THE FATE OF COFFEE IN KENYA

- AN ASSESSMENT OF FACTORS AFFECTING THE SMALL-SCALE COFFEE PRODUCERS' DECISION-MAKING PROCESS IN GATUGI VILLAGE, OTHAYA.

Picture: Left: Coffee branch with flowers. Right Naja and Issa at Gatugi Coffee Factory (Picture by Astrid)

A field work based report by:
Naja Skouw-Rasmussen (dlv228), Issa Kapande (jch890), Thomas Eisler (mkv178), Astrid Sigaard Andersen (mqr302) and Haftu Haile Gedremichael (dpv953)
Supervision by: *Christian P. Hansen and Ebbe Prag*
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TITLE PAGE

SIGNATURES BY AUTHOURS

Andersen, Astrid S. _____

Eisler, Thomas _____

Gedremicheal, Haftu Haile _____

Kapande, Issa _____

Skouw-Rasmussen, Naja _____

Picture: Our group at project presentations in Othaya (Picture by Group)

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ABSTRACT

This study was done with the objective of responding to the question: how do factors affect small-scale farmers' decision-making process regarding coffee production in Gatugi, Nyeri South District, Kenya? Data were collected from coffee farmers in Gatugi, the Othaya Farmer's Co-operative management, Karima ward agricultural extension officer and the Gatugi Coffee Factory manager. The methods employed for data collection included Participatory Rural Appraisal, semi-structured interviews, questionnaire, direct observation and informal conversation. Ostrom (1990) rational choice model was used as a way to understand the connection between internal world, external factors and production decisions. It proved to be difficult to deal with the internal world which individuals use as filter to value the different external factors. The results of analysis showed that economic factors such as low and volatile prices, the payment system and limited access to inputs and credit have negatively influenced farmers towards neglecting or uprooting of their coffee. Social factors such as educational level affect farmers ability to adapt to new production techniques and land inheritance culture prevents youth engagement in coffee production. Farmers did not express concern on environmental factors as an influence on their production decisions. Most of them consider that the environment is suitable for coffee production. Moreover, there exist mistrust of the management and leadership of the co-operative which causes disincentives to some of farmers to invest in coffee. It was concluded that increasing farmers access to technical skills, capital and market information would help to facilitate improved management of coffee farms leading to increased output and income.

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LIST OF ABBREVIATIONS

AEO	Agricultural Extension Officer
AGM	Annual General Meeting
CBD	Coffee Berry Disease
CFM	Coffee Factory Manager (of Gatugi)
CEO	Chief Executive Officer of the Othaya Co-operative
GCF	Gatugi Coffee Factory
ksh	Kenya Shilling
MC	Management Committee
MoE	Ministry of Agriculture
OFCS	Othaya Farmers Co-operative Society Limited
SC	Supervisory Committee
SSI	Semi-structured interview
masl	Meters Above Sea Level

1 INTRODUCTION

For several years coffee has been one of the most valuable primary products in the world trade. It has second value next to oil as a source of foreign exchange for many developing countries. It also ranks high among the most important agricultural commodities traded in international markets. The global coffee production is dominated by smallholder farmers. 70 per cent of the world's coffee supply is estimated to be produced by 25 million smallholders (Eakin et al., 2009, cited in Caswell et al., 2012). In total, close to 100 million people depend on coffee for their livelihood, including all the actors in the value chain such as coffee harvesters, processors and industry workers (Jha et al., 2011, cited in Caswell et al., 2012). However, coffee prices on the global market have had a declining trend after the International Coffee Agreement was abandoned in 1989. Furthermore, the value share of end producer price, that goes to the producer country, has declined from 20 per cent to 13 per cent (Ponte, 2002).

In Kenya, coffee has been grown since 1893. Until 1986, it was the number one source of foreign exchange for the country and it accounted for about 40.6 per cent of the national foreign exchange earnings. It earned about 107 billion ksh, which was about 10 per cent of agriculture's share of GDP between 1987/88 and 1997/98 (Republic of Kenya 1998, cited in Thuku et al, 2013).

Coffee has contributed immensely to the Kenyan economy due to its contribution to foreign exchange earnings, farm incomes, and employment (Thuku et al., 2013). Further, Kenyan coffee is known globally for its high quality which makes it competitive to coffee from other countries. It is the best coffee in the world and always fetches high surcharge prices in the world market (Ibid).

Kenya has a two-tiered production system of coffee. One tier consists of smallholders who do not have their own pulping station and process and market their coffee through co-operatives. The other tier consists of the large estates that do have their own access to processing and marketing. 65 per cent of coffee production in Kenya is done by smallholders (Karanja and Nyoro, 2002; Nyangito, 2005, cited in Thuku et al., 2013). The co-operatives produce a larger share of high quality coffee than the estates (Ponte 2001), which emphasize the importance of the smallholder producers in maintaining Kenya's position as a supplier to high-end markets. Nevertheless, the productivity of co-operatives was only 266 kg/ha while it was 510 kg/ha for estates (Nyangito, 2005). This could indicate a tradeoff between quality and quantity.

The contribution of coffee to the national foreign exchange earnings in Kenya has fallen gradually and reached 3 per cent in 2010. This decline was occasioned by fall in coffee production from a peak of 128,700 million tons in 1987/88 to 42,000 million tons in 2010 (Okibo and Mwangi, 2013). The declining production can not only be explained by the decreasing world market prices. Factors such as low productivity, use of non-resistant varieties, inefficiency of co-operatives and the structure of the marketing should be investigated for thorough understanding (Monroy et al., 2013).

According to Kegode (2005) the liberalisation of the Kenyan coffee sector in 1996 caused a decline in coffee production and prices received by farmers. Three major millers were appointed as marketing agents and got a greater share of the value. Despite high prices of Kenya coffee in the international market in 2002-2004, it was a norm for the farmer to sell coffee far below the production cost (Ibid). Inflationary pressure was not the sole reason for rising costs. According to The Point (2000), was also to a large extent because of the coffee berry disease (CBD). Most smallholder farmers incurred costs in disease control that took up a total of 30 per cent of the market prices (Ibid). In addition, the transport and processing costs for smallholders are more than twice the costs for estate producers (Monroy et al., 2013).

Decisions made by the individual producers, could be one of the reasons for decline in coffee production. These can be short term decisions such as harvesting less coffee berries, medium term decisions like investing less in maintaining the bushes (Nyangito, 2000) or long term decisions for example to uproot the trees and plant other crops (Owuor, 2009).

Despite much literature on the difficulties experienced by the coffee sector, literature on how the factors affect the production choices of small-scale coffee producers in Kenya is limited. Furthermore, there are some recent developments which effects are not yet entirely known. World prices this year have increased due to droughts in Brazil (Perez et al., 2014). There is also the decision of the Nyeri County Governor Nderitu Gachagua to mill and market Nyeri coffee centrally. This decision is supported by some coffee co-operatives and opposed by others (Ndung'u, 2014). From this global and national context we arrive at the core - the farmer who produces coffee. Therefore, the aim of this study is to answer the question:
How do factors affect small-scale farmers' decision-making process regarding coffee production in Gatugi, Nyeri South District, Kenya?

The working definition of factors includes norms, household structure, education, economy, environment, organisations and access to information affect the farmers' decisions. To answer this question, the fieldwork and data analysis is based on three objectives:
Objective 1: To understand smallholders' decision on engagement in coffee production, we will examine the overall production of coffee.
Objective 2: To understand the external factors affecting the decision making process of smallholders
Objective 3: To understand the internal factors affecting the decision making process of smallholders.
This report presents the results from a field study in the village Gatugi, Nyeri South District, Kenya conducted from 1st to 11th March 2014. Gatugi is a sub-location in Nyeri South District in the Kenya Central Highlands. According to the data from the assistant chief it consists of approximately 140 households. The village centre is located along the road 3.5 km Northeast of Othaya town at an elevation of 1825 masl. The residents are small-scale farmers that grow maize, cabbages, potatoes, coffee, tea, napier grass and bananas and most are engaged in dairy production.

In order to analyse the research on the decision-making process and classify the various

factors impacting that process, this study apply the Rational Choice Model formulated by Elinor Ostrom (1990). This framework is explained in the following chapter before moving on to the methods chosen for this project.

2 OSTROM'S RATIONAL CHOICE MODEL

Ostrom's (1990) 'Rational Choice Model' about making decision considers very broad conception of rational action of individuals (figure 2.1). In this model an individual's choice of strategy is influenced by internal and external factors. The internal factors refer to those within the mind of the decision maker. Particularly, there are four internal variables namely *expected benefits*, *expected costs*, *internal norms*, and *discount rate* which affect an individual's choice of strategies or decisions. The discount rate is how a person value future benefits and costs relative to the present. While making decisions, individuals take into account the expected costs and benefits of their choice of strategies. However, the internal norms that individuals possess are influenced by the shared norms held by others with regards to particular situations. Furthermore, the internal discount rates are also affected by a range of opportunities that an individual person has outside of his/her particular situation. External factors refer to all those variables that affect the above mentioned four internal variables and exist in outside the individuals mind.

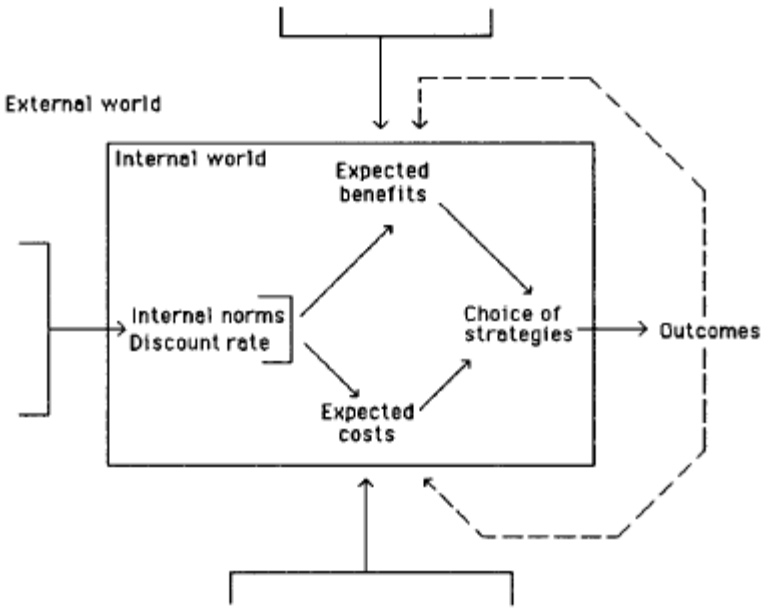


Figure 2.1: Rational choice framework model, Ostrom 1990

To classify the factors which influence individual farmers decision making we aim to identify through the fieldwork, we use Ostrom's definition of internal and external factors, and her theory of decision making, to analyze our data.

3 METHODOLOGY

In order to collect data which is required to find out how factors impact the decision making process of smallholders producing coffee, we used several methods and were in contact with various stakeholders. The methods are semi-structured interviews and questionnaires, triangulated with Participatory Rural Appraisal methods, as described in (Chambers, 1994; Mikkelsen, 2005), and members information from the records of the *Gatugi Coffee Factory* (GCF).
Since the perspective is on the farmer, the research aim to investigate topics in relation to farmers. In the following is a description of the methods used, why these were chosen and our experiences with them.

3.1 SEMI-STRUCTURED INTERVIEWS

Before reaching the field, the plan was to use the semi-structured interviews (SSIs) as the main method to obtain sufficient in-depth information to answer our research question. The semi-structured interviews were conducted both with farmers and managers of the *Othaya Farmers Co-operative Society Limited* (OFCS).

During the fieldwork, after gathering preliminary information through our guide and translators, an interview guide were designed, for interviews with farmers, based on Casley and Kumar(1988) (Appendix V). Beforehand, we had decided to interview farmers, representatives of the co-operative and the Agricultural Extension Officer (AEO). We decided to do interviews with persons with different positions within the co-operative such as the CEO, Gatugi Factory Manager and Management Committee members rather than several interviews with people in similar positions. These key informants were chosen as they could provide information about coffee production around Othaya and are the actors which the farmers interact with in relation to coffee production.

In practice, two persons from the group would conduct the interview - one as interviewer while the other would write notes and observe. Furthermore, in particular for the interviews with farmers one translator would be present (Appendix II). We aimed to ensure that an interviewer-observer pair consisted of both a female and male group member and thereby potentially better gain access and make farmers comfortable talking to us.

Additionally, because we relied on our guide in order to identify coffee farmers and invite participants for group discussions, we decided to conduct a short interview with her to find out more about her and identify if we should consider significant biases from her selection of subjects.

Out of the Nine interviews with farmers five have been recorded and followed the interview guide, and four were not recorded and were not following the guide. To keep farmers anonymous they are referred using capital letters as Farmer A, B, C,.....and I (Appendix IV).

Analysis of the key informants were done individually for each interview, and informants were referred to by title. Each key informant interview were recorded, but informal talks have also taken place with some key informants. In the analysis it is stated whether quotes or information are from interviews or informal conversations, based on the assumptions that information can be interpreted differently if it is given under knowledge of recording compared to informal talks.

3.2 Group Discussions (including focus group)

We hosted two group discussions which included mapping and ranking exercises and one focus group. For the group discussions, various coffee farmers were invited, and for the focus group youth between the age of 18-30 were invited, all through our guide. The aim of the group discussions was to identify problems and solutions to coffee production, and their relative importance to farmers. Farmers were invited in one group of farmers who put high effort into production and another group of farmers putting little effort or even uprooting coffee trees. Due to farmers arriving at the location for the group discussions at varying times, and not having time to wait for the others, the two groups ended up being divided into those who were there early and those who came later:

Picture: Participants of Group Discussion 2, Issa and Steven (Picture by

Group 1: Four women, two fluent in english and two only speaking Kikuyu.
Group 2: Two women and three men, four english speaking and one only speaking Kikuyu

The aim of the focus group was to get the view of the younger generation of coffee farmers and counter the possible problem, that most of the farmers we would meet for interviews were

over 30. Four men and two women were asked to discuss topics of coffee production and to rank these in terms of importance.

In the analysis, we extracted relevant information and observations from the group discussions and the focus group, and use it to support statements in discussion and conclusions, and for perspective on future outlook.

3.3 QUESTIONNAIRE

The original research strategy included using a questionnaire to investigate different factors through a ranking of predefined factors and about access to information. After testing the questionnaire and discussing them in relation to the preliminary impressions of interviewing farmers, we decided to modify the questionnaire. The questionnaire was used as a data collection tool for triangulating with the other methods. Therefore, the questionnaire covers issues about the individual farmers coffee production, information and issues related to the OFCS (Appendix III). To minimise mistakes, we read aloud the questions followed by a translation to Kikuyu, if necessary, and then wrote down the answers. In total, we got 43 replies.

3.4 DIRECT OBSERVATION AND INFORMAL CONVERSATIONS

During our stay with two families in Othaya and our work in Gatugi village, we had many interesting informal talks and made a number of direct observations, of relevance to our study. These were used to support findings and/or explanations of the correlations and discrepancies we find in our data.

3.4.1 VISITS TO FARMERS FIELD SCHOOLS

By chance, an opportunity to join the Farmers Field Schools (FFSs) conducted in Gatugi arose a couple of days in the field research because in that particular week several were taking place. They were organised by the Agricultural Extension Officer (AEO). The idea behind FFSs is to train the coffee farmers to be better producers and is an initiative derived from the farmers interest in sharing with one another and increase their production. Farmers meet on a volunteer basis and have chosen to follow the course. The course consists of 12 sessions - one session in a month - each session nominated to last for two hours with a different topic for each time. In the month of March the topic was ‘manure, coffee berry disease and leaf rust’. After participating in the 12 sessions, i.e. one year, the farmers receive certificate. Each group should be 20-30 coffee farmers. The location of the session is at one of the participants farms which provide the object of discussion, the coffee trees, at hand. Every month it is a new farmer who hosts the FFS. This is a way to check up on each others coffee trees. In total, we visited three of the sessions. One of the groups was newly founded, while the other two groups were more experienced.

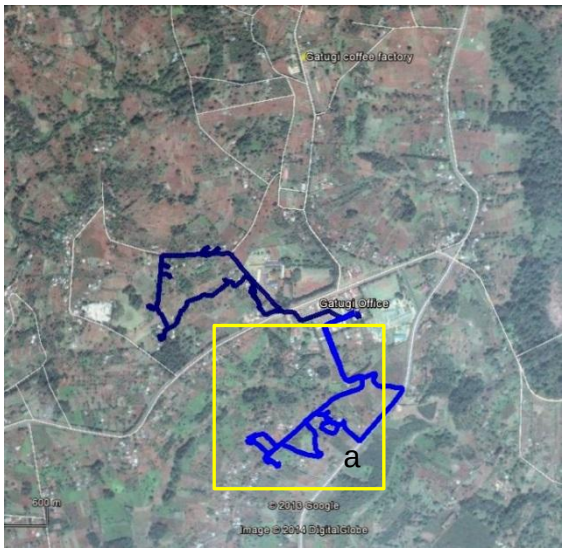
We attended the FFSs as observers and learned both a lot about the practice of coffee farming, and about the main information source farmers have access to, and how they use it.

3.5 SAMPLING AND GPS

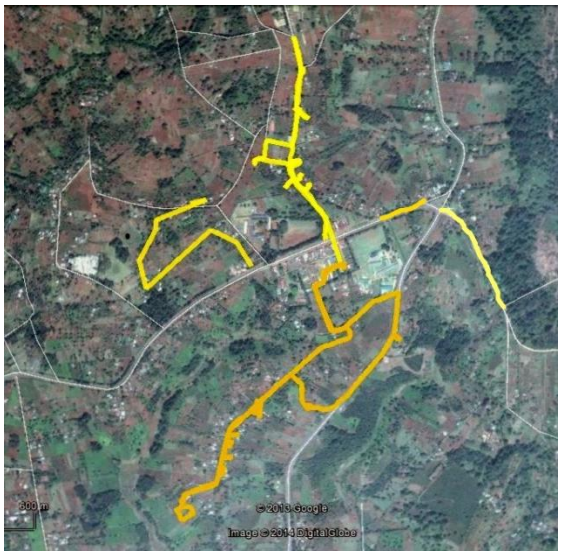
The original plan for sampling was to identify farmers for SSI's through transect walks in different areas of the Gatugi area and for the questionnaire, to randomly select farmers from the list of members from the Gatugi Coffee Factory.

For the SSI's five farmers were interviewed after a transect walk through the Southeast-area (Map 3.1A), four interviewed at the Farmers Field School and one was supposed to be part of one of the group discussions, but arrived very late. The four at the FFS we were introduced to by the AEO and the rest we met through Madam Monica - a village elder who had been hired to assist us.

We realised that it would be difficult and time consuming to find farmers for the questionnaire based on a list of names. Instead we collected answers through one session of the Farmer Field School and the rest from walking around in the Gatugi area. Map 3.1B shows the routes we took and give an idea of the random and a widespread range of respondents. The only selection criterion for the respondents was that they grow coffee.



Map 3.1A. GPS routes transect walks, (a= South East area)



Map 3.1B GPS routes questionnaire

3.6 COLLECTION OF RECORDS FROM CO-OPERATIVE AND FACTORY

From the Gatugi Coffee Factory, we were able to copy records of members with information on number of trees, production 2010/11 - 2012/13 and birth year. Furthermore we got information on price and production trends from the GCF.

4 ANALYSIS

This chapter covers the analysis of data gathered in the field which is presented according to the objectives of the study, namely the first about coffee production and the second about the external factors.

4.1 COFFEE PRODUCTION

This section provides results on coffee farming practices in Gatugi village, marketing and production trends among the members of the GFC.

4.1.1 The Coffee Farmers in Gatugi

In Gatugi village most of the farmers have coffee trees (Transect walks, 2014). The farmers are engaged in mixed farming and the typical coffee farmer has coffee on a quarter of his/her land (Questionnaire, 2014). Coffee farmers in the area belong to the Othaya Farmers Co-operative Society. The co-operative has 19 factories which are placed in different sub-locations. The GCF is located to the north of Gatugi village centre, which is the factory most of the respondent farmers belong to (Questionnaire, 2014). Currently, the GCF has 629 active members of which 163 are female (www.othayacoffee.com, 2014).

There are some differences between farmers. However, one way to group the coffee farmers is according to the number of trees they have, another is according to production. The results from a regression of yield per tree on number of trees, there is found statistically significant results for the years we have obtained data on (2010/11, 2011/12 and 2012/13) as seen in table 4.1. The coefficient is negative which confirms the hypothesis that farmers with fewer trees tend to have a higher productivity.

4.1 Statistical analysis.
Linear regression of productivity as a function of number of trees.

	2010/11	2011/12	2012/13
Intercept	0.84 (0.07) ***	3.63 (0.19) ***	2.10 (0.14) ***
Trees	-0.00047 (0.0002) *	-0.0018 (0.0007) *	-0.0012 (0.0005) *
Observations	429	500	541

** significant on 5 % level, ** significant on 1 % level, *** significant on 0.1 % level*
Regression results from statistical software.
Data source: Gatugi Coffee Factory

Farmers can be classified both on basis of number of trees and on total production, but it is important to notice that a farmer with many trees do not necessarily have a higher production than farmers with few trees - often the case is the opposite.

Table 4.2 **Distribution of members according to number of trees.**	
	Mature trees
Minimum	20
1st Quartile	100
Median	165
Mean	210
3rd Quartile	250
Maximum	1425
Missing values	5
Observations	553
Data from Gatugi Coffee Factory, 2014.	

The statistics on the distribution of farmers according to the number of trees held is shown in table 4.2. The mean is well above the median which indicates that few farmers have more trees than most others.
It is likely that, the negative correlation between many trees and high productivity is because each farmer has limited access to input and the farmer with fewer trees are then able to produce more intensively. These limits can be monetary limits to buy inputs and hire labour and non-monetary in the form of their own household labour and manure produced by the household. At the same time plots are small due to sub-division, hence, expansion through obtaining more land to plant trees can become a constraint for increasing production (AEO interview, 2014). According to the Agricultural Extension Officer a more feasible strategy is to increase production per tree to increase the overall production (AEO interview, 2014).

4.1.2 Farming Practice

Most of the trees in the area have been planted when coffee production was introduced in the 1950s (Farmer interviews, 2014). Only few farmers have recently planted new trees (Statistics from GCF, 2014).

Coffee is a perennial crop, most of trees in the area are over 50 years old, no annual land preparation and sowing are needed. Throughout the year the coffee trees are attended on a regular basis to maintain and/or increase the production. This includes mainly adding nutrients, pruning, spraying, weeding and mulching. The harvest of the coffee berries is the most labour intensive part of coffee farming and is done in November-December (AEO interview, 2014). This means that a farmer who owns coffee trees, do not choose whether or not to grow coffee from year to year, but whether or not to invest labour and other inputs, from year to year. The distribution of labour over the year makes coffee different from other local annual crops like maize, perennial crops like tea and keeping of livestock (AEO, 2014).

The practice of producing coffee, seems to be viewed positively by some farmers. In one SSI we ask a farmer why he produce coffee the answer is: “Nothing is better than coffee” (Farmer interview, 2014). The AEO state in an informal talk that it is important to consider and compare the opportunity costs of coffee. With coffee you can basically come once a month to take care of the field and then do other work. An interview with a farmer supports this, when asked if he would switch to another cash crop he answered: “No, because growing coffee gives me time to do other things, like I have a motorbike and sometimes, transport people to earn some extra cash” (Farmer interview, 2014).

4.1.3 Post Harvest Processes

Before the coffee is ready for market, it has to go through the processes of pulping, fermentation, milling and sorting. At the factory the ripe coffee cherries goes into a machine that removes the outer skin and pulp - pulping. Afterwards the pulped berries goes to the fermentation tanks to remove the layer around the parchment. Finally the coffee is dried and sorted and it is then named parchment coffee. The parchment coffee is taken to a dry mill to remove the husk that covers the bean and it then becomes green coffee. At the dry mill the green beans are sorted according to grade. The grade characterises the physical appearance of the bean by size and shape. For further assessment of the quality of the coffee the beans are roasted and liquored. The roasting and final packaging of coffee is most often done by companies in the countries of consumption (Direct Observation, 2014; Visit to GCF, 2014; SMS, 2011).

Previously, milling and sorting was done by private commercial millers. The OFCS has since 2010 operated their own dry mill stationed near Othaya (CEO interview, 2014). A smallholder is only connected to the coffee market through the co-operative.

4.1.4 Production Trends

Coffee production in the OFCS peaked in 1987/88[1] and also 1999/2000 had a high production with 9.5 mill. kg of coffee cherry. Mainly due to low prices farmers neglected their coffee and the production decreased to 3.6 mill. kg the following year. Production continued to decline until 2002/03 where it was as low as 1.4 mill. kg. Since then it has increased somewhat to 3.7 mill. kg. in 2013/14 which is though still low compared to before 2000 (CEO interview, 2014). The same trends with a decrease after 1999/2000 and increasing trend after 2002/03 are also seen in the production statistics for GCF as shown in figure 4.1. In Gatugi the production in 2013/14 even surpassed the level of production in 1999/2000. There is an exception from the trend in 2010/11 where production was even lower than 2002/03. This was explained as caused by extremely unfavourable weather (GCF manager, informal talk, 2014).

[1] The financial year for the Co-operative is from October to September

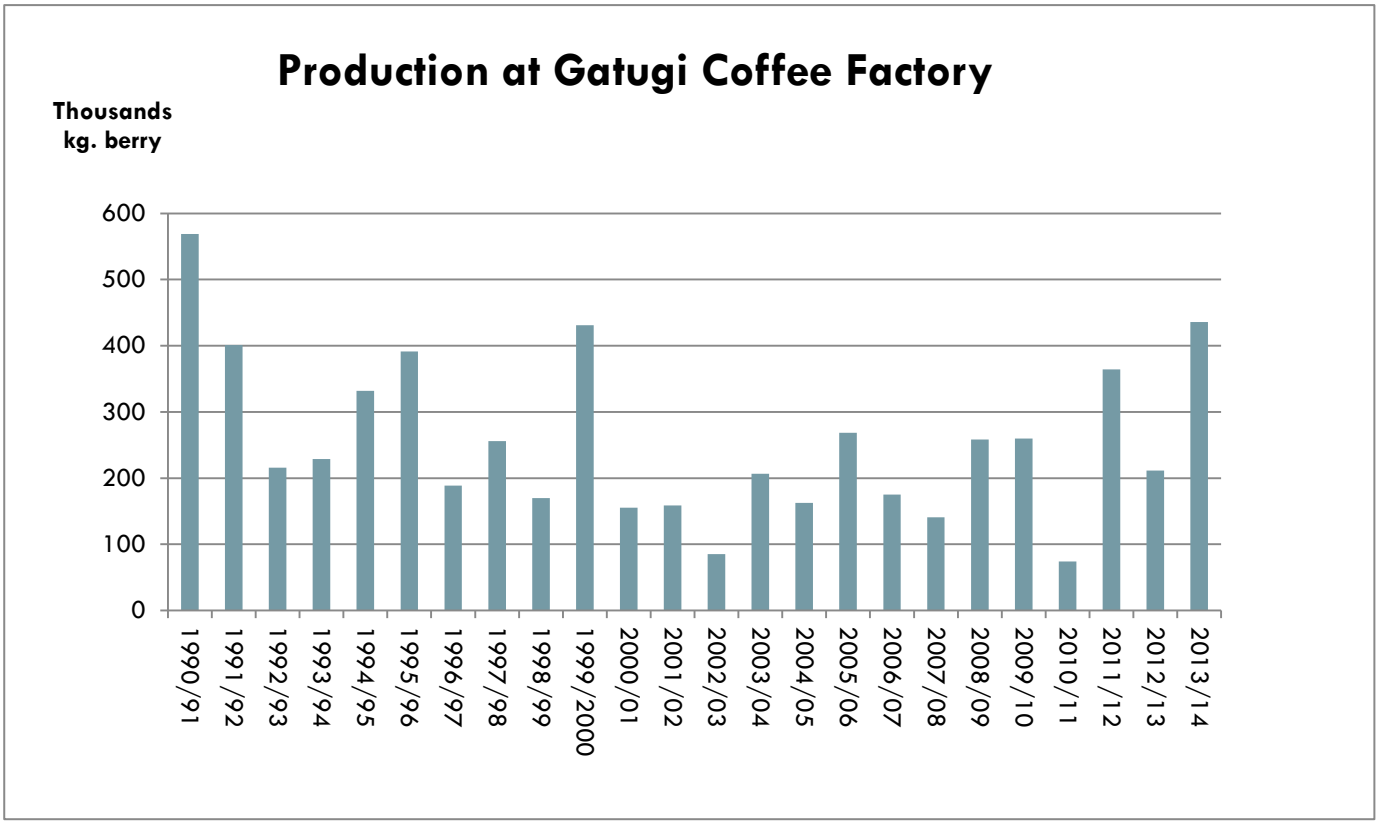


Figure 4.1: Production of kg coffee berry, from 1990/91 to 2013/14, Gatugi Factory (Source: Gatugi Factory)

The production trend of individual farmers vary a lot. In table 4.3 relative changes in production of individual farmers is compared to the relative change at the factory. The extreme minimum and maximum values indicate that some farmers almost opt out of coffee production some years. As an example a farmer can bring several hundred kilos one year and only two kilos the next or vice versa. If only the 1st and 3rd quartile is compared it does follow the same trends of increase or decrease at the factory level. The values though show a very large heterogeneity among farmers. The same tendency is seen in the results from the questionnaire. Among the respondents a little more than half increased their production while approximately one third decreased their production from the 2012/13 to 2013/14 as seen in table 4.4. It seems surprising that so many decreased their production as aggregate production at the GCF more than doubled in that period (figure 4.1).

Table 4.3
Distribution of production changes among farmers

	2010/11 to 2012/13	2011/12 to 2012/13	2010/11 to 2011/12
Minimum	-94 %	-99 %	-98 %
1st Quartile	33 %	-70 %	203 %

Median	139 %	-50 %	448 %
Mean	559 %	-1 %	991 %
3rd Quartile	410 %	-13 %	876 %
Maximum	37370 %	13100 %	22100 %
Missing values	122	58	136
Observations	553	553	553
Change in total production at factory	185 %	-42 %	391 %

Table 4.4: Production trend for individual farmers

Trend	Number of farmers
Negative change	14
Positive change	22
Empty	6
No change	1

Source: Questionnaires, 2014.

As only few farmers uproot their coffee and few trees are planted the changes in production can mainly be seen as results of weather conditions and the farming practice that farmers have conducted. Table 4.5 shows that the productivity per tree vary much between farmers. The following section focuses on what factors affect farmers decisions on their farming practices and its possible impact on their productivity.

Table 4.5
Distribution of productivity in kg/tree.

	2010/11	2011/12	2012/13
Min.	0,0125	0,01	0,02
1st Qu.	0,22	1,304	0,6233
Median	0,4611	2,488	1,239
Mean	0,7334	3,249	1,849
3rd Qu.	0,9625	4,596	2,28
Max.	6,704	17,54	21,64
NA	124	53	12

4.2 External World

In the theoretical framework about decision-making developed by Ostrom (1990), all the factors influences the internal decision-making process of a farmer exist in the external world. This section covers these different factors grouped under: social, environment, economic, organisations, regulation and legislation. It includes wide range of topics, yet, it is evident that some of them have more weight than others.

4.2.1 Social Factors

Coffee production is an expression of a farmer's choices. It is central to consider which social factors can have an impact on the decisions they make. Here, we looked at aspects such as age, gender, education and culture.

To begin with, age is interesting factor in relation to an observed youth-elder gap, access to land, labour and the farmer's future outlook. The age distribution of farmers contributing to the questionnaire suggests a majority of farmers over 60 years of age, while only around 10 per cent of the respondents were younger than 35 years old (Questionnaire, 2014). This indicates that not many coffee producers fall under the category 'youth' (18-35 years old).

There are at least two reasons for the absent of young coffee farmers. One is the lack of interest in pursuing a life as a coffee farmer while the other is the lack of acceptance and access for the youth to acquire land. In particular, the first reason was expressed by the AEO and the elder farmers (Farmer and AEO interviews, 2014). In line with this reason, some parents wish to give their children an education and the opportunity to pursue a different carrier than farming. The other reason was emphasised strongly by the youth invited to a focus group. For example, the youth often rely on inherent land from their parents. Most of the respondents land is ancestral (39 out of 43). The inheritance part seems to be a very sensitive issue and the youth explained that the young could be caught by the police for a talk with the assistant chief of the village about land inheritance (Focus group, 2014). It was unclear if the parents felt it as a threat or why the youth had to experience such an official reprimand. Young potential coffee farmers are constrained by access to land and have to wait for their parents to die (or get very old). Building on the link between age and access, the GCF manager stated that young people are more productive than elders. The reason being that young people have more manpower than elders (GCF manager interview, 2014). Apart from this statement, the collected data does not provide evidence supporting or rejecting this hypothesis.

In terms of individuals future outlook, there is a fundamental difference between a person who is 20 years old and one who is 70 years old. While the first is starting to shape his or her life, the other one might expect much for the future.

When it comes to gender, of the 43 farmers answering questionnaires 45 per cent were females and so were 1/3 of the interviewees. Gender seems to play a role in the decision-making process.

"Coffee is the man's crop because the landowner is often the man and the coffee on the land belongs to the man unless it is leased" (AEO interview, 2014).

This implies that cultural and legal systems challenge women's participation in coffee production. Women are not always considered for land inheritance and become dependent on what their husband or male relative own. Nevertheless, women are frequently seen working in the coffee fields and take care of the farm while the man of the house is occupied elsewhere (Direct observation, 2014; Informal talks, 2014). However, the impact on decision making regarding coffee production for these women is difficult to detect from our research as we have not focused on the internal power relations.
When relating gender to education, it shows that the women have a lower education than the men. For example, seven out of the eight respondents with no education are women. Six of these women are also over 60 years old, which refer back to a time when schooling for girls were not as widespread as today (Questionnaire, 2014; Informal talks, 2014). In general, 3/5 of the respondents holds none or primary education, which can have an impact on their engagement in the co-operative and access to information about coffee production. There is a high level of participation at the Annual General Meeting hosted by the OFCS (29 of the 43 respondents) and over 80 per cent of the farmers asked participate at the information meetings at the factory. A hypothesis is that people with low education are less likely to participate in the meetings. Yet, the data does not show such a pattern. People who do not participate at the meetings, range from none education to diploma (Questionnaire, 2014).

Another assumed linkage is between education level and means and sources of information. The major means of information are meetings, trainings and the radio, hence, ways that do not necessarily require strong reading skills. Education level can however influence the farmer's level of understanding yet, the data does not provide evidence for such conclusions. In general, the farmers education level is low (none or primary), which could affect their ability to adapt to new production methods. Farmers seek information mainly from the OFCS, the Agriculture Extension Officer and the factory (Questionnaire, 2014; Farmer interviews, 2014) and it would be oral messages which are interpreted and retold with the risk of individual modification.

The Farmers Field School is a means to educate the coffee farmers to increase their production. The participation is not based on the farmer's educational level and since the teaching is conducted in Kikuyu or Swahili it seems to be open to all. At two of the FFSs visited, the female/male division was 7/14 and 6/13 respectively (Farmers Field Schools, 2014). The gender inequality could be an indication of less women own the coffee fields; less women are registered as members at the factory; and that women, beyond working in the coffee fields, are occupied with other household task including taking care of the children (AEO interview; Farmer interviews; Direct observations, 2014; GFC membership data).

The last issue characterised as a social factor is the coffee culture. Coffee in Kenya used to be farmed in large estates operated by the British colonisers and the access to grow coffee was seen as part of empowerment of the native Kenyans (Informal talks with CEO and Chief of Othaya Township, 2014). Coffee was introduced in Gatugi around 1956/57 when also the OFCS was formed (CEO interview, 2014; www.othayacoffee.com).

Half of the coffee farmers in Gatugi were born from 1943 to 1965 (GCF statistics, 2014). This implies that the trees are likely to have been planted by their parents. The coffee trees have a lifespan of 100 years and the farmers have probably experienced that the same trees gave a good income for several decades. For some of the youth the trees are seen as an important heritage from their ancestors while others just see them as possible source of income. One youth expressed that he will not uproot coffee because is part of his tradition and they are not allowed to uproot the inherited trees (Focus group, 2014). Around 3/4 of the respondents stated in the questionnaire that there are historical or family reasons for their engagement in coffee farming (Questionnaire, 2014), which combined with the statements imply that history has an influence on the choices the farmer makes. Furthermore, around 90 per cent agree that coffee is important for the community.

Despite this historical significance of coffee as a farming practice, there is no culture for drinking coffee. The predominant drink among the farmers is chai - black tea with milk and sugar (Direct observations, 2014). Before independence coffee was not only grown by the colonisers but consumption of coffee was also reserved to them. The national consumption might increase as several coffee cafes are popping up in Nairobi. Locally, the OFCS has recently begun to roast and prepare coffee to serve. Therefore, the co-operative provide coffee to the members at factory meetings and the Farmers Field School (CFM interview and direct observation at FFS, 2014).

From this section, it should be evident that the farmers decision-making in particular regarding internal norms and discount rate are influenced by age, education and culture.

4.2.2 Environmental Factors

This section deals with different environmental factors such as rainfall, temperature, soil erosion, pest, weeds and disease and their impact on the production of coffee in Gatugi village.

In the semi-structured interviews, farmers did not express much concern about environmental factors as influencing their decisions in coffee production. Regardlessly, weather can have a big impact on coffee production. The total production at the GCF dropped with more than twothirds from 2009/10 to 2010/11 (see figure 4.1). As mentioned in section 4.1.4 this was caused by weather, according to the CFM. One farmer said “rain is very good for the plantation [farmers coffee field], the climate is good” (Farmer B interview, 2014). This may be because of the fact that occasional years with bad weather conditions are seen as normal

challenges for farmers. Only one farmer talked about that change in rainfall patterns could cause CBD (Farmer I interview, 2014) and farmers perceive spraying with chemicals as a solution that can deal with pest, weeds and diseases (Farmers Interviews, 2014).
In a nutshell, most farmers interviewed consider that the weather and environment are conducive for the production of coffee in their village.

4.2.3 ORGANISATIONS

The farmers depend on OFCS and its affiliated coffee factories for the processing and marketing of their coffee. This section presents the results on how the functioning is likely to impact on the coffee production. Firstly, background information on the history and structure of the co-operative before analysing different aspects of the OFCS's functioning. Finally, there is a section about the perceptions of the members of the management of the OFCS and the factories.

Background of Othaya Farmers Co-operative

The OFCS was established in 1956 by 250 farmers with the purpose of improving their living standard (CEO interview, 2014; www.othayacoffee.com), hence, seven years before Kenya became independent from the British colonial rule. The co-operative has 15,000 members, all small-scale coffee producers (www.othayacoffee.com). In order to become a member one has to produce coffee. A member that produces coffee is considered active. A member can be non-active for maximum three years before they are deleted (CEO interview, 2014). Currently 11,000 members are active (MC interview, 2014).
The supreme organ of the co-operative is the Annual General Meeting (AGM). The AGM constitutes all members of the co-operative. The AGM elects a Management Committee (MC) and a Supervisory Committee (SC). There are 13 elected members in the MC and three in the SC. The MC is responsible for the running of the co-operative while the Supervisory Committee has the responsibility to overlook the work of the MC and report to the AGM. The MC employs the CEO who is responsible for the daily running of the co-operative. Furthermore, there are 130 permanent employees (CEO interview, 2014).
At the AGM, the quorum is 650 members. This indicates that major decisions of the co-operatives can be passed by approximately six percent of the total members.
29 of the 43 respondents answered that they participate in the AGM (Questionnaire, 2014). This does not necessarily imply that they always participate in the AGM's. In the questionnaire (2014), half of the farmers answered that they read the minutes. This is despite that after designing the questionnaire we became aware that the minutes are not available for reading for the individual member. Instead the minutes are read aloud for the participants at the AGM the following year. The same is the case for the financial report. Only 13 of 43 questionnaire respondents said that they follow up on the accounts of the co-operative. Several added that they lacked the knowledge to understand the numbers (Remarks from questionnaire respondents, 2014). The MC of the co-operative is dominated by adult and elder men as all are male and above 35 years old. There is a rotational system so one third of the board members are replaced each year. The election procedure is through line up (queuing) system that has been practiced since the establishment of the society in 1956 (MC interview, 2014).

Supply of Input for Farmer Members

The OFCS provides farm inputs on credit. Many do not consider that they can get sufficient inputs from the factory (Questionnaire, 2014).

The limits to access inputs on credit seem to be determined by the CFM. He makes an assessment of what the farmer is able to produce based on their previous production, number of trees and the characteristics of the farmer and the coffee plantation (CFM interview, 2014). There was a discrepancy between statements by the CFM and the members of the MC. At the FFS, we observed that the factory manager informed the farmers to buy fertilizers by themselves because deliveries from the County were delayed (CFM at the FFS, 2014). However, the members of the MC said that the OFCS had bought all the necessary inputs to be supplied for the members.

The uncertainty about access to inputs impacts coffee production negatively. The importance of access to inputs is further elaborated in the section on economic factors.

Security and Theft in the Factories

Another topic in relation to the management and governance of the OFCS is the issue of security. We heard that coffee has been stolen from the GCF and the rumours seemed to accuse the CFM (Informal talks, 2014). It was confirmed, by the CFM (interview, 2014) and members of the MC (Interview, 2014), that there had been theft at the factories. The CFM even seemed to know of rumours about his alleged role, as he mentioned them when he was asked about the issue of theft (FFS). Both the CFM (Interview, 2014) and the MC (Interview, 2014) meant that that it was the commercial coffee marketers and millers, who were behind the theft of coffee. In order to prevent the problem of theft, the management is taking measures like engaging with the security forces, insuring coffee, and constructing big warehouse in the OCFS's dry mill. Further, they are also planning to install closed circuit television (CCTV) in the factories (MC and CFM interview, 2014).

To conclude, there is a prevailing security issue that increases the uncertainty which is likely to affect the farmers' motivation to invest in their coffee farm negatively.

Transparency of Pricing

This section deals with lack of transparency of pricing and payments. The importance of prices will be further elaborated in section 4.2.4. The coffee prices are volatile and the market is complex. In the SSI's one of the respondents was asked why he thought the price was low, and he replied "The market is the problem", and then elaborated "We are far from the market, but we hear things, we get little information about market from media. But we can't do anything." (Farmer interviews, 2014). It is also difficult for farmers to know how the OFCS determine the price. "It is a difficult – even for us", stated the CFM (Interview, 2014). Some farmers have the perception that the OFCS steals from them by giving them a low price (CFM interview, 2014). According to the CEO, the co-operative is required to give a minimum of 80 per cent of the income from sales to the farmers and in some cases they have been able to pay even 85 per cent. The remaining 15-20 per cent is used for financing the operational costs of the co-operative (CEO interview, 2014). 92 per cent of the respondents to questionnaire replied though that they do not know the selling price of the coffee (Questionnaire, 2014). The

MC members confirmed that the co-operative did not notify per unit sales price of their coffee to the members (MC interview, 2014). The uncertainty of price and market, and lack of clear information from the co-operative to the farmers can lead to disempowerment and mistrust among the farmers.

Members' Perception of OFCS's Management

In the previous section, it has been shown that there exist a lot of mistrust of the management and leadership of the OFCS. This is here further substantiated. As the co-operative is the only channel of marketing coffee and is also a central source of knowledge and inputs. Negative or positive perception of the co-operative may affect the motivation of farmers to invest in their coffee farm. In other words, farmers who are skeptical about the co-operative management might neglect their coffee trees.

In the youth focus group (2014), it was mentioned that some candidates for the committees bribe the farmers for their voice in times of election. Besides, they said that the MC members are not trustworthy because they do not keep their promises once they are elected and instead follow own objectives. For instance, the participants agreed that in the election campaign most of the candidates promise to improve the payment system, but there was no improvement so far. Also the participants in the group discussions (2014) stated that there is bribery and other malpractice in the co-operative. The focus group participants mentioned that the traditional line up election procedure enables those who bribed to check who is giving them his/her voice. Furthermore, they expressed concern about that privileges are given to some factories represented by board members. They claimed that there exist different prices in different factories even if they are all under the umbrella of the co-operative.
In the questionnaire, respondents were asked for their opinion to characterize the co-operative management as good, all right, poor, or neutral. 'Neutral' does not refer to the neutrality of the management but that the respondent want to remain neutral on this question. Out of 42 respondents 15, 6, 16, and 5 characterized as good, all right, poor, and neutral respectively.
A farmers production, productivity and access to inputs from the factory can affect their perception of the OFCS. It is also possible that a positive image of the co-operative encourages him/her to invest more in production. In order to assess these linkages we present in table 4.6 statistics where farmers are divided into groups based on their response to the questionnaire on their perception of the management. It seems that respondents who answered that the co-operative management was "good" or "all right" have a significant higher production than those who answered "poor" or wished to be neutral. There is though not a clear tendency when the productivity is analysed. For all groups the yield per tree does not vary much from the overall average. There does seem to a tendency that those farmers who think they are able to get sufficient inputs from the factory are more positive towards the management. There is not an opposite pattern for those who think that credit limits their production as would be expected if credit were also to refer to credit at the factory. The results are though with some uncertainty as there is few respondents.

Table 4.6: Farmers perception of co-operative management.					
	Perception of co-operative management				
Average values in questionnaire	Good	All right	Poor	Neutral	All respondents
Number of respondents	15	6	16	5	43
% of respondents	35 %	14 %	37 %	12 %	100 %
Trees	395	500	398	150	378
Production 2012/13	2020	1340	575	382	1067
Production 2013/14	1176	2440	833	530	1117
Yield per tree 2012/13	3.8	2.6	3.0	3.4	3.2
Yield per tree 2013/14	2.9	3.6	4.0	3.3	3.3
Sufficient inputs from factory	60 %	50 %	44 %	0 %	47 %
Credit limits production	80 %	83 %	69 %	60 %	74 %
Source: questionnaire, 2014 *Average production and yield per tree is for those who did produce that year.*					

The management of the coffee factory is generally perceived much more positive than the overall management of the co-operative (Questionnaire; Group discussions, 2014). This may be because the factory manager closely communicates with farmers. The CFM stated in that he puts a lot of emphasis on addressing the farmers. For the first time he sent a printed letter to each member with an invitation to a meeting. None had experienced that before and 350 of the 600 members attended that meeting (CFM interview, 2014). One respondent to the questionnaire remarked, that the management of the factory was improving and another mentioned that the new CFM was better at communicating and consulting with farmers (Informal conversation, 2014).

To conclude on the co-operative, it seems that the issue of mistrust plays an important role for the farmers and a lot can be related to lack of transparency.

4.2.4 Economic Factors

This section deals with the analysis of the economic factors such as price, credit service, input supply, and labour which possibly influence the production decisions of farmers.

Prices

Most respondents considered the price of coffee as the key factor that affect individuals farmer's decision whether to invest in their coffee trees, neglect them or uproot and shift to other crops. Analysis of the data gathered from the Gatugi factory shows that in the last two decades the price per kilogram coffee has been changing. The highest price of coffee was registered in the year 2010/11. Compared to the prices before 2009/10, prices in recent years have been higher (see figure 4.2). Nevertheless, most farmers who participated in the interviews perceive the prices as too low. One farmer stipulated that the returns from coffee he received is too little compared to the production costs such as labour and other input. During 2010/11 production of coffee in Gatugi was the lowest within the last two decades. Besides, the results in figure 4.2. show that for the 2010/11 harvest year price was the highest in the same decades. Furthermore, during the 2011/12 harvest year the production of coffee increased significantly and was one of the highest production years in the same time period. Nevertheless, the unit price of berry coffee per kilogram decreased significantly visa vise to the previous year's. Comparing the percentage changes of price and production the production years of 2010/11 and 2011/12 in which much variation in production is observed; percentage change in production was much higher than the percentage change in price which was 390 and 33 per cent respectively. This implies that the highest price in the harvesting year 2010/11 has motivated farmers to invest much in their coffee trees which led to higher coffee production. In other words, the coffee farmers in Gatugi village are highly sensitive to prices. The results of this analysis is similar to the feedbacks of most of the farmers who participated in the SSI's.390.7% and (33%) percent respectively. This implies that the highest price in the harvesting year 2010/11 has motivated farmers to invest much in their coffee trees which led to higher coffee production. In other words, the coffee farmers in the Gatugi village are highly sensitive to prices. The results of this analysis is similar to the feedbacks of most of the farmers who participated in the semi structured interviews.

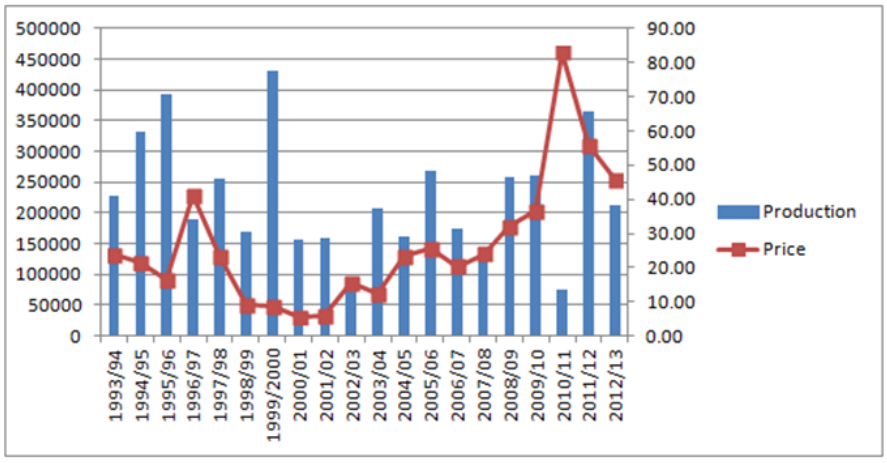


Figure 4.2 Coffee supplied to Gatugi (in kg - left) and price (in ksh - right) paid per kilogram by the coffee factory (*Nominal prices i.e. not corrected for inflation) Source: Data from Gatugi Coffee Factory 2014*

Payment System

When farmers deliver their berries to the factory they can receive an advance payment, depending up on their option. For instance, this year's advance payment was 15 ksh per kilogram. The remaining payment is made effective after the coffee is sold by the OFCS. This is normally done in September about nine months after the main harvest. From the questionnaire, it is evident that timing of payment is important for the majority of coffee farmers. Among 43 respondents 35 answered 'yes' for the question whether the time of payment matters or not because they need to receive the payment to finance school fees, basic living expenses and in order to pay for fertiliser and labour used at harvest time. Consequently, several farmers suggested that payments should be distributed throughout the year (Farmer F interview, remarks by questionnaire respondents, 2014). In conclusion, the current payment system seems to influence farmers to switch into other types of farming such as diary which can provide them an immediate and regular income.

Inputs and Credit Access

Coffee requires fertilizer for improved productivity and is exposed to diseases such as leaf rust and coffee berry disease (CBD). Therefore, the farmers needs to buy inputs such as pesticides and fertilizer if they are going to boost their production. Most of the interviewed farmers use both manure and artificial fertilizer. Two farmers only use manure, because they do not have money to buy fertilizer. They are also the only interviewees who have uprooted parts of their plantation, and invest less effort into it, now than before. This shows that lack of money to procure inputs such as fertilizers and manure is also a limiting factor for farmers to continue producing coffee (Farmer interviews, 2014).

Acknowledging the financial problems of its members, the OFCS provides inputs on credit. As can be seen in Table 4.7, 74 per cent of the questionnaire respondents replied that access to credit is limiting them from maintaining or increasing their coffee production. Moreover, in some of the interviews with farmers they explained their concern on the challenges of getting credit access. They are supposed to demonstrate a certain level of coffee production in order to get credit (Farmer interviews, 2014). In addition, the MC members also confirmed that they do not provide credit for less performing coffee farmers. The OFCS credit policy poses a challenge in improving productivity for farmers who have neglected their coffee and for those who partly uprooted their coffee tree.

Table 4.7: Farmers answer to question from questionnaire

Does access to credit limit your ability to maintain or increase your coffee production?	Number of respondents	Percentage (%)
Yes	31	73.8
No	11	26.2

Source: Questionnaires, 2014, N=42

Nevertheless, some farmers particularly those who perform well in their coffee production are able to buy inputs on credit at the GCF. Results in table 4.8 shows that the majority of respondents do not think that they are able to buy sufficient inputs at the the factory.

Table 4.8: Farmers answer to question from questionnaire		
Are you able to buy sufficient fertilizer, pesticides and so forth at the factory?	Number of respondents	Percentage (%)
Yes	17	42.5
No	23	57.5
Source: Questionnaire 2014, N=40.		

4.2.5 Regulation, Legislation and the Farmers' Perceptions

In order to regulate the coffee sector, the Kenyan government has promulgated the Kenya Coffee Act in the year 2001. Revisions of the Coffee Act have enabled co-operatives to sell directly to buyers. According to this Act the small-scale coffee farmers in Kenya are supposed to market coffee through their respective co-operative. In other words, it is legally prohibited for the small-scale farmers to market their coffee through other marketing channels.

In case of farmers uprooting their trees the co-operative must be notified as a way for the co-operative and the county to keep statistics of the amount of trees. Among the farmers there was a perception that you would have to apply for a licence to uproot, which mean that farmers do not always notify the factory about uprooting of trees (AEO interview, 2014).

Another issue which impact the coffee production, is intercropping. There is no mention of intercropping in the Coffee Act of 2001, however, several farmers emphasised that they are not supposed to have other plants intercropped with the coffee (SSI). They fear that if discovered, the factory might not accept the coffee and Farmer G mentions that the factory will close your account (Farmer interview, 2014). During the group discussion one of the problems with intercropping is explained as being critical for the quality:

"If a farmer grew onions or tobacco in a coffee farm then the coffee would acquire the onion or tobacco flavor. The law against intercropping helps to avoid this." (Group discussion, 2014)

According to the AEO, intercropping is not recommended because the farmers are not capable enough to manage it and it jeopardizes the quality and productivity of coffee. The reason is that crops which are intercropped compete with the coffee trees for the different nutrients in the soil. Furthermore, chemicals are sprayed on the coffee trees and this negatively affects the intercropped food crops. Perhaps this may make them inedible. However, planting trees sparsely is not a problem, according to the AEO. Nevertheless, in order to discourage intercropping the coffee factories might not accept coffee produced through intercropping. Consequently, farmers are faced with no choice regardless of intercropping only being a recommendation in Gatugi.

4.3 THE FUTURE

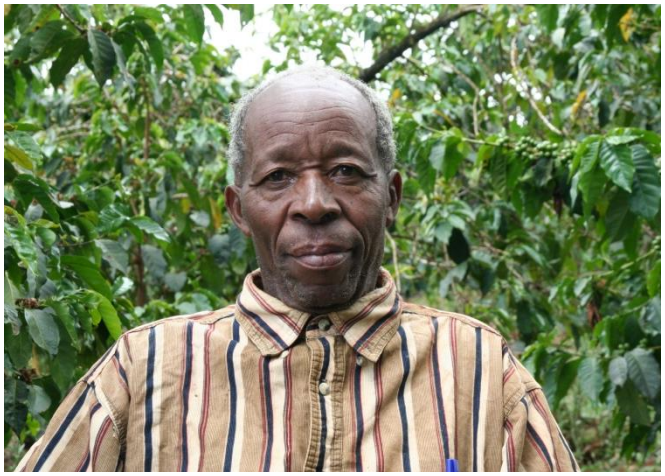
It is very difficult to predict the future particularly in terms of world market prices for coffee. However, this last section, before moving on to the discussion, presents the perspectives which the farmers and the OFCS have for the future when asked.

4.3.1 FARMERS' OUTLOOK

The respondents of the SSI's had mixed feelings concerning the future outlook of coffee production in Gatugi. The majority of them agreed that their involvement in coffee production depends upon its price. Those who are pessimistic are dissatisfied by the current coffee prices. One of the interviewees (B) said "unless we are paid well, I will not go further for coffee. I will uproot it." According to this farmer "in 1981 there were high coffee plantations but now the plantations are low." Another farmer (A) said whether to make an effort on coffee production or not depends upon the payment.

In contrast, some other respondents view a bright coffee future because they believe that their children have learned on how to grow coffee and they can take over and pursue producing coffee. One respondent (G) said "I am one of the community trainers and I believe the future of coffee in the community is promising." Interestingly one respondent (C) considered those who uproot their coffee as lazy.

In general, most of the farmers consider price as the major determinant factor for continued coffee production.



Picture: Left/right farmers participating in Farmers Field School (Picture by

4.3.2 THE CO-OPERATIVE'S OUTLOOK

From the OFCS perspective, coffee has a bright future despite the challenges which the coffee production in Othaya region has experienced. According to the CEO, the OFCS have some initiatives in the pipeline to improve the situation for their members. In terms of marketing strategies, the co-operative aims to promote domestic consumption. However, we did not investigate further the feasibility or how wise it is. As earlier stated, coffee is primarily exported

but through an expansion in the domestic market, the co-operative would diversify their sale. In relation to this, the co-operative consider to invest in own roastery which can be seen as vertical upgrading in the value chain. In the beginning of 2014, the media reported a dispute about the proposal from the Nyeri County Governor Nderitu Gachagua concerning that all coffee produced in Nyeri should be milled and marked centrally. 21 coffee societies, including OFCS, support this suggestion and made a public statement regarding their support. The co-operative believes that centralisation of milling will reduce the bean losses and centralising marketing will increase the bargaining power in particular towards international buyers (Statement by Nyeri County Coffee Growers Co-operative Societies on Coffee Marketing, 2014). It is a way to cut out the private millers who the co-operative sometimes suspected for cheating. For example, in the last drying process, the average weight loss is between 15 to 20 per cent. But the private miller would sometimes claim a loss of 30 per cent or more (CEO interview, 2014). There is significant support to the centralised marketing by the farmers with 37 out of 42 answering that this is a good idea (Questionnaire 2014).

Another marketing strategy is to establish more partnerships with international buyers and organisations. Currently, the co-operative is working on a partnership with the Danish coffee roaster and importer Peter Larsen and the NGO Just Fair, sponsored by Danida (CEO interview, 2014; The Star, 2014). According to the CEO the purpose of such partnership is capacity building and training of farmers.

5 DISCUSSION

The analysis has shown that there are several factors which impact the decision-making process of coffee farmers.
An overall key issue is trust and transparency because it determines the relation between the co-operative and the smallholder coffee producers. The farmers are dependent on the co-operative for processing and marketing their coffee. The co-operative is in charge of marketing, determine the payment system and regulation regarding access to input.
Several sources criticize the coffee co-operatives in Kenya for being corrupt (Pflaeger, 2012; Mude, 2005; Nyoro and Ngugi, 2007). Without investigating corruption directly in the field, as our focus was on the smallholder coffee producers, our data identify levels of mistrust and unclarity of the operation/management of the co-operative. From the analysis it is evident that there is no transparency in the pricing and the payment. Price is determined by the international market, however, the payment of the farmer is determined by the co-operative (MAFAP, 2013; Mude, 2005). Lukanima and Swaray (2013) suggest that producer prices are more volatile than international market prices supporting the assumption that the price that the farmers receive is not only dependent on the international market prices.

According to Mude (2005) the payment system for smallholder coffee producers in Kenya are suffering from 'increasing level of corruption, political opportunism and gross mismanagement' (p.1). Our research shows that the farmers are concerned about the payment system. School fees are to be paid every three months, inputs to the coffee production has to be purchased timely and there are mouths to fill every day, therefore the system with only payment once a year is a challenge for the smallholders. In Kenya this 'once-a-year' payment system causes farmers to be vulnerable and there is an increased level of indebtedness (Pflaeger, 2012). There is a risk that farmers leave coffee production in favour of for example tea, to have a more stable and frequently paid income.

As the analysis shows, advance payment is possible, which as Mude (2005) notes, is crucial for the access to necessary inputs. Inputs, in terms of fertiliser and spray, can be purchased on credit from the GCF and beyond advance payment, the access to credit pose a limitation to obtain those inputs, which almost ¾ of the respondents perceived as a challenge.
Furthermore, our findings show that access to input can be a constraint to increase their productivity in particular if they own many trees (400+). Access to input at farmers' disposal is a crucial factor for production decisions translating into the yield of coffee cherry and in the end the availability of income (Mude, 2005).
Beside inputs and training to increase the productivity of coffee, the farmers' never mentioned the issue of having to invest in new trees. The productivity of coffee trees steadily declines at a certain age after maturity (Mude, 2005). Our informants did not mention the age of the coffee trees as an aspect of how to increase the production - their focus was on improving the trees through better management. Why this is the case is questionable, but could be due to limited access to information, and lack of economic means that makes replacing trees not a viable option for the individual farmer. In order to focus on productivity, there is a necessity for

capacity building to farmers in terms of farmers' access to technical skills, capital, labor, and market information, which would facilitate improved management of coffee leading to increased output and income without increasing land size (Ayoola, 2012).
Ostrom (1990) mentions how external environmental sources of uncertainty such as rainfall, temperature and diseases are significant. Therefore, it is surprising that the farmers do not mention the environment and potential soil erosion as central for their production decisions. Currently, price and the relationship to the co-operative pose greater challenges towards the farmers than the environment, which could explain the limited focus on environmental factors.

To see the coffee production in Gatugi in a broader perspective, national and international events could assistance in explaining some of the fluctuations in the production. After a peaking year in 1990 the production level decreased, which could be linked to the collapse of the International Coffee Agreement in 1989 - an agreement aimed to stabilise the international market price through a quota system. The aftermath of the collapse was volatile prices (Fridell, 2013). Around 1996 the production and prices fluctuated significantly. It corresponds with the time of liberalisation of the coffee sector in Kenya. A task force was established in 1992 to formulate reforms of the coffee industry and the report was published in 1996, when the liberalisation of the sector then took off (Kegode, 2005).

5.4 Reflection on Theory

We use the Ostrom rational choice model mostly as a way to understand the connection between the different factors and the outcomes - where the latter refer to the production decisions of the farmers.
We have found it somewhat difficult to deal with the internal world. While the external world includes some tangible factors the internal world does not. The discount rate, norms, expected benefits and expected costs are not directly observable, but functions as a filter to value the different external factors. The consequences of the internal world affection on decisions are that farmers with the apparently similar conditions make different decisions. We have not included our discussions on how the internal world is affected by the external world in the report as we considered these seemed quite speculative. This implies that our research objective three, on understanding the internal factors have had less focus than the other two objectives on understanding coffee production and the external factors.

5.5 Reflection on Methods

Some of the participants in SSIs, and all the group discussions participants were invited by our guide who was a gatekeeper. We tried to reduce the gatekeeper's potential bias in selecting respondents through clarifying to her the purpose of the study and the desire to include representatives from all locations of the village. In our interview with her, we found her reasonable neutral. If she was somehow biased, it was in favor of the poor farmers. Therefore, we expect that dependence on the gatekeeper will not lead to major biases in our findings. In addition, during our visits to the farmer field school sessions, we also interviewed farmers, recommended by the extension officer, who were attending the field school training. Moreover,

so as to avoid biases in selecting questionnaire respondents we went to several parts of the Gatugi area.

It is natural that sometimes researchers get biased in analyzing the data gathered from different sources. Cognizant of this potential problem, we tried to analyze in a neutral way through discussing the cautions to be considered, beforehand, and by switching each other's work and commenting on it.
One of the main barriers in the use of our qualitative methods was the language barrier. Both for interviews, group discussions and questionnaires, having the same understanding of questions and answer is crucial for the methods to work optimally. In this aspect, we were facing three challenge. The first was that the translators interpreted the questions and answers independently. One systematic bias this created was that one translator only asked about family reasons in the the last question of the questionnaire even though the question referred to history as well as family. The second that some respondents understood different levels of english, they often prefered to use the English they had and it could prove difficult to determine how much they understood. This was especially problematic when conducting questionnaires. The questions were read aloud and then sometimes answered by a 'yes' or 'no' (or nod or shake of head) and a lot of misunderstanding may not be recognized by the interviewer, especially if it is more important to the respondent to show understanding of english or being polite, than give correct answers. Also in the group discussions, this was problematic, when participants posses different levels of english, and begin answering a question or debating a topic before the translation was done. The third challenge was the use of academic language used by interviewers, even though we were aware of this in our field work, it proved difficult in practice when going from academic internal group[2] discussion on data and collection, to conducting interviews with farmers.

Triangulation with key informant interview, members information from the factory and participation in FFSs and talks about these challenges with our guide and translators, were done to counter above mentioned challenges.

[2] Internal group discussions refer to discussions in the researchers group, in the process of both fieldwork and report writing.

6. CONCLUSION

On the basis of our analysis and discussion, we conclude that external factors affect small-scale coffee farmers' decision-making process in terms of uprooting, neglecting or investing in their coffee trees. As the analysis show, there are various factors impacting the choice of strategies by smallholders. However, the most significant external factors seem to include economic, social and organisational factors.

In terms of economic factors; price, payment system and access to input and credit concern the farmers most. The price is to some extent considered to be out of control of the farmers and the real concern is how the international coffee price is translated into their payment. Not surprisingly, the payment is central for both their livelihood and their ability to purchase input. In particular, these two elements are crucial for the decisions relating to strategy for future engagement in coffee. The very volatile prices and a 'once-a-year' payment system seems to push farmers more towards neglecting or uprooting.

In terms of social factors; age, education, gender and culture play a role in the decision-making process of farmers. Due to the culture in Kenya, age and gender can be limiting factors in getting access to land, which indirectly affect the actors in the coffee production. This means that the youth and women are less likely to inherit land and thereby make the decisions on the coffee production. The option of training affects the decision-making process towards investing in coffee and to become better producers.

Finally, in terms of organisational factors, the issue of mistrust and lack of transparency are significant for the farmers' decisions. Lack of transparency in the work of the co-operative particularly regarding the price of coffee develops mistrust among farmers which can inversely influence choices about coffee production. Furthermore, the issue of security at the factory level affects the engagement in investing in coffee production negatively. It seems to us that the rumors of corruption and maybe even the corruption itself, if it is there, would not be kept alive, if there was more transparency within the co-operative.

The different perceptions of the farmers' about the transparency and trust of the OFCS and the payment/price of coffee may cause them to have pessimistic or optimistic outlooks on the coffee future. This might impact the pessimistic farmers to neglect/uproot their coffee trees.

6.1 RECOMMENDATIONS

The conclusion leads to the following recommendations:

1) The OFCS should increase openness and access to information specially on pricing and processing and marketing costs through the factory which may insure farmers trust in coffee production and increase their willingness to invest in production.

2) Access to inputs through credit for farmers with small or bad production, may motivate to them restart coffee-plantation that have been neglected.

3) Farmers capacity building that provide information, capital and knowledge sharing should be further strengthened. Farmers Field Schools should continue and learnings should go

beyond production practices and include understanding the coffee markets and the financial functioning of the OFCS.

4) In order to avoid the possible gap in coffee production once the existing generation of farmers is passed, all stakeholders should ensure the involvement of the youth in coffee production.

5) The future plan of the Cooperative to create domestic demand for coffee is good initiative and it has to be done strategically.

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The Fate of Coffee in Kenya - an assessment of factors affecting the small-scale coffee producers' decision-making process.

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Naja Skouw-Rasmussen (dlv228)

Issa Kapande (jch890)

Thomas Eisler (mkv178)

Astrid Sigaard Andersen (mqr302)

Haftu Haile Gedremichael (dpv953)

This synopsis begins with a presentation of the international coffee market, followed by the coffee industry in Kenya which experiences challenges. This leads to the formulation of our research question and objectives which we wish to investigate in the Gatugi village, Nyeri South District, Kenya. As framework for our research, and later on data analysis, we use Elinor Ostrom's (1990) 'Rational Choice Model' that is explained after the introduction. The synopsis finishes with a review of the methods to be used in the field.

Introduction

For several years coffee has been one of the most valuable primary products in the world trade. It has second value next to oil as a source of foreign exchange for many developing countries. It also ranks high among the most important agricultural commodities traded in international markets. The global coffee production is dominated by smallholder farmers. 70 per cent of the world's coffee supply is estimated to be produced by 25 million smallholders (Eakin et al, 2009, cited in Caswell, et al, 2012). In total close to 100 million people depend on coffee for their livelihood, including all the actors in the value chain such as coffee harvesters, processors and industry workers (Jha et al, 2011, cited in Caswell, et al, 2012). However, coffee prices on the global market have had a declining trend after the International Coffee Agreement was abandoned in 1989. Furthermore, the value share of end producer price that goes to the producer country has declined from 20 per cent to 13 per cent (Ponte, 2002).

In Kenya coffee has been grown since 1893. Until 1986, it was the number one source of foreign exchange for the country and it accounted about 40.6 per cent of the national foreign exchange earnings. It earned about 107 billion Kenyan Shillings, which was about 10 per cent of agriculture's share of GDP between 1987/88 and 1997/98 (Republic of Kenya 1998, cited in Thuku et al, 2013).
In a nutshell, coffee has contributed immensely to the Kenyan economy due to its contribution to foreign exchange earnings, farm incomes, and employment (Thuku et al, 2013). Further, Kenya's coffee is worldly known for its high quality which makes it competitive to coffee from other countries. It is the best coffee in the world and always fetches high surcharge prices in the world market (Ibid).

Kenya has a two-tiered production system of coffee. One tier consists of smallholders who do not have their own pulping station and process and market their coffee through cooperatives. The other tier consists of the large estates that do have their own access to processing and marketing. 65 per cent of coffee production in Kenya is done by smallholders (Karanja and Nyoro, 2002 and Nyangito, 2005, cited in Thuku *et al*, 2013). The cooperatives produce a larger share of high quality coffee than the estates (Ponte 2001), which emphasize the importance of the smallholder producers in maintaining

Kenya's position as a supplier to high-end markets. Nevertheless, the productivity of cooperatives was only 266 kg/ha while it was 510 kg/ha for estates (Nyangito 2005). This could indicate a trade-off between quality and quantity.
Smallholder coffee production are sometimes integrated in traditional Central Kenyan agroforestry production systems. These systems have less severe impact on soil fertility and ecosystem then some of the alternative cash crop production systems with cabbage and tomato (Kitalyi 2013).

The contribution of coffee to the national foreign exchange earnings in Kenya has fallen gradually and reached 3 per cent in 2010. This decline was occasioned by fall in coffee production from a peak of 128,700 million tons in 1987/88 to 42,000 million tons in 2010 (Okibo and Mwangi, 2013). The declining production cannot only be explained by the decreasing world market prices. Factors such as low productivity, use of non-resistant varieties, inefficiency of cooperatives and the structure of the marketing should be investigated for thorough understanding (Monroy et al. 2013).
Since the Kenyan government started liberalizing the coffee sector in 1996, the trend of coffee production and price has also been declining. For instance, the average price per 50 kg bag in the auctions for the last two years has been Ksh. 9,000/bag. The world price for the same coffee has been Ksh 20,000/bag, but the coffee farmer received only Ksh 7,500/bag. Despite the high price of Kenya coffee in the international market it has become a norm for the farmer to sell coffee far below the production cost (Kegode, 2005). According to The Point (2000), the cost of production for the smallholder farmers in Kenya is rising. The reason behind the rise in the production cost is not only due to inflationary pressure within the country, but also to a large extent because of the coffee berry disease. Most smallholder farmers incurred costs in disease control that took up a total of 30 per cent of the market prices (Ibid). In addition, the transport and processing costs for smallholders are more than twice the costs for estate producers (Monroy *et al,* 2013).

Decisions made by individual producers, could be one of the reasons for decline in coffee production. These can be short term decisions such as harvesting less coffee berries, medium term decisions like investing less in maintaining the bushes (Nyangito, 2000) or long term decisions for example to uproot the trees and plant other crops (Owuor, 2009).
Despite much literature on the difficulties experienced by the coffee sector, literature on the factors that affect the production choices of small-scale coffee producers in Kenya is limited. The research question is therefore:

How do factors affect small-scale farmers' decision-making process regarding coffee production in Gatugi, Nyeri South District, Kenya?

Based on literature reviews, we expect that factors such as norms, household structure, education, socio-economic status, environment, institutions and access to information, will affect the farmers' decisions. Furthermore, there are some recent changes in the coffee market with world prices on coffee increasing due to droughts in Brazil and the political situation in Kenya, referring to the disagreement between the governor of Nyeri and the coffee cooperatives, which effects are not yet entirely known (Perez et al., 2014; Ndung'u, 2014).

From the main research question above we derive three objectives, on which our sub-questions are based. The sub-questions can be found in Appendix 1, in a matrix, linked with data type, data source, methods, materials and some thoughts on possible problems we might encounter.

* Objective 1: To understand smallholders' decision on engagement in coffee production, we will examine the overall production of coffee.
* Objective 2: To understand the internal factors affecting the decision making process of smallholders through mapping and examination.
* Objective 3: To understand the external factors affecting the decision making process of smallholders through mapping and examination.

To guide the research on decision-making process and classify the various factors impacting that process, this study applies the rational choice model formulated by Ostrom (1990). This framework is explained in the following paragraph before moving on to the field methods chosen for this project.

Theoretical framework

Ostrom's (1990) 'Rational Choice Model' considers very broad conception of rational action (see figure 1.1). In this model an individual's choice of strategy is influenced by internal and external factors. The internal factors refer to those within the mind of the decision maker. Particularly, there are four internal variables namely expected benefits, expected costs, internal norms, and discount rates which affect an individual's choice of strategies or decisions. The discount rate is how a person value future benefits and costs relative to the present. While making decisions, individuals take into account the expected costs and benefits of their choice of strategies. However, the internal norms that individuals possess are influenced by the shared norms held by others with regards to particular situations. Furthermore, the internal discount rates are also affected by a range of opportunities that an individual person has outside of his/her particular situation. External factors refer to all those variables that affect the above mentioned four internal variables.

To classify the factors we aim to identify through the fieldwork, we use Ostrom's definition of internal and external factors, and her theory of decision making, to analyse our data.

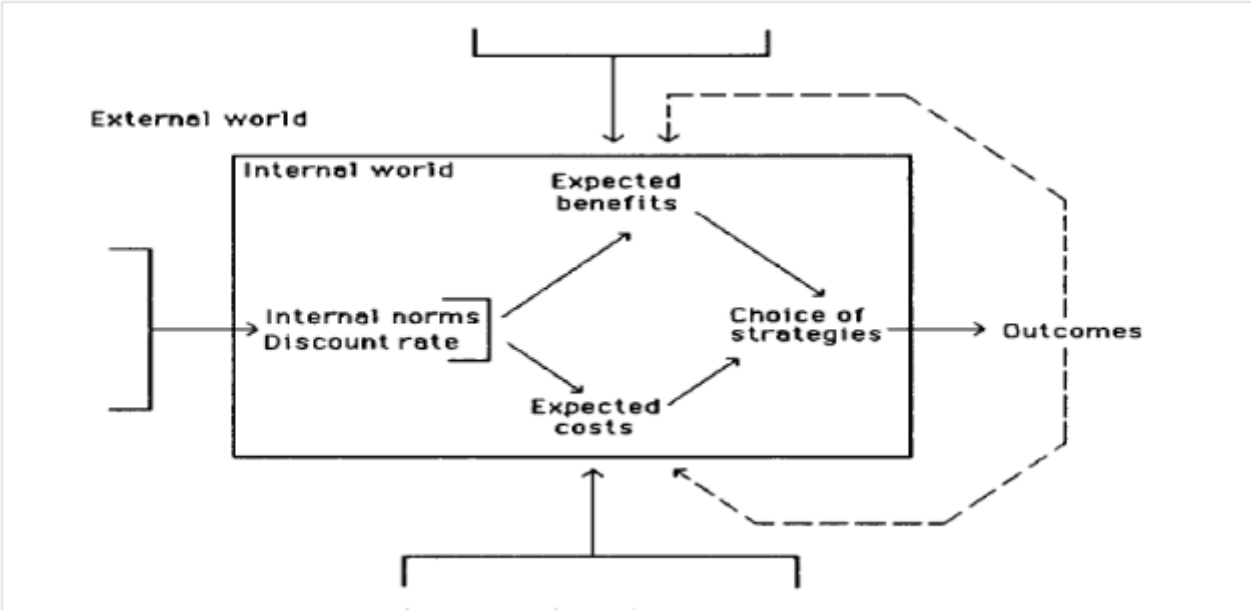

Fig 1.1: Rational Choice Model (Ostrom, 1990).

Methods

In the field we will mostly work with semi-structured interviews, participatory rural appraisal (PRA), questionnaires, direct observation and possible focus group discussion. These methods will mainly aim to undercover farmers' and villagers' perception of factors that affect their production. To triangulate the mainly qualitative methods, we will measure soil quality in selected fields, and take notes of crop and intercrop diversion, such as the use of shade trees.
Before entering the field, we are conducting more in depth literature review, designing the interview guide and prepare for the questionnaire. These tasks will be coordinated with our two 'remote' group members, Rosemary Gichure and Opondo Keyah, who are students at the University of Nairobi, Kenya.

Our research objects are individuals in contrast to households, which are perceived as a unit, that have an impact on the different individuals' decision-making.

Participatory Rural Appraisal

Participatory Rural Appraisal, mostly referred to as PRA, as described in (Chambers 1994, Mikkelsen 2005) include several methods. The methods that we will focus on are the transect walk, (focus) group discussion, mapping and ranking.

Two transect walks are planned, one on or just after arrival to Gatugi, a mainly informal citywalk with the aim to get acquainted with the village. Another more focused walk with a not yet decided number of farmers and maybe village leaders. From the walk we hope to learn more about the local coffee production, to get an overview of the community and identification of fields for later soil sampling. Doing the walk we will conduct informal open interviews.

Two group discussions, including mapping and ranking exercises, are planned with farmers still producing coffee and farmers with strongly reduced or past productions respectively. The discussions will be centered on reasons for or against coffee production. Then we will map the reasons and the relations between them, and afterwards rank the reasons on the basis of importance. We use the mapping and ranking exercises to identify internal and external factors that the farmers perceive as central for their decisions regarding coffee production.

We plan to use focus groups as a way to address populations groups, like young people or women, whose opinion may not be presented in the discussion groups, and also to address more difficult problems, as current political situation, and the problems with the coffee cooperatives. We plan on very small groups of around 4 people, to account for translation difficulties.

Direct observation

Throughout the different exercises the opportunity to do direct observation can prove to be valuable as it will give information about the interaction between the different informants and potentially identify social structures in the community. Furthermore, direct observations are believed to happen on a daily basis since we are living in the village Gatugi where the fieldwork will take place. "*Observation of physical structures, social differences, behaviors, action and symbols, in solitude or with others with whom observations are discussed, provides important information for posing central questions*" (Mikkelsen 2005, p. 88). We will use information gathered by observing norms and practice, for understanding the community, and more directly to gather knowledge on access to information and means of getting information in the community.

Semi-structured interviews

For the purpose of investigating the internal and external factors, in regard to smallholders producing coffee, interviewing is a central method. To allow for flexibility semi-structured interviews will be used. The idea is to interview both farmers and managers in the cooperative, and in case of availability the Agricultural Extension Officer in Othaya. With the semi-structured interviews there is an element of uncertainty and it has to be considered if it should be the same interviewers who conduct the interview for either all the farmers or all the people in the cooperative. This is due to allow for better comparison afterwards. The interviews will build on designs and guides by Casley and Kumar (Casley and Kumar 1988 and Mikkelsen 2005). We are designing 2 semi-structured interviews, to conduct interview with farmers (currently producing coffee or with a history of coffee production) and cooperative managers respectively. The number of interviewees and the questions will be decided after the initial walks and informal interview.

Questionnaires

A short, more informal, questionnaire will be created to use in the first few days of our fieldwork. The questionnaire will be used to gain knowledge about life in the community and different people's relation to coffee production and the cooperatives. The questionnaire will be no longer that around 15 questions, with a sample size of 10-30 depending on time, and sampling done by talking to people at public areas. The idea is that we can gain knowledge about some language and norms from this, that will help us design future work, and at the same time let the people of the community meet us in a more informal way.

Another questionnaire will be used to collect a wider amount of data on local information sources, to gather statistical data on information access more generally in Gatugi.

The questionnaires will be designed based on knowledge of questionnaires from Rear and Parker (Rea and Parker 2005). The sample group will be smallholders and the sample size 20 based on time frame (we would like to sample around 20 per cent of the smallholders, but before we know the real- and working population, 20 per cent is an unknown amount, and we have to consider the time limit). To sample farmers we hope to obtain a list of members of the local cooperative. From the list we will randomly sample 5-10 names or households and either ask each interviewee to guide us to another possible informant (Snowballing) or conduct interviews with surrounding households (Cluster sampling).

Soil samples

To triangulate the qualitative information about field fertility and coffee production, we will take soil samples from a number of farmer's fields, and measure soil composition, density and pH. With this information we can see if there is a notable correlation between soil fertility and farmer's decision. Samples of 100 cm3 will be taken from topsoil and uppermost two layers of soil profile. The samples will be dried and transported to the University of Copenhagen for analysis.

Biodiversity assessment

Doing transect walks, interviews or other visits to coffee farmers, we will count the number of different species of shade trees used at coffee fields, and measure density of shade trees, to see if there is a correlation between farmer's decision and biodiversity of shade trees. If there is time we will count number of different crops in smallholders' farms in addition to coffee.

Pre-test of methods

We plan to test both semi-structured interviews and questionnaires on our counterpart local students and maybe host families and interpreters.

Appendix

For more details of PRAs and questionnaire see Appendix 2 and 3, and for relations between methods and research questions/objectives see Appendix 1.

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Appendix 1: Project Matrix

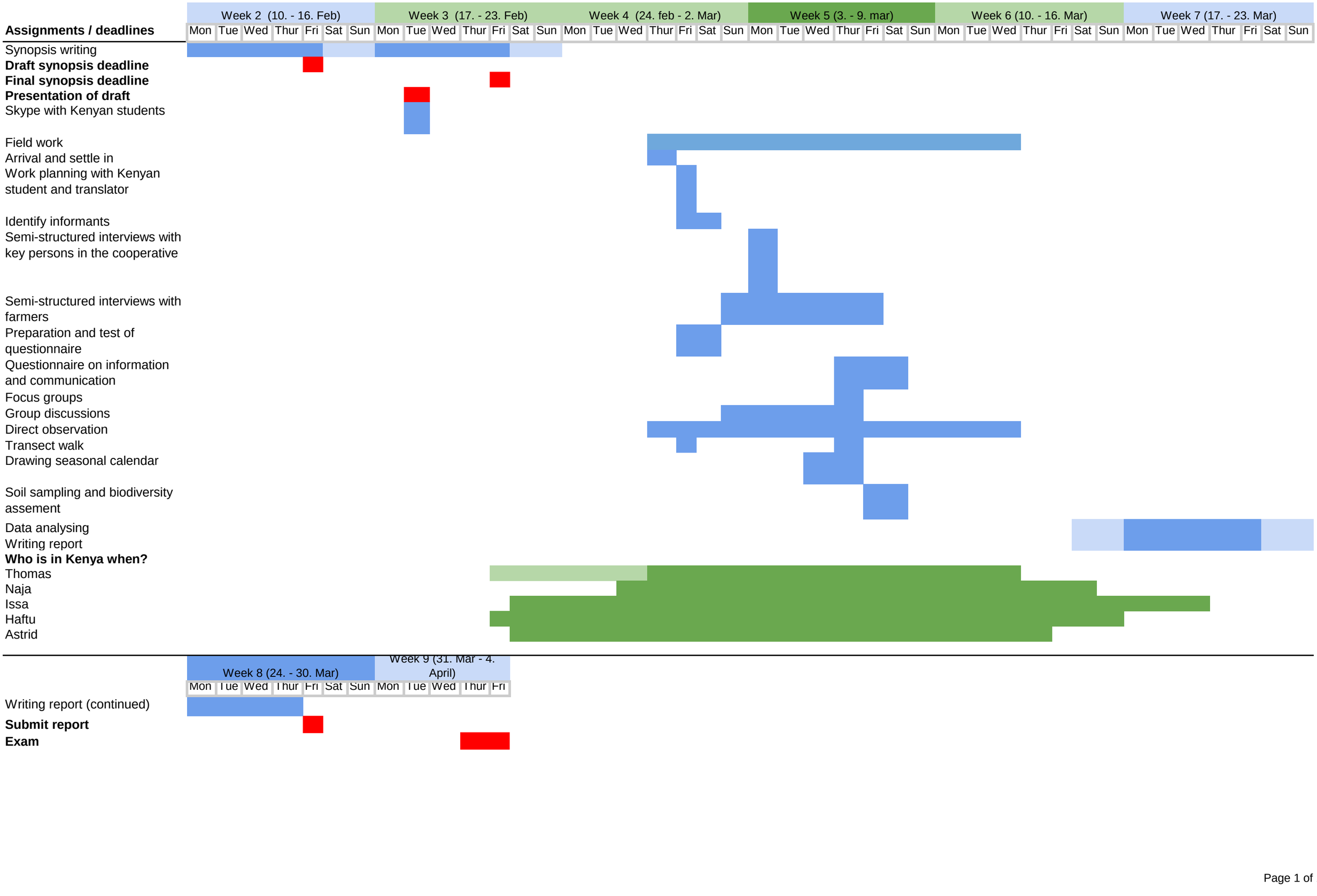
Main research question: How do factors affect small-scale farmers decision-making process regarding coffee production in Gatugi, Nyeri South District, Kenya?

Objectives	Sub research question	Data type	Data source	Method	Material	Possible problems we might encounter
1. To understand smallholders decision on engagement in coffee production, we will examine the overall production of coffee	1.1 How do smallholders produce coffee?	Inputs (use of fertiliser, plants, irrigation), labour, coffee types, transportation etc.	Primary data from farmers	Transect walk, PRA: seasonal calender of different tasks, semi-structured interview	Recorder, notebook, pen, flipchart, camara, markers	
	1.2 Who makes the decision on coffee production practices?	Informal institutions, power relations in the household, division of labour	Primary data from farmers	Semi-structure interviews	Recorder, notebook, pen	Sensitive issue. Power relations within a household can disguise who really makes decisions on the production.

2. To understand the internal factors affecting the decision making porcess of smallholders through mapping and examination	2.1 What are the internal factors affecting smallholder coffee producers decision making?	Qualitative and quantitative data regarding cognitive biases (risk aversion, discount rate), past experience, household characteristics (age and gender), beliefs in personal relevance, and socio-economic status (knowledge, income, social class)	Primary data from farmers	Semi-structured interview, participatory mapping	Recorder, note book, pen, post-its, flipchart, markers, camara	Language barrier and problems with understanding
	2.2 How do the internal factors affect farmers decisions on coffee production?	Opinions and perceptions	Primary data from farmers	Semi-structured interview/ focus group discussion, ranking exercise	Recorder, notebook, pens, flipchart, bricks	Language barrier in particular with the focus groups can limit how much we get from it.
	2.3 What are the outcomes of smallholders decisions influenced by inernal factors?	Quantitative/qualitative data on production trend, size of plantation, quality of coffee, intercroping, etc	Primary data from farmers and coffee cooperatives	Semi-structured interview/focus group discussion	Recorder, note book, pen	See above

3. To understand the external factors affecting the decision making process of smallholders through mapping and examination	3.1 What are the external factors affecting small-holder coffee producers' decision making?	Qualitative data on farmers perception of external factors that influence their decision making.	Primary data from farmers	Semi-structured interviews, focus group/mapping	Recorder, note book, pen, flipcharts and markers	Same issues as mentioned with under objective 2 (internal factors)
	3.2 How do natural and environmental factors affect decision making?	Farmers perception on the importance of climate, environment, risk of disease (like coffee cherry bore), etc.	Primary data from farmers	Semi-structured interviews, focus group/mapping, soil sampling, diversity assessment	Recorder, notebook, pen, flipchart, camara, ring, rubber hammer, plastic bags, shovel, knife, tape meassure	Time constraint and relevant data regarding soil sampling and biodiversity assessment
	3.3 How do social and economic external factors affect decision making?	Social networks, norms, village structure, organisation, education, religion, income diversitfication	Primary data from farmers and fields	Semi-structured interview, focus group discussion	Recorder, notebook, pen, camera.	
	3.4 How do institutions like the cooperatives, markets, legalislation and government affect decision making?	Factors like the cooperatives, legislation, marketing agents, global markets. Quantitative data on the co-op performance	Farmers, key informants in the village, co-operative key persons, co-operative records, news papers	Semi-structured interview, focus group discussion, data collection (newspapers, records)	Recorder, notebook, pen, camera, computer	The performance of the cooperative and other institutions might be controversial, so respondents can be reluctant to reply on these issues
	3.5 How do farmers access to information and their use of communication affect their decision making?	Means, ways and technology of information dissemination and communication	Farmers, cooperatives, extension officers, 'village'	Questionnaire, direct observation	Papers, question-naire, pens, notebook	

Appendix 4: Preliminary work plan



Appendix II

Work Division - Fieldwork and report writing

Fieldwork	**Responsible researcher**
Transect walks	All
Interview with Agricultural Extention Officer (AEO)	All
Interview with Coffee Factory Manager (CFM)	Issa, Thomas, Rose
Interview with CEO of Othaya Cooperative (CEO)	Issa, Naja, Thomas
Interview with Member of Management Committee (MC)	Haftu, Opondo
Interview with Madam Monica	Naja, Astrid, Rose
Design of Semi structured interview (Farmers)	Astrid, Opondo
Interview with Farmer A	Opondo, Astrid
Interview with Farmer B	Opondo, Astrid
Interview with Farmer C	Astrid
Interview with Farmer D	Opondo, Astrid
Interview with Farmer E	Astrid
Interview with Farmer F	Issa
Interview with Farmer G	Astrid, Opondo
Interview with Farmer H	Issa
Interview with Farmer I	Astrid, Opondo
Group discussion design	All
Group discussion 1	Astrid, Opondo
Group discussion 2	Naja, Issa
Focus group design	Rose, Opondo
Focus group	Rose, Opondo
Questionnaire design	Haftu, Naja, Thomas
Questionnaire w. 43 farmers	All
Visit to Farmer Field School 1	Haftu, Naja, Rose
Visit to Farmer Field School 2	Rose, Thomas

Appendix II

Visit to Farmer Field School 3	Issa, Astrid
Report section	**Main Authors (Contributing Authors)**
Introduction	All
Ostrom's Rational Choice model	Haftu
Methodology	-
- Semi structured Interviews	Astrid
- Group discussions (Focus group)	Astrid
- Questionnaire	Naja
- Direct observations	Astrid
- Visit to Farmer Field School	Naja
- Sampling and GPS	Astrid, Naja
- Collection of records from co-operative and factory	Thomas, Issa
Analysis	-
- Coffee production	Astrid, Thomas
- Social factors	Naja, Issa, (Haftu)
- Environmental factors	Astrid, (Thomas, Haftu)
- Organizations	Haftu, Thomas, (Naja, Issa)
- Economic factors	Issa, (Thomas, Haftu)
- Regulations, Legislations and the farmers' perceptions	Naja, Haftu
- Farmers outlook	Haftu, (Astrid)
- The Cooperatives outlook	Naja, (Haftu)
- Discussion	All
- Conclusion	All

Questionnaire including answers (numbers)

No.	Question	Answer options	Answers
1	Gender	Male	24
		Female	19
2	Age	18-35	5
		35-60	15
		>60	23
3	Educational level	None	8
		Primary	18
		Secondary	14
		Certificate	1
		Diploma	1
		BA/BS	0
		MA/MSc	0
4	What is your main occupation?	Coffee farming	10
		Mixed farming	33
		Off-farm activities	2
5	Are you the Head of household?	Yes	33
		No	9
6	How many people in your household?		Average 4.7
7	Are there any member(s) of the household/family you support economically outside the homestead?	Yes	23
		No	20
8	Are there any member(s) of the household/family support you economically outside the homestead?	Yes	21
		No	22
9	How many acres of land do you farm?		
10	How much of the land is used for coffee production?		
11	How many coffee trees do you have?		
12	Is your land ancestral, bought or rented?	Ancestral	39
		Bought	3
		Rented	1
13	How many kilograms of coffee did you produce:	2012/13	
		2013/14	
14	How many persons in the household contribute to the coffee farming throughout the year?		
15	Where do you get information about coffee production?	see codes below	
16	Do you hire labour at harvest time?	Yes	33
		No	9
17	Do you hire labour throughout the year?	Yes	18
		No	25
18	Are any of the persons working at the farm between 18-30 years old?	Yes	23
		No	20
19	Are you able to buy sufficient fertiliser, pesticides and so forth at the factory?	Yes	20
		No	23
20	Does access to credit limit your ability to maintain or increase your coffee production?	Yes	31
		No	11

21	Does it matter when you get your payment from coffee?	Yes	35
		School fees	24
	a. If yes, why?	Buying food	17
		Other	4
		No	8
		Off-farm income	1
	b. If no, why?	Other farming income	3
		Credit	1
		Other	0
22	Do you participate in the Annual General Assembly?	Yes	29
		No	14
23	Do you read the minutes from the Cooperative?	Yes	21
		No	22
24	Do you follow up the accounts of the cooperative?	Yes	13
		No	30
25	Which factory are you a member off?		
26	Do you participate in information meeting at the factory?	Yes	35
		No	8
27	How would you characterise the cooperatives management?	Good	15
		All right	6
		Poor	16
		Neutral	5
28	How would you characterise the management at the factory?	Good	28
		All right	5
		Poor	8
		Neutral	2
29	Do you think that marketing all the Nyeri coffee from the	Good idea	37
	different cooperatives centrally is a good or bad idea?	Bad idea	5
30	Do you know how much the cooperative sell the coffee for?	Yes	4
		No	38
31	Do you think that coffee production is important for the	Yes	39
	community?	No	3
32	Are there any historical/family reasons for you producing coffee?	Yes	31
		No	12
33	Is there anything you think we should consider about coffee production which we have not asked about here?		

Appendix IV

Reference	Date	Recording	Interviwer	Observer	Gender	Production category
Agricultural Extention Officer (AEO)	05.03	Yes	Astrid	All	Male	NA
Coffee Factory Manager (CFM)	07.03	Yes	Issa	Thomas, Rose	Male	NA
CEO of Othaya Cooperative (CEO)	04.03	Yes	Issa	Naja, Thomas	Male	NA
Member of Management Committee (MC)	07.03	Yes	Haftu	Opondo	Male	NA
Madam Monica	07.03	Yes	Naja	Astrid	Female	NA
Farmer A	04.03	Yes	Opondo	Astrid	Female	Very few
Farmer B	04.03	Yes	Opondo	Astrid	Male	Normal
Farmer C	06.03	No	Astrid	-	Male	Normal
Farmer D	05.03	Yes	Opondo	Astrid	Male	Very few
Farmer E	06.03	No	Astrid	-	Male	NA
Farmer F	06.03	No	Issa	-	Female	Normal
Farmer G	04.03	Yes	Astrid	Opondo	Female	Few trees
Farmer H	06.03	No	Issa	-	Male	Normal
Farmer I	04.03	Yes	Astrid	Opondo	Male	Normal

Production category refer on respondents number of coffee trees:
0-100: very few, 100-200: few, 200-400: normal, 400-: Many

Appendix V

Design of semi-structured interviews with farmers

For farmers - topic classification:

Topic 1: Current production (How many trees? Yield pr. tree (kg)? How many times harvest a year? Nutrients, fertiliser?) Price (What did you earn per kg last harvest? Do you think it's enough? When do you get the payment for your coffee)	Topic 2: History of production (Have you always done this way/ have things changed, how have things changed?) Price (Have you always done this way/ have things changed, how have things changed?) *- look for if answers on tradition come into light*
Topic 3: External factors - Effect on production/price? Rainfall patterns? Intensity, frequency, predictability, changes? Temperature? Soil erosion? More/less? Diseases? Pests? Weeds? Other crops, replacement with more valuable cash crops/or economic activities (Is there other crops/activities you would rather grow/do?) Cash-crops trees as shade-trees? (What kind of shade-trees do you have?) *- Environmental* *- Risk (internal-perception of risk)*	Topic 4: External factors - Effect on production/price? Regulation: What are the current coffee-laws affecting you? (marketing laws) Cooperation: Which cooperative society are you a member of? - Is that good for you? *(follow up on leads)* Finances: Could you get money from other sources for the coffee-production? Would it be easy or hard? *- Relation to Coop* *- Regulation* *- Finances (access)*
Topic 5: Who taught you how to grow coffee? How do you find out which fertilizer/nutrients/pesticides/herbicides, to use?	Topic 6: What do you see as a future of coffee production in your community? Or what do you see as the future of your coffee production?

What would you do if you discovered a new disease or pest? How do you know which cooperative to be a member of? How did you know about that? - *Knowledge* - *Information*	Would you want your children to become coffee farmers? - Perception of the future

- Identify the different indicators for the different topics and potential some wording for question.