	7.206	3.123	4.560	0.000	3.082	16.851
						experience	1.052	0.022	2.400	0.016	1.009	1.096
						inherit_farm	0.384	0.179	-2.050	0.040	0.154	0.959
						incother	2.334	0.928	2.130	0.033	1.071	5.089
						distr_huan~a	2.377	1.175	1.750	0.080	0.902	6.263
	163	61.69	0.0000	0.3316	pr_shade	treatment |	25.443	15.735	5.230	0.000	7.571	85.505
						incother	3.478	1.809	2.400	0.017	1.255	9.640
						vill_healt	13.669	11.528	3.100	0.002	2.617	71.386
						hh0till5	2.000	0.644	2.150	0.032	1.063	3.761
						distr_huan~a	4.998	3.806	2.110	0.035	1.124	22.229
						vill_educ	0.383	0.182	-2.020	0.044	0.151	0.973
	163	42.11	0.0000	0.3562	pr_shade (weighted)	treatment |	28.998	18.435	5.300	0.000	8.341	100.812
						vill_educ	0.384	0.185	-1.980	0.047	0.150	0.988
						vill_healt	17.666	14.122	3.590	0.000	3.687	84.638
						hh0till5	1.956	0.640	2.050	0.040	1.030	3.714
						distr_huan~a	5.512	3.721	2.530	0.011	1.468	20.700
						incother	4.002	2.293	2.420	0.015	1.302	12.303
	165	20.00	0.0002	0.1641	pr_chem	treatment |	0.167	0.111	-2.690	0.007	0.046	0.614
						hh0till5	1.899	0.574	2.120	0.034	1.050	3.433
						reli_evang~t	0.359	0.208	-1.760	0.078	0.115	1.121
	165	10.98	0.0041	0.1358	pr_chem (weighted)	treatment	0.168	0.111	-2.700	0.007	0.046	0.613
						reli_other	3.727	2.280	2.150	0.032	1.123	12.363

Table Nr.	N	F / chi2	Prob > F / chi2	R2 / Pseudo R2	Outcome Indicator (=y)	Explanatory Variables (=x)	β / Odds Ratio	SE	t/z	P > [z/t]	95 % Confidence Interval	
17 (cont.)	169	30.91	0.0000	0.1821	pr_orgfert	treatment |	6.188	3.134	3.600	0.000	2.293	16.698
						farmtoroad	1.007	0.003	2.270	0.023	1.001	1.014
						vill_educ	0.424	0.208	-1.750	0.080	0.162	1.107
						coff07_hist	1.073	0.033	2.270	0.023	1.010	1.139
	169	16.09	0.0029	0.1664	pr_orgfert (weighted)	treatment |	5.746	3.254	3.090	0.002	1.893	17.437
						vill_educ	0.423	0.215	-1.690	0.090	0.156	1.145
						farmtoroad	1.007	0.003	2.600	0.009	1.002	1.013
						coff07_hist	1.072	0.030	2.490	0.013	1.015	1.132
	156	44.16	0.0000	0.2046	pr_sproinbag	treatment |	2.013	0.821	1.710	0.086	0.905	4.478
						hhage	1.038	0.018	2.130	0.033	1.003	1.075
						hh6till18	1.341	0.200	1.970	0.049	1.001	1.798
						altitudepl~s	0.997	0.001	-3.160	0.002	0.996	0.999
						vill_healt	2.321	1.172	1.670	0.096	0.862	6.246
						distr_junin	0.465	0.213	-1.670	0.095	0.190	1.141
						distr_other	0.334	0.206	-1.780	0.075	0.100	1.117
						farmtoroad	0.988	0.005	-2.630	0.009	0.979	0.997
						reli_other	0.243	0.185	-1.860	0.064	0.054	1.083
						hheduc	1.280	0.150	2.110	0.035	1.018	1.610
	156	33.18	0.0001	0.2156	pr_sproinbag (weighted)	altitudepl~s	0.997	0.001	-3.050	0.002	0.996	0.999
						reli_other	0.129	0.082	-3.200	0.001	0.037	0.452
						hh6till18	1.355	0.207	1.990	0.047	1.004	1.828
						coff07_hist	1.088	0.037	2.520	0.012	1.019	1.162
						cultsize_4	0.912	0.040	-2.120	0.034	0.838	0.993
						hheduc	1.279	0.138	2.280	0.023	1.035	1.580
						farmtoroad	0.988	0.005	-2.180	0.029	0.977	0.999
						vehicle_be~4	1.303	0.183	1.890	0.059	0.990	1.716
	152	13.18	0.0014	0.1049	pr_sprman	treatment |	4.869	2.674	2.880	0.004	1.659	14.289
						hheduc	0.779	0.096	-2.030	0.042	0.612	0.991
	152	20.11	0.0012	0.1739	pr_sprman (weighted)	treatment |	3.883	2.278	2.310	0.021	1.230	12.262
						hheduc	0.740	0.101	-2.220	0.027	0.567	0.966
						reli_other	0.264	0.202	-1.740	0.082	0.059	1.186
						villagetop~i	1.005	0.003	1.680	0.093	0.999	1.010
						distr_huan~a	0.304	0.192	-1.890	0.059	0.088	1.048

Table Nr.	N	F / chi2	Prob > F / chi2	R2 / Pseudo R2	Outcome Indicator (=y)	Explanatory Variables (=x)	β / Odds Ratio	SE	t/z	P > [z/t]	95 % Confidence Interval	
17 (cont.)	141	26.07	0.0000	0.1934	pr_prunman	treatment |	5.512	3.064	3.070	0.002	1.854	16.387
						experience	0.939	0.027	-2.220	0.026	0.889	0.993
						hh6till18	1.568	0.322	2.190	0.029	1.048	2.344
						hh0till5	0.493	0.157	-2.220	0.027	0.264	0.921
	141	15.97	0.0031	0.2113	pr_prunman (weighted)	treatment |	5.539	3.239	2.930	0.003	1.761	17.425
						experience	0.932	0.025	-2.660	0.008	0.886	0.982
						hh6till18	1.598	0.281	2.670	0.008	1.132	2.256
						hh0till5	0.443	0.164	-2.200	0.028	0.214	0.916
	168	40.41	0.0000	0.2427	pr_har	treatment |	14.164	8.177	4.590	0.000	4.569	43.913
						hhage	1.057	0.026	2.270	0.023	1.008	1.109
						villagetop~i	1.007	0.003	2.110	0.035	1.001	1.014
						hh0till5	2.407	0.844	2.500	0.012	1.210	4.787
						reli_other	14.770	18.947	2.100	0.036	1.195	182.525
						farmtoroad	0.987	0.005	-2.680	0.007	0.978	0.997
						vill_healt	3.950	2.839	1.910	0.056	0.966	16.155
	168	22.06	0.0012	0.2186	pr_har (weighted)	treatment |	11.951	6.658	4.450	0.000	4.011	35.611
						hhage	1.054	0.029	1.890	0.059	0.998	1.113
						farmtoroad	0.989	0.005	-2.000	0.046	0.979	1.000
						hh0till5	2.380	0.894	2.310	0.021	1.141	4.968
						vill_healt	4.657	3.290	2.180	0.029	1.166	18.594
						villagetop~i	1.006	0.004	1.650	0.099	0.999	1.013
18	169	23.96	0.0000	0.1526	pr_matorg (weighted)	hhcap	8.630	4.650	4.000	0.000	3.001	24.814
						experience	1.046	0.025	1.920	0.055	0.999	1.095
						distr_huan~a	2.456	1.294	1.710	0.088	0.874	6.900
	120	15.58	0.0082	0.1279	pr_matorg (weighted)	capa_freq |	1.030	0.014	2.140	0.032	1.002	1.057
						villagetop~i	0.994	0.002	-2.580	0.010	0.990	0.999
						incother	2.805	1.206	2.400	0.016	1.208	6.514
						inherit_farm	0.221	0.117	-2.860	0.004	0.079	0.623
						distr_huan~a	4.869	3.943	1.950	0.051	0.995	23.815
	163	31.94	0.0000	0.2350	pr_shade (weighted)	hhcap |	9.908	5.652	4.490	0.000	3.637637	6.986
						vill_healt	6.134	5.533	2.010	0.044	1.047	35.939
						vill_educ	0.218	0.103	-3.230	0.001	0.086	0.549
						hh0till5	1.812	0.563	1.910	0.056	0.986	3.332
						distr_huan~a	8.863	6.991	2.770	0.006	1.888	41.594
						distr_junin	2.173	0.996	1.690	0.090	0.885	5.337

Table Nr.	N	F / chi2	Prob > F / chi2	R2 / Pseudo R2	Outcome Indicator (=y)	Explanatory Variables (=x)	β / Odds Ratio	SE	t/z	P > [z/t]	95 % Confidence Interval	
18 (cont.)	104	15.08	0.0887	0.5532	pr_shade (weighted)	capa_freq |	1.224	0.086	2.870	0.004	1.066	1.405
						farmtoroad	0.986	0.007	-2.150	0.031	0.972	0.999
						vill_healt	16.332	16.466	2.770	0.006	2.264	117.821
						hh0till5	6.376	4.395	2.690	0.007	1.652	24.616
						distr_junin	8.977	9.747	2.020	0.043	1.069	75.402
						distr_other	161.179	304.650	2.690	0.007	3.967	6549.25
						inherit_farm	0.040	0.054	-2.360	0.018	0.003	0.576
						incother	3.939	2.821	1.910	0.056	0.968	16.029
						hheduc	1.449	0.267	2.020	0.044	1.010	2.078
	165	12.91	0.0016	0.1084	pr_chem (weighted)	hhcap |	0.258	0.133	-2.630	0.009	0.094	0.709
						reli_other	4.783	3.151	2.380	0.018	1.315	17.394
	114	24.55	0.0063	0.4104	pr_chem (weighted)	altitudepl~s	1.007	0.002	3.840	0.000	1.004	1.011
						hhage	0.830	0.062	-2.480	0.013	0.716	0.961
						hh6till18	0.189	0.100	-3.140	0.002	0.067	0.534
						hh0till5	0.106	0.112	-2.120	0.034	0.013	0.846
						vill_educ	0.073	0.108	-1.760	0.079	0.004	1.349
						incother	34.205	47.437	2.550	0.011	2.257	518.293
						vill_healt	20.586	19.050	3.270	0.001	3.357	126.258
						reli_evang~t	0.006	0.010	-3.060	0.002	0.000	0.161
						reli_other	10.217	12.983	1.830	0.067	0.847	123.297
						hheduc	0.586	0.137	-2.280	0.023	0.370	0.928
	169	19.38	0.0007	0.1548	pr_orgfert (weighted)	hhcap |	10.302	8.380	2.870	0.004	2.092051	50.734
						farmtoroad	1.008	0.003	2.580	0.010	1.002	1.015
						coff07_hist	1.065	0.031	2.160	0.030	1.006	1.127
						vill_educ	0.429	0.200	-1.810	0.070	0.172	1.072
	120	15.29	0.0016	0.1013	pr_orgfert (weighted)	capa_freq |	1.024	0.014	1.710	0.088	0.997	1.052
						farmtoroad	1.009	0.003	2.710	0.007	1.002	1.016
						cultsize_4	1.075	0.047	1.650	0.098	0.987	1.171

Table Nr.	N	F / chi2	Prob > F / chi2	R2 / Pseudo R2	Outcome Indicator (=y)	Explanatory Variables (=x)	β / Odds Ratio	SE	t/z	P > [z/t]	95 % Confidence Interval	
18 (cont.)	156	37.48	0.0000	0.2529	pr_sproinbag (weighted)	hhcap	4.032	2.106	2.670	0.008	1.448	11.224
						hheduc	1.229	0.133	1.910	0.056	0.995	1.519
						hh6till18	1.372	0.213	2.040	0.041	1.013	1.859
						coff07_hist	1.074	0.035	2.180	0.029	1.007	1.145
						farmtoroad	0.987	0.006	-2.240	0.025	0.976	0.998
						vehicle_be~4	1.388	0.212	2.140	0.032	1.028	1.873
						altitudepl~s	0.997	0.001	-3.390	0.001	0.995	0.999
						cultsize_4	0.897	0.038	-2.560	0.011	0.825	0.975
						reli_other	0.133	0.080	-3.360	0.001	0.041	0.432
	111	21.28	0.0034	0.2430	pr_sproinbag (weighted)	altitudepl~s	0.997	0.001	-2.900	0.004	0.994	0.999
						hheduc	1.212	0.139	1.680	0.094	0.968	1.517
						hh6till18	1.635	0.335	2.400	0.016	1.094	2.445
						farmtoroad	0.988	0.006	-2.090	0.037	0.976	0.999
						reli_other	0.145	0.115	-2.440	0.015	0.031	0.685
						coff07_hist	1.115	0.053	2.300	0.022	1.016	1.224
						cultsize_4	0.902	0.049	-1.900	0.057	0.812	1.003
	152	16.79	0.0021	0.1221	pr_sprman (weighted)	illagetop~i	1.006	0.003	2.100	0.035	1.000	1.012
						hheduc	0.745	0.088	-2.480	0.013	0.590	0.940
						distr_huan~a	0.238	0.155	-2.210	0.027	0.067	0.851
						reli_other	0.188	0.130	-2.410	0.016	0.048	0.731
	111	20.01	0.0005	0.2140	pr_sprman (weighted)	villagetop~i	1.008	0.003	2.600	0.009	1.002	1.013
						reli_other	0.168	0.132	-2.270	0.023	0.036	0.785
						reli_evang~t	4.888	4.024	1.930	0.054	0.974	24.537
						vill_educ	3.680	2.911	1.650	0.100	0.781	17.348
	141	19.89	0.0005	0.2122	pr_prunman (weighted)	hhcap	6.720	3..9788	3.220	0.001	2.106	21.446
						experience	0.925	0.025	-2.870	0.004	0.877	0.976
						hh6till18	1.699	0.322	2.790	0.005	1.172	2.465
						hh0till5	0.519	0.196	-1.730	0.083	0.248	1.089
	108	21.99	0.0002	0.2302	pr_prunman (weighted)	altitudepl~s	0.998	0.001	-1.930	0.054	0.995	1.000
						experience	0.914	0.027	-3.010	0.003	0.863	0.969
						hh6till18	2.231	0.674	2.660	0.008	1.235	4.032
						hh0till5	0.343	0.165	-2.230	0.026	0.134	0.880

Table Nr.	N	F / chi2	Prob > F / chi2	R2 / Pseudo R2	Outcome Indicator (=y)	Explanatory Variables (=x)	β / Odds Ratio	SE	t/z	P > [z/t]	95 % Confidence Interval	
18 (cont.)	168	30.89	0.0000	0.1883	pr_har (weighted)	hhcap |	11.861	5.741	5.110	0.000	4.593	30.629
						cultsize_4	0.928	0.037	-1.880	0.060	0.858	1.003
						villagetop~i	1.005	0.003	1.670	0.095	0.999	1.011
						hh0till5	2.648	1.000	2.580	0.010	1.263	5.551
						coff07_hist	1.078	0.036	2.230	0.026	1.009	1.152
	108	7.19	0.0275	0.0900	pr_har (weighted)	farmtoroad	0.991	0.004	-2.420	0.016	0.984	0.998
						hh0till5 |	5.026	3.759	2.160	0.031	1.160	21.772
						farmtoroad	0.994	0.004	-1.800	0.072	0.987	1.001
22	169	93.46	0.0000	0.4251	inv_comp	treatment	31.014	17.464	6.100	0.000	10.286	93.512
						hhage	1.052	0.023	2.340	0.019	1.008	1.098
						hh6till18	1.510	0.272	2.290	0.022	1.061	2.149
						hous2_befo~4	0.924	0.041	-1.790	0.074	0.848	1.008
						vill_educ	5.137	2.674	3.140	0.002	1.852	14.249
						experience	1.102	0.037	2.900	0.004	1.032	1.177
						distr_other	4.727	3.594	2.040	0.041	1.065	20.975
	169	57.73	0.0000	0.4336	inv_comp (weighted)	treatment	37.744	19.656	6.970	0.000	13.601	104.742
						hhage	1.058	0.026	2.250	0.025	1.007	1.111
						hh6till18	1.586	0.293	2.500	0.013	1.104	2.278
						hous2_befo~4	0.914	0.041	-1.990	0.046	0.836	0.998
						farmtoroad	0.993	0.003	-2.140	0.033	0.986	0.999
						vill_educ	3.975	2.119	2.590	0.010	1.398	11.301
						distr_other	5.189	5.010	1.710	0.088	0.782	34.429
						experience	1.096	0.035	2.870	0.004	1.029	1.166
	162	26.07	0.0001	0.1918	inv_prunsaw	reli_evang~t	0.397	0.211	-1.740	0.082	0.140	1.126
						hheduc	0.736	0.110	-2.060	0.040	0.549	0.986
						cultsize_4	1.328	0.135	2.780	0.005	1.087	1.622
						hh0till5	0.469	0.141	-2.520	0.012	0.260	0.845
						distr_huan~a	0.218	0.139	-2.380	0.017	0.063	0.763
	162	17.74	0.0014	0.1884	inv_prunsaw (weighted)	distr_huan~a	0.289	0.183	-1.960	0.050	0.083	1.000
						cultsize_4	1.305	0.132	2.640	0.008	1.071	1.590
						inherit_farm	0.392	0.201	-1.830	0.068	0.143	1.071
						hh0till5	0.445	0.137	-2.630	0.009	0.243	0.814

Table Nr.	N	F / chi2	Prob > F / chi2	R2 / Pseudo R2	Outcome Indicator (=y)	Explanatory Variables (=x)	β / Odds Ratio	SE	t/z	P > [z/t]	95 % Confidence Interval	
22 (cont.)	169	44.36	0.0000	0.1950	inv_prunsci	treatment	3.256	1.315	2.920	0.003	1.476	7.185
						altitudepl~s	0.997	0.001	-3.100	0.002	0.995	0.999
						cultsize_4	1.137	0.052	2.800	0.005	1.039	1.244
						hh0till5	0.554	0.151	-2.160	0.031	0.325	0.946
						experience	1.073	0.035	2.190	0.028	1.008	1.143
						coff07_hist	0.923	0.037	-1.970	0.049	0.853	1.000
						hous2_befo~4	0.944	0.031	-1.760	0.079	0.885	1.007
	168	39.20	0.0000	0.2111	inv_prunsci (weighted)	treatment	3.248	1.325	2.890	0.004	1.460	7.224
						cultsize_4	1.142	0.048	3.160	0.002	1.052	1.240
						altitudepl~s	0.997	0.001	-2.820	0.005	0.995	0.999
						hh0till5	0.515	0.154	-2.210	0.027	0.286	0.927
						hous2_befo~4	0.933	0.032	-2.010	0.044	0.873	0.998
						distr_junin	2.017	0.734	1.930	0.054	0.988	4.116
						coff07_hist	0.908	0.036	-2.430	0.015	0.840	0.982
						experience	1.085	0.034	2.590	0.009	1.020	1.155
	168	22.49	0.0001	0.1308	inv_prunknife	treatment	4.436	2.085	3.170	0.002	1.765	11.147
						reli_other	4.115	2.732	2.130	0.033	1.120	15.120
						cultsize_4	1.122	0.044	2.960	0.003	1.040	1.211
	168	17.52	0.0006	0.1230	inv_prunknife (weighted)	treatment	4.359	1.977	3.250	0.001	1.792	10.605
						reli_other	4.598	2.972	2.360	0.018	1.295	16.320
						cultsize_4	1.114	0.047	2.570	0.010	1.026	1.210
	168	0.00		0.0000	inv_helm	na						
	168	11.51	0.0007	0.0257	inv_helm (weighted)	vehicle_be~4	1.054	0.016	3.390	0.001	1.023	1.087
	168	21.59	0.0000	0.1276	inv_glove	treatment	5.571	2.724	3.510	0.000	2.137	14.524
						experience	1.040	0.023	1.800	0.073	0.996	1.086
	168	15.35	0.0005	0.1252	inv_glove (weighted)	treatment |	7.841	4.173	3.870	0.000	2.763	22.252
						altitudepl~s	0.998	0.001	-2.050	0.040	0.997	1.000
	168	40.99	0.0000	0.1957	inv_masks	treatment |	7.840	3.309	4.880	0.000	3.429	17.928
						experience	1.054	0.022	2.460	0.014	1.011	1.098
	168	35.18	0.0000	0.2292	inv_masks (weighted)	treatment	9.715	4.207	5.250	0.000	4.158	22.703
						inherit_farm	2.200	0.969	1.790	0.073	0.928	5.217
						reli_evang~t	0.452	0.179	-2.000	0.045	0.207	0.983
						experience	1.053	0.028	1.980	0.048	1.001	1.109
						hheduc	0.768	0.095	-2.140	0.032	0.602	0.978

Table Nr.	N	F / chi2	Prob > F / chi2	R2 / Pseudo R2	Outcome Indicator (=y)	Explanatory Variables (=x)	β / Odds Ratio	SE	t/z	P > [z/t]	95 % Confidence Interval	
22 (cont.)	168	22.75	0.0000	0.1963	inv_poncho	treatment |	17.505	13.440	3.730	0.000	3.887	78.828
						hheduc	0.685	0.137	-1.890	0.058	0.462	1.013
	168	18.45	0.0001	0.1815	inv_poncho (weighted)	treatment |	15.392	11.708	3.590	0.000	3.466	68.356
						hheduc	0.676	0.113	-2.350	0.019	0.487	0.937
	169	49.82	0.0000	0.2133	inv_wastw	cultsize_4	1.083	0.041	2.090	0.036	1.005	1.167
						hh6till18	1.379	0.189	2.340	0.019	1.054	1.804
						experience	1.086	0.027	3.360	0.001	1.035	1.140
						altitudepl~s	1.004	0.001	4.080	0.000	1.002	1.005
						distr_junin	2.011	0.837	1.680	0.093	0.890	4.547
						distr_other	5.783	3.467	2.930	0.003	1.786	18.729
						incother	0.425	0.159	-2.290	0.022	0.204	0.885
	169	36.24	0.0000	0.7401	inv_wastw (weighted)	treatment |	1127.11	1316.04	6.020	0.000	114.312	11113.3
						villagetop~i	0.994	0.003	-2.220	0.027	0.989	0.999
	167	28.47	0.0000	0.1478	inv_caldep	treatment |	4.554	1.875	3.680	0.000	2.032	10.207
						coff07_hist	1.063	0.033	1.960	0.050	1.000	1.130
						vill_educ	3.364	1.493	2.730	0.006	1.410	8.029
	167	21.39	0.0001	0.1604	inv_caldep (weighted)	treatment |	4.839	2.061	3.700	0.000	2.100	11.150
						vill_educ	3.891	1.813	2.920	0.004	1.561	9.699
						coff07_hist	1.060	0.032	1.910	0.056	0.998	1.124
	169	32.73	0.0000	0.1727	inv_ferttan	treatment	3.484	1.471	2.960	0.003	1.523	7.972
						vill_educ	0.500	0.206	-1.680	0.093	0.223	1.122
						villagetop~i	1.007	0.003	2.030	0.042	1.000	1.014
						experience	1.086	0.033	2.770	0.006	1.025	1.152
						vill_healt	5.082	3.242	2.550	0.011	1.455	17.745
	169	24.52	0.0002	0.1662	inv_ferttan (weighted)	treatment |	3.747	1.535	3.220	0.001	1.678	8.364
						coff07_hist	0.913	0.045	-1.840	0.065	0.829	1.006
						experience	1.149	0.057	2.800	0.005	1.042	1.266
						vill_healt	5.567	3.279	2.910	0.004	1.755	17.660
						villagetop~i	1.005	0.003	1.880	0.061	1.000	1.011
	169	19.71	0.0002	0.1181	inv_certan	treatment |	3.206	1.443	2.590	0.010	1.327	7.745
						farmtoroad	0.983	0.006	-2.900	0.004	0.972	0.995
						villagetop~i	1.006	0.003	1.790	0.073	0.999	1.012

Table Nr.	N	F / chi2	Prob > F / chi2	R2 / Pseudo R2	Outcome Indicator (=y)	Explanatory Variables (=x)	β / Odds Ratio	SE	t/z	P > [z/t]	95 % Confidence Interval	
22 (cont.)	169	24.42	0.0004	0.1743	inv_certan (weighted)	treatment |	3.024	1.392	2.400	0.016	1.226	7.453
						villagetop~i	1.006	0.003	1.770	0.076	0.999	1.013
						hous2_befo~4	1.102	0.058	1.860	0.064	0.995	1.222
						experience	1.104	0.056	1.970	0.049	1.000	1.219
						farmtoroad	0.982	0.006	-3.170	0.002	0.971	0.993
						coff07_hist	0.878	0.052	-2.200	0.028	0.781	0.986
	167	41.28	0.0000	0.2100	inv_dryabogr	treatment |	7.756	3.613	4.400	0.000	3.113	19.325
						experience	1.073	0.024	3.180	0.001	1.028	1.121
	167	31.51	0.0000	0.1894	inv_dryabogr (weighted)	treatment	6.875	3.183	4.160	0.000	2.774	17.037
						experience	1.075	0.026	2.990	0.003	1.025	1.127
	169	36.77	0.0000	0.1988	inv_storage	treatment |	5.805	2.625	3.890	0.000	2.393	14.082
						reli_other	7.968	8.608	1.920	0.055	0.959	66.212
						experience	1.095	0.036	2.730	0.006	1.026	1.168
	169	31.98	0.0000	0.2333	inv_storage (weighted)	treatment |	8.132	4.107	4.150	0.000	3.022	21.885
						vill_educ	2.198	1.014	1.710	0.088	0.890	5.429
						reli_other	10.842	10.318	2.500	0.012	1.679	70.015
						experience	1.076	0.037	2.150	0.031	1.007	1.151
						distr_other	0.365	0.187	-1.970	0.049	0.134	0.994
23	169	60.98	0.0000	0.3267	inv_comp (weighted)	hhcap	27.814	14.065	6.580	0.000	10.323	74.940
						vehicle_be~4	1.364	0.167	2.540	0.011	1.073	1.734
						hh6till18	1.440	0.247	2.130	0.034	1.029	2.015
						vill_educ	2.394	1.234	1.690	0.090	0.871	6.575
						vill_healt	0.258	0.146	-2.400	0.016	0.086	0.781
						distr_other	5.174	3.036	2.800	0.005	1.639	16.339
	162	17.74	0.0001	0.1884	inv_prunsaw (weighted)	inherit_farm	0.392	0.201	-1.830	0.068	0.143	1.071
						distr_huan~a	0.289	0.183	-1.960	0.050	0.083	1.000
						cultsize_4	1.305	0.132	2.640	0.008	1.071	1.590
						hh0till5	0.445	0.137	-2.630	0.009	0.243	0.814
	168	31.31	0.0001	0.1809	inv_prunsci (weighted)	hhcap	3.219	1.571	2.400	0.017	1.237	8.380
						cultsize_4	1.094	0.042	2.350	0.019	1.015	1.179
						vill_healt	0.386	0.196	-1.870	0.061	0.142	1.046
						hh0till5	0.562	0.163	-1.980	0.047	0.318	0.993
						experience	1.058	0.035	1.700	0.088	0.992	1.128
						altitudepl~s	0.998	0.001	-2.900	0.004	0.996	0.999
						coff07_hist	0.928	0.034	-2.040	0.042	0.864	0.997

Table Nr.	N	F / chi2	Prob > F / chi2	R2 / Pseudo R2	Outcome Indicator (=y)	Explanatory Variables (=x)	β / Odds Ratio	SE	t/z	P > [z/t]	95 % Confidence Interval	
23 (cont.)	168	16.72	0.0022	0.1110	inv_prunknife (weighted)	hhcap	4.151	2.338	2.530	0.011	1.376	12.517
						reli_other	3.727	2.362	2.080	0.038	1.076	12.909
						cultsize_4	1.106	0.042	2.640	0.008	1.026	1.192
						distr_huan~a	2.648	1.475	1.750	0.080	0.889	7.889
	168	11.51	0.0007	0.0257	inv_helm (weighted)	vehicle_be~4	1.054	0.016	3.390	0.001	1.023	1.087
	168	20.84	0.0003	0.1336	inv_masks (weighted)	hhcap	5.996	3.151	3.410	0.001	2.141	16.795
						inherit_farm	2.336	0.938	2.110	0.034	1.064	5.130
						experience	1.046	0.025	1.890	0.058	0.998	1.096
						hheduc	0.805	0.088	-1.990	0.047	0.651	0.997
	168	11.15	0.0109	0.0743	inv_glove (weighted)	hhcap	3.269	1.939	2.000	0.046	1.022	10.452
						inher_house	2.547	1.409	1.690	0.091	0.861	7.533
						experience	1.049	0.022	2.280	0.022	1.007	1.092
	168	18.00	0.0030	0.1854	inv_poncho (weighted)	hhcap	20.878	23.936	2.650	0.008	2.207	197.499
						inher_house	3.620	2.557	1.820	0.069	0.907	14.457
						hheduc	0.717	0.095	-2.510	0.012	0.553	0.929
						vehicle_be~4	1.141	0.088	1.720	0.086	0.982	1.326
						vill_healt	0.235	0.169	-2.010	0.044	0.057	0.963
	169	29.07	0.0001	0.3815	inv_wastw (weighted)	hhcap	133.616	155.280	4.210	0.000	13.698	1303.38
						hous2_befo~4	1.084	0.043	2.050	0.040	1.004	1.172
						hh6till18	1.381	0.212	2.100	0.036	1.022	1.865
						vill_healt	0.200	0.099	-3.250	0.001	0.076	0.527
						altitudepl~s	1.002	0.001	2.320	0.021	1.000	1.005
						distr_other	3.852	2.133	2.440	0.015	1.301	11.405
	167	18.02	0.0004	0.1079	inv_caldep (weighted)	hhcap	2.868	1.118	2.700	0.007	1.337	6.156
						coff07_hist	1.053	0.033	1.660	0.096	0.991	1.119
						vill_educ	3.212	1.413	2.650	0.008	1.356	7.608
	169	22.69	0.0009	0.1787	inv_ferttan (weighted)	hhcap	6.269	2.941	3.910	0.000	2.500	15.721
						hhage	0.959	0.019	-2.130	0.033	0.922	0.997
						hh6till18	0.786	0.111	-1.710	0.087	0.596	1.036
						hheduc	0.779	0.083	-2.350	0.019	0.633	0.959
						coff07_hist	0.915	0.047	-1.740	0.083	0.828	1.012
						experience	1.130	0.057	2.440	0.015	1.024	1.247

Table Nr.	N	F / chi2	Prob > F / chi2	R2 / Pseudo R2	Outcome Indicator (=y)	Explanatory Variables (=x)	β / Odds Ratio	SE	t/z	P > [z/t]	95 % Confidence Interval	
23 (cont.)	169	21.30	0.0003	0.1584	inv_certtan (weighted)	hhcap	4.143	1.869	3.150	0.002	1.711	10.032
						villagetop~i	1.008	0.004	2.070	0.038	1.000	1.016
						farmtoroad	0.982	0.006	-3.110	0.002	0.971	0.993
						hous2_befo~4	1.083	0.050	1.720	0.086	0.989	1.185
	169	28.86	0.0000	0.2203	inv_storage (weighted)	hhcap	6.290	2.856	4.050	0.000	2.583	15.313
						experience	1.086	0.039	2.280	0.023	1.012	1.166
						incother	0.426	0.193	-1.880	0.060	0.175	1.037
						reli_other	10.334	11.469	2.100	0.035	1.174	90.981
27	168	117.87	0.0000	0.5113	cert	treatment	108.529	72.611	7.010	0.000	29.245	402.753
						altitudepl~s	0.998	0.001	-1.710	0.087	0.996	1.000
						coff07_hist	0.907	0.048	-1.860	0.063	0.818	1.005
						experience	1.100	0.046	2.290	0.022	1.014	1.194
						vehicle_be~4	1.368	0.255	1.680	0.092	0.950	1.970
						distr_junin	3.189	1.705	2.170	0.030	1.118	9.096
	168	48.46	0.0000	0.5060	cert (weighted)	treatment	108.529	72.611	7.010	0.000	29.245	402.753
						altitudepl~s	0.998	0.001	-1.710	0.087	0.996	1.000
						coff07_hist	0.907	0.048	-1.860	0.063	0.818	1.005
						experience	1.100	0.046	2.290	0.022	1.014	1.194
						vehicle_be~4	1.368	0.255	1.680	0.092	0.950	1.970
						distr_junin	3.189	1.705	2.170	0.030	1.118	9.096
	168	91.64	0.0000	0.4343	cert_utz	treatment	90.945	73.111	5.610	0.000	18.814	439.609
						hhage	0.946	0.027	-1.980	0.048	0.895	0.999
						experience	1.093	0.038	2.540	0.011	1.020	1.170
						villagetop~i	0.996	0.002	-1.750	0.081	0.992	1.000
						coff07_hist	0.893	0.043	-2.350	0.019	0.812	0.981
	168	22.52	0.0127	0.4790	cert_utz (weighted)	treatment	201.523	271.290	3.940	0.000	14.403	2819.74
						hhage	0.926	0.031	-2.270	0.023	0.866	0.989
						vehicle_be~4	1.498	0.282	2.150	0.032	1.036	2.165
						vill_healt	4.373	3.398	1.900	0.058	0.954	20.053
						distr_huan~a	3.779	2.847	1.760	0.078	0.863	16.544
						distr_junin	3.009	1.841	1.800	0.072	0.907	9.981
						villagetop~i	0.995	0.003	-1.900	0.058	0.990	1.000
						experience	1.102	0.048	2.210	0.027	1.011	1.200
						coff07_hist	0.907	0.054	-1.660	0.097	0.807	1.018
						vill_educ	0.200	0.123	-2.620	0.009	0.060	0.667

Table Nr.	N	F / chi2	Prob > F / chi2	R2 / Pseudo R2	Outcome Indicator (=y)	Explanatory Variables (=x)	β / Odds Ratio	SE	t/z	P > [z/t]	95 % Confidence Interval	
27 (cont.)	168	78.19	0.0000	0.4047	cert_flo	treatment	64.661	54.069	4.990	0.000	12.557	332.969
						experience	1.131	0.046	3.060	0.002	1.045	1.224
						vill_healt	3.870	2.783	1.880	0.060	0.945	15.840
						coff07_hist	0.922	0.045	-1.660	0.097	0.838	1.015
						distr_huan~a	8.561	6.756	2.720	0.007	1.823	40.206
						distr_junin	4.930	2.742	2.870	0.004	1.657	14.665
	168	31.12	0.0000	0.3812	cert_flo (weighted)	treatment	54.490	50.141	4.340	0.000	8.975	330.815
						vehicle_be~4	1.267	0.104	2.880	0.004	1.079	1.488
						vill_healt	3.715	2.483	1.960	0.050	1.002	13.771
						experience	1.069	0.030	2.340	0.019	1.011	1.130
						distr_huan~a	9.246	6.623	3.110	0.002	2.271	37.641
						distr_junin	5.146	2.692	3.130	0.002	1.846	14.345
	167	91.13	0.0000	0.4306	cert_org	treatment	61.790	45.442	5.610	0.000	14.619	261.167
						hhage	1.044	0.022	2.040	0.041	1.002	1.089
						experience	1.079	0.031	2.670	0.008	1.020	1.142
						vill_healt	3.626	2.375	1.970	0.049	1.005	13.091
						distr_huan~a	4.050	3.058	1.850	0.064	0.922	17.789
						distr_junin	6.328	3.448	3.390	0.001	2.175	18.410
						vehicle_be~4	1.480	0.277	2.100	0.036	1.026	2.136
	167	31.49	0.0001	0.4318	cert_org (weighted)	treatment	73.677	62.918	5.030	0.000	13.817	392.854
						hhage	1.054	0.022	2.570	0.010	1.013	1.098
						vehicle_be~4	1.527	0.251	2.580	0.010	1.107	2.106
						experience	1.083	0.031	2.830	0.005	1.025	1.145
						distr_huan~a	4.271	3.095	2.000	0.045	1.032	17.675
						distr_junin	7.171	3.975	3.550	0.000	2.420	21.255
						vill_healt	3.982	2.448	2.250	0.025	1.193	13.289
	168	24.71	0.0000	0.4794	cert_num	treatment	1.864	0.190	9.810	0.000	1.488	2.239
						vill_healt	0.463	0.249	1.860	0.065	-0.029	0.956
						hh6till18	0.156	0.064	2.430	0.016	0.029	0.283
						coff07_hist	-0.041	0.019	-2.170	0.032	-0.078	-0.004
						experience	0.057	0.015	3.900	0.000	0.028	0.086
						distr_junin	0.435	0.185	2.360	0.020	0.070	0.799
						_cons	-0.598	0.240	-2.500	0.014	-1.071	-0.125

Table Nr.	N	F / chi2	Prob > F / chi2	R2 / Pseudo R2	Outcome Indicator (=y)	Explanatory Variables (=x)	β / Odds Ratio	SE	t/z	P > [z/t]	95 % Confidence Interval	
27 (cont.)	168	24.79	0.0000	0.4673	cert_num (weighted)	treatment	1.860	0.184	10.100	0.000	1.496	2.224
						vehicle_be~4	0.018	0.007	2.360	0.019	0.003	0.032
						hh6till18	0.135	0.068	1.980	0.050	0.000	0.270
						coff07_hist	-0.046	0.021	-2.190	0.030	-0.088	-0.004
						experience	0.059	0.016	3.680	0.000	0.027	0.090
						distr_junin	0.510	0.197	2.580	0.011	0.120	0.900
						vill_healt	0.500	0.253	1.980	0.050	0.001	0.998
						_cons	-0.580	0.219	-2.660	0.009	-1.012	-0.149
28	168	54.99	0.0000	0.4823	cert (weighted)	hhcoop	114.012	74.572	7.240	0.000	31.637	410.862
						incother	0.434	0.219	-1.650	0.099	0.161	1.169
						vill_healt	0.267	0.150	-2.360	0.018	0.089	0.801
						farmtoroad	1.010	0.004	2.930	0.003	1.003	1.017
	168	30.80	0.0000	0.4670	cert_utz (weighted)	hhcoop	154.700	166.568	4.680	0.000	18.750	1276.41
						hhage	0.959	0.023	-1.750	0.080	0.916	1.005
						hh6till18	1.560	0.321	2.160	0.031	1.042	2.337
						incother	0.235	0.116	-2.950	0.003	0.090	0.616
						vill_educ	0.220	0.117	-2.840	0.005	0.077	0.625
						inherit_farm	2.641	1.257	2.040	0.041	1.039	6.711
	168	47.06	0.0000	0.3532	cert_flo (weighted)	hhcoop	27.434	15.657	5.800	0.000	8.964	83.961
						villagetop~i	1.006	0.003	2.090	0.037	1.000	1.011
						hh6till18	1.430	0.234	2.190	0.029	1.038	1.970
						incother	0.408	0.193	-1.890	0.059	0.161	1.033
						distr_huan~a	6.023	4.454	2.430	0.015	1.414	25.660
						distr_junin	3.772	2.012	2.490	0.013	1.326	10.729
						experience	1.052	0.028	1.940	0.053	0.999	1.107
						hous2_befo~4	1.073	0.044	1.740	0.081	0.991	1.162
	167	36.44	0.0000	0.4108	cert_org (weighted)	hhcoop	52.553	42.834	4.860	0.000	10.637	259.642
						hhage	1.031	0.018	1.680	0.093	0.995	1.067
						hh6till18	1.633	0.291	2.760	0.006	1.152	2.315
						farmtoroad	1.010	0.004	2.780	0.005	1.003	1.018
						reli_other	0.184	0.132	-2.360	0.018	0.045	0.750
						distr_junin	4.268	1.979	3.130	0.002	1.720	10.591
						experience	1.077	0.030	2.660	0.008	1.020	1.137

Table Nr.	N	F / chi2	Prob > F / chi2	R2 / Pseudo R2	Outcome Indicator (=y)	Explanatory Variables (=x)	β / Odds Ratio	SE	t/z	P > [z/t]	95 % Confidence Interval	
28 (cont.)	168	25.13	0.0000	0.4721	cert_num (weighted)	hhcoop	1.780	0.177	10.060	0.000	1.431	2.130
						villagetop~i	0.002	0.001	1.670	0.097	0.000	0.004
						hh6till18	0.204	0.068	2.990	0.003	0.069	0.339
						vehicle_be~4	0.011	0.006	2.010	0.047	0.000	0.023
						incother	-0.485	0.197	-2.460	0.015	-0.875	-0.095
						distr_junin	0.426	0.217	1.970	0.051	-0.001	0.854
						inherit_farm	0.434	0.236	1.840	0.068	-0.033	0.900
						experience	0.035	0.012	3.010	0.003	0.012	0.058
						reli_other	-0.588	0.217	-2.710	0.007	-1.017	-0.160
						_cons	-0.876	0.254	-3.450	0.001	-1.378	-0.374
32	169	46.95	0.0000	0.2201	se_probfield	treatment	12.212	5.710	5.350	0.000	4.884	30.533
						hh6till18	0.749	0.105	-2.070	0.039	0.569	0.985
						hheduc	1.246	0.154	1.770	0.077	0.977	1.588
						experience	0.953	0.023	-1.990	0.047	0.910	0.999
	169	40.85	0.0000	0.2421	se_probfield (weighted)	treatment	14.173	6.441	5.830	0.000	5.816	34.540
						hh6till18	0.747	0.109	-2.010	0.045	0.562	0.993
						experience	0.948	0.024	-2.130	0.034	0.903	0.996
						hheduc	1.248	0.160	1.720	0.085	0.970	1.605
	168	41.72	0.0000	0.2095	se_givopin	treatment	11.275	5.219	5.230	0.000	4.551	27.935
						distr_huan~a	4.339	2.956	2.150	0.031	1.142	16.490
						villagetop~i	0.995	0.002	-2.180	0.029	0.991	1.000
	168	26.68	0.0000	0.2273	se_givopin (weighted)	treatment	12.630	6.220	5.150	0.000	4.811	33.157
						villagetop~i	0.995	0.002	-2.540	0.011	0.992	0.999
						distr_huan~a	3.688	2.903	1.660	0.097	0.788	17.252
	169	32.66	0.0000	0.1723	se_partcom	treatment	8.975	4.305	4.570	0.000	3.505	22.981
						farmtoroad	0.990	0.004	-2.860	0.004	0.983	0.997
	169	19.49	0.0001	0.1779	se_partcom (weighted)	treatment	8.744	4.479	4.230	0.000	3.204	23.863
						farmtoroad	0.990	0.003	-3.260	0.001	0.984	0.996
33	169	20.77	0.0001	0.1173	se_probfield (weighted)	hhcoop	3.268	1.161	3.330	0.001	1.628	6.557
						incother	0.406	0.145	-2.520	0.012	0.201	0.819
						hheduc	1.365	0.217	1.960	0.050	1.000	1.864

Table Nr.	N	F / chi2	Prob > F / chi2	R2 / Pseudo R2	Outcome Indicator (=y)	Explanatory Variables (=x)	β / Odds Ratio	SE	t/z	P > [z/t]	95 % Confidence Interval	
33 (cont.)	169	27.39	0.0000	0.1461	se_probfield (weighted)	hhcap	9.142	4.323	4.680	0.000	3.619	23.096
						incother	0.516	0.190	-1.800	0.073	0.250	1.063
						experience	0.930	0.023	-2.870	0.004	0.886	0.977
						hous2_befo~4	1.052	0.029	1.830	0.068	0.996	1.112
						vill_healt	0.341	0.176	-2.090	0.037	0.124	0.936
	168	13.65	0.0011	0.0680	se_givopin (weighted)	hhcoop	3.066	1.120	3.070	0.002	1.498	6.273
						incother	0.497	0.184	-1.890	0.059	0.241	1.027
	168	23.61	0.0001	0.1408	se_givopin (weighted)	hhcap	8.278	3.716	4.710	0.000	3.434	19.955
						distr_huan~a	4.696	3.968	1.830	0.067	0.897	24.600
						hh0till5	1.852	0.521	2.190	0.029	1.066	3.215
						villagetop~i	0.997	0.002	-1.810	0.070	0.993	1.000
	169	14.60	0.0056	0.1118	se_partcom (weighted)	hhcoop	2.743	1.085	2.550	0.011	1.263	5.956
						altitudepl~s	1.002	0.001	1.910	0.056	1.000	1.003
						farmtoroad	0.987	0.005	-2.590	0.010	0.977	0.997
						villagetop~i	1.005	0.003	1.820	0.069	1.000	1.010
	169	22.80	0.0000	0.1614	se_partcom (weighted)	hhcap	4.817	2.006	3.780	0.000	2.130	10.895
						vill_educ	0.467	0.202	-1.760	0.079	0.200	1.091
						altitudepl~s	1.002	0.001	1.770	0.077	1.000	1.003
						farmtoroad	0.983	0.006	-3.010	0.003	0.971	0.994
						villagetop~i	1.006	0.003	1.900	0.057	1.000	1.012
37	167	4.34	0.0006	0.0740	yield	hous2_befo~4	-7.161	3.879	-1.850	0.067	-14.819	0.498
						farmtoroad	-1.150	0.463	-2.490	0.014	-2.064	-0.237
						hh6till18	-31.346	17.361	-1.810	0.073	-65.628	2.937
						_cons	538.006	42.321	12.710	0.000	454.439	621.574
	167	6.56	0.0001	0.1067	yield (weighted)	farmtoroad	-1.303	0.275	-4.750	0.000	-1.845	-0.761
						altitudepl~s	0.179	0.094	1.900	0.059	-0.007	0.366
						hh6till18	-36.167	18.740	-1.930	0.055	-73.172	0.839
						hous2_befo~4	-7.604	3.553	-2.140	0.034	-14.620	-0.587
						_cons	343.854	106.468	3.230	0.002	133.610	554.098

Table Nr.	N	F / chi2	Prob > F / chi2	R2 / Pseudo R2	Outcome Indicator (=y)	Explanatory Variables (=x)	β / Odds Ratio	SE	t/z	P > [z/t]	95 % Confidence Interval	
38 & 39	132	5.74	0.0001	0.1840	yield (weighted)	pr_matorg	134.854	62.522	2.160	0.033	11.125	258.584
						coff07_hist	-12.111	4.019	-3.010	0.003	-20.065	-4.157
						farmtoroad	-1.934	0.388	-4.990	0.000	-2.702	-1.167
						pr_prun	181.557	102.298	1.770	0.078	-20.888	384.002
						altitudepl~s	0.264	0.100	2.640	0.009	0.066	0.463
						_cons	80.371	157.998	0.510	0.612	-232.30	393.045
43	166	4.33	0.0000	0.2184	cost07_kg	hous2_befo~4	0.068	0.039	1.750	0.082	-0.009	0.145
						hh6till18	0.345	0.161	2.140	0.034	0.027	0.663
						hh0till5	-0.664	0.329	-2.020	0.045	-1.315	-0.014
						experience	-0.072	0.029	-2.460	0.015	-0.129	-0.014
						distr_huan~a	-2.706	0.821	-3.300	0.001	-4.328	-1.084
						distr_junin	-1.158	0.583	-1.990	0.049	-2.309	-0.007
						distr_other	-1.409	0.761	-1.850	0.066	-2.912	0.094
						reli_evang~t	-1.167	0.466	-2.500	0.013	-2.088	-0.246
						altitudepl~s	-0.002	0.001	-2.290	0.023	-0.004	0.000
						farmtoroad	0.015	0.004	3.510	0.001	0.006	0.023
						_cons	7.015	1.416	4.950	0.000	4.217	9.813
	166	1.88	0.0525	0.2258	cost07_kg (weighted)	experience	-0.075	0.030	-2.480	0.014	-0.135	-0.015
						hh6till18	0.344	0.172	2.000	0.047	0.004	0.684
						hh0till5	-0.731	0.314	-2.330	0.021	-1.351	-0.111
						hous2_befo~4	0.075	0.041	1.830	0.069	-0.006	0.157
						distr_huan~a	-2.713	0.970	-2.800	0.006	-4.630	-0.796
						distr_junin	-1.299	0.764	-1.700	0.091	-2.808	0.210
						distr_other	-1.450	0.801	-1.810	0.072	-3.032	0.133
						reli_evang~t	-1.127	0.449	-2.510	0.013	-2.015	-0.240
						altitudepl~s	-0.002	0.001	-1.710	0.088	-0.004	0.000
						farmtoroad	0.015	0.007	2.080	0.040	0.001	0.029
						_cons	7.070	1.619	4.370	0.000	3.871	10.269
	156	3.73	0.0033	0.1105	time07_kg	treatment	0.017	0.008	2.180	0.031	0.002	0.032
						altitudepl~s	0.000	0.000	-1.950	0.053	0.000	0.000
						cultsize_4	-0.002	0.001	-2.450	0.015	-0.003	0.000
						experience	0.001	0.000	1.900	0.059	0.000	0.002
						villagetop~i	0.000	0.000	1.710	0.089	0.000	0.000
						_cons	0.050	0.019	2.590	0.010	0.012	0.089

Table Nr.	N	F / chi2	Prob > F / chi2	R2 / Pseudo R2	Outcome Indicator (=y)	Explanatory Variables (=x)	β / Odds Ratio	SE	t/z	P > [z/t]	95 % Confidence Interval	
43 (cont.)	156	35.92	0.0000	0.1234	time07_kg (weighted)	treatment	0.017	0.008	2.230	0.028	0.002	0.033
						vehicle_be~4	0.001	0.000	6.630	0.000	0.001	0.001
						experience	0.001	0.000	1.810	0.073	0.000	0.002
						reli_other	-0.016	0.008	-1.980	0.050	-0.031	0.000
						cultsize_4	-0.002	0.001	-2.520	0.013	-0.004	-0.001
						altitudepl~s	0.000	0.000	-2.000	0.047	0.000	0.000
						_cons	0.065	0.020	3.280	0.001	0.026	0.104
	166	6.12	0.0144	0.0360	cost07_hec	coff07_hist	-32.859	13.285	-2.470	0.014	-59.091	-6.627
						_cons	1489.54	171.934	8.660	0.000	1150.05	1829.03
	166	8.21	0.0047	0.0441	cost07_hec (weighted)	coff07_hist	-36.286	12.662	-2.870	0.005	-61.288	-11.283
						_cons	1559.65	205.522	7.590	0.000	1153.84	1965.46
	156	4.88	0.0029	0.0879	time07_hec	vehicle_be~4	0.300	0.167	1.800	0.074	-0.029	0.630
						cultsize_4	-0.586	0.215	-2.720	0.007	-1.011	-0.161
						distr_other	6.724	2.989	2.250	0.026	0.819	12.629
						_cons	12.983	1.744	7.450	0.000	9.538	16.428
	156	131.56	0.0000	0.0633	time07_hec (weighted)	cultsize_4	-0.673	0.227	-2.970	0.003	-1.121	-0.226
						vehicle_be~4	0.292	0.021	13.620	0.000	0.250	0.334
						_cons	14.674	2.458	5.970	0.000	9.817	19.530
44	131	2.42	0.0232	0.2295	cost07_kg (weighted)	pr_matorg	-1.124	0.594	-1.890	0.061	-2.300	0.051
						hh0till5	-1.097	0.382	-2.870	0.005	-1.853	-0.341
						hheduc	-0.317	0.155	-2.050	0.042	-0.624	-0.011
						distr_huan~a	-1.468	0.698	-2.100	0.038	-2.850	-0.086
						farmtoroad	0.020	0.008	2.620	0.010	0.005	0.035
						reli_evang~t	-1.857	0.632	-2.940	0.004	-3.109	-0.605
						incother	1.151	0.591	1.950	0.053	-0.018	2.320
						_cons	5.227	1.309	3.990	0.000	2.635	7.819
	122	50.02	0.0000	0.1700	time07_kg (weighted)	pr_matorg	0.017	0.010	1.770	0.079	-0.002	0.036
						vehicle_be~4	0.001	0.000	6.010	0.000	0.001	0.001
						reli_other	-0.028	0.010	-2.660	0.009	-0.048	-0.007
						coff07_hist	0.002	0.001	2.290	0.024	0.000	0.004
						altitudepl~s	0.000	0.000	-2.250	0.026	0.000	0.000
						villagetop~i	0.000	0.000	1.680	0.096	0.000	0.000
						cultsize_4	-0.003	0.001	-2.400	0.018	-0.006	-0.001
						_cons	0.055	0.021	2.550	0.012	0.012	0.097

Table Nr.	N	F / chi2	Prob > F / chi2	R2 / Pseudo R2	Outcome Indicator (=y)	Explanatory Variables (=x)	β / Odds Ratio	SE	t/z	P > [z/t]	95 % Confidence Interval	
44 (cont.)	131	4.44	0.0053	0.1033	cost07_hec (weighted)	reli_evang~t	-411.45	210.345	-1.960	0.053	-827.68	4.788
						coff07_hist	-58.090	16.760	-3.470	0.001	-91.254	-24.925
						hh0till5	-248.89	127.052	-1.960	0.052	-500.30	2.523
						_cons	2177.78	337.995	6.440	0.000	1508.95	2846.61
	122	15.62	0.0000	0.1837	time07_hec (weighted)	pr_matorg	5.285	2.949	1.790	0.076	-0.558	11.128
						pr_shade	4.049	2.169	1.870	0.064	-0.248	8.347
						pr_chem	6.653	3.649	1.820	0.071	-0.578	13.883
						cultsize_4	-0.913	0.308	-2.970	0.004	-1.522	-0.303
						pr_orgpest	-5.422	2.786	-1.950	0.054	-10.942	0.098
						vehicle_be~4	0.230	0.030	7.530	0.000	0.169	0.290
						distr_huan~a	-5.253	2.752	-1.910	0.059	-10.705	0.199
						pr_prunman	4.337	1.726	2.510	0.013	0.917	7.757
						reli_other	-7.378	3.368	-2.190	0.031	-14.051	-0.705
						_cons	8.913	2.521	3.540	0.001	3.918	13.907
48	48	2.94	0.0630	0.1156	price06_cert	distr_huan~a	-0.427	0.247	-1.730	0.090	-0.924	0.069
						vill_healt	-0.577	0.291	-1.980	0.053	-1.163	0.009
						_cons	5.494	0.114	48.130	0.000	5.264	5.724
	48	3.95	0.0033	0.2412	price06_cert (weighted)	vill_educ	0.469	0.215	2.180	0.035	0.034	0.903
						villagetop~i	0.002	0.001	1.720	0.093	0.000	0.004
						vill_healt	-1.010	0.348	-2.900	0.006	-1.713	-0.306
						vehicle_be~4	0.006	0.002	2.610	0.013	0.001	0.010
						distr_huan~a	-0.878	0.305	-2.880	0.006	-1.494	-0.262
						experience	-0.021	0.008	-2.640	0.012	-0.037	-0.005
						_cons	5.517	0.265	20.790	0.000	4.982	6.053
	65	8.38	0.0000	0.4154	price07_cert	treatment	0.745	0.152	4.920	0.000	0.442	1.049
						hous2_befo~4	0.014	0.007	2.070	0.043	0.000	0.028
						hh6till18	0.060	0.032	1.880	0.065	-0.004	0.124
						villagetop~i	0.001	0.001	1.920	0.060	0.000	0.002
						farmtoroad	-0.002	0.001	-2.110	0.039	-0.004	0.000
						_cons	5.204	0.163	32.020	0.000	4.879	5.529

Table Nr.	N	F / chi2	Prob > F / chi2	R2 / Pseudo R2	Outcome Indicator (=y)	Explanatory Variables (=x)	β / Odds Ratio	SE	t/z	P > [z/t]	95 % Confidence Interval	
48 (cont.)	65	9.18	0.0000	0.4170	price07_cert (weighted)	treatment	0.722	0.237	3.050	0.003	0.247	1.196
						hous2_befo~4	0.014	0.005	2.670	0.010	0.003	0.024
						hh6till18	0.060	0.035	1.720	0.091	-0.010	0.130
						villagetop~i	0.001	0.000	2.820	0.006	0.000	0.002
						farmtoroad	-0.002	0.000	-3.830	0.000	-0.003	-0.001
						vehicle_be~4	0.006	0.001	4.690	0.000	0.003	0.008
						_cons	5.222	0.241	21.680	0.000	4.740	5.704
	115	5.17	0.0003	0.1917	price06_inte	treatment	0.408	0.117	3.500	0.001	0.177	0.639
						farmtoroad	-0.002	0.001	-1.990	0.049	-0.004	0.000
						hheduc	0.066	0.035	1.880	0.062	-0.003	0.135
						vehicle_be~4	0.055	0.033	1.670	0.097	-0.010	0.120
						cultsize_4	-0.033	0.012	-2.770	0.007	-0.056	-0.009
						_cons	4.465	0.164	27.190	0.000	4.139	4.790
	115	6.79	0.0000	0.1824	price06_inte (weighted)	treatment	0.413	0.118	3.510	0.001	0.180	0.646
						hheduc	0.073	0.027	2.660	0.009	0.019	0.128
						vill_healt	0.276	0.140	1.970	0.051	-0.001	0.553
						cultsize_4	-0.032	0.012	-2.730	0.007	-0.055	-0.009
						vehicle_be~4	0.061	0.022	2.750	0.007	0.017	0.105
						_cons	4.327	0.148	29.310	0.000	4.035	4.620
	141	6.27	0.0000	0.2191	price07_inte	treatment	0.541	0.116	4.670	0.000	0.312	0.771
						reli_evang~t	-0.195	0.114	-1.720	0.088	-0.420	0.030
						hheduc	-0.071	0.033	-2.150	0.033	-0.136	-0.006
						farmtoroad	-0.003	0.001	-2.320	0.022	-0.005	0.000
						vill_healt	-0.329	0.150	-2.190	0.030	-0.625	-0.032
						experience	-0.020	0.007	-2.940	0.004	-0.034	-0.007
						_cons	5.618	0.180	31.170	0.000	5.261	5.974
	141	7.31	0.0000	0.1619	price07_inte (weighted)	treatment	0.570	0.131	4.360	0.000	0.311	0.829
						distr_other	-0.245	0.122	-2.020	0.046	-0.486	-0.005
						farmtoroad	-0.002	0.001	-1.790	0.076	-0.005	0.000
						experience	-0.017	0.005	-3.150	0.002	-0.028	-0.006
						_cons	5.189	0.125	41.460	0.000	4.942	5.437

Table Nr.	N	F / chi2	Prob > F / chi2	R2 / Pseudo R2	Outcome Indicator (=y)	Explanatory Variables (=x)	β / Odds Ratio	SE	t/z	P > [z/t]	95 % Confidence Interval	
48 (cont.)	128	9.43	0.0000	0.1857	price06	treatment	0.538	0.115	4.680	0.000	0.310	0.766
						farmtoroad	-0.002	0.001	-2.160	0.033	-0.004	0.000
						cultsize_4	-0.024	0.011	-2.090	0.039	-0.046	-0.001
						_cons	4.688	0.117	40.170	0.000	4.457	4.919
	128	9.92	0.0000	0.2100	price06 (weighted)	treatment	0.520	0.120	4.340	0.000	0.283	0.758
						hheduc	0.051	0.031	1.680	0.096	-0.009	0.112
						cultsize_4	-0.030	0.012	-2.550	0.012	-0.053	-0.007
						farmtoroad	-0.002	0.001	-1.760	0.081	-0.005	0.000
						vehicle_be~4	0.011	0.003	3.490	0.001	0.005	0.017
						_cons	4.550	0.152	29.970	0.000	4.250	4.851
	164	24.78	0.0000	0.3173	price07	treatment	0.708	0.087	8.130	0.000	0.536	0.880
						hhage	-0.008	0.004	-2.180	0.031	-0.016	-0.001
						inher_house	-0.293	0.132	-2.220	0.028	-0.553	-0.033
						_cons	5.317	0.119	44.710	0.000	5.082	5.552
	164	21.11	0.0000	0.3129	price07 (weighted)	treatment	0.696	0.092	7.550	0.000	0.514	0.878
						hhage	-0.009	0.004	-2.370	0.019	-0.016	-0.001
						vehicle_be~4	0.006	0.003	2.370	0.019	0.001	0.012
						inher_house	-0.286	0.141	-2.030	0.044	-0.564	-0.008
						_cons	5.341	0.127	41.980	0.000	5.090	5.592
49	128	11.03	0.0000	0.3124	price06 (weighted)	floorg06	0.849	0.151	5.610	0.000	0.549	1.149
						utz06	0.582	0.137	4.260	0.000	0.312	0.853
						farmtoroad	-0.002	0.001	-1.720	0.088	-0.004	0.000
						cultsize_4	-0.029	0.011	-2.740	0.007	-0.050	-0.008
						hheduc	0.058	0.026	2.270	0.025	0.008	0.109
						vehicle_be~4	0.010	0.003	3.170	0.002	0.004	0.016
						_cons	4.540	0.138	32.790	0.000	4.266	4.814
	164	34.34	0.0000	0.4217	price07 (weighted)	floorg07	0.919	0.088	10.440	0.000	0.745	1.093
						utz07	0.767	0.113	6.780	0.000	0.544	0.990
						hhage	-0.011	0.004	-2.990	0.003	-0.018	-0.004
						farmtoroad	-0.001	0.001	-1.730	0.085	-0.003	0.000
						_cons	5.421	0.117	46.260	0.000	5.189	5.652

Table Nr.	N	F / chi2	Prob > F / chi2	R2 / Pseudo R2	Outcome Indicator (=y)	Explanatory Variables (=x)	β / Odds Ratio	SE	t/z	P > [z/t]	95 % Confidence Interval	
50	115	6.90	0.0000	0.2055	price06_inte (weighted)	cert	0.440	0.117	3.740	0.000	0.207	0.672
						hhage	-0.010	0.005	-2.000	0.048	-0.020	0.000
						cultsize_4	-0.027	0.011	-2.440	0.016	-0.049	-0.005
						vill_healt	0.285	0.140	2.040	0.044	0.008	0.562
						vehicle_be~4	0.054	0.024	2.260	0.026	0.007	0.102
						hheduc	0.077	0.026	3.000	0.003	0.026	0.128
						_cons	4.576	0.197	23.180	0.000	4.185	4.968
	134	8.52	0.0000	0.1980	price07_inte (weighted)	cert	0.635	0.127	5.000	0.000	0.384	0.887
						villagetop~i	0.002	0.001	1.850	0.067	0.000	0.003
						experience	-0.014	0.006	-2.470	0.015	-0.026	-0.003
						farmtoroad	-0.003	0.001	-2.480	0.014	-0.006	-0.001
						_cons	4.943	0.220	22.440	0.000	4.507	5.378
51	128	8.46	0.0000	0.1238	price06 (weighted)	hhcoop	0.376	0.128	2.950	0.004	0.124	0.629
						vehicle_be~4	0.013	0.003	4.040	0.000	0.007	0.019
						hheduc	0.061	0.031	1.970	0.051	0.000	0.122
						cultsize_4	-0.031	0.012	-2.510	0.013	-0.055	-0.006
						_cons	4.537	0.163	27.770	0.000	4.214	4.861
	164	20.32	0.0000	0.2416	price07 (weighted)	hhcoop	0.625	0.096	6.500	0.000	0.435	0.815
						hhage	-0.011	0.004	-3.140	0.002	-0.018	-0.004
						vehicle_be~4	0.007	0.002	2.840	0.005	0.002	0.012
						_cons	5.395	0.113	47.690	0.000	5.172	5.619
	115	5.31	0.0002	0.1465	price06_inte (weighted)	hhcoop	0.236	0.122	1.930	0.056	-0.006	0.479
						altitudepl~s	0.001	0.000	1.870	0.065	0.000	0.001
						cultsize_4	-0.030	0.013	-2.360	0.020	-0.055	-0.005
						hheduc	0.078	0.028	2.790	0.006	0.023	0.134
						vehicle_be~4	0.056	0.025	2.200	0.030	0.006	0.106
						_cons	3.840	0.366	10.490	0.000	3.115	4.566
	141	5.88	0.0008	0.1706	price07_inte (weighted)	hhcoop	0.539	0.142	3.800	0.000	0.259	0.820
						experience	-0.015	0.005	-3.030	0.003	-0.025	-0.005
						vill_healt	-0.476	0.286	-1.670	0.098	-1.041	0.089
						_cons	5.174	0.078	66.290	0.000	5.019	5.328
55	144	62.70	0.0000	0.3329	mc06_cer	treatment	45.762	30.621	5.710	0.000	12.329	169.854
						altitudepl~s	0.998	0.001	-1.790	0.074	0.996	1.000

Table Nr.	N	F / chi2	Prob > F / chi2	R2 / Pseudo R2	Outcome Indicator (=y)	Explanatory Variables (=x)	β / Odds Ratio	SE	t/z	P > [z/t]	95 % Confidence Interval	
55 (cont.)	144	25.39	0.0000	0.3413	mc06_cer (weighted)	treatment	66.210	56.501	4.910	0.000	12.432	352.623
						vehicle_be~4	1.181	0.089	2.190	0.029	1.018	1.370
						altitudepl~s	0.998	0.001	-1.950	0.051	0.997	1.000
						reli_other	6.152	5.495	2.030	0.042	1.068	35.426
	167	91.99	0.0000	0.4121	mc07_cer	treatment	48.010	28.247	6.580	0.000	15.154	152.102
						reli_evang~t	0.334	0.159	-2.300	0.021	0.131	0.849
						vehicle_be~4	1.419	0.266	1.870	0.061	0.983	2.049
						hh0till5	0.502	0.169	-2.050	0.041	0.260	0.971
						incother	2.257	1.082	1.700	0.090	0.882	5.774
	167	54.29	0.0000	0.3832	mc07_cer (weighted)	treatment	36.532	18.679	7.040	0.000	13.411	99.515
						reli_evang~t	0.353	0.160	-2.300	0.021	0.145	0.856
						vehicle_be~4	1.471	0.261	2.170	0.030	1.039	2.083
						hh0till5	0.513	0.178	-1.920	0.054	0.260	1.013
	144	62.25	0.0000	0.3746	mc06_cerinte	treatment	159.995	181.413	4.480	0.000	17.336	1476.58
						reli_other	17.486	21.460	2.330	0.020	1.578	193.790
						hous2_befo~4	1.079	0.041	2.020	0.043	1.002	1.162
						vill_educ	0.367	0.201	-1.830	0.067	0.126	1.073
						experience	0.939	0.028	-2.090	0.036	0.886	0.996
						incother	3.355	1.764	2.300	0.021	1.197	9.404
						inherit_farm	0.376	0.210	-1.750	0.080	0.126	1.123
	144	25.62	0.0006	0.3632	mc06_cerinte (weighted)	treatment	160.896	196.610	4.160	0.000	14.669	1764.77
						reli_other	22.033	25.718	2.650	0.008	2.236	217.083
						inherit_farm	0.386	0.193	-1.900	0.058	0.145	1.031
						vill_educ	0.310	0.161	-2.260	0.024	0.112	0.856
						experience	0.941	0.028	-2.030	0.042	0.888	0.998
						hous2_befo~4	1.082	0.034	2.510	0.012	1.017	1.150
						incother	3.320	1.672	2.380	0.017	1.237	8.907
	167	75.06	0.0000	0.3940	mc07_cerinte	treatment	102.794	88.571	5.380	0.000	18.991	556.412
						incother	2.606	1.283	1.950	0.052	0.993	6.839
						reli_evang~t	0.265	0.137	-2.560	0.010	0.096	0.731
						vill_healt	0.282	0.198	-1.800	0.071	0.071	1.116
						coff07_hist	0.908	0.037	-2.330	0.020	0.838	0.985
						villagetop~i	0.993	0.003	-2.540	0.011	0.988	0.998

Table Nr.	N	F / chi2	Prob > F / chi2	R2 / Pseudo R2	Outcome Indicator (=y)	Explanatory Variables (=x)	β / Odds Ratio	SE	t/z	P > [z/t]	95 % Confidence Interval	
55 (cont.)	167	25.08	0.0052	0.4366	mc07_cerinte (weighted)	treatment	331.061	436.652	4.400	0.000	24.958	4391.34
						farmtoroad	1.010	0.004	2.440	0.015	1.002	1.019
						villagetop~i	0.986	0.004	-3.240	0.001	0.978	0.995
						incother	2.695	1.379	1.940	0.053	0.988	7.346
						coff07_hist	0.910	0.035	-2.490	0.013	0.845	0.980
						distr_junin	0.361	0.203	-1.820	0.069	0.120	1.084
						distr_other	0.145	0.119	-2.350	0.019	0.029	0.724
						reli_evang~t	0.270	0.147	-2.410	0.016	0.093	0.782
						reli_other	6.110	4.994	2.210	0.027	1.231	30.323
						vill_educ	0.359	0.201	-1.830	0.067	0.120	1.075
57	144	29.08	0.0001	0.3137	mc06_cerinte (weighted)	hhcoop	72.299	60.512	5.110	0.000	14.019	372.870
						experience	0.947	0.025	-2.050	0.040	0.899	0.998
						hous2_befo~4	1.083	0.040	2.170	0.030	1.008	1.165
						vill_educ	0.426	0.214	-1.700	0.089	0.159	1.140
						reli_other	6.178	4.582	2.450	0.014	1.444	26.436
						villagetop~i	1.010	0.004	2.620	0.009	1.002	1.017
	167	36.96	0.0000	0.3138	mc07_cerinte (weighted)	hhcoop	33.384	23.197	5.050	0.000	8.552	130.320
						reli_evang~t	0.366	0.172	-2.140	0.032	0.146	0.919
						hh6till18	1.279	0.186	1.690	0.091	0.962	1.701
						farmtoroad	1.012	0.004	2.910	0.004	1.004	1.021
						coff07_hist	0.937	0.030	-2.000	0.045	0.879	0.999
						villagetop~i	0.992	0.004	-1.890	0.059	0.985	1.000
						vill_healt	0.128	0.099	-2.670	0.007	0.028	0.578
61	161	6.76	0.0000	0.2084	innccof07_kg	treatment	2.092	0.531	3.940	0.000	1.043	3.141
						hh6till18	-0.361	0.182	-1.990	0.049	-0.721	-0.002
						hh0till5	0.844	0.357	2.370	0.019	0.140	1.548
						farmtoroad	-0.019	0.005	-3.740	0.000	-0.029	-0.009
						distr_huan~a	2.076	0.783	2.650	0.009	0.529	3.623
						reli_evang~t	1.414	0.528	2.680	0.008	0.371	2.457
						_cons	1.008	0.562	1.790	0.075	-0.102	2.118

Table Nr.	N	F / chi2	Prob > F / chi2	R2 / Pseudo R2	Outcome Indicator (=y)	Explanatory Variables (=x)	β / Odds Ratio	SE	t/z	P > [z/t]	95 % Confidence Interval	
61 (cont.)	161	2.77	0.0050	0.2481	innccof07_kg (weighted)	treatment	2.064	0.594	3.480	0.001	0.891	3.237
						hh6till18	-0.384	0.198	-1.940	0.054	-0.775	0.007
						hh0till5	1.065	0.376	2.830	0.005	0.322	1.808
						farmtoroad	-0.020	0.008	-2.580	0.011	-0.036	-0.005
						distr_huan~a	2.165	0.645	3.360	0.001	0.890	3.439
						experience	0.055	0.027	2.030	0.044	0.002	0.108
						cultsize_4	-0.171	0.057	-3.010	0.003	-0.284	-0.059
						reli_evang~t	1.333	0.512	2.600	0.010	0.320	2.345
						famsize	0.023	0.009	2.480	0.014	0.005	0.041
						_cons	1.021	0.996	1.030	0.307	-0.947	2.989
	161	5.91	0.0002	0.1316	innccof07_hec	hous2_befo~4	-39.338	17.497	-2.250	0.026	-73.899	-4.777
						vill_healt	-530.17	297.649	-1.780	0.077	-1118.1	57.774
						farmtoroad	-8.067	2.163	-3.730	0.000	-12.340	-3.794
						altitudepl~s	1.058	0.436	2.430	0.016	0.198	1.918
						_cons	401.968	529.470	0.760	0.449	-643.89	1447.82
	161	7.05	0.0000	0.1414	innccof07_hec (weighted)	hous2_befo~4	-44.657	12.515	-3.570	0.000	-69.378	-19.936
						hh6till18	-144.31	79.988	-1.800	0.073	-302.31	13.689
						farmtoroad	-7.288	1.663	-4.380	0.000	-10.574	-4.003
						altitudepl~s	1.076	0.450	2.390	0.018	0.188	1.965
						_cons	545.311	546.252	1.000	0.320	-533.69	1624.32
62	150	9.01	0.0000	0.4488	innccof07_kg (weighted)	cost07b	0.000	0.000	-4.430	0.000	-0.001	0.000
						kg07a	0.001	0.000	3.760	0.000	0.000	0.001
						price07	1.193	0.186	6.400	0.000	0.824	1.562
						farmtoroad	-0.012	0.006	-2.030	0.044	-0.023	0.000
						reli_evang~t	0.747	0.366	2.040	0.043	0.025	1.470
						coff07_hist	0.047	0.028	1.700	0.091	-0.008	0.102
						distr_huan~a	1.296	0.435	2.980	0.003	0.436	2.155
						_cons	-4.428	1.394	-3.180	0.002	-7.184	-1.671

Table Nr.	N	F / chi2	Prob > F / chi2	R2 / Pseudo R2	Outcome Indicator (=y)	Explanatory Variables (=x)	β / Odds Ratio	SE	t/z	P > [z/t]	95 % Confidence Interval	
62 (cont.)	150	17.52	0.0000	0.6537	innccof07_hec (weighted)	cost07b	-0.161	0.024	-6.800	0.000	-0.208	-0.114
						kg07a	0.630	0.074	8.540	0.000	0.484	0.776
						price07	369.686	105.155	3.520	0.001	161.814	577.558
						cultsize_4	-62.396	25.412	-2.460	0.015	-112.63	-12.162
						experience	-19.925	9.295	-2.140	0.034	-38.299	-1.551
						farmtoroad	-2.639	1.062	-2.490	0.014	-4.739	-0.540
						inher_house	-429.31	182.729	-2.350	0.020	-790.53	-68.086
						_cons	-576.77	568.325	-1.010	0.312	-1700.2	546.698
68	169	7.26	0.0001	0.1165	inve_land	cultsize_4	-0.035	0.020	-1.770	0.079	-0.075	0.004
						incother	-0.538	0.184	-2.920	0.004	-0.902	-0.174
						coff07_hist	-0.031	0.014	-2.160	0.032	-0.060	-0.003
						_cons	1.449	0.210	6.900	0.000	1.034	1.863
	169	3.90	0.0100	0.1151	inve_land (weighted)	coff07_hist	-0.032	0.012	-2.700	0.008	-0.055	-0.009
						incother	-0.474	0.180	-2.640	0.009	-0.829	-0.120
						cultsize_4	-0.034	0.015	-2.240	0.026	-0.064	-0.004
						_cons	1.406	0.301	4.670	0.000	0.812	2.000
	169	9.26	0.0000	0.1842	land_percult	distr_junin	-7.164	4.096	-1.750	0.082	-15.253	0.924
						villagetop~i	-0.093	0.022	-4.170	0.000	-0.137	-0.049
						vill_healt	12.370	5.697	2.170	0.031	1.120	23.619
						experience	-0.524	0.231	-2.270	0.025	-0.981	-0.067
						_cons	79.894	6.034	13.240	0.000	67.980	91.809
	169	11.08	0.0000	0.1820	land_percult (weighted)	vill_healt	12.116	5.202	2.330	0.021	1.845	22.387
						experience	-0.529	0.205	-2.580	0.011	-0.933	-0.125
						villagetop~i	-0.090	0.024	-3.710	0.000	-0.138	-0.042
						reli_other	-13.011	4.811	-2.700	0.008	-22.511	-3.511
						_cons	77.135	6.017	12.820	0.000	65.253	89.016
69	161	4.16	0.0072	0.1256	inve_land (weighted)	coff07_hist	-0.034	0.012	-2.810	0.006	-0.058	-0.010
						incother	-0.486	0.184	-2.640	0.009	-0.850	-0.122
						cultsize_4	-0.040	0.016	-2.480	0.014	-0.072	-0.008
						_cons	1.478	0.310	4.760	0.000	0.865	2.092

Table Nr.	N	F / chi2	Prob > F / chi2	R2 / Pseudo R2	Outcome Indicator (=y)	Explanatory Variables (=x)	β / Odds Ratio	SE	t/z	P > [z/t]	95 % Confidence Interval	
69 (cont.)	161	13.17	0.0000	0.2342	land_percult (weighted)	distr_junin	-8.063	4.209	-1.920	0.057	-16.377	0.250
						reli_other	-10.925	4.806	-2.270	0.024	-20.418	-1.432
						vill_healt	9.278	5.225	1.780	0.078	-1.042	19.599
						villagetop~i	-0.121	0.022	-5.500	0.000	-0.164	-0.077
						experience	-0.567	0.204	-2.780	0.006	-0.970	-0.164
						_cons	86.077	6.411	13.430	0.000	73.413	98.742
	161	4.16	0.0072	0.1256	inve_land (weighted)	coff07_hist	-0.034	0.012	-2.810	0.006	-0.058	-0.010
						incother	-0.486	0.184	-2.640	0.009	-0.850	-0.122
						cultsize_4	-0.040	0.016	-2.480	0.014	-0.072	-0.008
						_cons	1.478	0.310	4.760	0.000	0.865	2.092
	161	13.17	0.0000	0.2342	land_percult (weighted)	villagetop~i	-0.121	0.022	-5.500	0.000	-0.164	-0.077
						distr_junin	-8.063	4.209	-1.920	0.057	-16.377	0.250
						experience	-0.567	0.204	-2.780	0.006	-0.970	-0.164
						vill_healt	9.278	5.225	1.780	0.078	-1.042	19.599
						reli_other	-10.925	4.806	-2.270	0.024	-20.418	-1.432
						_cons	86.077	6.411	13.430	0.000	73.413	98.742
74	169	12.00	0.0000	0.2264	educ_18plus	vehicle_be~4	1.012	0.193	5.250	0.000	0.632	1.393
						distr_other	-6.999	3.284	-2.130	0.035	-13.484	-0.514
						farmtoroad	0.104	0.028	3.720	0.000	0.049	0.159
						villagetop~i	-0.057	0.016	-3.630	0.000	-0.088	-0.026
						_cons	12.073	2.451	4.930	0.000	7.233	16.913
	169	38.95	0.0000	0.1756	educ_18plus (weighted)	vehicle_be~4	0.961	0.109	8.840	0.000	0.747	1.176
						distr_other	-7.732	1.933	-4.000	0.000	-11.549	-3.915
						hous2_befo~4	-0.298	0.159	-1.880	0.062	-0.612	0.015
						villagetop~i	-0.026	0.008	-3.220	0.002	-0.042	-0.010
						_cons	11.702	3.046	3.840	0.000	5.688	17.717
	169	10.54	0.0000	0.1608	educ_6till18	vill_healt	8.235	3.729	2.210	0.029	0.871	15.598
						hh6till18	4.774	0.965	4.950	0.000	2.870	6.679
						altitudepl~s	0.009	0.005	1.740	0.083	-0.001	0.020
						_cons	68.827	6.765	10.170	0.000	55.470	82.183

Table Nr.	N	F / chi2	Prob > F / chi2	R2 / Pseudo R2	Outcome Indicator (=y)	Explanatory Variables (=x)	β / Odds Ratio	SE	t/z	P > [z/t]	95 % Confidence Interval	
74 (cont.)	169	9.55	0.0000	0.1760	educ_6till18 (weighted)	vehicle_be~4	0.277	0.060	4.590	0.000	0.158	0.396
						hh6till18	4.474	0.822	5.440	0.000	2.851	6.097
						vill_healt	9.641	2.301	4.190	0.000	5.098	14.184
						hhage	-0.172	0.088	-1.950	0.053	-0.346	0.003
						altitudepl~s	0.011	0.006	1.950	0.053	0.000	0.022
						_cons	70.799	9.050	7.820	0.000	52.930	88.668
75	161	42.29	0	0.1729	educ_18plus (weighted)	vehicle_be~4	0.953	0.090	10.590	0.000	0.775	1.131
						villagetop~i	-0.022	0.008	-2.910	0.004	-0.037	-0.007
						distr_other	-6.827	1.717	-3.970	0.000	-10.220	-3.434
						inher_house	-5.070	1.449	-3.500	0.001	-7.932	-2.208
						_cons	10.828	2.665	4.060	0.000	5.563	16.093
	161	9.33	0	0.1772	educ_6till18 (weighted)	altitudepl~s	0.012	0.006	1.960	0.052	0.000	0.023
						hh6till18	4.590	0.835	5.500	0.000	2.941	6.238
						vehicle_be~4	0.281	0.062	4.510	0.000	0.158	0.403
						hhage	-0.170	0.093	-1.830	0.069	-0.354	0.014
						vill_healt	9.615	2.382	4.040	0.000	4.909	14.320
						_cons	69.751	9.291	7.510	0.000	51.398	88.105
76	168	5.84	0.0001	0.1212	educ_18plus (weighted)	hhcap	6.837	1.981	3.450	0.001	2.925	10.748
						villagetop~i	-0.024	0.008	-3.070	0.003	-0.040	-0.009
						hous2_befo~4	-0.355	0.138	-2.580	0.011	-0.628	-0.083
						vehicle_be~4	2.134	0.649	3.290	0.001	0.852	3.416
						distr_other	-7.934	2.134	-3.720	0.000	-12.148	-3.721
						_cons	6.318	2.073	3.050	0.003	2.226	10.411
	169	9.55	0	0.176	educ_6till18 (weighted)	vill_healt	9.641	2.301	4.190	0.000	5.098	14.184
						hh6till18	4.474	0.822	5.440	0.000	2.851	6.097
						vehicle_be~4	0.277	0.060	4.590	0.000	0.158	0.396
						hhage	-0.172	0.088	-1.950	0.053	-0.346	0.003
						altitudepl~s	0.011	0.006	1.950	0.053	0.000	0.022
						_cons	70.799	9.050	7.820	0.000	52.930	88.668