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**Smallholder Livelihoods in Semi-Arid Areas in Transition:
Longitudinal Results from Laikipia, Kenya**

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**Smallholder Livelihoods in Semi-Arid Areas in Transition:
Longitudinal Results from Laikipia, Kenya**

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Front page chapter 3: View from the foot-slopes towards Mount Kenya. Ulrich, 2010.
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Preface

This study was conducted in the context of a research project on «*Semi-arid Areas in Transition: Livelihood Security, Socio-ecological Variability and the Role of Development Interventions in East Africa*» under the project lead of Prof. Dr. Marcus Nüsser, South Asia Institute, Heidelberg University. The project is funded by the Volkswagen Foundation. The focus lies on livelihood strategies in semi-arid regions that undergo rapid transition due to global climatic change, migration, resource conflicts and changing access regimes. The study on hand aims to be conducive to the project goals contributing to knowledge about livelihoods in rural Africa. The study analyzes how livelihood assets and strategies of smallholders in the Laikipia district in Kenya have changed based on data from semi-structured household interviews as a follow-up survey of longitudinal data available from a long-term research project on livelihood strategies conducted by the Centre for Training and Integrated Research in Arid and Semi-arid Lands Development (CETRAD) in Nanyuki, Kenya. The initial livelihood survey was carried out under the lead of Prof. Dr. Urs Wiesmann, Centre for Development and Environment (CDE), University of Bern.

The present survey was undertaken between February and May 2010 in Laikipia District, Kenya. For their contribution and support I would most deeply like to thank the following persons: Prof. Dr. Marcus Nüsser, South Asia Institute, Heidelberg University, for the great opportunity to join the research project, the support and supervision of the thesis. Prof. Dr. Urs Wiesmann, Centre for Development and Environment (CDE), University of Berne, for putting the data from livelihood surveys in 1997 at my disposal. Dr. Boniface Kiteme, Centre for Training and Integrated Research in Arid and Semi-arid Lands Development (CETRAD) in Nanyuki, Kenya, for the great support and warm welcome in Kenya and in CETRAD. Paul Roden, PhD candidate, Heidelberg University, for the many discussions and valuable insights, for proof reading, for the strong support throughout and, above all for the great times in Nanyuki.

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Erklärung

Ich versichere, dass ich die vorliegende Diplomarbeit ohne Hilfe Dritter und ohne Benutzung anderer, als der angegebenen Hilfsmittel angefertigt habe und die den benutzten Quellen wörtlich oder inhaltlich entnommenen Stellen als solche kenntlich gemacht habe. Diese Arbeit hat in gleicher oder ähnlicher Form noch keiner Prüfungsbehörde vorgelegen. Mit der Einsichtnahme Dritter bin ich einverstanden.

Heidelberg, 10. Februar 2011

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Summary

The rural population in semi-arid lands in Kenya faces multiple transitions that leave the inhabitants with risks and opportunities. Longitudinal data on household asset endowment enable a deeper analysis of change and continuity in livelihoods strategies showing opportunities and constraints for development. The study analyzes how livelihood assets and strategies of smallholders in the Laikipia district in Kenya have changed based on data from semi-structured household interviews in 1997 and a follow-up survey conducted in 2010. Taking an actor-oriented approach focus lies on smallholders in the semi-arid region. Based on livelihood assets a well-being indicator was derived and livelihood portfolios from 1997 and 2010 compared. The study reveals a striking persistence in low asset endowment for the majority of households from an aggregated perspective, whereas from a household perspective transitions into and out of better livelihood conditions become evident. It seems that households can easily slip back into poverty and it is argued that smallholders lack options to invest in risk buffering assets. Asset portfolios show constraints for smallholders to expand in natural resource related activities. Substantial loss in livestock particularly for relatively better-off households calls for further research. While off-farm activities offer crucial additional income sources and could possibly provide a pathway out of poverty it is argued that the prevailing low level of income and high insecurity for the majority who are engaged in off-farm employment, hinder development towards improved livelihoods in the area.

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1. PROBLEM STATEMENT AND GOAL OF THE STUDY

PROBLEM STATEMENT AND FOCUS OF THE STUDY

1.1. RESEARCH QUESTIONS

1.2. STRUCTURE OF THE STUDY

1. Problem statement and goal of the study

Poverty persists in Kenya. Its reduction remains one of the greatest challenges for development and has been revived as a central development theme.¹ Half of the population is estimated to live below the poverty line (IFAD 2006; UNDP 2006). The rural population in arid and semi-arid lands (ASAL), which constitute 80 percent of Kenya, are among the most vulnerable due to the erratic and unreliable rainfall that does not allow for good crop harvest (Mati 2005). Mainly based on crop and livestock, rural livelihoods face new challenges as a result of rapid changes in ecological, socio-economic and political dimensions. The increasing frequency of droughts and floods shown by recent climate change reports pose a threat to their livelihoods.² Massive population growth since Independence in 1963 as well as land use changes and land degradation respectively have further led to dramatic socio-ecological changes (Kiteme et al. 2008).

The continuous change of conditions leaves the inhabitants with risks and opportunities (Nüsser and Ifejika Speranza 2007). The necessity to understand their capability to cope with a difficult and changing environment as well as their ability to take advantage of opportunities has been widely acknowledged in the development literature. Although local actors are most affected by the region's development, they are also the most influential on it (Wiesmann 1998). Their livelihoods and adaptation processes, thus, have become increasingly important for development research. Likewise, the concept of livelihood strategies has become an integrated part in many development practices in recent years. The current discourse in development literature often speaks of *improving* livelihoods (Brown et al. 2006). But what are current livelihood activities? Have livelihood strategies changed in the past decades? Brown et al. (2006) points to livelihood analysis as a prerequisite for development interventions whenever they aim to improve choices or outcomes for households. Livelihood analysis can help target improvements, as studies have shown that poverty is a much more complex phenomenon than just low income or insufficient food production (Ashley 2000). Development interventions may aim at agricultural production, on human capital investments or help expand in off-farm earnings (Karugia et al. 2006). Thus, for improved targeting of development intervention, a better understanding of diversified strategies and the asset base available seems inevitable. This diversification of activities is particularly important in the case of the poor as they often rely on a number of different types of economic activities for their livelihoods (Ellis 2000). This is also in line with new approaches differentiating chronic and transitory poverty (Carter and Barrett 2006).

¹ The Poverty Reduction Strategy Papers (PRSP) adopted in 1999 and the Millennium Development Goals (MDG) adopted in 2000 attest this fact. Source: HDR UNDP 2006:17

² Climate Reports: IPCC WG II, 2001, 2007; Ifejika Speranza 2006

1.1. Research questions

In the light of this, the study on hand aims to investigate into dynamics and adaptation processes or lack of these – and the opportunities and threats for livelihood strategies in the semi-arid region north-west of Mount Kenya. The region is characteristic for the low-potential semi-arid areas in East Africa (Notter et. al. 2007). Taking local actors as key agents within research contributes to a problem-oriented understanding of the dynamics (Wiesmann 1998). Considering this, the study's approach is actor-oriented and focus lies on smallholder³ livelihoods, their opportunities and constraints. Kohler (1988) argues that smallholders' subsistence farming is not sustainable in the region and questions back in the 80s whether small-scale farming will persist to the same extent. More than twenty years later there is continuous population growth and a declining agro-ecological potential. Thus, how do smallholders manage to secure a living? Previous livelihood studies enable longitudinal data sets and the possibility of a more in-depth study of activities and asset portfolios – and how these have changed. The aim is to gather quantifiable and qualitative data on the asset endowments. As assets are defining attributes of livelihoods and important determinants of the activities that individuals and households follow (Hatlebakk 2009; Ellis 2000), from these, insights into livelihood strategies among smallholders are discussed and the understanding of rural livelihoods deepened. Their situation today is compared with findings from 1997 in an attempt to shed light on transitions and continuity within smallholder strategies, their options and constraints.

The research questions are defined as follows:

- (i) With the availability of longitudinal data how have asset portfolios changed in rural households in Laikipia for the past decades?
- (ii) From these insights, can changes in livelihood strategies be identified? If so, in what form?

³ The term smallholder, small-scale farmers and peasant is used interchangeably in this study. Characteristics of smallholders are covered in chapter 3.3.

1.2. Structure of the study

With the problem statement and research questions on hand, the present study is structured as follows. First, the theoretical framework is outlined and lays the background for understanding the aim and methods used to conduct this study. An introduction about the study area with its specific characteristics follows. Particularly the socio-ecological conditions that shape rural livelihoods as well as the characteristics of local actors that this study focuses on are presented. The chapter on methodology then highlights the methods used for data collection. Limitations within this approach will be discussed to enable an understanding and interpretation of this study's results with appropriate care. The approach for data analysis is then outlined deriving a well-being index in an attempt to systematically analyse rural actor's development.

The study then proceeds with its main part - the analysis of smallholders' livelihoods using data available from the nineties and new conducted data from 2010. This part is structured according to the sustainable livelihood framework and comprises local actors' human, natural, financial, physical and social capital. It is subdivided into the following sub-chapters. In a first step household characteristics are discussed comprising aspects of human capital such as demographic household structure and education. Then plot sizes are presented and serve as indicator for access to natural resources. Diversification in on-farm activities and their significance within the overall household structure are outlined, taking into account the role of crop production and livestock keeping as well as subsistence farming and market orientation. An analysis of off-farm activities follows where typologies are derived to allow for a conclusion on level of remittance and the significance of this sphere of action for households. The study proceeds to compare the income generating activities and sheds light on expenditure and investment options leading to a discussion on physical capital available to smallholders. Data that refer to social capital wind up the analysis of smallholders asset base, before livelihood portfolios are presented. From there developments within livelihood strategies and development into and out of poverty are discussed. The study results in a synthesising conclusion and outlook for potential further research.



2. THEORETICAL FRAMEWORK

2.1. SUSTAINABLE LIVELIHOOD FRAMEWORK

2.1.1. THE LIVELIHOOD PLATFORM

2.1.2. VULNERABILITY CONTEXT AND TRANSFORMING STRUCTURES AND PROCESSES

2.1.3. LIVELIHOOD STRATEGIES AND OUTCOMES

2.1.4. THE SUSTAINABLE LIVELIHOOD APPROACH AND ITS USEFULNESS IN THIS STUDY

2.2. ANALYTICAL MODEL OF SMALLHOLDER HOUSEHOLD STRATEGIES (WIESMANN 1998)

2. Theoretical framework

The sustainable livelihood approach (Carney 1998; Scoones 1998) serves as theoretical framework for this study. The sustainable livelihoods concept has been widely acknowledged within the development debate. An analytical model of smallholder strategies (Wiesmann 1998) complements the approach. It has been particularly designed for the study area and has served as concept for previous livelihood studies in the region. This chapter elaborates both frameworks and their basic components. Usefulness and constraints of the theoretical background within this study will be discussed.

2.1. Sustainable livelihood framework

The sustainable livelihood concept has its origin in the strands of livelihood ideas developed through the 1980s and 1990s such as the publications of Sen (1981) and Swift (1989) on famine analysis, as well as the work of Chambers (1983) on multiple realities of rural poverty (Ellis and Biggs 2001). It found its way into practice since the mid-1990s and since then has been widely used as guiding principle for rural development practice internationally. A number of governments, non-governmental and multi-lateral organisations have adopted the sustainable livelihood approach (Ellis and Biggs 2001).

The concept is based on a normative holistic and human-oriented understanding of poverty (DFID 1999). The rational of the Sustainable livelihood approach is poverty alleviation and new insights into poverty were integrated. One is the understanding that the capability of the poor to take advantage of economic opportunities matters and that there is a need to include the poor and their knowledge in decision making processes. Another is that poverty is not just a question of low income but also poor health, illiteracy, lack of social services, and the vulnerability and powerlessness.

“[...] raising quality of life is not a matter simply of improving the incomes of the poor. Most of all, it means increasing people’s capacity to provide for themselves and lift themselves out of poverty.” (Krantz 2001:9).

With this rather holistic view the approach takes a range of resources and their combination that are important for the poor as core principles. It takes into account physical and natural resources as well as social and human capital. In this it is different to other approaches which look primarily at sectoral economic growth, modernisation of institutions or at increasing material wealth (DFID 1999).

The most recognised definition of livelihoods comes from Chambers and Conway (1992:8):

"A Livelihood comprises the capabilities, assets and activities required for the means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets both now and in the future, while not undermining the natural resource base."

In his definition of livelihoods Ellis (2000:10) puts a greater emphasis on the access to assets:

"A livelihood comprises the assets (natural, physical, human, financial and social capital), the activities, and the access to these (mediated by institutions and social relations) that together determine the living gained by the individual or household."

The approach delivers a framework for analysing livelihoods that are achieved through access to a range of livelihood resources and mediated through organisational and institutional factors (Scoones 1998). It is a bottom-up approach and emphasises strategies of action and their meaning embedded in the overall context of social networks (DFID 1999). The framework therefore can be used as an analytical tool to organise various factors that impact on livelihoods of individuals or families. It includes their health, well-being and income as well as the maintenance of natural resource condition and thus provides a systematic understanding of how various factors impact on local people's livelihoods (Krantz 2001). The approach aims to improve development programmes in order to better address the priorities of the poor, both directly and at a policy level (DIFD 1999). It has been used extensively to analyse how livelihoods are changing in response to changing conditions and for classification of factors that support or inhibit livelihood change (IMM et al. 2008). Ellis (2000) summarises the sustainable livelihood framework as a framework of linkages and interactions between people, their assets, the institutional environment in which they live, the vulnerability context that affects them, the livelihood strategies they develop and the livelihood outcomes they achieve (see figure 1). These constitute the key elements of the sustainable livelihood approach and will be introduced in the next section.⁴

2.1.1. The livelihood platform: livelihood assets

Assets owned, controlled or claimed are an essential component of livelihoods and constitute a good starting point of the framework. They are the basis upon which households are able to produce, engage in labour markets and participate in reciprocal

⁴ For a more detailed discussion on the sustainable livelihoods framework refer to Scoones 1998; Carney 1998; Carney 2008; Ellis 2000; DFID: www.livelihoods.org.

exchanges (Ellis 2000). Moser (1998) refers to the nature and use of assets as key determinants of the constraints and opportunities households have to enhance their standard of living. Thus analyzing assets provides insight in change over time, what causes change and the differences within access and control of assets between social groups (Carney 1998). Scoones (1998) and Carney (1998) classify assets into five categories: human capital, natural capital, financial capital, physical capital and social capital.

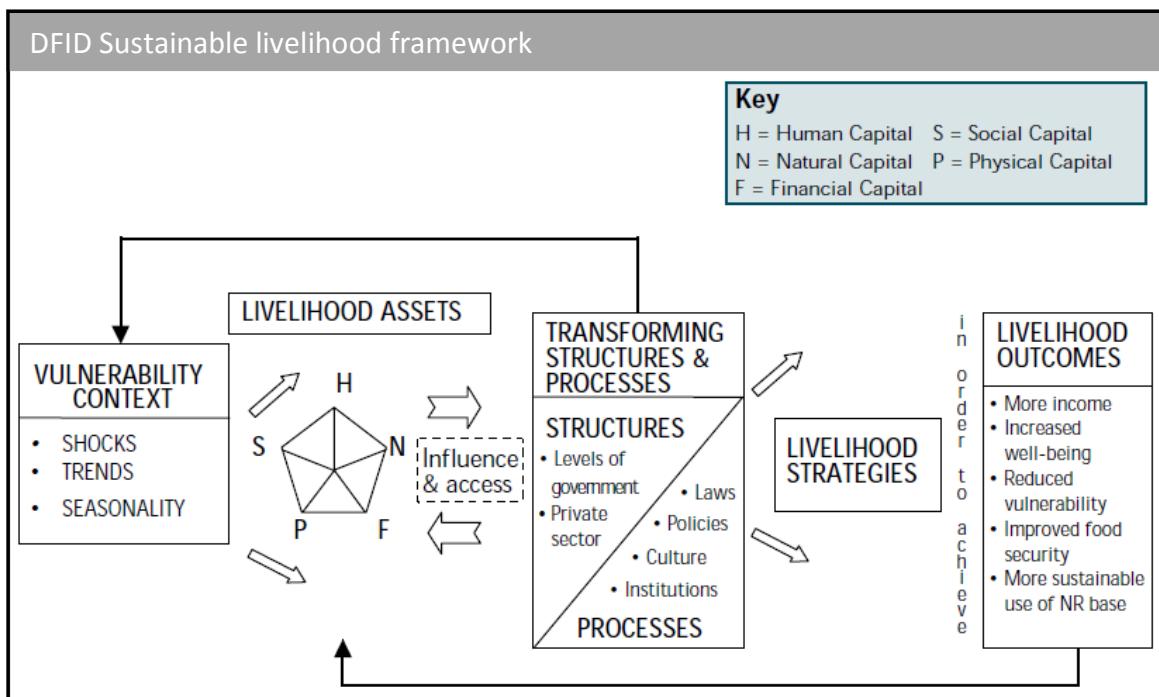


Figure 1: The sustainable livelihood framework.

Source: DFID, in: Ashley and Carney (1999:47).

Human capital comprises the labour available to the household, its education, skills and health. Due to internal demographic dynamics, the human capital composition of a household is changing constantly.⁵ Human capital plays a significant role in underpinning economic growth (Ellis 2000) and Mortimore (1998 cited in Campbell et al. 2002) argues that the allocation of human capital, in particular labour, is the most important resource decision for households.

Natural capital comprises land, water and biological resources that are utilised by people to generate means of survival (Ellis 2000). In the context of Laikipia the renewable natural resources such as forest, water levels, water flows and soils are crucial. Most important are perennial river flows, level of underground aquifers, soil quality and trees (Notter et al. 2007).

⁵ Human capital changes through births, marriage, migration, children growing older, deaths etc.

Financial capital refers to stocks of money such as savings and access to credit in the form of loans. They are not productive forms of capital but are convertible into other forms of capital or directly into consumption (Ellis 2000). In semi-arid areas financial capital in the form of cash is highly constrained and the lack of cash prevents frequent and large investments (Campbell et al. 2002). Moser and Felton (2007) distinguishes three components labour security,⁶ transfer or rental income as non-earned monetary resources and productive durables.⁷

Physical capital comprises buildings, irrigation canals, roads, tools and so on. They are characterised as created by economic production processes and defined as producer good or man-made capital. Generally, physical capital is purchased as a means to generate a future flow of income. It often substitutes for natural capital (e.g. water pipes substituting open water channels which reduces loss from leakage and evaporation) and thus can potentially help reduce pressure off natural resources (Ellis 2000).

Social capital can refer to personal and family networks that offer potential support as well as authority relationships on the one hand and social groups that pursue one objective of common interest on the other hand. It is increasingly accepted that social capital is crucial for societies to achieve sustainable growth (Bebbington 1999 cited in Campbell et al. 2002). This is well articulated by Ellis (2000:44) who states that "*Human and social capital facilitate diversification by increasing the range of opportunities from which choice can be made.*" Social capital is commonly considered as extremely difficult to measure as the assets are non-physical and difficult to translate into monetary terms (Moser and Felton 2007; Campbell et al. 2002).

Reardon and Vosti (1995 cited in Ellis 2000) stress the importance of both the type of asset endowment as well as the ability to convert one asset into another as critical points for poverty reduction. The easier it is for households or individuals to convert one type of asset into another, the more options are available for livelihood generation (Ellis 2000). How households have access to and can make use of these assets is mediated by the vulnerability context and transforming structures and processes.

2.1.2. Vulnerability context and transforming structures and processes

The framework distinguishes on the one hand the vulnerability context where shocks, trends and seasonality critically affect the availability of assets. On the other hand emphasis is laid on transforming structures and processes which have major impacts on possible livelihood strategies. Scoones (1998) calls it institutional processes and

⁶ Measuring the extend of security to use one's labour potential as an asset - difficult but it tries to include labour as an asset and to include employment vulnerability.

⁷ Productive durables are durable goods that have an income-generating capability.

organisational structures that link elements like assets, strategies and outcomes together. The translation of the assets owned by or available to a household into a livelihood strategy is mediated by a great number of contextual social, economic and policy considerations.⁸ They are the framing conditions of action and are key factors influencing access to assets and their use. Mediating factors are social relations, institutions and organisations on the one hand and exogenous trends and shocks on the other hand.⁹

2.1.3. Livelihood strategies and outcomes

With the assets that are available to the households and the mediating processes that impact on households' capability to use these assets, households develop (adapt and adopt) livelihood strategies (DFID 1999). Being constantly responding to pressures and opportunities they need to be seen as dynamic (Ellis 2000). Development agents and researchers follow questions that arise from here: How do the actors make use of the assets available to them? What is their rationale of action? How can they cope with uncertainty and risk? Can ways out of poverty be determined? Scoones (1998) classifies three different livelihood strategies: agricultural intensification or extensification; livelihood diversification; and migration. Ellis (2000) and Wiesmann (1998) on the other hand differentiate between natural resource and non-natural resource based activities.

Agriculture is the basic occupation in rural economies. Nevertheless, hardly anyone only follows one activity or holds wealth in only one single asset (Barrett et al. 2001). Instead, smallholders derive their sources of income from crop production, livestock keeping and sale, low-income off-farm and non-farm activities and social networking (Ellis 2000). This diversification of assets, sources of incomes and activities is a dominant and important characteristic of rural livelihoods in Sub-Saharan Africa.

Reasons for diversification in livelihood strategies can be divided into necessity on the one and choice on the other hand (Ellis, 2000; Hatlebakk 2009). Analogue to this Barrett et al (2001) classifies push and pull factors as motives for diversification. Push factors are motives like risk reduction, diminishing factor of returns e.g. family labour supply or land constraints, crisis or liquidity constraints or high transaction costs which leads households to provide for goods and services themselves. Pull factors are complementarities between activities, e.g. between crop and livestock production and comparative advantage (e.g. superior technology, skills, endowments) leading to specialisation. Diversification can smooth seasonality, reduce risk and can help increase the income and asset level. With rich and varied livelihood portfolios households have greater flexibility to substitute between assets. Hence, a "[...] diverse portfolio of activities contributes to the security of a

⁸ This refers to history and politics, economic trends, climate, agro-ecology, demography and social differentiation, as well as laws, institutions, incentives (relative price) and social relations.

⁹ For a thorough discussion on the mediating components see Ellis (2000).

rural livelihood because it improves its long-run resilience in the face of adverse trends or sudden shocks." (Ellis 2000:235).

With these household strategies and given combination of livelihood resources different livelihood outcomes can be achieved. The framework incorporates livelihood outcomes that are divided into livelihood security and environmental sustainability. Livelihood security refers to attributes related to "[...] *income level, income stability, reduction in adverse seasonal effects, and reduction in the overall risk profile of the income portfolio.*" (Ellis 2000:42). It represents people's capacity to manage adverse trends and cope with shocks.

2.1.4. The sustainable livelihood approach and its usefulness in this study

Considering the complex factors and feedback loops influencing people's decisions on livelihood strategies it becomes apparent that there cannot be a perfect model. The claim to be a holistic framework makes the sustainable livelihood framework open to critiques. Gaps within the model are criticised. So are intrinsic motivations for decision making not captured in the concept and Wiesmann (1998) points to the lack of perception, valuation and interpretation of dynamic conditions of action for understanding actors' activities. Murray (2001) criticises that power and conflicts of interests are not reflected whereas Ashley (2000) points to the lack of incorporating empowerment in the framework. Bryceson and Bank (2001) further argue that with its local focus on people's well-being, larger contextual forces are not considered enough. On another note, the vagueness of the term *sustainable* is criticized (Murray 2001; Krantz 2001) as the term is difficult to define and assess (Ellis 2000). The same applies to the term *poor*. The approach wants to target the poor, but the question of who are the poor is not addressed. Although DFID clearly states that particularly the definition of who is poor should be an *outcome* of livelihood analysis with the help of the framework. Another constraint is the basic unit of analysis. On the *household* level decisions are made and economic activities combined into livelihood strategies. Livelihood analysis thus tends to focus on households as the basic unit. This, however, leads to the overlook of intra-household inequalities of interests and opportunities as well as power and control (e.g. gender) (Krantz 2001).

The strongest critique might be the complexity and scope of the approach. Due to the complex interrelationships between assets, access and activities examining livelihoods presents a challenge for any empirical enquiry. It is difficult to decide what factors to include or exclude to capture different livelihood aspects. (Ellis 2000). Kollmair and Gamper (2002) further argue that it is difficult to assess the five capitals, particularly social capital is hardly possible to be measured and compared. Ashley (2000) further points to the difficulties to quantify changes and contributions to livelihoods. Scoones (1998) admits that not all dimension of the framework can possibly be addressed by one

study or policy work. However, he states that, "*In work of this sort the principle of optimal ignorance must always be applied, seeking out only what is necessary to know in order for informed action to proceed.*" (Scoones 1998:13). This study focuses on asset endowments which is the building block of livelihood analysis (Ellis 2000) and from there schematically discusses developments within livelihood strategies.

In a review of DFIDs experience with sustainable livelihood approaches Clark and Carney (2008) determine the reduced interest in the concept within DFID. But they also emphasize as one of the main benefits its usefulness as analytical or heuristic tool. They argue that the framework helps to understand the nature of poverty, the linkages between different aspects and thus to understand complex and changing situations. It can help to identify key differences between the poorest and other groups and can be used to track change over time. It therefore serves as an appropriate tool for analysing change within smallholder households in Laikipia. Key elements in the framework are the effective use of natural resources and diversification of economic activity which are both key aspects of rural life in Laikipia. One of its strengths is that it puts the people in the centre and that it focuses on assets rather than problems. This aspect is further strengthened in Wiesmann's analytical model of smallholder livelihoods which complements the sustainable livelihoods framework and will be discussed in the next section.

2.2. Analytical model of smallholder strategies

The present study focuses on analysis of assets available to households and their livelihoods strategies. For this purpose the problem-oriented model to analyse livelihood strategies conceptualised by Wiesmann (1998) will be used to complement the livelihood concept described above. It was particularly designed for Laikipia and allows to systematically analyze strategies in a rural development context (Wiesmann 1998). It is an actor-oriented approach and Wiesmann stresses the perspective from local actors. Thus it aims at a comprehensive understanding and consideration of all actor-categories in the regional context. Small-scale farmers are key agents of resource degradation and at the same time the people most affected. Hence they build the key actors in Laikipia. For the analytical model the smallholder households are the relevant acting unit.

Wiesmann (1998) classifies different spheres of action. He emphasizes the importance to understand action and reactions of local actors in terms of their embedment in the overall household strategy. In the light of problems of resource degradation and ecological adaptation Wiesmann distinguishes between spheres of action that are directly related to the use of natural resources and spheres of action that are not directly related to natural resources (see figure 2).

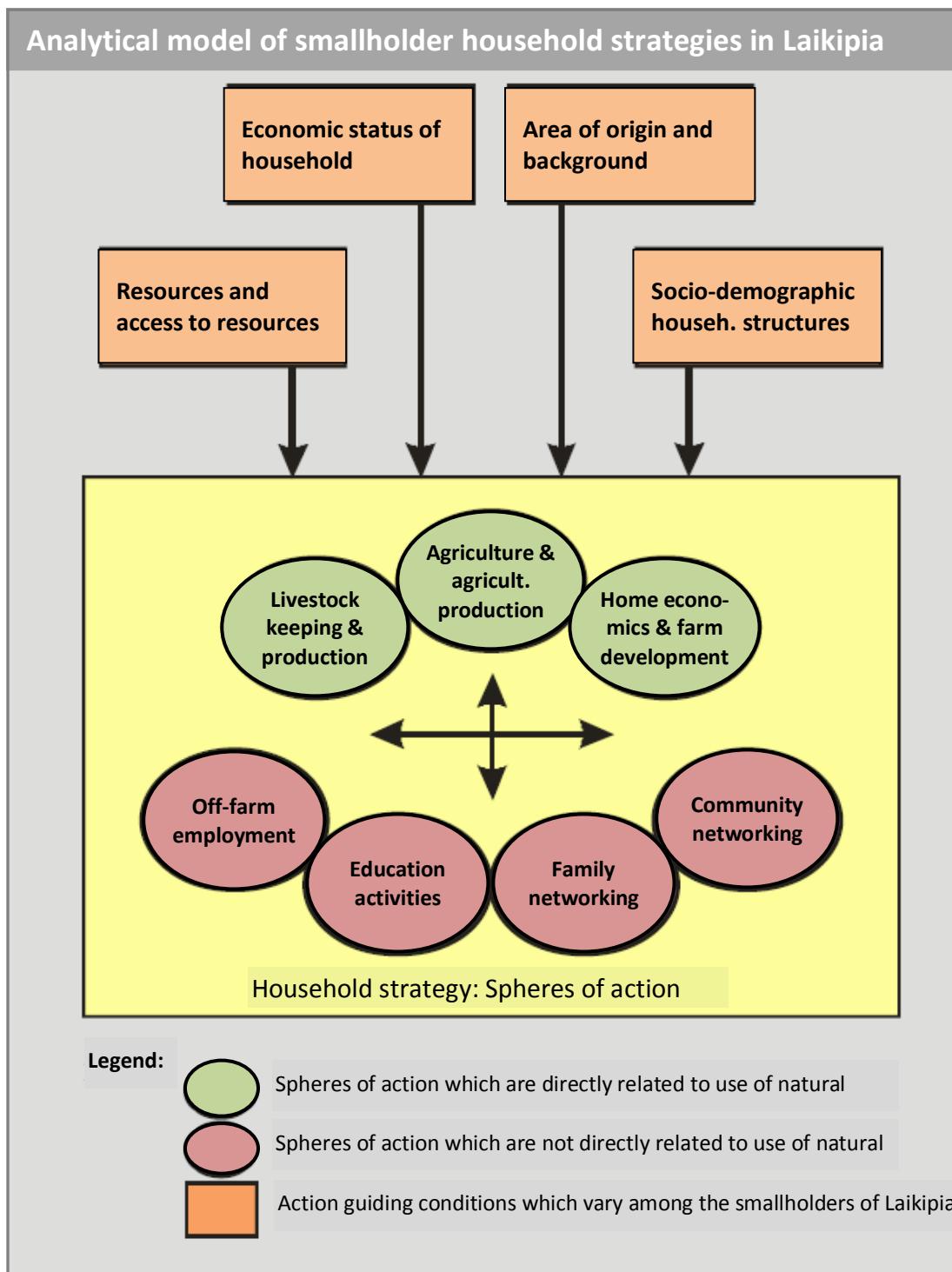


Figure 2: Analytical model of smallholder household strategies.

Source: Wiesmann 1998:13.

The spheres of action that are directly related to resource use are classified into three categories. (1) *Agriculture and agricultural production* refers to activities related to cropland, cultivations of crops, garden production, trees as well as land use techniques applied. The potential of these activities to contribute to subsistence and/or market production is crucial to determine their significance within household strategies.

(2) *Livestock keeping and production* refers to large and small livestock and its role for subsistence and market production. (3) *Home economics and farm development* refers to additional household activities such as use of water, collection of fuel wood and the development of the homestead.

The model further distinguishes four categories of spheres of action that are not directly related to resource use. (4) *Off-farm employment* is of great importance within the overall household strategy. The allocation of labour and economic resources between agriculture, livestock and off-farm is of great interest to understand livelihood portfolios and their role for securing a standard of living. Previous studies have already stressed the importance of off-farm employment not only in rural East Africa, but also particularly in Laikipia. (5) *Educational activities* are particularly interesting in the light of opportunities it raises and the burden through the cost of education as well as the forgone labour and long-term investment in future generations. (6) *Family networking* relates to the social networks with and within the wider family. Particularly interesting is the role as risk insurance and whether and how households are investing in these social relations to understand its significance within the wider network of activities. (7) *Community networking* is of relevance particularly considering reciprocity as important factor in peoples live as well as support networks due to the hazardous environment.

These spheres of action are further influenced by action-guiding conditions that Wiesmann (1998) distinguishes into four areas: the availability and access to resources, the economic status of households, the area of origin and background as well as the socio-demographic household structures. The action guiding conditions as classified by Wiesmann are to a great extend incorporated in the asset portfolio (e.g. economic or socio-demographic household structures and access to resources) that this study focuses on.

The sustainable livelihoods framework and the model of smallholder livelihoods both use simplifying indicators and thus provide only an abstract, an indirect picture. Considering the scope and complexity of livelihoods and the factors that influence outcomes, it becomes clear that significant action guiding conditions and mediating processes cannot be captured in the analysis within the scope of the study. Focus lies on livelihood assets and their combination and how they may lead to different livelihood strategies. The potential in using the described models lies in their usefulness as an analyzing tool. The frameworks serve as appropriate tool to analyze asset endowments over time and the adoption and adaptation of livelihood strategies, particularly as previous livelihood studies have been based on the same concepts. Not claiming to be able to present a complete livelihood portfolio, it still allows to detect areas of shift and/ or persistence, and to see smallholder development with regard to their livelihood assets. In this the frameworks not only help to structure the household interviews, but also are an essential framework for the analysis of the data.



3. STUDY AREA

3.1. LOCATION AND NATURAL RESOURCES

3.2. SOCIO-ECONOMIC TRANSFORMATION PROCESSES

3.3. THE RURAL POPULATION: SMALLHOLDERS AS KEY LOCAL ACTORS

3. Study area

The study on hand has its geographical focus on Laikipia district, in the Rift Valley Province in Kenya. The district lies on the north-western, semi-arid foot zone of Mount Kenya and is embedded in the highland-lowland system of the Ewaso N'giro river basin with complex ecological and socio-economic dynamics. Laikipia has experienced massive transition in the last decades in socio-political, economic and ecological dimensions. They all shape the region's development and put increasing pressure on natural resources (Kiteme et. al. 2008; Wiesmann et al. 2000). With its rural population, limited resource base and these transformation processes the region is characteristic for the situations in semi-arid regions in Sub-Saharan Africa (Notter et. al. 2007). In Kenya, arid and semi-arid lands take up 80 percent of the total land area. In Laikipia research has continuously been conducted since the 1980s including some in-depth livelihood surveys. This allows for the longitudinal analysis that this study aims for.

In the following the natural resource base and the socio-economic conditions that smallholders in this area are facing will be discussed. Focus will hereby lie on transitions of ecological and socio-economic conditions that shape peoples' livelihood. A thorough understanding about the study area and the opportunities and constraints for people's livelihoods will serve as a crucial foundation for the livelihood analysis.

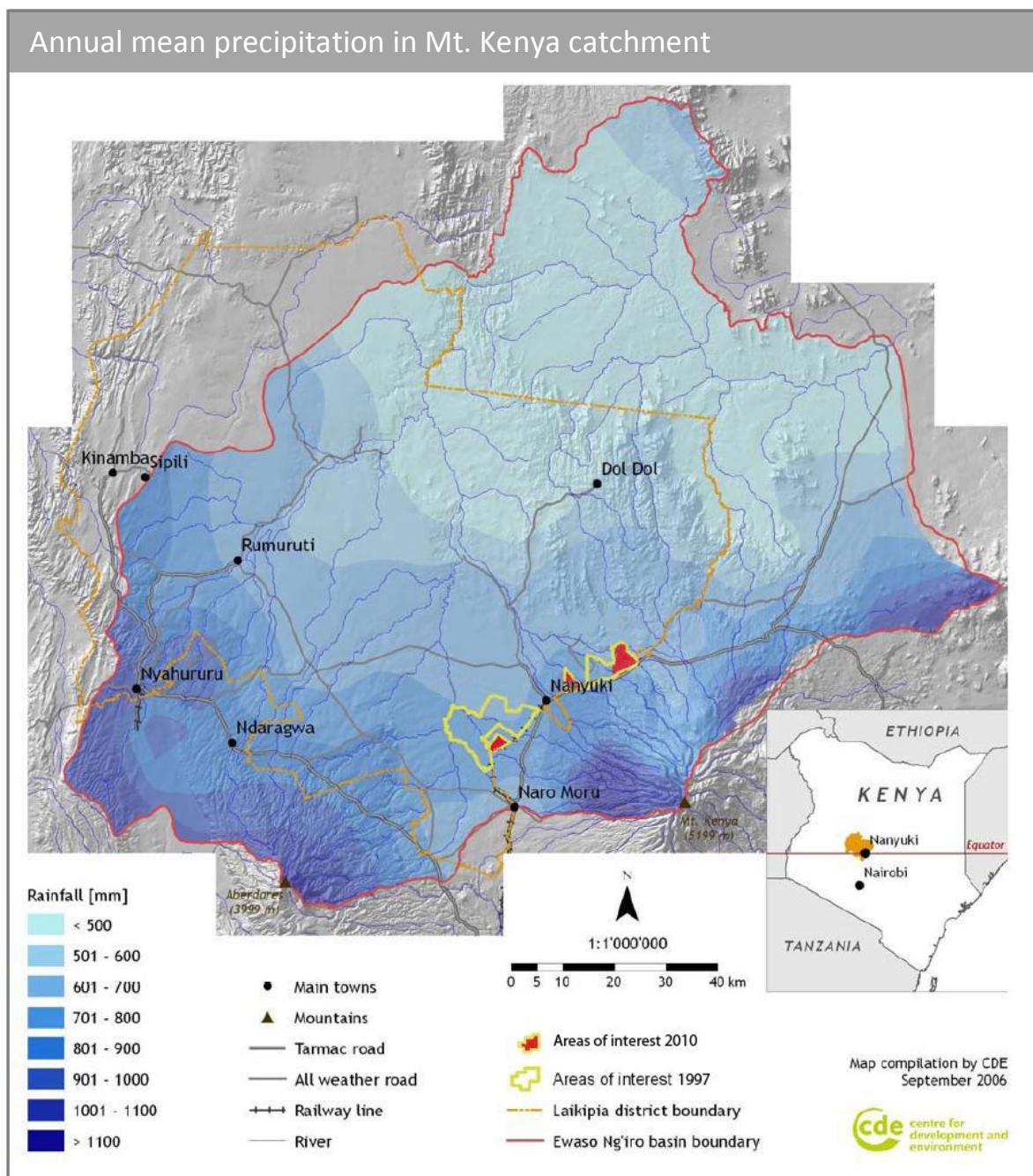
3.1. Location and natural resources

The semi-arid Laikipia district is situated in the north-west of Mount Kenya. It spans a total area of 9,700 km² and is located on a high plateau with an altitude between 1,600 and 2,300 meter (Kiteme et al. 2008). To the west the Laikipia plateau is bordered by the Great rift and its lakes. The Samburu Plains and lowlands are found adjacent to the north of the district. Nyandarua Range (Aberdares) (3,999m) and Mt Kenya (5,199m) form the southern to south-eastern border. The high-plateau is predominantly of volcanic rock. The topography shows little relief energy and dissection. Prevailing soils are Vertisols and Phaeozems, the first being not well suited for use, the latter being a deep soil with a high water retention but great erodibility (Wiesmann 1998).

The Region experiences two rainy seasons: long rains from March to June and short rains from September to December. Average annual precipitation is 600-700 mm in the savannah zone, but rainfall varies tremendously in time and amount (Liniger et al. 1998). The district is embedded in the upper catchment of the Ewaso Ng'iro river basin (Wiesmann 1998). The function of Mount Kenya as *water tower* for its surrounding foot zone and adjoining lowland areas has been repeatedly emphasized as it receives high annual rainfall on its slopes and highly influences rainfall patterns (Wiesmann 2000;

3. Study area

Notter et al. 2007). The mountain provides water to over 7 million people who are living in its surroundings (Kiteme et al. 2008). In Laikipia and further downstream in the arid lowlands the perennial rivers are the only source of surface freshwater in the dry season (Notter et al. 2007) and are therefore of crucial importance for the population. The footzone is the natural transition zone between Mount Kenya forest (highland) and the savannah (lowland). It is mostly under cultivation nowadays (Notter et al. 2007) and also marks where most of the population lives. This transition zone is the most vulnerable area (NCCR 2009) and will be the prime area of interest for this study (see map 1).



Map 1: Annual mean of precipitation in the Mt. Kenya catchment.

Source: CDE, adapted from Holdener 2007:24.

With these characteristics of high variability and unreliability of rainfall, land degradation and high erodibility of soils, local actors in the area face harsh ecological conditions. Water which is considered a major constraint to agricultural production in semi-arid environment (Ngigi et al. 2007) has been identified as the most limiting factor for local actors (Wiesmann 1998). Studies suggest that the pressure on the already scarce resource will increase. On the one hand this is due to global climate change. According to Hulme et al. (2001 cited in Notter et al. 2007) global warming significantly affects particularly arid and semi-arid areas in Africa. In the study area climate models predict changes in rainfall patterns resulting in changes of freshwater availability.

The crucial point may not be the amount but the variability. Flood peaks are predicted to become more extreme (up to 20 times as much as currently) posing a threat to crops, settlement and infrastructure along the river in the rainy season. Opposed to that dry periods are predicted to become more severe and even longer with low flows of possibly 1/10 of present value and the probability of drought is rising (Wiesmann 1998; Kiteme et al 2008; Notter et al. 2007). On a second note the situation has been and will further be exacerbated by socio-economic changes, which is elaborated in the following chapter. Whereas it is not clear if the land use changes and demographic developments or if climate change may have a larger impact, there is consensus that both further aggravate the already delicate resource situation in the semi-arid region (Kiteme et al. 2008; Notter et al. 2007).

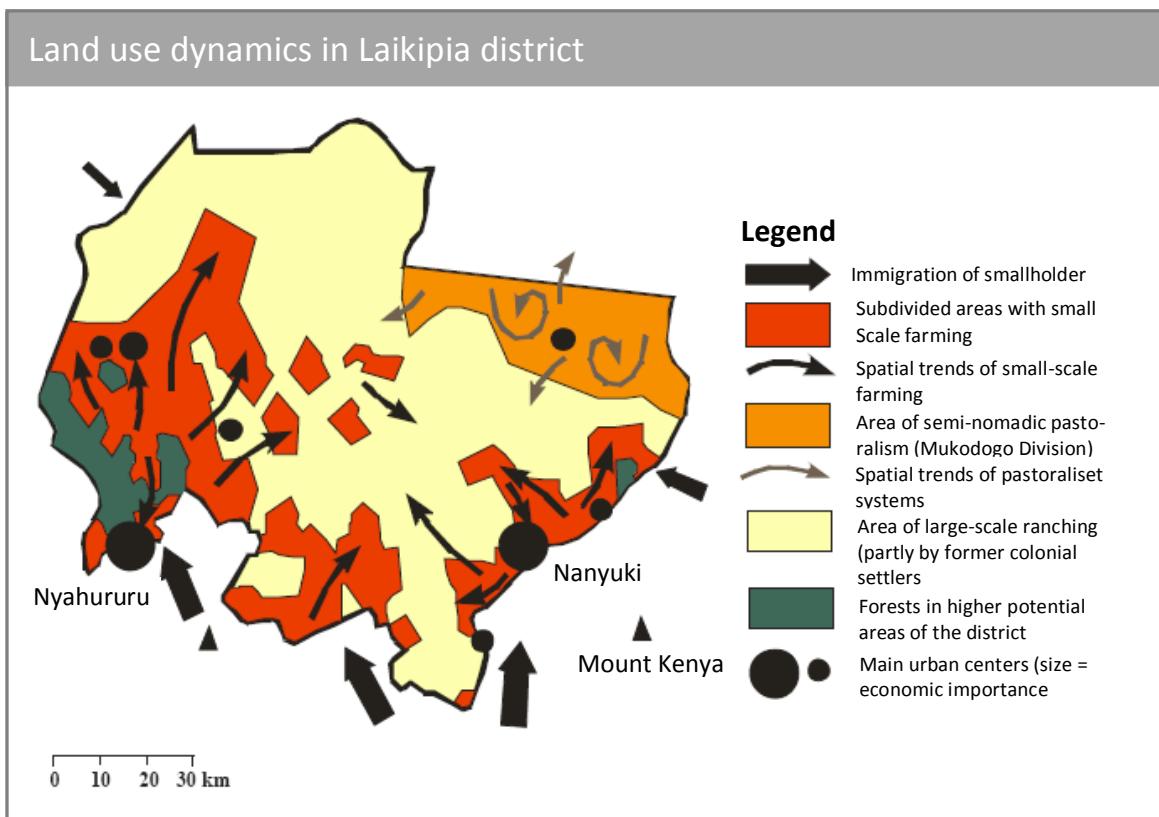
3.2. Socio-economic transformation processes

In order to capture the study area not only in its natural resources but also in its social and economic dimension this chapter elaborates on the historical settlement development and economic trends that shape people's livelihoods. It gives a basic understanding of social and economic dimensions that impact not only directly on livelihoods but also on the natural resource base as hinted on above.

Before colonisation the area had been pastoral land. The Maasai had been grazing the lands that later became known as the *White Highlands*. With the arrival of the British the Maasai were forced to settle in a native reserve (*Mukogodo*) which was one of the driest and least fertile parts of the region. Population density there led to land degradation. Other parts of the area were settled by white settlers (*wazungu*). The land use shifted from pastoral farming to extensive large-scale farming and population there was halved (Wiesmann 1998).

With Kenya's independence in 1963 another profound change took place. Due to the land distribution programme large properties got sold and subdivided into much smaller plots.

The former *White Highlands* were opened up for African settlement. This led to large-scale internal migration, particularly to the regions northwest of Mount Kenya (Kiteme et al. 2008). This high influx of people led to population increase from 60,000 in 1960 to over 400,000 residents in 2010 in the area (KNBS).¹⁰ Land use changed respectively from large-scale ranching to small-scale mixed farming (see map 2). The majority of the new migrants belonged to the tribe Kikuyu who were coming from high-potential but densely populated Central Kenya (Wiesmann 1998).



Map 2: Land use dynamics in Laikipia District.

Source: Wiesmann 1998:91.

Kenya has been integrated into global markets since colonial times with coffee and tea production on the one side and tourism on the other. None of these global markets had its geographical dimension within the study area, so that Laikipia has not experienced noticeable impacts from these. With a new and increasingly growing focus on horticultural production for European markets the region north-west of Mount Kenya was incorporated into global markets for the first time. Beginning in the mid-1980s large-scale irrigation horticulture production began in Kenya and in the study area. The boom of the sector is shown nationwide as well as it is reflected in the region. Export value of horticulture crops increased 20-fold between 1983 and 2002 (Kiteme et al. 2008). In Laikipia, remaining large farms in the foot-zone of Mount Kenya were transformed into

¹⁰ In Laikipia growth rate rose to over 7 percent per annum between 1969 and 1979, it was then by far the fastest growing area in Kenya, overriding even Nairobi and Nyeri. Apart from the small-scale farming sector, the major centres played an important part for the development of the region (Kohler 1998:42).

highly technical horticultural enterprises that are oriented towards international markets (Wiesmann et al. 2000).

The transformation in land use systems is reflected in the land use pattern: towards the mountain, on the highlands and mountain foot-slopes, small-scale farming becomes denser and large-scale horticulture enterprises have been established (Ngigi et al. 2007). Most of the population lives in that area. A network of regional towns and local trading centres developed with Nanyuki being the biggest town. The further away from the mountain, the drier the area and small-scale farming fades away, making place for large ranches, game parks and tourist lodges as well as pastoralist (Ngigi et al. 2007; Wiesmann et al. 2000). The potential for conflicts in the highland-lowland system rises with the land use changes and related growing pressure on already scarce natural resources (see figure 3). How ecological sustainability and livelihood security are threatened by the growing pressure can be illustrated by the example of local perennial rivers.

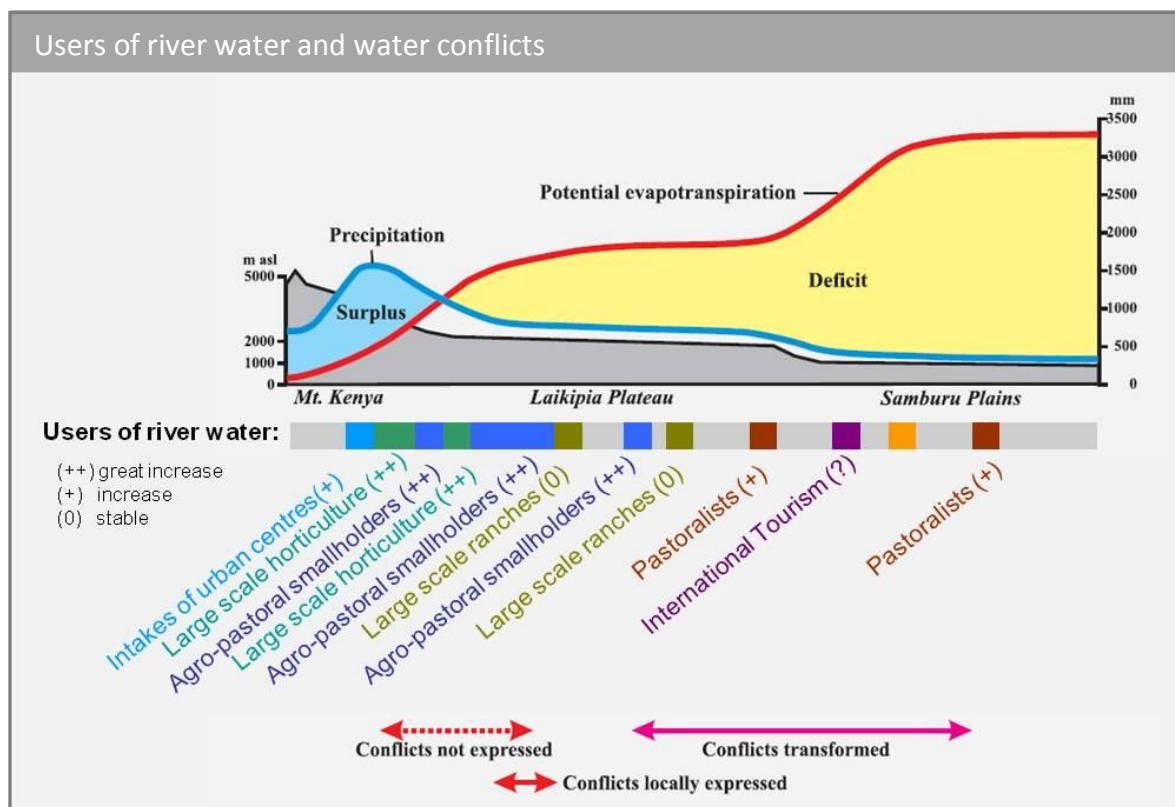


Figure 3: Users of river water and water conflicts.

Source: Wiesmann and Liniger 1999, adapted from Wiesmann et al. 2000:11.

Perennial rivers play a crucial role as in the dry season they are the only source of surface freshwater in Laikipia and further downstream in the arid low lands (Notter et al. 2007). In recent years the main rivers have dried up for certain periods causing trans-regional ecological problems. As rainfall shows no decreasing trend in the last decades it does not serve as explanation for the reduced river flow (Liniger et al. 2005 cited in Notter et al. 2007). But there are a growing number of water abstractions for irrigation, livestock and

domestic purpose (Aeschbacher et al. 2005 cited in Notter et al. 2007). The water scarcity then leads to growing competition and conflicts between users.

3.3. The rural population: smallholders as key local actors

After having discussed the framing socio-ecological conditions, this section presents key local actors in the area in reference to the goal of the study and what constitutes their livelihood within this environment.

The transition processes described above are particularly worrying, as the rural population are predominantly poor and depend on the use of natural resources for their livelihoods. In Laikipia district an estimated 44 percent of the population lives below the poverty line (KNBS). Some communities have recently received food relief after a severe drought hit in 2009 followed by extreme rains in 2010. Poverty is widespread and food security in the area is very low - food production covers 65 percent of the needs near the mountain, only 5-10 percent in the drier areas further away from the mountain (Kiteme et al. 2008).

Wiesmann (1998) argues that smallholders are key actors in regional development in rural Africa. It had become clear that smallholders are increasingly involved in and at the same time affected by Laikipia's development. In Laikipia 75 percent of rural population are smallholders and they are the most rapidly growing group. They will be the actor-category this study focuses on. The term smallholder, small-scale farmer and peasant is used interchangeably in this study. Smallholders share a range of characteristics which are thoroughly discussed in Ellis (1988) and are shortly presented here: they are considered as a social group that is always part of a larger economic system. They are partially integrated in and dependent on imperfect markets. Ellis (1988:5) stresses in his definition of peasants that they are in transition, that they are "*[...] undergoing a continuous process of adaptation to the changing world around them.*" They are foremost farmers (often a combination of farming and livestock production) and are characterised as having access to the resource land which builds the basis of their livelihood. The agricultural production is primarily, but not exclusively, based on household labour with varying levels of subsistence.

A short introduction on smallholder rational of action will allow better understanding of the uptake or neglect of livelihood strategies. The sustainable livelihoods framework and the analytical model of smallholder strategies by Wiesmann (1998) both argue that smallholder households operate in an economically rational way. From a micro-economic theory two rationales dominate - the theory of the profit maximising peasant and the theory of the risk-averse peasant. They are both based on the assumption that the

peasant is an individual optimising unit (Ellis 1988). In developing countries typical conditions that farm households face are a high level of *risk* and *uncertainty*,¹¹ e.g. variability of rainfall, diseases. This uncertainty results in arguments for an economic view that sees peasants as risk-averse. It explains farming practices and reinforces social differentiation (Ellis 1998). The theory of the utility optimising peasant combines the risk-averse with the profit maximising perspective.

"Peasants optimise utility by trying to ensure their basic livelihood, their position in society and their basic social and material resources. This is done primarily by employing multi-faceted strategies of action that seek to minimise risks within the overall structures of meaning and take advantage of opportunities in particular spheres of their strategies to maximise utility with reference to respective particular aims." (Wiesmann 1998:55).

What both do not take into account is that households have multiple goals (instead of a single goal) which lead to more unpredictable reaction to socio-economic changes (Ellis 1988).

Understanding smallholder livelihood asset base and their strategies constitutes a fundamental prerequisite for sustainable regional resource management and for better targeting of development interventions. But how can change in livelihood assets and strategies be captured? The next chapter will explore in detail the methods applied in this study to gain insight into smallholders' livelihoods.

¹¹ Ellis (1988:83) defines risk contrarily to uncertainty as something where probabilities can be attached to (also a subjective probability).



4. METHODOLOGICAL APPROACH

4.1. DATA FROM PREVIOUS LIVELIHOOD STUDIES

4.2. METHODS USED AND DATA COLLECTION

4.3. SAMPLING AND SURVEY SITES

4.4. LIMITATIONS

4.5. DATA ANALYSIS

4. Methodological approach

The present study aims to collect quantifiable and qualitative data on livelihood assets and from there derive conclusions on change and/ or persistence of livelihood strategies. This chapter elaborates the methods used for data collection and analysis within this study.

4.1. Data from previous livelihood surveys in Laikipia

Considering the aim of the study, in a first step the data available from previous studies is examined. Previous data gathered by Urs Wiesmann¹² between 1988 and 1997 builds the basis for the longitudinal data set. The research was done within the Laikipia Research Programme (LRP).¹³ First, a plot-based general survey was done by LRP between 1989 and 1990 through a survey with a standard questionnaire.¹⁴ The databank collected comprises 7,494 described plots and interviews with 2,728 smallholder households and is used as reference map in this study. Within these, in-depth interviews were held with 170 smallholder households in a first round in 1991/92 and in a second round 1997. The latter builds the basis for the longitudinal analysis.

The 170 households for the in-depth survey represent a random sample of 10% of the households from eleven settlement areas.¹⁵ The questionnaire was developed on the basis of long-term experiences of LRP researchers as well as exploratory, non-structured interviews with smallholder households. The result was a semi-quantitative questionnaire that was repeatedly tested and modified, also making sure that intercultural problems were faced. Primarily composed of semi-open questions the survey was complemented with open-ended questions. This priority was laid as a number of tests showed that detailed questions about activities and features were qualitatively better than more open questions on opinions or assessments (Wiesmann 1998).

¹² Prof. Dr. Urs Wiesmann, Centre for Development and Environment (CDE), University of Berne, Switzerland.

¹³ See Wiesmann 1998, chapter 1 for further information on the LRP.

¹⁴ See Wiesmann 1994.

¹⁵ Semi-arid areas: Weruini South and North, Marura, Burguret, Mburugutia, Sweetwaters, Ichuga. Semi-humid areas: Nyakairo, Ngenia, East Laikipia, Mia Moja.

4.2. Methods used and data collection

To ensure comparability the 1997 questionnaire was adopted and modified. Due to the length of the original survey (2-4 hours) and this study's specific objectives, it had to be reduced. Modifying the questionnaire attention was laid on still covering all aspects of livelihood capitals to be able to provide a holistic view. For a best possible comparison of the answers in 1997 and 2010 it was important to have the same questions asked in the same way. Other aspects that were deemed important for the research questions were added e.g. questions on health, security issues, consumer durables and horticulture employment. The questionnaire covers all five capitals discussed in the livelihoods framework as well as questions on livelihood priorities.¹⁶ Indicators that are covered, how they are measured and how they relate to the livelihood framework are shown in an overview in table 1. Finally the questionnaire was discussed and modified with the help of a research assistant within CETRAD.¹⁷ She could give valuable insights into the feasibility of the approach as well as the distinct households and their situation. Not only has she grown up in the area and has been part of the research team continuously since the 1990s but also helped to conduct the particular survey in 1992 and 1997.

The field work was done in four weeks in March and May 2010 in collaboration with CETRAD. The research team consisted of the two trained research assistants (one male and one female), a driver and the author. Responses were coded and transcribed immediately after the field work process. This happened in close collaboration with the two research assistants to be able to discuss upcoming questions. With the exception of three households the author accompanied all interviews that were conducted.¹⁸ The interviews were held in Kikuyu, the local language, in order to ensure a background and language people felt comfortable in. Still it was indispensable to be present during the interviews and visit their homestead to be able to interpret and analyze the data gathered.

Observation in conjunction with discussion with the research team played a major role in gaining grounded and important background information and to be able to fit the data in a wider context. Informal conversation during the four month stay in Laikipia played another role to gain insight in the region's context – be it with colleagues within the research institution CETRAD, with the research team or equally important from farmers and neighbours met during the stay in Laikipia.

¹⁶ Refer to appendix table 4 for the questionnaire; original questions from the survey in 1997 are marked.

¹⁷ Centre for Training and Integrated Research in arid and semi-arid Land Development (CETRAD), Nanyuki, Kenya.

¹⁸ This was due to illness.

Indicators of different livelihood capitals and their components

Capital	Assets	Components
Human capital	Labour power	- Amount of labour available - Dependency Ratio
	Demographic structure	Sex, age and place of living
	Education	Education level of household members
	Health	- Constraints due to health status - Access to health facilities
Natural capital	Land	- Size of land and farmland - Subsistence production
	Livestock	Number; type; use
	Access to water	- Piped water - Irrigation
Financial capital	Labour security	Type of employment (state employee, private sector, permanent worker, self-employed; casual worker)
	Productive durables	Car, motorcycle, sewing machine, etc.
	Income	Income from (crop and garden products, livestock, off- or non-farm activities, or from remittances)
	Consumer side	- Expenditure (education, health and investment) - Sources for assets accumulated
Social Capital	Kinship	Ties with family and relatives
	Safety Nets	Type and degree of support in emergency
	Community network	Participation in community groups
Physical Capital	Housing	Housing material (mud, wood or stone house)
	Consumer durables	TV, radio, bike, solar panel, etc.
	Infrastructure	Access to tarmac road, markets, education, electricity etc.

Table 1: Indicators of different capitals and components covered in the questionnaire.

Source: own compilation.

4.3. Sampling and survey sites

Interviews were conducted in five settlement areas, namely in Ngenia (12 farmers), Mia Moja (7 farmers), Nyakairu (5 farmers), East Laikipia (4 farmers) and Burguret (2 farmers). Among these only Burguret is classified as semi-arid, all other estates are in the semi-humid region north-east of Nanyuki. Needless to say, for a comparison of livelihoods and their changes between the semi-arid and semi-humid areas a bigger sample from the semi-arid area is needed. The estates were chosen prior to the field trip.¹⁹

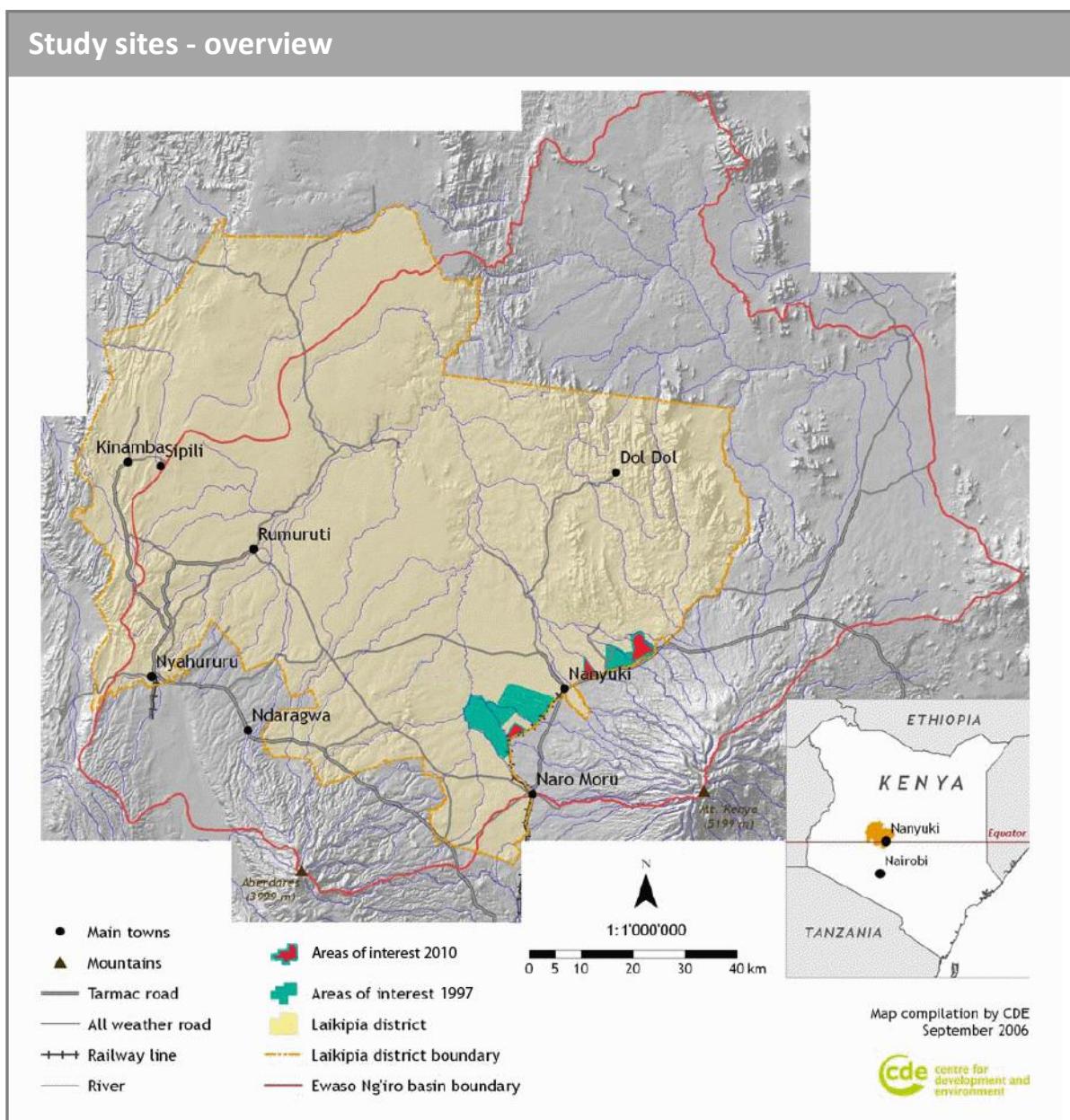
Households, that fulfilled the criteria having been part of the in-depth survey in 1997, were randomly chosen in the selected areas. Depending on their availability and accessibility there may be a bias in this sampling towards households with better access, e.g. regarding road conditions.²⁰ From fifty visited plots, thirty households were interviewed. Reasons why no interviews were conducted are the following: no presence, not willing, deceased, moved away or no horticulture employment.²¹

Map 3 shows the study sites and their location north-west of Mount Kenya. Map 4 – 6 display the settlement areas (a) Ngenia, Mia Moja and East Laikipia, (b) Nyakairu and (c) Burguret. The plot-based maps mark the household sampling for the areas showing where interviews were conducted back in 1997, and which were visited and interviewed again in 2010.

¹⁹ Settlement areas were chosen with regards to their location near several commercial horticulture farms, as initially one focus was laid on impacts of these farms on smallholders which could not be covered in this paper to the extent planned.

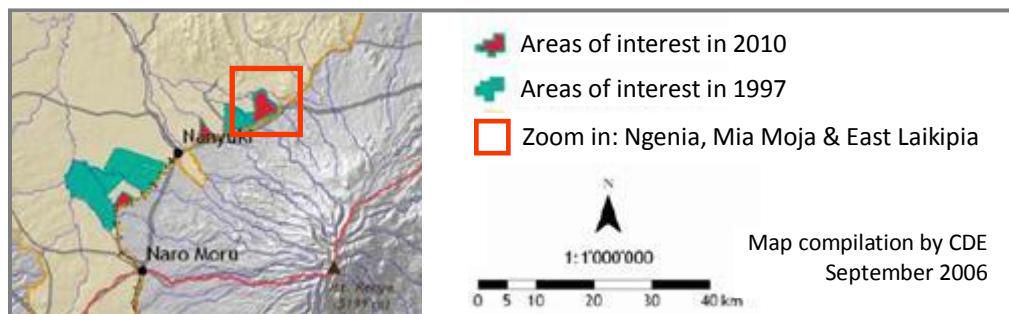
²⁰ Constraints that occurred were: farms where no one was at home due to absence, death or movement; farmers who did not wish to participate; farms where access was denied e.g. due to severe rainfall and bad road conditions.

²¹ So it is important to note that the number of people involved in horticultural production is not representative for the studied area, as these households were clearly given priority for interviews.

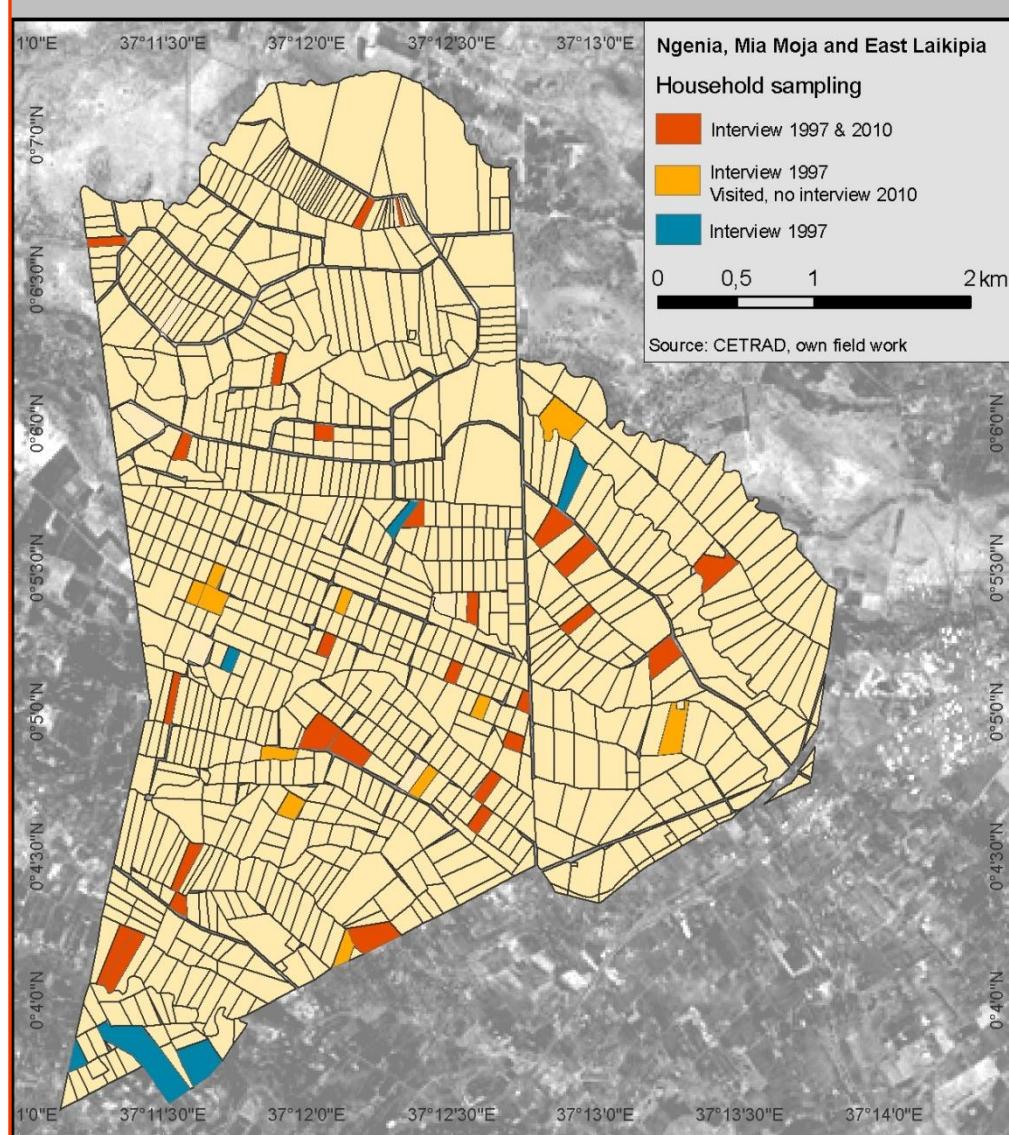


Map 3: Study sites: an overview.
Source: CDE, in: Holdener 2007:22, adapted.

Household sampling shown on plot based map: Area 1



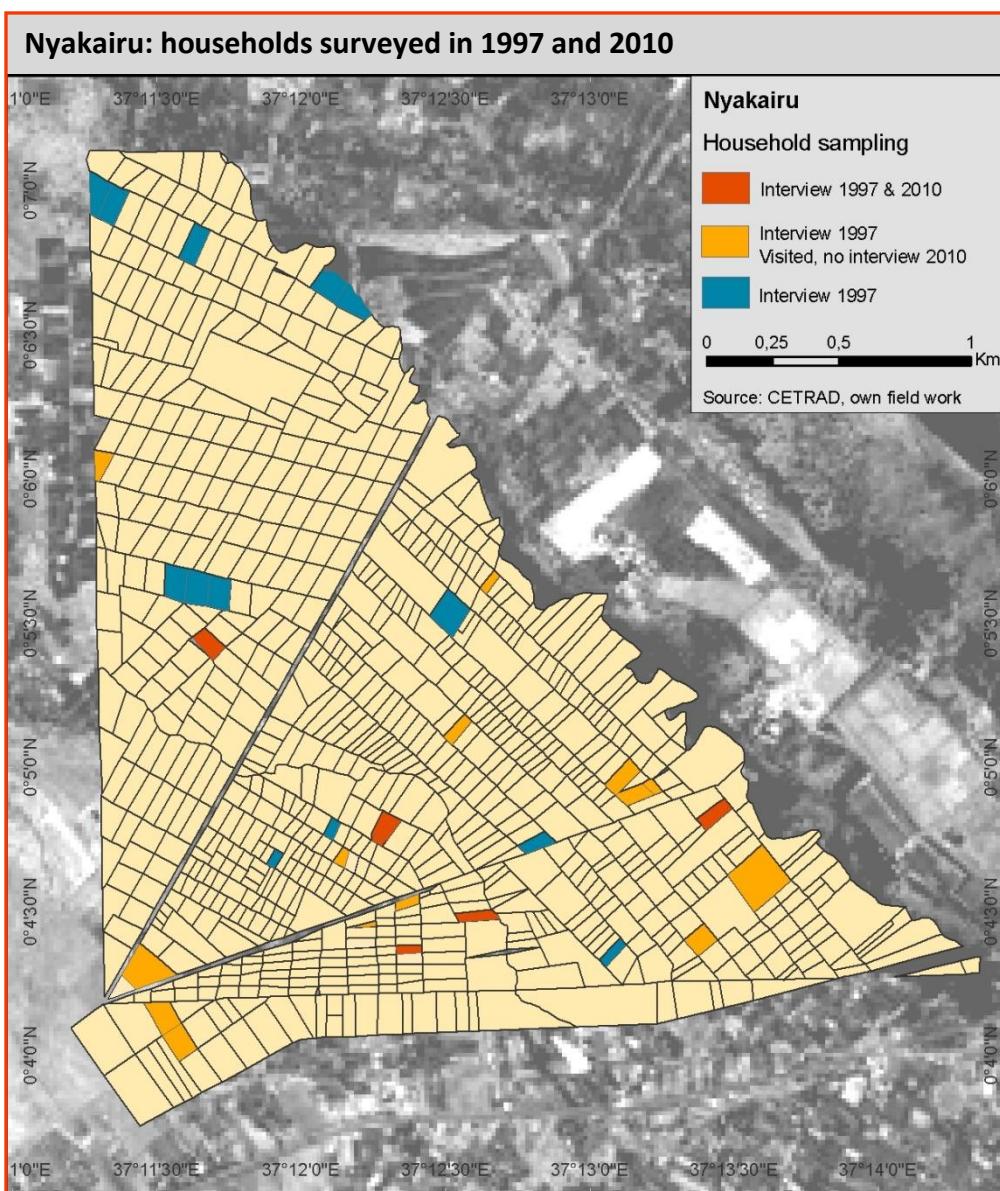
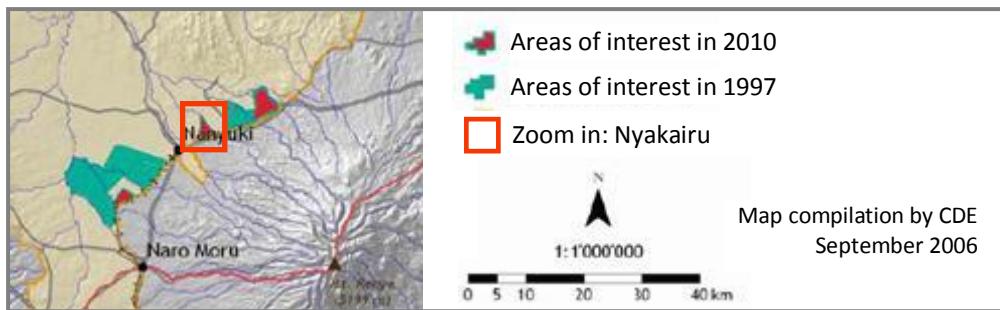
Ngenia, Mia Moja and East Laikipia: households surveyed 1997 and 2010



Map 4: Smallholder settlements in Ngenia, Mia Moja and East Laikipia.

Source: LRP/CETRAD, own fieldwork; background: Digital Globe Quickbird preview.

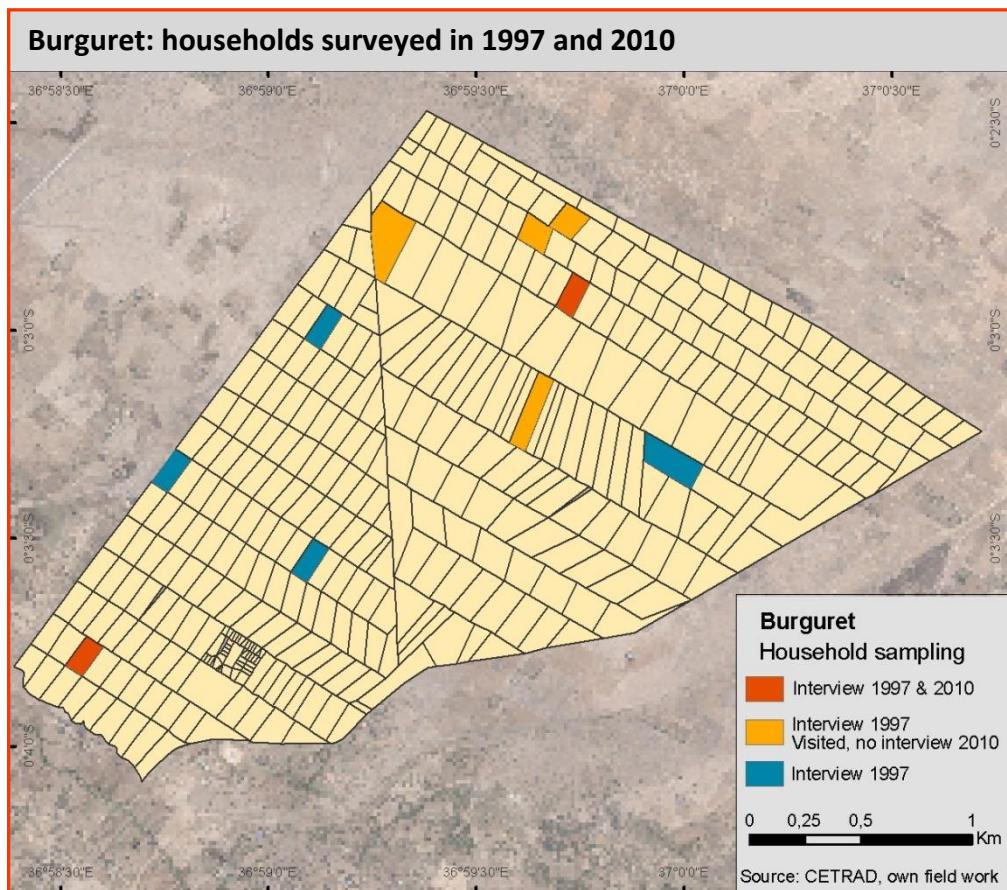
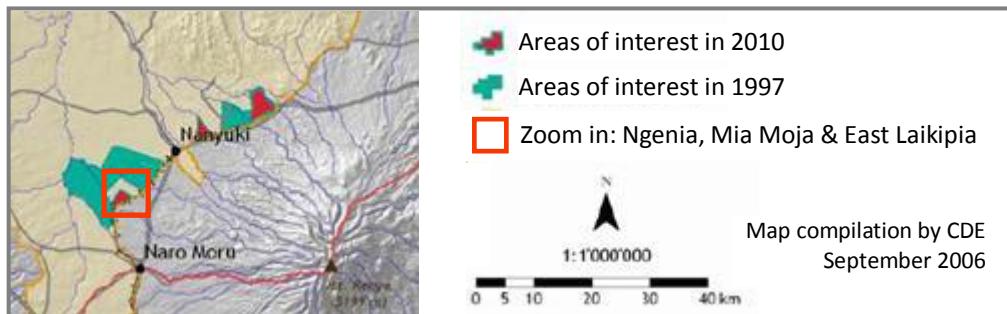
Household sampling shown on plot based map: Area 2



Map 5: Smallholder settlements in Nyakairu.

Source: LRP/CETRAD, own fieldwork; background: Digital Globe Quickbird preview.

Household sampling shown on plot based map: Area 3



Map 6: Smallholder settlement in Burguret.

Source: LRP/CETRAD, own fieldwork; background: Digital Globe Quickbird preview.

4.4. Limitations

With these methods applied in the study, there are also limitations that need to be considered. One of the most limiting issues considering analysis and interpretation of the data gathered is the *sample size*. The number of interviews conducted poses great limitations to the representativeness of the findings. The number of thirty households was chosen as a balance between scope of the thesis and the ability to do statistical tests with the data set.

The *household as analysing unit* poses further constraints for data gathering and analysis alike. Interviews were held on the household level. A household is defined as people sharing the same *abode* or *hearth*. Household is a useful unit of analysis on the assumption that within a household resources and income is shared and decisions are made jointly (Ellis 1988). Problems are the ambiguity of answers (another person out of the same household might answer differently due to different experiences, perceptions and values) as well as the fact that power relations and inequalities within the household are not shown. Constraints also occur where data is collected at *individual level* (e.g. education, employment, health) but is then analysed at the *aggregated level* of the household. Furthermore, for time series surveys the same person should be interviewed, but this criteria could not be met entirely due to the availability of household members.²² Where possible the household head was interviewed as this was the criteria in 1997. Another problem occurred where plots had been divided due to inheritance which led to difficulties in comparing today's with previous household assets and strategies. Limitations are also given as - despite the quantitative approach - the answers given may be rather subjective than objective. So is the information e.g. on income and expenditure a rough estimate by the interviewee and merely a judgment. Problems also occurred when farmers were asked to take reference to *good*, *normal* and *bad* years. The fact that one farmer was referring to the latest *normal* year being back in 1998, makes the difficulties to compare such judgment clear.

It is important to mention, that surveys for the two study periods 1997 and 2010 do by far not enable to speak of any *trends* when analyzing changes. The analysis is further constrained as farmers are affected very differently in their livelihood by *action guiding conditions* (e.g. drought, flood, diseases, macro-economic trends or shocks) depending on the time of the survey. This becomes particularly clear as Laikipia was hit by drought in the three previous years to the survey in 2010. Thus the representativeness of the findings is further limited. However, both surveys were conducted between May and June ensuring a similar schedule within a year's agricultural calendar.

²² For example due to absence or death.

The many benefits from working in a research team cannot delude from the fact that there are some serious limitations that need to be discussed. The different cultural and linguistic background of local actors and the author poses limitations to the study. The interviews were held in Kikuyu with two research assistants as translators. To enable smooth interviews and respect the time the interviewees devoted to the research team, the conversation was not translated to English during the interview. For the author to be able to follow and raise questions the answers were put in the questionnaire directly in English. Nevertheless important information in-between the lines went unnoticed, if not mentioned by the translators. Thus, it must be acknowledged that a lot of background information, anecdotes or concerns were lost due to the language barrier. Furthermore, a bias through the interpretation of not only the interviewee, but also the translator and then again via the author must be considered. It has been noted that answers given by smallholders may differ with the presence of a foreigner (Wiesmann 1998) which should be kept in mind.

4.5. Data analysis

In line with the research questions a sequential approach is followed when examining the data. In a first step the different capitals are examined and compared to the situation in 1997. Findings are presented in discussion with relevant literature. It gives hints of livelihood aspects people could invest in or others that might have lost importance. The aspects are then, in a second step, further analyzed for their significance within the overall household strategies. Finally livelihood portfolios are used to capture and identify change and/ or persistence in a more integrative way.

In order to enable an overall comparison, taking into account different aspects of livelihoods, a well-being index was constructed. The index was constructed with the help and knowledge of local research assistants and smallholders. The indicators of different capitals chosen for the aggregation are presented in Table 2. The choice took relevant literature on livelihood assets into account, while at the same time being confined to the scope of the study and limited as to what information is available from surveys already conducted. Human capital is represented by *education*. Education is measured on individual level and has to be aggregated for an assessment on a household level. *Plot size* is used as indicator for natural capital. *Livestock* and *subsistence* farming is also represented in the index and can be considered either as natural or financial capital. Livestock is thereby measured in standard livestock units adopted from Wiesmann 1998 (Table 2). Subsistence farming is measured in months that households are able to cover their needs with their own food. Due to the variability in rainfall and thus in agricultural production, this was asked for a relatively *good* year as well as in a relatively *bad* year. Financial capital further comprises *farm income* (from crops, garden and livestock

products) and is measured in Kenyan Shilling. For money terms the real value was calculated with 2009 as base year. Representing the same capital is the *income level from off- or non-farm activities*, where the type of employment is differentiated to indicate low-return work or skilled high-return activities similar to the differentiation according to Brown et al. (2006:7). *Housing material* builds up physical capital - differentiated in non-permanent, semi-permanent and permanent housing - whereas social data is limited to community social capital and measured in *households' participation in community groups*.²³

It needs to be kept in mind, that these indicators as components of the index give only partial picture of livelihoods. Nevertheless, the aggregation of indicators enables a more precise picture of reality than just looking at one of them. The chosen indicators all typically correlate with well-being. As, Krishna et al (2004) found in the study in Western Kenya the purchase of land and dairy cattle, investment in a business and the construction of a permanent house are associated with households that are relatively well-off. Income which is often used for a judgment on individual's or household's performance does not necessarily provide a reliable measure of well-being on its own (Moser and Felton 2007). The use of assets as a measure should complement income and consumption-based measures of welfare and wealth in developing countries (Carte and May 2001, Filmer and Pritchett 2001 cited in Moser and Felton 2007). This is of course particularly important as households might have shifted their priorities within the household portfolio which the study explicitly tries to capture. The index is further similar to a well-being index constructed by Campbell et al. (2002), where wealth quartiles are based mostly on physical and natural capital.

In a second step three local researchers – two of them who have grown up in the area and all of them having visited numerous households for research purposes - as well as four local farmers from the study area were consulted to weight the described indicators according to their importance to indicate the well-being of a household. Each of them decided on the importance giving the indicator values, that together came up to a score of 100 (see appendix 2). The final weights used in the index are shown in percent in table 2.

In order to be able to classify each household's performances within the index, in a third step distinct classifications for each indicator were developed. As some data was metrical, whereas other was ordinal, this happened in a quantitative or narrative way depending on the data available. Insights from the research assistants²⁴ allowed for a basic

²³ Similarly, Moser et al. (2007:14) measured social capital in binary variables like household participation in various activities and groups.

²⁴ The research assistants not only live in the area but also have visited over fifty households for this study and have training and background from previous surveys for CETRAD.

classification of what indicates that someone is better off or contrarily that someone is considered quite poor in the region's context. For analysis purposes the classification were given points from one up to five, with one being the lowest score and five the highest. For instance plot size was classified as follows. Households get one point if they have less than one acre, two points if they have between one and three acres, three points if they have between three and six acres, four points if they have between six and ten acres and a maximum of five points if they own more than ten acres. The other indicators were classified in the same manner, always taking into account local perspective on what seems to be an average and what constitutes a rather poor or relatively well-off situation. Housing material and community participation are the only two indicators where a division into three categories was deemed most appropriate, so that e.g. a household with a mud house gets only one point, whereas if they have a wooden house they get three points and if they have a stone house they get the maximum of five points.²⁵ The classification of all indicators in this point system is shown in table 2.

Each household is given the points it achieved in the indicators, these are then summed up according to the weights the indicators are given. Thus, each household gets points between the minimum of one and the maximum of five (see appendix 3). This way, household performances may be compared on an inter- and intra-household basis within and between the two research periods (1997, 2010). The index is used for overall judgement on households' performance. It further enables to distinguish the sample into those who are considerably better off and those who are considered quite poor in the area. Given the background for the point system for ranking households within the index, households that could be considered as relatively better-off in the local context get at least on average more than three points for the indicators. For 1997 and 2010 eight households are within this category, they mark the "*top*" households.²⁶ On the other hand, households that do not even achieve two points in the index can be considered as relatively poor and are thus called "*bottom*" ranked. In 1997 seven households and in 2010 five households belong to this category. Others that have between two and three points are in the "*middle*". Interviewed households shifted in and out of categories and are therefore not per se the same households for each category in 1997 and 2010. The categorisation of households enables to detect differentiated asset endowment and livelihood strategies depending on the overall well-being of a household.

²⁵ In the local context mud houses are considered as non-permanent, wood houses as semi-permanent and stone houses as permanent housing.

²⁶ The households shifted in and out of categories and are therefore not per se the same households in 1997 and 2010.

4. Methodological approach

Table 2: Classification: performance in eight indicators.

Source: Own field work.

Capital	Indicator	Weight (%)	1 point	2 points	3 points	4 points	5 points
H	Education Level	16	No one has completed secondary school	Majority has not completed secondary school	Majority has completed secondary, but also low level prevalent	Majority has completed sec., at least one w/ medium/ higher training	Overall high level of education w/ at one going to college/ uni
N	Land Size (acres)	21	< 2	2 – 3	3 – 6	6 – 10	> 10
N/F	Production in (a) good & (b) bad year (in months)	10	<3	4 – 6	7 – 9	10 – 12	> 12
N/F	Livestock (LSU)*	13	< 1	1 – 2	2 – 3	3 – 4	> 4
F	Farm Income (KSH)**	13	< 10,000	10,000 – 20,000	20,000 – 30,000	30,000 – 50,000	> 50,000
F	Estimated level of off-farm income	7	No off-farm income	At least one pers. w/ occasional casual employment	At least one pers. in regular casual employment or informal sector	At least one person in permanent employment (or self-employed)	At least one pers. in skilled, high return employment
P	Housing Material	15	Mud House	--	Wooden House	--	Stone House
S	Community Participation	5	No Participation	--	Participation in one group	--	Participation in more than one group

* Factors for livestock unit: *1 milk cow; *0.7 oxbull; *0.5 heifer; *0.2 calf; *0.15 dairy goat; *0.1goats and sheep; *0.02 chicken.

** Income (Kenyan Shilling) measured in real value, base year is 2009.



5. LIVELIHOOD ANALYSIS: LONGITUDINAL RESULTS FROM LAIKIPIA

	5.1. HUMAN CAPITAL: HOUSEHOLD CHARACTERISTICS
H	5.1.1. HOUSEHOLD STRUCTURE AND DEMOGRAPHICS 5.1.2. EDUCATION AND HEALTH
N	5.2. NATURAL RESOURCES – THE ASSET LAND
N F P	5.3. ON-FARM ACTIVITIES <ul style="list-style-type: none"> 5.3.1. CULTIVATION OF CROPS AND THE ROLE OF SUBSISTENCE FARMING 5.3.2. CROP FARMING AS SOURCE OF INCOME 5.3.3. LIVESTOCK KEEPING 5.3.4. PRIORITIES AND OVERALL SIGNIFICANCE OF ON-FARM ACTIVITIES
F	5.4. OFF-FARM ACTIVITIES <ul style="list-style-type: none"> 5.4.1. TYPE OF OFF-FARM ACTIVITIES 5.4.2. LEVEL OF REMITTANCE FROM OFF-FARM ACTIVITIES
F	5.5. PRIORITIES AND SIGNIFICANCE OF DIFFERENT SOURCES OF INCOME
P/N	5.6. PHYSICAL CAPITAL: ACCESSIBILITY AND INVESTMENTS
S	5.7. SOCIAL CAPITAL <ul style="list-style-type: none"> 5.7.1. FAMILY NETWORKS 5.7.2. COMMUNITY NETWORKS
◇	5.8. SMALLHOLDERS' PERCEPTION ON DEVELOPMENT 5.9. LIVELIHOOD PORTFOLIOS: PATTERNS IN LIVELIHOOD DEVELOPMENT?

H= human capital, N= natural capital, F= financial capital, P= physical capital, S= social capital.

◇ = human, natural, financial, physical and social capital.

5. Livelihood analysis: longitudinal results from Laikipia

Laikipia and its smallholders as key actors are characteristic for semi-arid areas in sub-Saharan Africa. How do these actors cope with the framing livelihood conditions described above? This chapter analyzes livelihood assets and strategies in the study area and links the findings to existing livelihood theories in the literature. Available data from the nineties and new conducted data from 2010 serve as basis for the analysis. To allow for an integrative perspective the discussion follows the broad structure of the sustainable livelihoods framework. It comprises local actors' human, natural, financial, physical and social capital and looks into natural resource related and non natural resource related activities. It is subdivided into the following sub-chapters. In a first step household characteristics are discussed comprising aspects of human capital such as demographic household structure and education. Then plot sizes are presented and serve as indicator for access to natural resources. Diversification in on-farm activities and their significance within the overall household structure are outlined, taking into account the role of crop production and livestock keeping as well as subsistence farming and market orientation. An analysis of off-farm activities follows where typologies are derived to allow for a conclusion on level of remittance and the significance of this sphere of action for households. The study proceeds to compare the income generating activities and sheds light on expenditure and investment options leading to a discussion on physical capital available to smallholders. Data that refer to social capital wind up the analysis of smallholders asset base, before livelihood portfolios are presented. The analysis is brought together in the end examining livelihood portfolios and the performance of households in terms of their well-being.²⁷ From there developments within livelihood strategies and development into and out of poverty are discussed.

5.1. Human capital: household characteristics

5.1.1. Household structure and demographics

The majority of respondents are Kikuyu or Meru (93.3 percent). This picture of ethnic affiliation is typical for what is found in Laikipia and does not differ significantly from Wiesmann's sample.²⁸ They have similar traditional livelihoods and land use systems as they both belong to the *Central Bantu* and originate from high potential areas on the slopes of Mount Kenya or have been living as *squatters* in the White Highlands due to the colonial labour market (Kohler 1988; Wiesmann 1998). Almost two thirds of the

²⁷ Refer to chapter 4.5 for the indicators that serve as proxy for well-being in this study.

²⁸ Wiesmann (1998:131) found 96.5 percent of all households investigated (n=2728) in Laikipia to be Kikuyu or Meru.

respondents were female which does not reflect the number of female headed houses versus male headed households. Still almost one third were female headed due to the death of their husbands. Eighty percent of the respondents are over forty-five years old - half of them are over 65 years.

In order to understand household dynamics, the household structure is an important factor determining opportunities and constraints for households – with regard to the producer-consumer ratio, age and gender structures and the distribution of responsibilities. As a first indicator for the household structure household size can be considered.²⁹ The size of households varies between 2 and 17 persons. The average household includes 7 persons (sd. 4.1)³⁰ and is slightly smaller than 1997 with 9 persons (sd. 5.7). Looking at household typology, around half of the households live together with three generations in a medium to large or complex household size. One third of the households can be considered as nuclear families. Large household size has the advantage that it reduces the risk of illness to affect livelihood security and enables more diverse occupation strategies to be pursued (Toulmin 1992 cited in Ellis 2000). It is significant in terms of labour availability and dependency within households. Two fifths of the households have a low dependency ratio³¹ of less than 50 percent, another two fifths have a high dependency of more than 75 percent.³² In comparison with the data from 1997 the number of households with both low and high dependency ratio doubled, suggesting a higher differentiation into either low or very high dependency ratio. With increasing ratio there may be an increased burden on the productive part of the household.

5.1.2. Education and health

Other determinants of productivity are skills, knowledge acquired and the degree of experience (Campbell et al. 2002). Education is a crucial factor for human development and has been taken as proxy for knowledge, skills and experience. When looking at the specific level of education for the surveyed thirty households one detects a persistence of low education levels. Households where most of the household members have not completed secondary school still constitute the majority (see figure 4).

²⁹ Household size differs from family size. The number of persons that live permanent on the homestead are counted as within one household in the same way as was done in the survey 1997 (see Wiesmann 1998:132).

³⁰ Sd. = standard deviation.

³¹ The dependency ratio is an age-population ratio that measures the percentage of dependant people who are typically not in the labour force to those economically active. To measure the dependency ratio of each household, the ratio of children and old people (> 65 years) to those in the labour force was measured.

³² Classification of low, middle and high dependency ratio according to Wiesmann (1998).

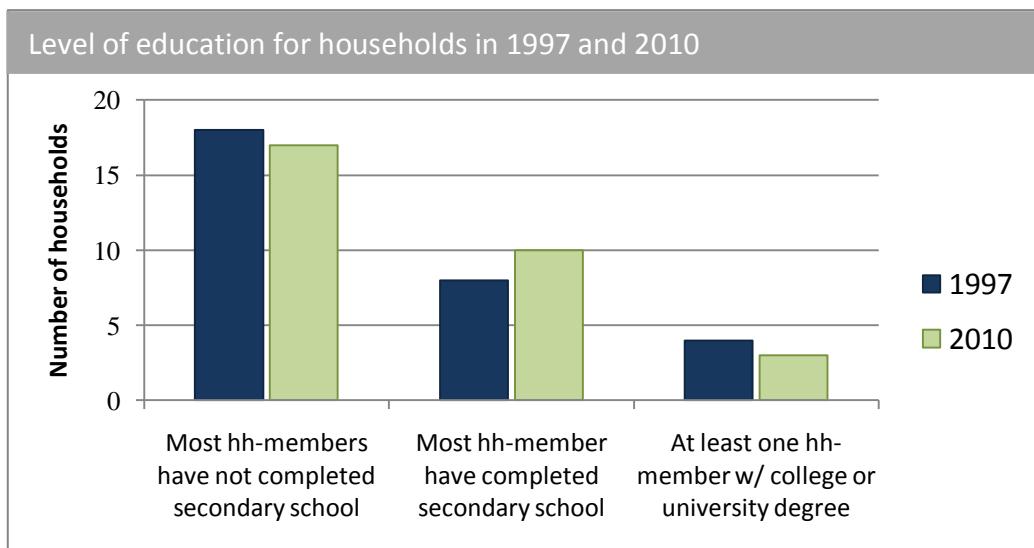


Figure 4: Level of education.

Data: Wiesmann Survey 1997 and own field work 2010; own illustration.

This rough estimate on education level only shows an aggregated view on overall education level. It seems appropriate to look more closely on individual education within households to provide further insights. To detect development in the last decades within this sphere of action, household members between the age of 16 and 45 years are looked at. Considering the likelihood that particularly those family members with higher education are moving away for better job opportunities in local, regional or national centres, it becomes clear that they should not be neglected. The unit for analysis is therefore the household as well as the family.

Of all household members not even 3 percent in 1997 and 4 percent in 2010 have managed to go beyond secondary school (see figure 5). What did increase for household members is the percentage of persons who started primary school but did not complete – due to less household members with no formal education (this is now only found in the oldest generation). It seems likely that people who have the option of better education move away (secondary school is often boarding school, colleges or universities are in bigger towns) and will then also more likely find a job elsewhere and not back on the home farm. It is shown that those family members not living on the plot are more likely to have a better education.

However, individual education level seems to have gotten worse for both the household as well as the wider family. Household members who ended education with ending primary school constitute 60 percent now compared to around 43 percent in 1997. For the wider family those who finished education with at least complete secondary school decreased by around ten percent (see figure 5).

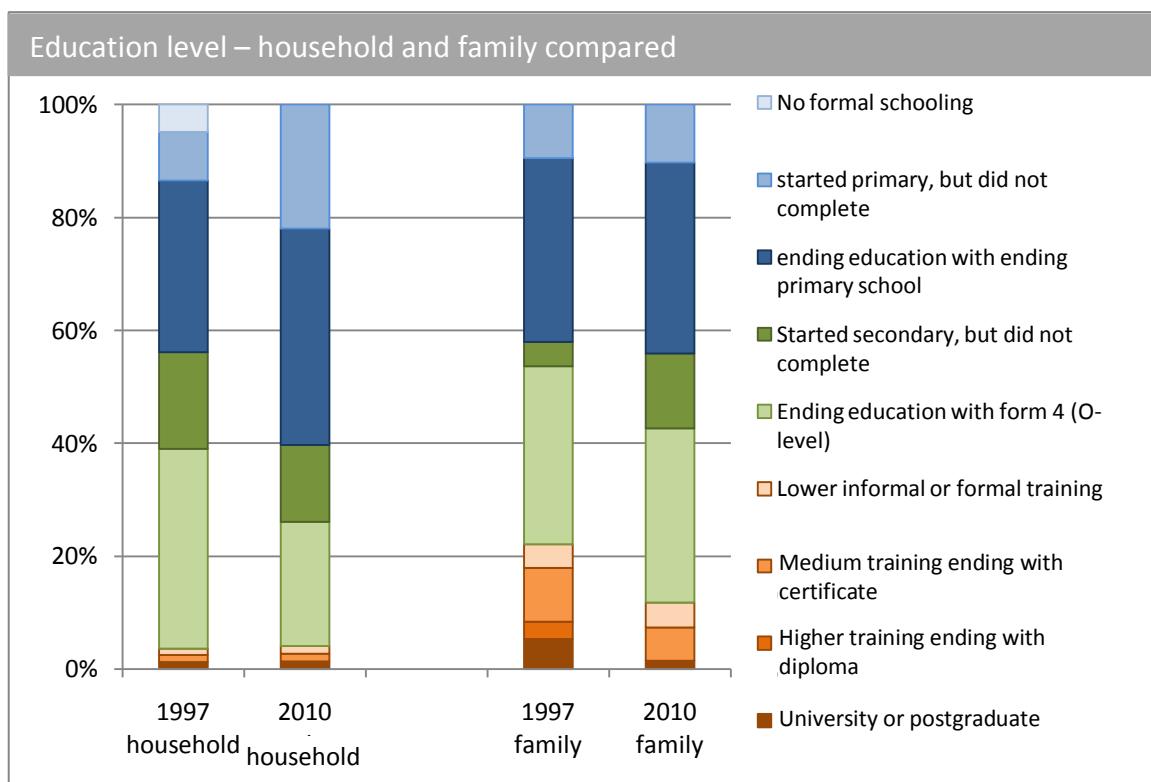


Figure 5: Education level for households and family.

Data: Wiesmann Survey 1997 and own field work 2010; own illustration.

Mwabu et al. (2002) point to education as the most important determinant in poverty. They state that people with at least secondary school education are less affected by increase in poverty (study period 1997-2000) than those with lower schooling level. In the present study the data shows that those households with higher education levels also are more likely to perform better in the other assets as well.

What could be positively noted are children's enrolment rates, where one may see improvements with regard to basic education through primary school.³³ In 1997 six children of school age (which constitute around 5 percent) were found working on the farm instead of going to school. In 2010 all children were said to be going to school. This might reflect national developments. State primary schools have been free of charge in Kenya since 2003, reintroduced by Mwai Kibaki (SACMEQ 2010). Research by the Centre for the Study of African Economies (CSAE) and the Kenyan government in 2008 shows an increasing primary school enrolment of children among the poor (IIG 2009). However, with this high increase in enrolment, new challenges have been emerging. Drawbacks have been poor quality in education as a result of overcrowding, lack of teachers and material. While pupils rose from 50 to 70 pupils per class, facilities and the number of teachers stayed the same (Mathooko 2009). Inequality in access to education has

³³Daniel Arap Moi introduced the 8-4-4 education system in 1985, which means 8 years primary, 4 years secondary, 4 years college/university. Free primary education was introduced in January 2003. Compulsory education is 8 years (SACMEQ 2010).

declined, but as more poor students enrol in public schools, richer students have moved to private schools³⁴ resulting in a large performance gap between private and public schools (IIG 2009). Thus, a good basic education for the rural poor seems even more threatened and constitutes a major constraint for rural development.

Another constraint for households are health issues. Despite the importance health plays for everyone's livelihood, this study only comprises marginal information on health status and thus is not able to conclude about its development or impacts. However, half of the respondents mentioned that at least one household member was suffering from health problems, which affects the household not only in terms of personal suffering, but also in money for treatment and forgone labour. Health problems were major for around ten households who had to cope with cancer, stroke, diabetes, mental problems, drug addiction or high blood pressure. Others mentioned cold, inflammation and knee problems. Often the decline of health may lead to social and economic downfall. One farmer had to sell his land to be able to support his wife who fell ill. This hints at the role health status plays for development and the threat it poses to livelihood security. Krishna et al. (2004) found in their study in Western Kenya that health was *the* main reason why households fell into poverty. Further research in this respect seems necessary to gather this important aspect in people's lives.

5.2. Natural resources: the asset land

In rural Africa, smallholder livelihoods are strongly connected to natural resources be it land for crop and livestock production, woodland for a variety of goods and services, water for household consumption or irrigation. These natural resources are not static in their quality and quantity as they can be reduced or increased by human activity (Campbell 2002). Land owned by or available to households is an important indicator of natural capital and shows access to resources. It is a fundamental asset in the context of rural regions and agricultural systems (Ellis 2000) and is the long term security for a household as land ownership shields the family against hazards of life (Ellis 1988). Furthermore, land is a measure of social status, a store of wealth and serves as collateral for loans. In addition, land value has been increasing continuously due to its intensive use and increasing population growth (Ellis 2000). A strong attachment to land in Kikuyu culture in particular has been discussed in Droz (1999) and Sottas (1992) (cited in Holdener 2007). Land ownership has deep roots within the culture and marks the basis for livelihoods and social status. This has been strengthened when local farmers and

³⁴ The number of children in private primary school education has nearly tripled (IIG 2009).

researchers alike identified land ownership and plot size as the most important factor within the well-being index.³⁵

To understand land distribution in Laikipia the settlement history is looked at. Households interviewed have settled on average about 30 years ago. The year of settlement ranges between 1966 and 1989. They are all part of non-governmental purchase of land through private cooperation and companies.³⁶ Plots in Ngenia had been purchased between 1960 and 1969, whereas the other settlement areas within this study (Burguret, Nyakairo, Mia Moja and East Laikipia) belong to a subsequent settlement phase in the 1970s (Kohler 1988). What is important to know is that unlike the public settlement schemes these private initiatives did not consider agro-ecological potential when distributing the land to its members. This is shown e.g. in plot sizes. They are typically around three to six acres in the area (Kohler 1988). This is also found for the thirty households. The average plot size did not change much with 4.79 acres (sd. 2.9) in 1997 and 4.98 acres (sd. 3.8) in 2010.

Thus the small plot sizes persist, despite their unfavourable agro-ecological potential, due to increasing scarcity of land in the area. The increased standard deviation by around one acre indicates a wider differentiation between households. Plot sizes and their development for individual households are shown in figure 6. Almost two thirds of the households own less than five acres, where persistence is particularly clear.

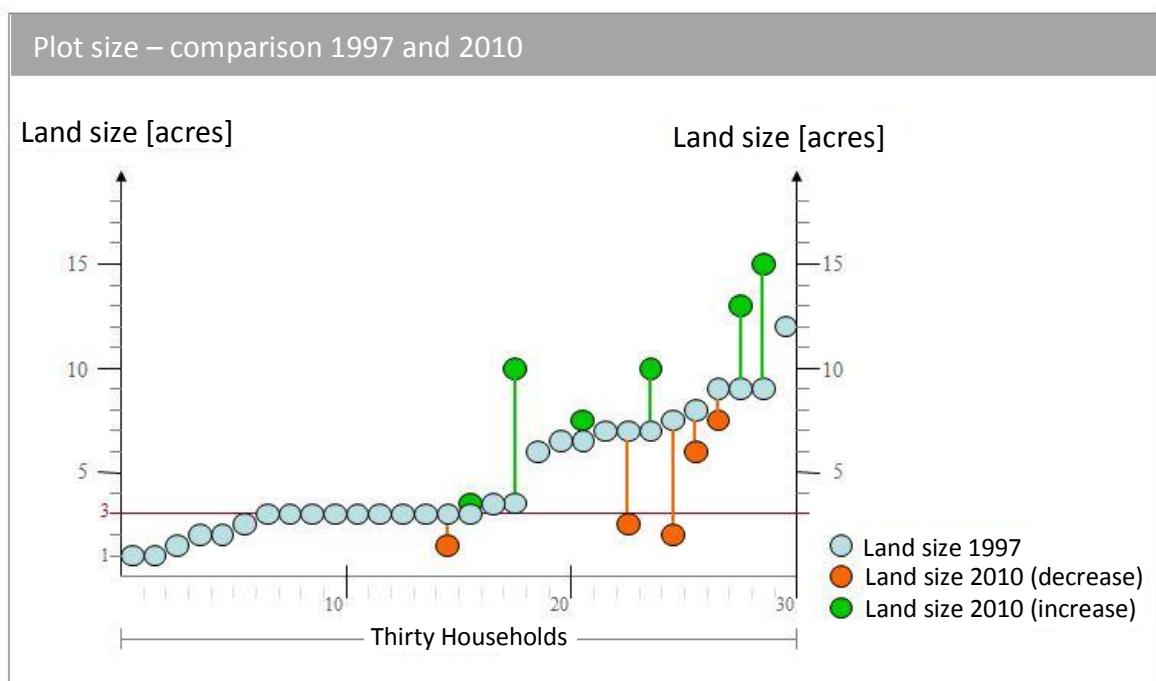


Figure 6: Inter-household comparison of plot sizes for 1997 and 2010.
Data: Wiesmann Survey 1997 and own field work 2010; own illustration.

³⁵ See appendix 2.

³⁶ Non-governmental purchase constitutes the most important category of African land ownership. For a thorough discussion on different settlement phases and patterns see Kohler 1988.

Kohler (1988) stated already in 1988 that plots of this size are by far not able to secure full subsistence due to the given agro-ecological potential. This is underpinned by the fact that in the early public settlement scheme, where attention was paid for plot sizes to enable full subsistence and the additional cash income needed, plot sizes range from fifteen to thirty acres and are furthermore in parts in western Laikipia that are more suitable for agricultural production.³⁷ Hence, the potential for smallholder farming in the study area is rather limited.

Examining land as an indicator for access to resources not only plot size matters but also the settlement density. It indicates to what extent farmers can make use of common property, e.g. grazing for livestock (Wiesmann 1998). Wiesmann (1998) argues that settlement density and plots size are the critical factors determining livelihood strategies. He found that smallholders in Laikipia generally try to secure a minimum basic mix³⁸, and only after doing so expand within strategies. What is interesting now is whether the theory of securing a basic mix and the sequential rational stated by Wiesmann (1998) can be supported after this time or whether farmers changed within their strategies (or if they even have the capacity to adapt). Thus the next chapter looks into the different aspects of on-farm activities and attempts to capture potential change and/or persistence of assets with the aim to conclude on livelihood strategies.

³⁷ Public settlement schemes namely the “One Million Acre Scheme” paid attention for plot sizes to enable full subsistence with additional possible cash income in order to secure a living. The area around Nyahuru has a higher agricultural potential compared to the area around Nanyuki due to higher amount of rainfall (Kohler 1988:41).

³⁸ Mixed farming is traditional with rain-fed agriculture producing a basic mix of maize, beans and potatoes in combination with livestock keeping (Wiesmann 1998).

5.3. On-farm activities

Agriculture is the backbone of the national economy and particularly the principal source of livelihood for poor people in rural Africa (IFAD 2006). This is also the case for smallholders in Laikipia. On-farm activities may include crop and garden as well as livestock production and home economics. This section explores activities on the farm and how these have changed compared to 1997 - from crop harvest to livestock keeping and from the role of subsistence to market production and tries to capture their significance within the overall household strategy.

5.3.1. *Cultivation of crops and the role of subsistence farming*

Similar to plot size in general is the picture for land allocated to crop production. The average crop land and garden differs only slightly from 2.24 (sd. 1.0) acres in 1997 to 2.33 (sd. 1.5) in 2010. Distribution of land allocated for crop and garden production within the households is similar to 1997. About one third use less than two acres for crop farming; only around ten percent use more than four acres. Crop-land accounts for 56 per cent of individualised land use in 2010, which has not changed compared to 1997. It is important for all thirty households.

As maize is the staple food in Kenya it is not surprising to find that all households cultivate maize. Together with beans and potatoes it constitutes the basic mix for all smallholders. This has already been pointed out for the study area by Kohler in 1988 and again by Wiesmann in 1998. The amount harvested does not differ significantly for 1997 and 2010 and is at the same time difficult to interpret with only two snap shots given by the surveys. Harvest varies tremendously particularly due to variability in rainfall. With the variability and insecurity of agricultural production smallholder mentioned repeatedly that it is impossible to refer to a "normal" year of production. Harvest is therefore difficult to compare. The interviews showed, however, that the production of wheat declined both in numbers of households growing it and the amount harvested. Out of thirty households, seven grow horticulture products such as kales, spinach, cabbage, snow and garden peas or tomatoes or napier grass.

Subsistence farming is acknowledged as the basis of smallholder livelihoods (Ellis 1998). Kohler (1988) defines sustainable subsistence as not only a minimum provision of calories but also the ability to gain additional means to provide for basic needs such as clothes or education. Through a comparison of the vegetation period with the moisture needs of crops cultivated in the area, it has been shown that maize is rather unsuitable. Constraint free yields are only ensured in 10 percent of the years and the variability of the

vegetation period is striking (Kohler 1988).³⁹ This variability has even increased due to climate factors and land use changes as discussed earlier. Although climate variability is not the only risk factor,⁴⁰ the persistence in growing maize under these circumstances and it being a staple food arguably shows a primary focus on subsistence farming (Kohler 1988). One third of household grow their agricultural products for home use only (see Figure 7). Hence, subsistence agriculture plays an important role in the overall household strategy.

Given plot sizes as discussed above, sustainable subsistence seems hardly possible. Kohler (1988) also identified a substantial decline in the level of subsistence production when looking along a gradient of decreasing rainfall. The question arises on how the level of subsistence has changed within the past decades? In interviews in 1997 and 2010 farmers judged how long they can live off their own production in both a good and a bad year. The months households can live off their own production has not changed on average, but variation between households has increased. In a good year the average was 9.8 months in 1997 (sd. 2.2) and 9.5 months in 2010 (sd. 3.5). The data shows all except two households cannot live of their own food production for more than three months during bad years. However, it has to be noted that these judgements have to be considered with care as there is no clear definition of what constitutes a good and a bad year. Furthermore, given the frequency of droughts *bad* years are more prevalent than *good* or *normal* years.⁴¹

In summary, subsistence cropping still plays a dominant role in people's livelihoods while at the same time the level is rather low. Although maize production is the primary source of food for subsistence, it is also sold to cover other basic household needs (Kohler 1988). In order to understand the role of subsistence agriculture for smallholders' livelihoods and food security, it is important to consider how it relates to their other livelihood strategies.

5.3.2. Crop farming as source of income

The majority that produce crop and garden products for market production sell their products to brokers, others sell to neighbours or at local markets. Figure 7 shows the income from crop and garden production. Despite a small shift away from "subsistence only" compared to 1997, this category still comprise one third of households, emphasizing the role subsistence farming plays in smallholders livelihoods. For another twelve

³⁹ The vegetation period was based on the humid and sub-humid phase, when enough moisture is in the soil for plants to grow; length of vegetation period between 1934 and 1981 (FAO 1978 cited in Kohler 1988).

⁴⁰ Risk perception varies, other risk factors are wild life threads and disease; low inputs in money and labour and the use of maize straw as fodder also plays a role for choosing the crops (Kohler 1988).

⁴¹ Some respondents referred to as far back as 1998 as their last «good» year.

households income from crop and garden products is less than 10,000 KSH per year,⁴² and thus only a very small additional cash income.

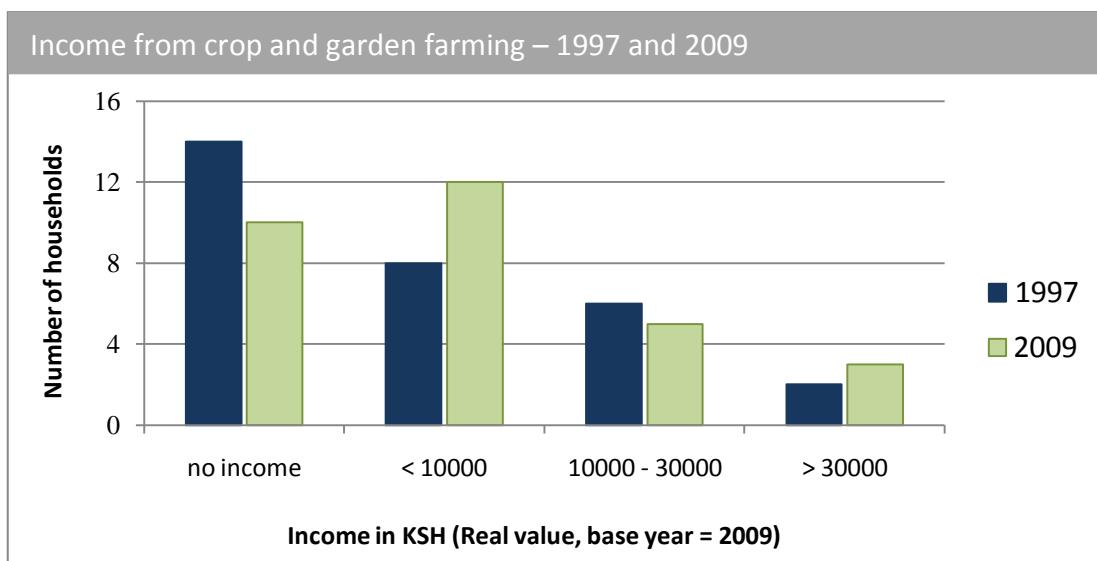


Figure 7: Income from crop and garden products.
Data: Wiesmann Survey 1997 and own field work 2010; own illustration.

In comparison with the data from 1997 it stands out that the income distribution is rather persistent as shown in figure 8. Notably is only a slightly higher income. Still, only five households earn more than 20,000 KSH annually. Two households show a remarkable exception. They experienced a very high increase in earnings from crop and garden of up to 90,000 KSH per year.

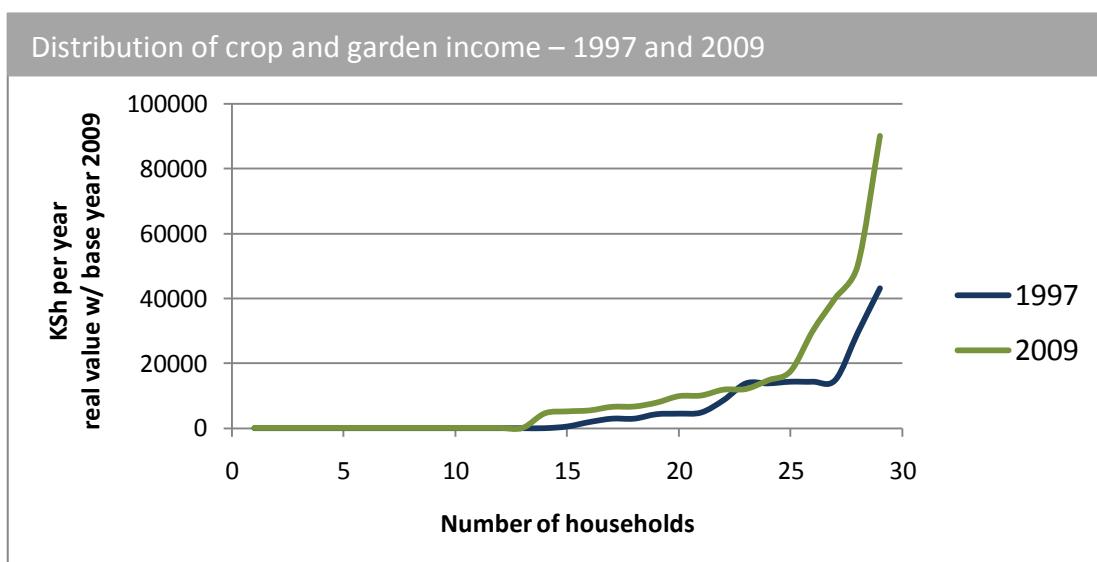


Figure 8: Distribution of income among smallholder households.
Data: Wiesmann Survey 1997 and own field work 2010; own illustration.

⁴²KSH = Kenyan Shilling; real value, base year is 2009; 10,000 KSH ~ 100 €

How satisfied farmers are with their crop farming shows figure 9. It is striking how much their opinion on crop farming has shifted into the negative. In 1997 all except two households were at least *quite satisfied* with crop farming. In 2010 two thirds are now *not fully satisfied* and two households are *not satisfied*. This could express the difficulties smallholders are facing with land degradation and increasing water stress as discussed before. Considering that the previous years (2007-2009) were all characterized by periods of drought, a negative perception of performances in cropping may be anticipated.

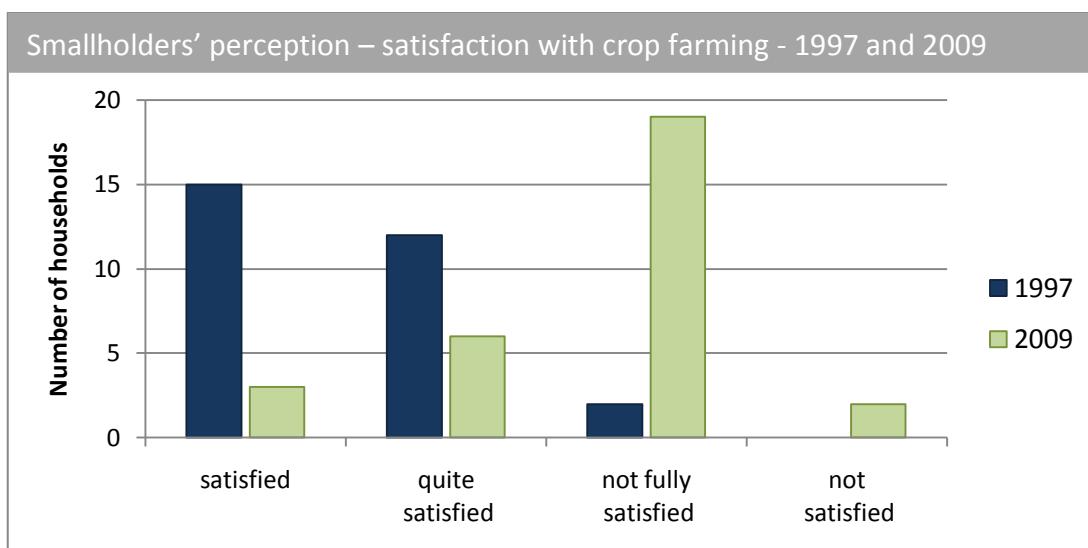


Figure 9: Satisfaction with crop farming compared to 1997.
Data: Wiesmann Survey 1997 and own field work 2010; own illustration.

It is questionable if this rather negative perception has inclinations on adaptation processes that Wiesmann (1998) showed to be quite limited. Further research is needed to understand whether and why the perception of smallholders with regard to their farming has changed – whether it is rather due to, for example increased frequency of droughts, or increased choices and opportunities outside the farm. It may be that smallholder perceptions are a current reflection of the adverse conditions for farming. It cannot be concluded whether this shows a trend that might lead to adaptation processes.

5.3.3. Livestock keeping

In sub-Saharan Africa livestock plays an important role as an asset and is an integral part of livelihood strategies, e.g. as part of on-farm diversification. Livestock keeping plays a critical role as a buffer against bad times (Ellis 2000). It is the traditional means of banking cash (Ifejika Speranza et al. 2008) and an important storage of wealth for households (Campbell et al. 2002) as they are used as a means to hold surpluses between current production and consumption (Ellis 2000). To enable a comparison between different animals, livestock is measured in standard livestock units as classified by Wiesmann

(1998).⁴³ The number of livestock units decreased from an average of 2.9 (sd. 2.2) in 1997 to only 1.8 (sd. 1.3) in 2010. This substantial loss in livestock units might be of dramatic consequences considering the importance of livestock holdings for livelihood security. So how can this decline be interpreted?

In an attempt to answer this question figure 10 shows the longitudinal change in relation to each household themselves. It reveals that while most of the households have lost more than half of their livestock units,⁴⁴ particularly those who did not have many animals in 1997 increased their livestock.

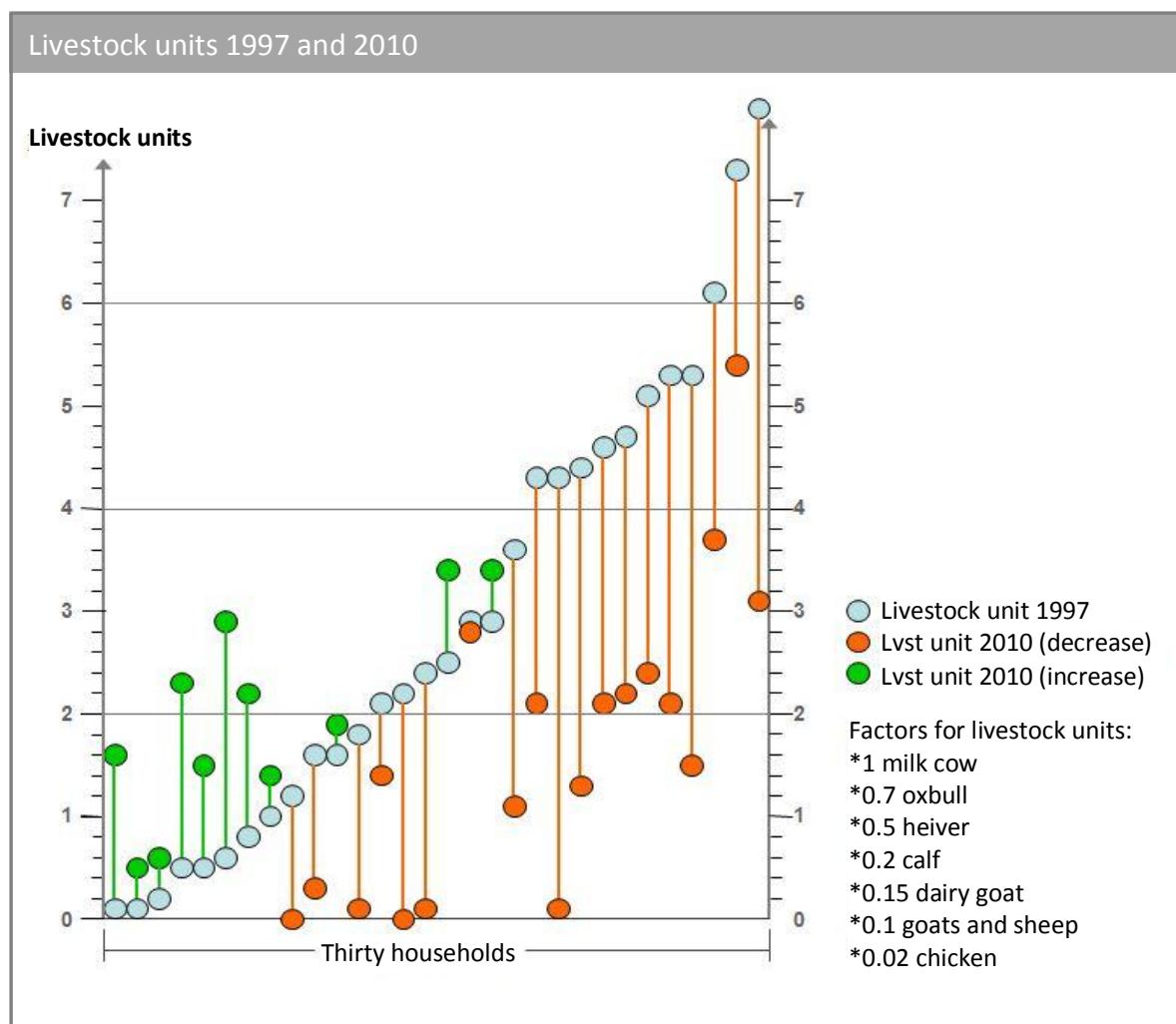


Figure 10: Inter-household comparison of livestock units.

Data source: Wiesmann Survey 1997 and own field work 2010; own illustration.

⁴³ Classification of standard livestock units see Figure 10.

⁴⁴ Mean of livestock loss is 63% (sd. 27).

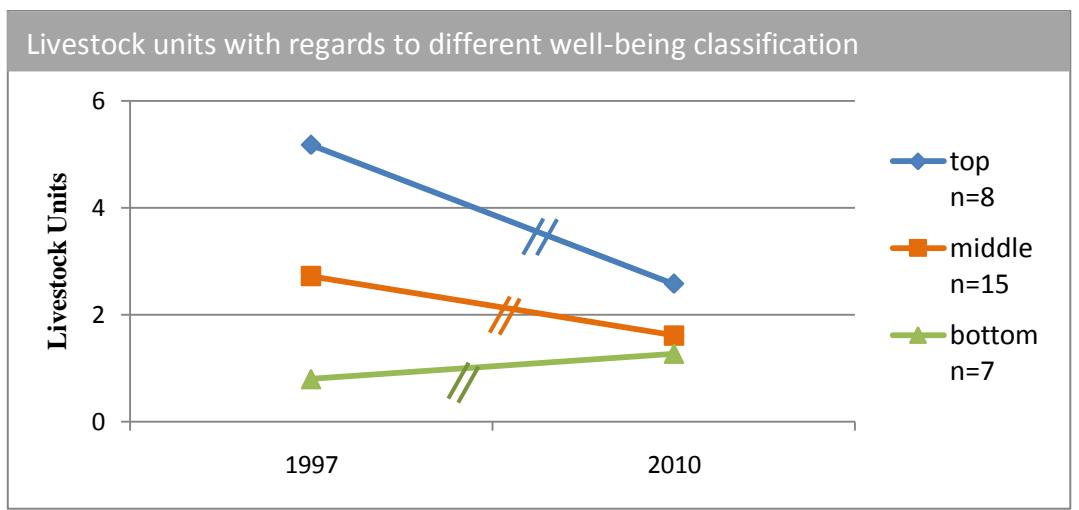
Kristjanson et al. (2004) named three main reasons for loss in livestock as: drought, insecurity and social obligations. Drought seems very likely in the context of the study area, particularly as three years prior to the survey in 2010 the area was hit by drought periods.⁴⁵ However, the fact, that those households with only limited livestock could invest and increase their livestock to numbers above that recorded in 1997, despite the recent drought and, contrary to other households that had a tremendous decrease, may lead to the conclusion that drought alone cannot be held responsible for the loss. The second reason mentioned by Kristjanson et al. (2004) is insecurity, particularly due to frequent cattle rustling and banditry. Künzi et al. (1998), in their study within Laikipia, point to security risks as a major constraint for expansion in livestock production. From the smallholders that I interviewed twelve lost some of their livestock due to theft. These cases do not correspond with the loss shown in the comparison between 1997 and 2010. Thus on its own it does not deliver a conclusive explanation to the decline in livestock numbers. However, considering the number of households directly affected and the severity for some losses (11 sheep or 5 cattle stolen), livestock theft (cattle rustling) does pose a relatively important threat to people's livelihoods in Laikipia.

The third reason by Kristjanson et al. (2004) are social obligation, the most common example are slaughter for funerals. On a first glance it does not serve as explanation considering the overall tremendous decrease. But Krishna et al. (2004) found in a study of twenty villages in western Kenya that the slaughter for funerals has been one of the main reasons for households to fall into poverty and thus it should not be underrated here.

Wiesmann (1998) points out the limiting factor of available land for livestock grazing. He argues that settlement density determines herd sizes and hinders expansion in this respect. Similar to this, Campbell et al. (2002) found declining herd sizes due to land pressure and resulting smaller patches for livestock grazing for smallholders. A lower emphasis on livestock might therefore be interpreted as higher pressure on available grazing resources and limited possibilities to expand in livestock production (Wiesmann 1998). To test this, the spatial variation of crop- and livestock production pattern needs to be examined. Due to the limited sample size and the lack of data on open pasture land this cannot be examined within the scope of this study.

⁴⁵ Referring to people's perception.

However, the question arises whether different strategies exist depending on the overall well-being of households and whether households might deliberately substitute investment in livestock with other assets. Figure 11 shows that better-off (=top) households still own more livestock in absolute terms. But there has been a significant decline in variation and those who had relatively little could increase their livestock holdings and hardly have less than the average. Hence, those that have hardly any options see the possibility to improve their livelihoods when increasing livestock. While the expansion of herd sizes for more wealthy households seems constrained where all above mentioned reasons might play a role.



NOTE: Decreasing trend is not linear; Households in categories are not per se the same in 1997/2010

Figure 11: Livestock units with regard to wealth categories.

Data: Wiesmann Survey 1997 and own field work 2010; own illustration.

Whereas Campbell et al. (2002) found the direct link between livestock and wealth weakened, Kristjanson et al. (1998) contrarily found in their study in Western Kenya that diversification of on-farm products through livestock was one of the major reasons for households to escape poverty. How has the decline in livestock units affected cash income for the interviewed households? Figure 12 shows the annual income from livestock and livestock products in Kenyan Shilling (KSH) with the calculated real value (base year is 2009). Despite the tremendous decrease in livestock units this is not shown to the same extent in earnings. What can be seen is that in 2010 seven households (compared to four households in 1997) do not have any income from livestock. At the same time there are eleven households (compared to ten in 1997), that earn more than 10,000 KSH per year.

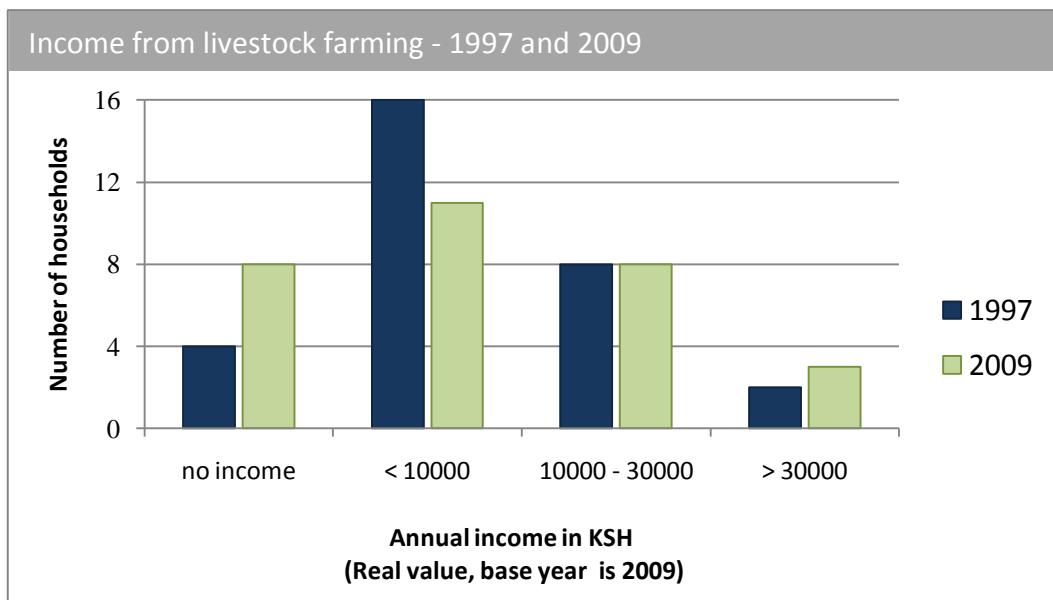


Figure 12: Income from livestock and livestock products.
Data: Wiesmann Survey 1997 and own field work 2010; own illustration.

Despite severe loss in livestock units, the amount of income has hardly changed at all with an exception of one household earning up to 120,000 KSH per year as shown in figure 13. With standard livestock units of 2.1 the named household has slightly more livestock than the average (1.8), but it enables him to earn more by far. Some farmers point to volatile prices for agrarian products which again makes it difficult to conclude on income earnings as stated above.

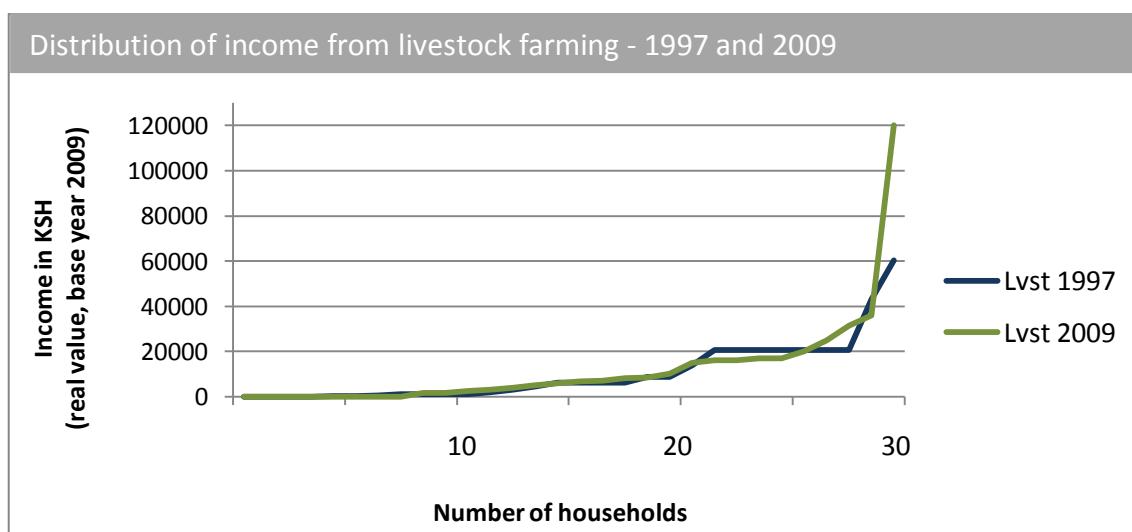


Figure 13: Distribution of income from livestock farming.
Data: Wiesmann Survey 1997 and own field work 2010; own illustration.

While other case studies in semi-arid areas indicate severe loss of cattle in particular (Campbell et al. 2002), this is different in the case of the interviewed households. The number of smallholders that have cattle stayed the same,⁴⁶ whereas the number that own poultry decreased from 29 to 23 and for those owning sheep or goats even more from 24 to 16.

5.3.4. Priorities and overall significance of on-farm activities

Having looked at livestock and crop farming separately, their interrelation as well as on-farm activities within the overall household strategy are of great interest. Wiesmann (1998) found that mixed farming plays a constant key aspect in smallholder livelihood strategies. This mixed farming is traditional with rain-fed agriculture producing a basic mix of maize, beans and potatoes in combination with livestock keeping (Wiesmann 1998). Despite a shift away from livestock production one can still see a broad spectrum of combinations of crop and livestock production. Wiesmann (1998) argued that the relationship between cropland and pasture can be seen as an indicator for ecological adaptation and can give insights into opportunities and constraints. Considering the fact that in semi-arid conditions livestock keeping is better suited than rain-fed agriculture (Wiesmann 1998) one cannot speak of ecological adaptation since 1997 in that sense.

However, despite the fact that the number of livestock units has declined quite dramatically compared to 1997, this shift away from livestock is contradicted looking at the income generated from both crops and livestock (see figure 14).

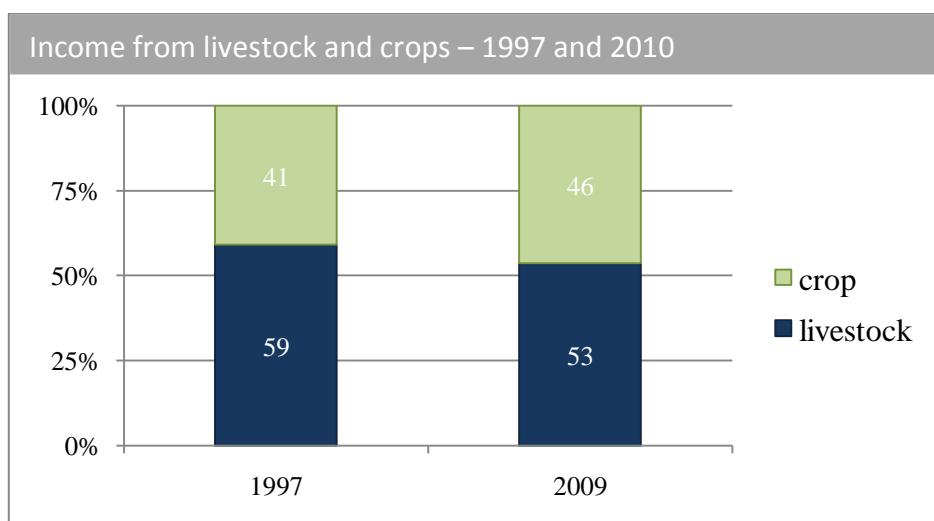


Figure 14: Income from farm products in percent.
Data: Wiesmann Survey 1997 and own field work 2010; own illustration.

⁴⁶ 23 households owned cattle in 1997, in 2010 these are 24.

Relatively more income is generated by crop farming than this was the case in 1997, but still more than half of the income is from livestock production. Livestock therefore has hardly lost importance with regard to the generation of cash and for investments.

This significance of livestock despite the decline of livestock units leads to the following thoughts. It might question the accuracy of the income mentioned by the interviewees, but it might also be due to higher prices for livestock products relative to crop prices. Explanation could also be the role that subsistence farming plays for crop production, where only half of the households sell crops, whereas two thirds sell livestock or livestock products. It again emphasizes the importance that livestock still plays for additional cash income. This is also expressed in the wish of seven smallholders to expand in dairy farming.

The annual farm income (gross income from all crop and livestock farming activities) indicates the degree of market-orientation of farm activities and the potential financial resources that might be available for innovations (Wiesmann 1998). Not included is the level of subsistence which is a non-cash component of income and the level of remittance from off-farm employment. Looking at annual farm income (see figure 15 and 16) it shows that the amount of cash generated with farm products has very strikingly not changed at all with the exception that two households managed to go beyond the earnings of everyone else with up to 90,000 KSH and 170,000 KSH per year. Thus there is a striking persistence for the majority of smallholders in income levels from on-farm activities.

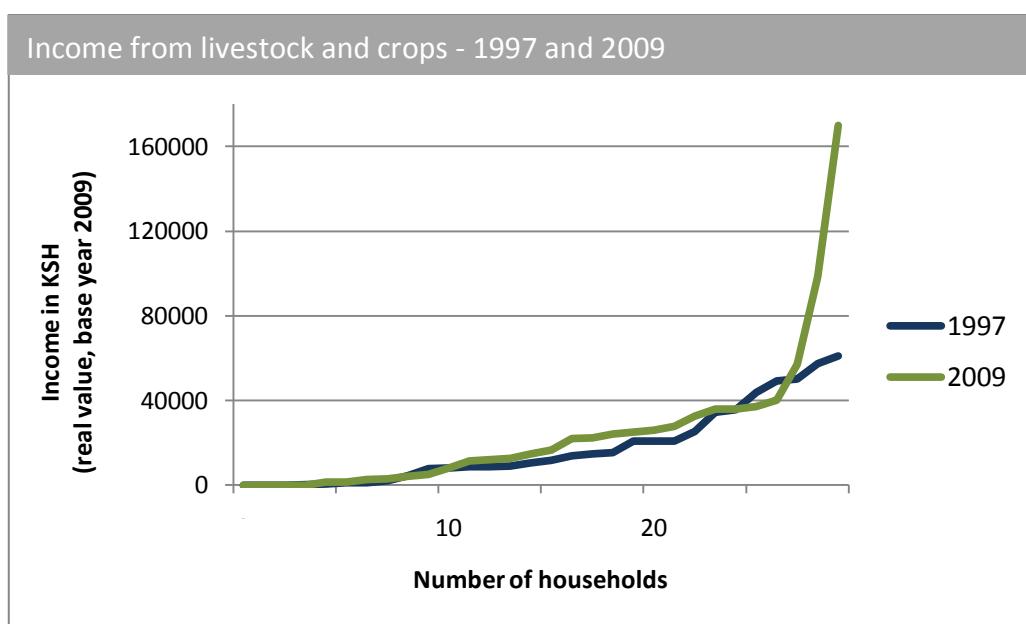


Figure 15: Distribution of farm income from livestock and crop production.
Data: Wiesmann Survey 1997 and own field work 2010; own illustration.

Wiesmann (1998) distinguished income levels into low, medium and high income. Households have medium income when earning more than 10,000 KSH annually in 1997 and high income when earning more than 30,000 KSH. These figures translate in real value into around 35,000 and 100,000 KSH respectively for 2009. Compared to 1997 income levels continue to be low. Still in 2009, twenty three out of thirty smallholders have no or low income, six have medium income and one household has high income (see figure 16). The low level of income from farm activities shows limitations to expand in this area as expressed by Place et al. (2007:158) who argues that "*In densely populated areas with small average farm sizes, there are obviously limitations as to how much income and production can be generated by a household.*"

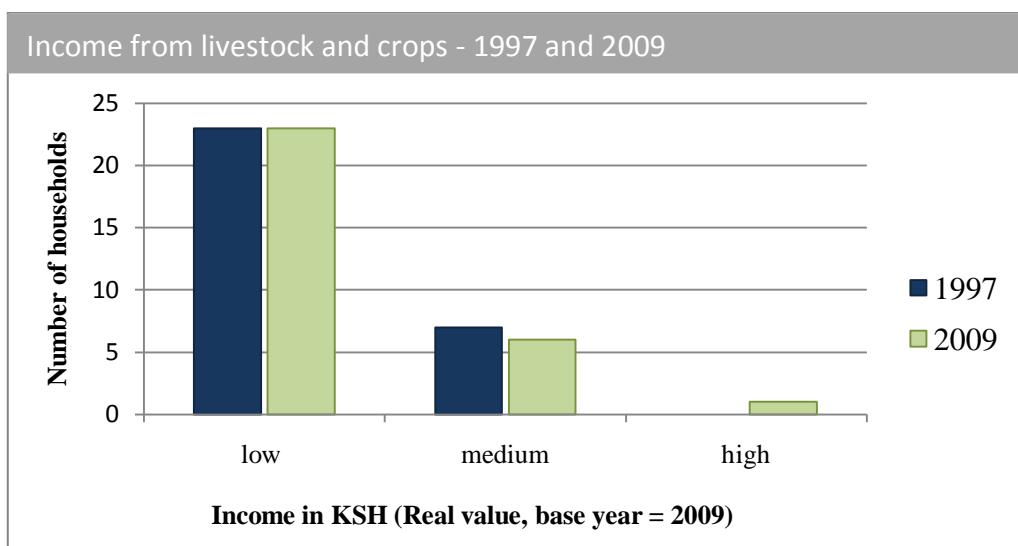


Figure 16: Low, medium or high income distribution.
Data: Wiesmann Survey 1997 and own field work 2010; own illustration.

Despite the persistence of the overall income level, when looking from a micro-perspective it becomes clear, that there have been quite some transitions in terms of who is earning how much (see figure 17).

Contrary to the persistent income level perceived at an aggregated perspective, the micro-level examination shows quite some transition. Approximately one third have substantially increased their income compared to 1997, whereas almost the same number of households experience less income and another third has hardly any change. Quite substantial increases from the bottom and at the same time decreases for the top half can be detected. The dynamics do not surprise considering the multiple factors that affect farming outputs, e.g. drought, disease (human and livestock), land degradation, water shortage, labour constraints etc. The households with the biggest increase in income have land sizes above ten acres in common and additionally to the basic crop mix grow horticultural products. With the data available it is not possible to detect a causal line that would explain the farming improvements. A follow up with more qualitative data for further insights is deemed necessary to understand improvements and equally decreases in well-being.

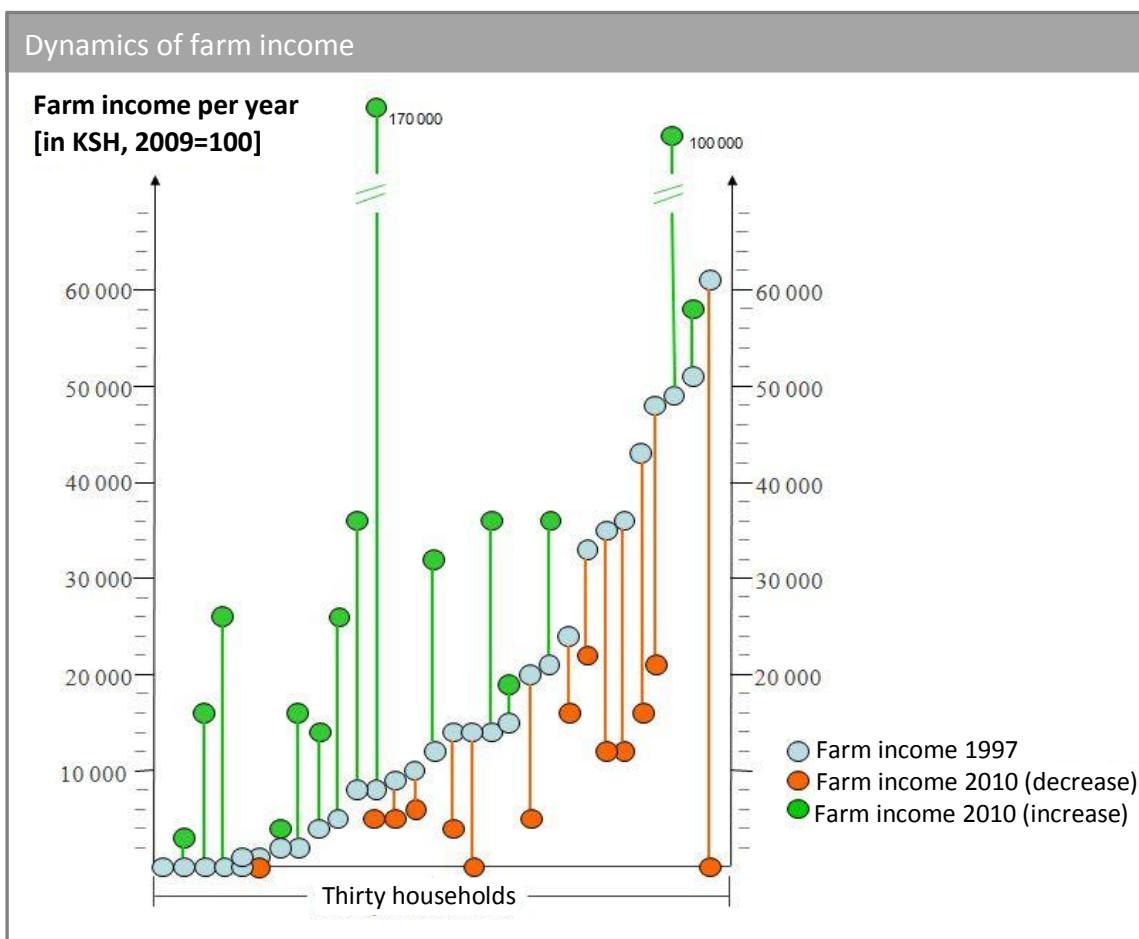


Figure 17: Dynamics of farm income.
Data: Wiesmann Survey 1997 and own field work 2010; own illustration.

Although interpretation is rather limited due to the unreliability of answers in relation to income on the one hand and only two specific points in time on the other hand – this dynamic picture of income development hints at a potentially substantial flow into and out of poverty as was noted by Krishna et al. (2004) for twenty Kenyan villages. This must be further looked into at a later stage, when a more holistic livelihood picture has been given. To understand the transitions shown and their significance for smallholder households the next chapters examines other aspects of smallholder livelihoods to gather a more holistic view.

5.4. Off-farm activities

The importance of off-farm activities for rural livelihoods has been stated with increasing force. Kohler (1988) attributed 45 percent of total income of households in Laikipia to off-farm activities. This figure is also found elsewhere in the literature for rural Africa where the growing importance in off-farm activities for poverty reduction in developing countries is expressed. It is typically found as being positively correlated with income and wealth⁴⁷ (Barrett et al. 2001; Karugia et al. 2006). Barrett et al. (2001) questions whether off-farm opportunities are a pathway out of poverty, or whether the rural poor are constraint by entry barriers and investment requirements to benefit from off-farm activities. This chapter aims to shed light on this question in the case of smallholders in Laikipia.

Wiesmann (1998) and Kohler (1988) define off-farm activities as all income generating activities that are not done on the own farm, be it on other farms or non-farm activities. The lack of quantitative data on earnings from off-farm activities makes it difficult to judge the importance of this sphere of action within the household strategy. As levels of income varies tremendously it seems appropriate to establish a typology of activities to be able to compare different levels of off-farm activities. On the basis of classifications by Kohler (1988), Brown et al. (2006) and Holdener (2007) this study distinguishes different levels of income generated by off-farm activities with regard to required skill and associated earnings. Main categories found are (1) permanent employment with further subdivision of (1a) high return and (1b) low return activities; (2) casual employment that is further distinguished into (2a) regular and (2b) occasional employment; and (3) no off-farm activity. With permanent employment the amount of income is substantial, the activity is crucial for the household and is balancing the risk of agricultural production (Kohler 1988). Permanent employment can still be distinguished between low return, unskilled employment and high return, skilled employment. High return employment is e.g. within public services. Pensions are also associated with continuous high return employment in Kenya (Brown et al. 2006). Contract work or casual employment is associated with a lower level of income and higher insecurity. It is by far less effective to balance or spread risk. In addition high demand for labour for casual work typically collides with high demand on the own farm. The level of remittance from off-farm becomes even less with fewer people involved in such activities. No or very low off-farm remittance can be assumed where only one or two household members are involved in occasional casual employment. In this category focus lies on their activity on the farm, which is supplemented with occasional labour.

⁴⁷ Barrett et al. (2001) speaks here of wealth in the form of land and livestock.

5.4.1 Type of off-farm activities

Analysing off-farm activities within smallholder livelihoods, it makes sense to look not only from a household perspective, but also to look at other relatives that moved away from the plot. It would not be wise to neglect the latter as particularly those who moved away are likely to pursue off-farm work as jobs are more easily find in centers and towns (Krishna et al. 2004). If they move away for job opportunities, or if they get the job opportunities because they move away is not discussed here (a combination of both could be assumed here). Figure 18 shows the type of employment with regard to the household (in dark colours) and family not living on the plot (light colours). In 1997 as well as in 2010 permanent employment and employment in the public sector is mainly pursued by family members that do not live on the plot. This may suggest that the study area lacks those job opportunities.

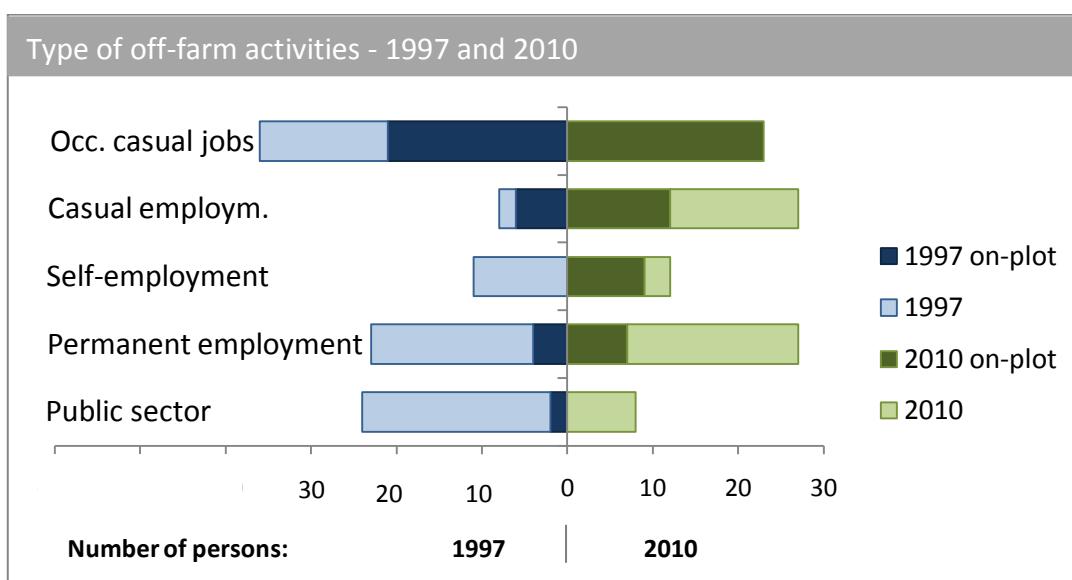


Figure 18: Type of off-farm activity.
Data: Wiesmann Survey 1997 and own field work 2010; own illustration.

In the study all except two households diversify their sources of income with at least some sort of off-farm activities. The number of persons engaging in off-farm activities has increased within households (from 33 to 54). This might suggest – as emphasized in the literature (e.g. Barrett et al. 2001) – that off-farm activities have gained importance within the overall household strategy.

Occasional off-farm activities was and still is representing the majority of job types. The highest increase is found in the category of regular casual employment, where emphasis goes to off-farm activity but income and security level (with regard to continuous pay) can be regarded as equally low. Another increase to the same extend is shown in the category of self-employment, where five out of nine are involved in the informal setor. No one is employed in the public sector any more. Whereas in 1997 twelve households had no one

living on the plot that was engaged in off-farm activities for income generation, in 2010 these were only two. Thus off-farm activities have gained importance for households in Laikipia. It could be interpreted towards the attempt to spread risk of agricultural misfortune (extern or intern). It may also point to more opportunities available to households for extra earnings beside the farm. However, the problem is that the number of salaried employment (or high/continuous return, skilled labour) is still very low and thus are the potential earnings and the security against adverse events. It is likely that the prevalence of casual jobs shows a lack of better employment opportunities rather than cases where on-farm activities are seen as more important.

In Laikipia casual employment is mainly found in the primary sector on other large-scale farms, e.g. in the large ranches or commercial horticulture farms. The risks that come along with agriculture production be it crop, garden or livestock are often the same as for the big farms. In times of drought, when households would need mostly the additional opportunities to secure a living, off-farm employment becomes more scarce (Speranza et al. 2008) and people are laid off. Contrarily a situation where most jobs are assumingly offered, is also when labour is most needed on the own farm (Schuler 2004).

In summary there is a high increase in casual employment while at the same time a decrease in the high return, skilled employment is noticeable. Thus, despite the increase in the number of persons involved, the type of employment and the associated earnings stayed rather low with the majority undertaking casual jobs. This is particularly the case for relatively poor households. Karugia (2004) argues that improved access to off-farm opportunities (such as self-employment or formal employment) can provide poor households with a means to secure their livelihoods and climb the income ladder. But as Barrett et al. (2001) point out unskilled labour does little to reduce risk exposure or increase in expected income for households. What role does this sphere of action then actually play for rural households? The next section therefore looks further into the level of remittance from off-farm activities.

5.4.2 Level of remittance from off-farm activities

Considering the low level of remittance that is associated with the types of employment most common, this section examines as to what extend this sphere of action is important for rural households. Figure 19 shows the estimated level of remittance from off-farm activities to the household.

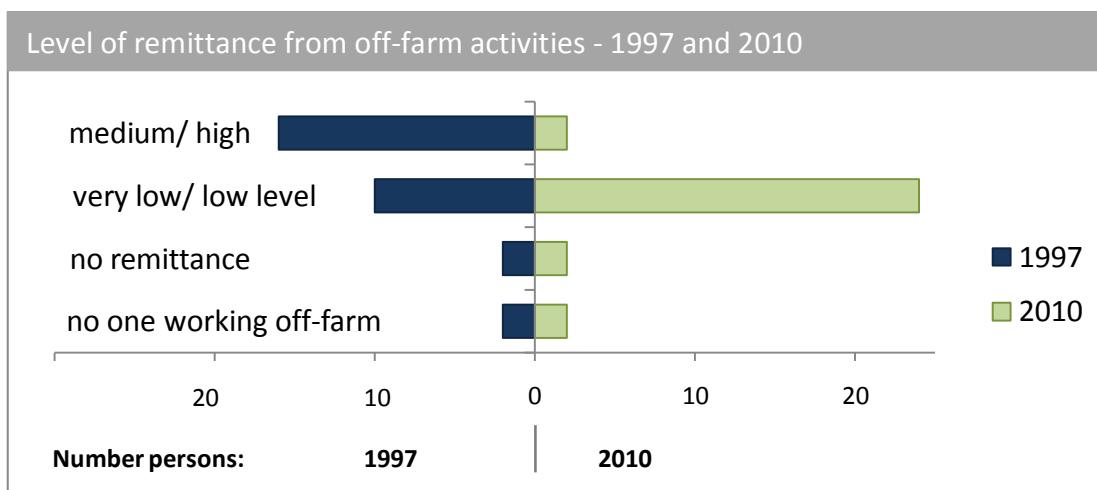


Figure 19: Level of remittance from off-farm activities.

Data: Wiesmann Survey 1997 and own field work 2010; own illustration.

The decline in perceived level of remittance is striking. Yet, the interpretation is limited as the statements are subjective judgments. It is therefore proposed to look into reasons why the perception is quite negative, rather than to compare the answers with those in 1997. Explanation for the estimated low level of remittance might be for one that only very few people are still employed in high return jobs. Payment in other employment - be it casual or permanent - is rather low. It might also partly be explained by the fact, that linkage within the family are loosened, i.e. that household and family members used to remit more.

Furthermore, the importance of off-farm activities within household strategies not only depends on the type of employment, but also on the remittance that those working off-farm actually give. This is strengthened by the fact that households with secure and skilled employment do not necessarily coincide with the households that mentioned medium to high level of remittance. Examining the type of remittance from off-farm activities the picture that evolves, supports the findings from the estimated level of remittance. Back in 1997 the majority of households said that remittance is *regular*. In 2010 this was only the case for one third of the households, almost as many stated *no regular remittance* and again *no remittance at all* (see figure 20). The discrepancy between the income and significance to the individual versus the household makes it rather difficult to assess the significance within the household strategy.

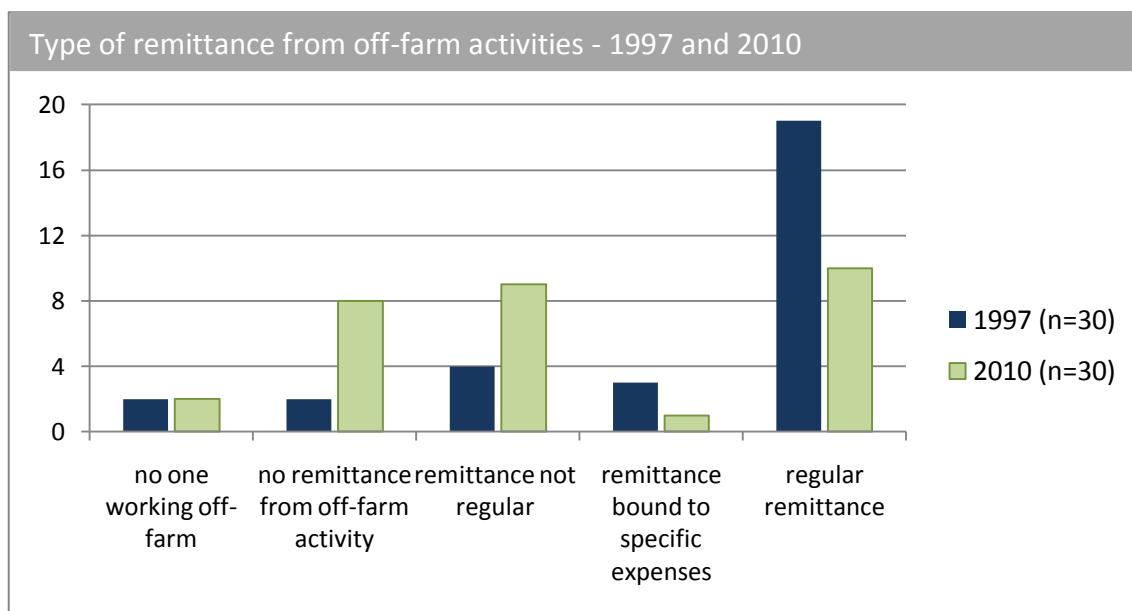


Figure 20: Remittance from off-farm activities.

Data: Wiesmann Survey 1997 and own field work 2010; own illustration.

Another aspect is, that those moving away and engaging in off-farm activities might be the ones that become independent and establish their own household (Krishna et al. 2004). This perspective might be lost in the interviews with households. It is somewhat present in the perception of smallholders, as many argue that their situation has improved because their children are independent now, where many of them moved away engaging in off-farm employment.

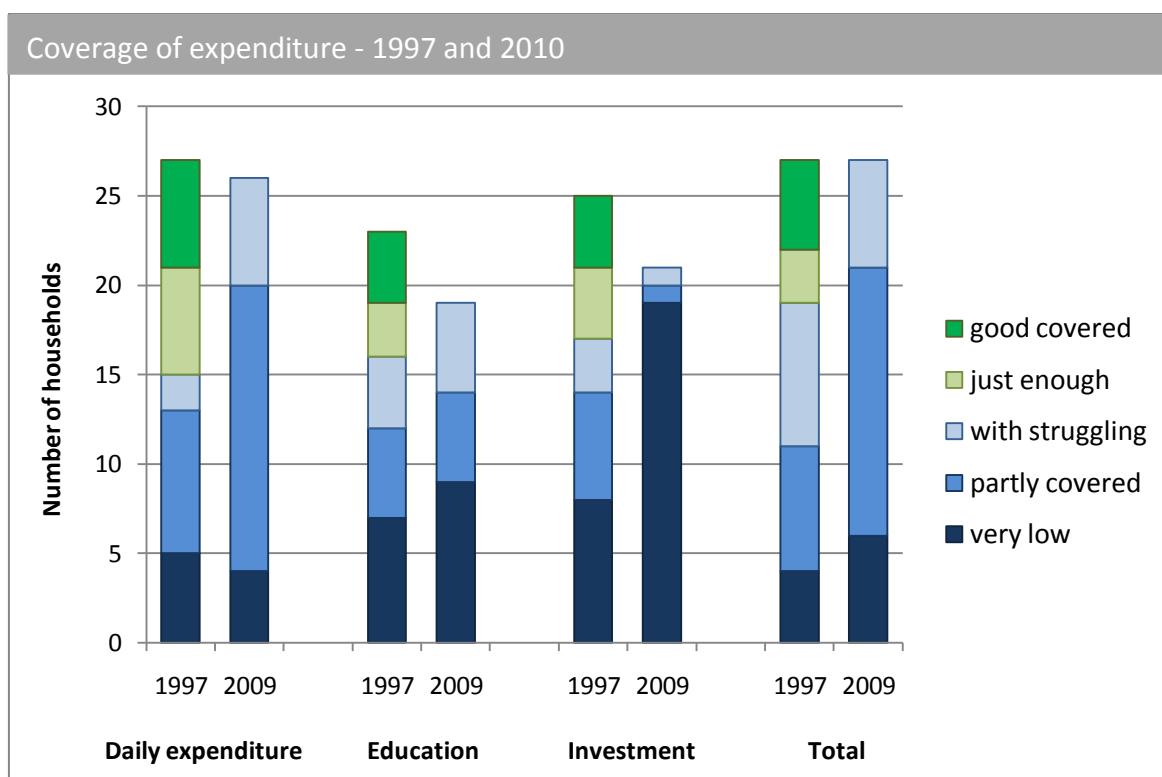


Figure 21: Coverage of daily expenditure.

Data: Wiesmann Survey 1997 and own field work 2010; own illustration.

With regard to the aggregated household level, the coverage of daily expenditure, education and investment from off-farm income is shown in figure 21. It becomes clear that in 1997 all three categories used to be covered better and for a larger number of households. They were covered roughly to the same extend with just around half of household where off-farm activities *hardly* or only *partly* cover expenditure but also around ten households where expenditure is covered *with struggling, just enough* or even *good*. In 2010 more than two thirds can or do *not* cover their expenses with off-farm activities. Education is applicable for fewer households and also it is less well covered than daily expenditure. That is even more so for investment. It becomes apparent that 2010 no single household said that off-farm income covers any of the three (daily expenditure, education, investment) enough or even good. This is most apparent with investment. All except two households said off-farm activities cover investment on a very low level.

5.5. Priorities and significance of different sources of income

Diversification as a significant component of rural livelihoods has been widely acknowledged within the development literature (Ellis 2000, Barrett 2001). The availability of labour is crucial for this diversification. Wiesmann (1998) argues that labour is one of the most limiting factors for households to develop spheres of action. Mortimore (1998 cited in Campbell et al. 2002) comes to the same conclusion and regards labour as chief resource available to households. The allocation of labour within households therefore may give insights into priorities of livelihood strategies and shows the constellation of labour considering gender aspects.

In a first step, labour distribution among household members with regard to on-farm activities (see figure 22) is examined. The workload lies almost always on household heads. Traditionally crop and garden farming seems to be more within the responsibility of female household heads whereas livestock keeping and production lies more in the responsibility of male household heads. In the survey 2010 a shift towards more shared responsibility was detected in both farm components. To hire labour is uncommon, households work with own labour available.

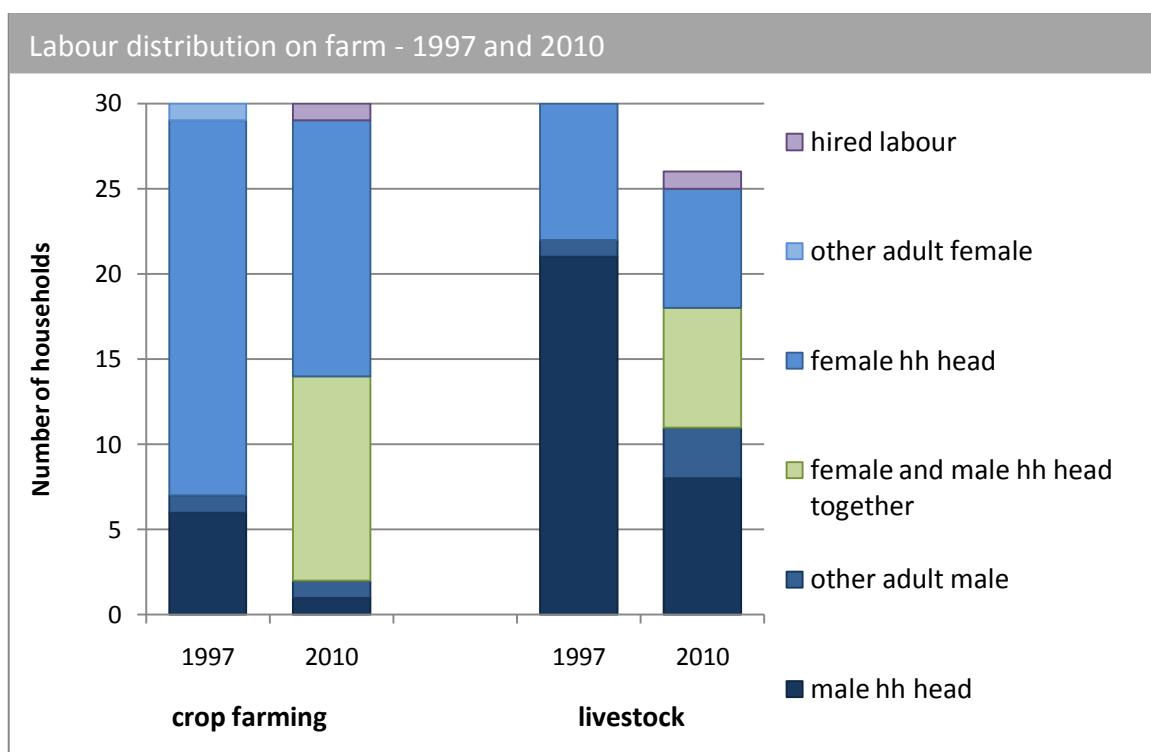


Figure 22: Labour distribution for crop and livestock.
Data: Wiesmann Survey 1997 and own field work 2010; own illustration.

Figure 23 shows who within households is engaged in off-farm activities. The decrease of household heads being responsible might be partly explained by their growing age. While male adults are still the dominant group engaged in off-farm, the growing number of female workers is striking.

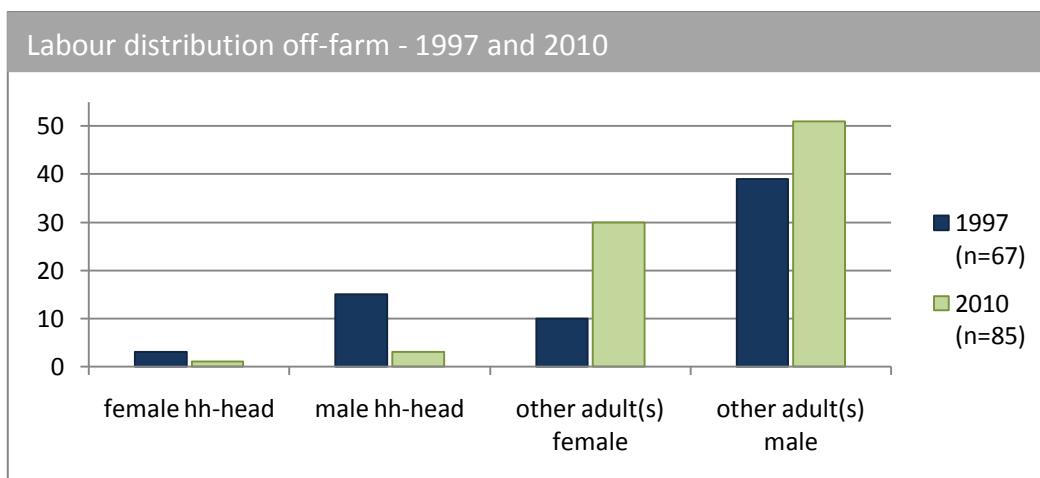


Figure 23: Labour distribution for off-farm activities.
Data: Wiesmann Survey 1997 and own field work 2010; own illustration.

The number of women working off-farm more than doubled. Women constitute almost forty percent of all persons engaged in off-farm compared to only twenty percent in 1997 (see figure 24). The increase can be explained by push and pull factors. On the one hand it seems plausible that households are pushed to expand towards off-farm employment given the risks associated with farming and increasing pressure on natural resources. This perception is strengthened by Kohler (1988) who found a clear increase in women's participation in contract work when moving towards more dry and agriculturally less potential areas. On the other hand it could also show an increase of opportunities. An example for this, are the growing number of commercial horticultural farms in this area where 75 percent of all employees are female. They are mainly employed in low skill labour (planting, weeding, picking) (Schuler 2004).

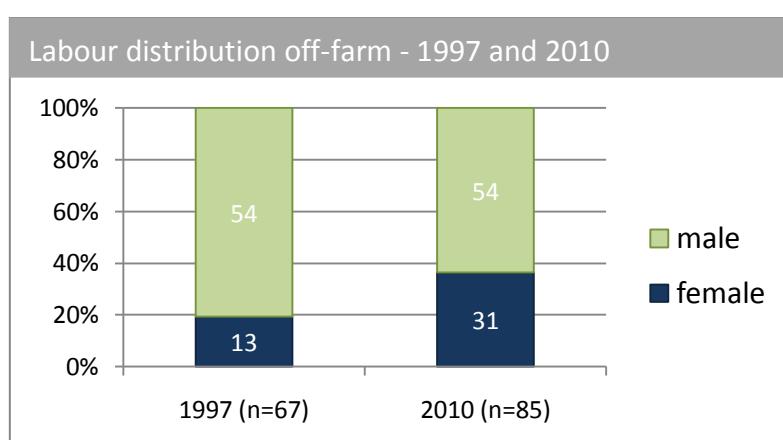


Figure 24: Labour distribution among male and female.
Data: Wiesmann Survey 1997 and own field work 2010; own illustration.

Similar to the utility maximising peasant where smallholders try to minimise risk and at the same time take opportunities where possible, a combination of both factors can be assumed here. However, the type of employment for women constitute occasional off-farm activities in the primary sector for the majority (14 women), regular casual employment for three other and self-employment in a small business (*jua kali*) for another three women. None of the women was found to have a permanent job. Thus, women seem to face even more constraints to obtain remunerative employment.

Priorities within households can be examined looking at the percentage of household members working on-farm, partially off-farm or off-farm (see figure 25). The figures strengthen the earlier findings that within household strategies, off-farm activities gained importance – despite a rather negative perception of returns. For both, male and female, the percentage working off-farm has increased by around twenty percent. The percentage of men working only on-farm stayed the same, but more people are now working only off-farm instead of mainly on the own farm combined with casual off-farm employment. For women both increased, so that now women only working on farm decreased from over 80 percent in 1997 to just over 60 percent in 2010.

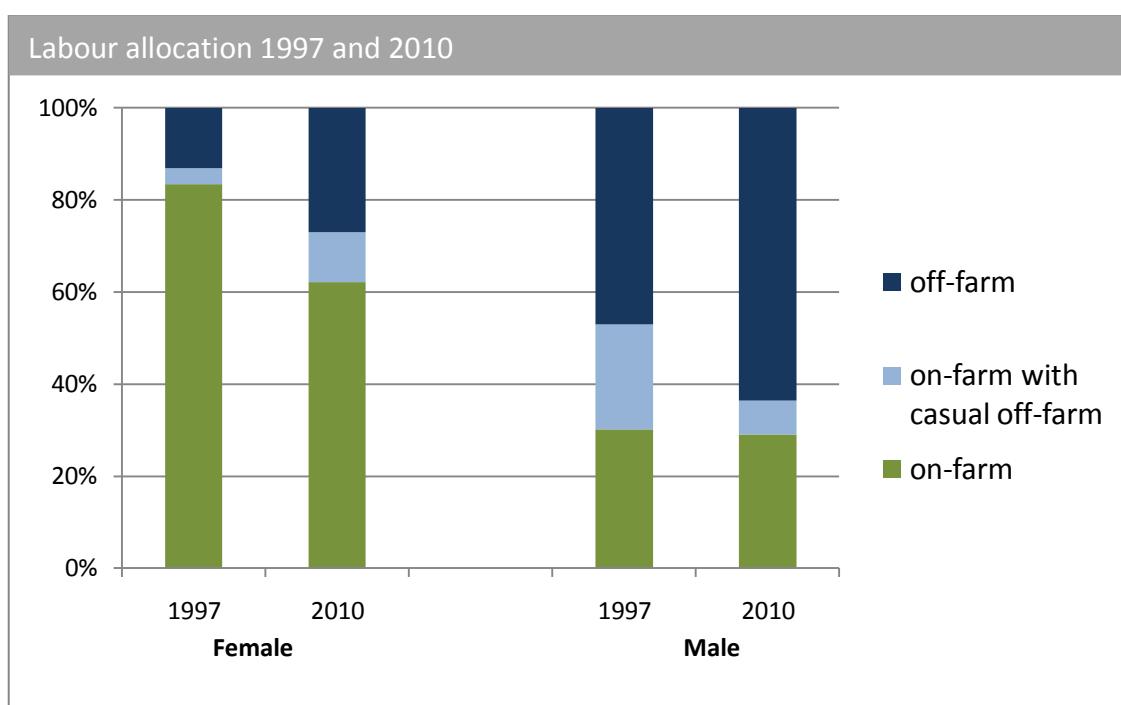


Figure 25: Labour allocation 1997 and 2010.
Data: Wiesmann Survey 1997 and own field work 2010; own illustration.

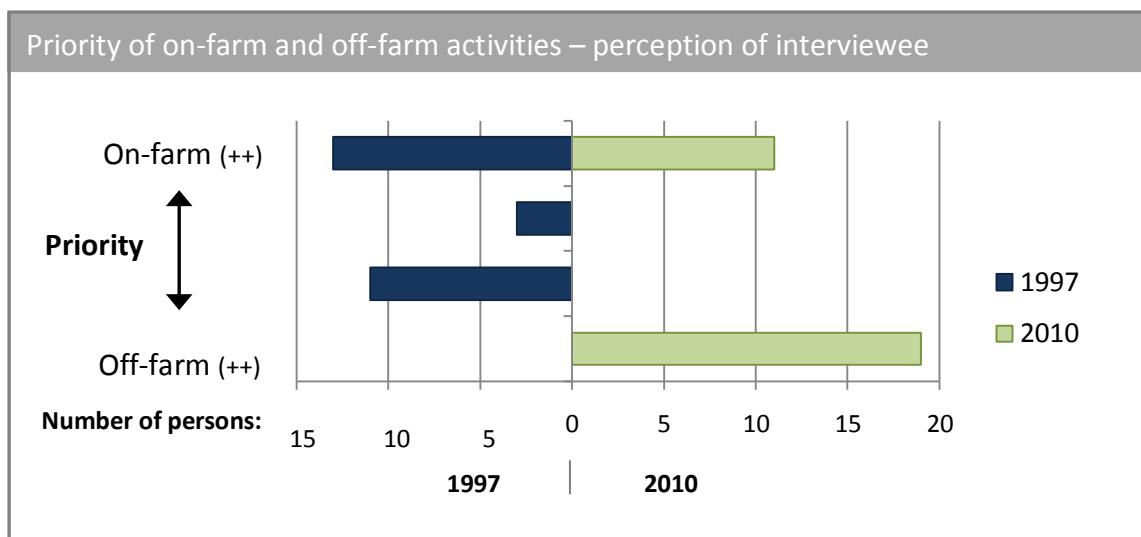


Figure 26: Priority of on-farm and off-farm activities.
Data: Wiesmann Survey 1997 and own field work 2010; own illustration.

The picture of increasing engagement in off-farm activities is further strengthened when looking at the priorities between on-farm and off-farm activities. As is shown in figure 26 the positions are more polarized than before with a noticeable increase in the priority of off-farm. This strengthens the assumption made earlier, that there is a lack of opportunities to engage in off-farm employment (see chapter 5.4.1).

To understand the significance of off-farm activities and remittance from family members the farmers were asked to rank the importance (see figure 27).

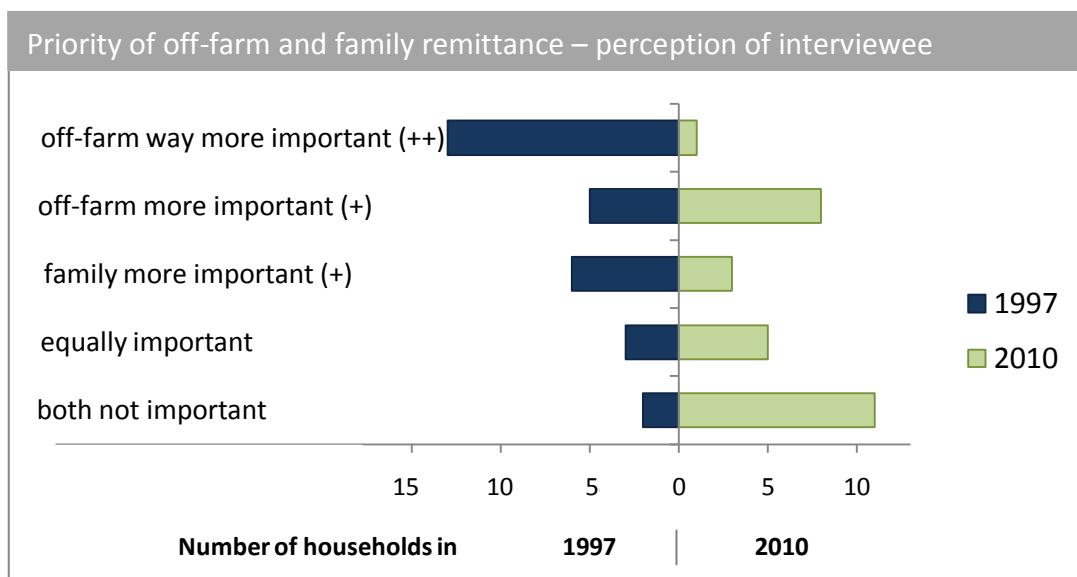


Figure 27: Priority of remittance from off-farm or family.
Data: Wiesmann Survey 1997 and own field work 2010; own illustration.

In 1997 two thirds considered off-farm as more important than family support for their household. In 2010 these were not even one third, the majority considered neither off-farm nor family remittance as important for their household. Both family networking and off-farm activities lost significance to the households. Only three households ranked the importance of family network higher than off-farm remittance.

Family members that do not live on the plot but remit to the household are problematic. It is sometimes difficult to distinguish between family members not living on the plot that are engaged in off-farm work, where some are clearly not remitting to the household interviewed, whereas in other cases parents leave their children with the grandparents and thus might be better counted as within the household. For comparison's sake, it was held unto the strict definition of a household. But the problem should be noted at this stage as it interferes with interpretation of the significance of the different spheres of action.

When asked about the labour balance with regard to supply and demand of labour, the balance was perceived as more even than it used to be. However, looking at the distribution of responsibilities the perception in 2010 is more negative than in 1997 (see figure 28).

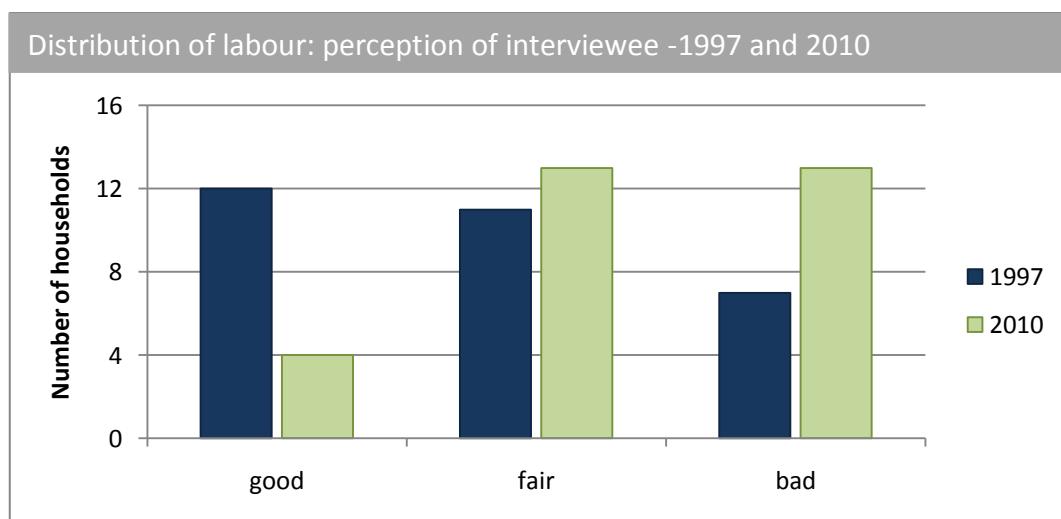


Figure 28: Distribution of labour.
Data: Wiesmann Survey 1997 and own field work 2010; own illustration.

Aiming at a better understanding of household strategies (and in the light of the harsh agro-ecological conditions combined with high poverty levels) it is necessary to look at how smallholders manage to cover months with insufficient food. Main categories are (1) engaging in casual jobs to be able to buy food, (2) selling of crop and livestock products, (3) selling of livestock, (4) remittance from children and (5) relief aid (Figure 29). The strategy to sell livestock has been mentioned the most (13 households) both in 1997 and 2010. Casual jobs also mentioned one third in both years as a coping strategy. Relief aid

and remittance from children are also important aspects, but there are no comparative numbers for 1997. It seems that on-farm activities are more important than casual jobs to cover months with insufficient food. Considering that most often insufficient food occurs due to bad conditions for agriculture this may lead to the assumption that there are only very limited possibilities to earn additional cash via casual jobs.

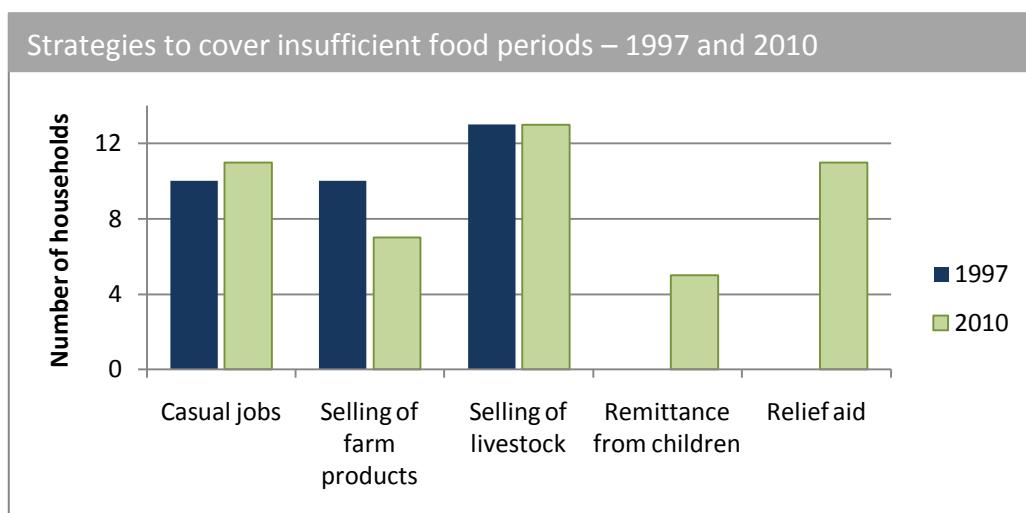


Figure 29: Strategies to cover insufficient food periods.

Data: Wiesmann Survey 1997 and own field work 2010; own illustration.

Not only the income perspective is important, but also the consumption of households. The expenditure per household in KSH in the last one year (2009) is shown in figure 30.

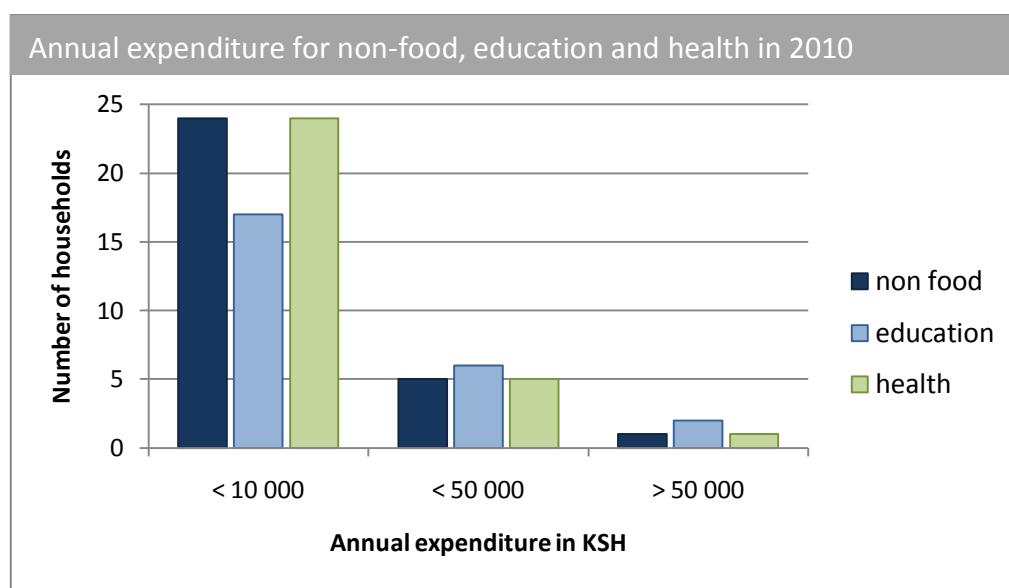


Figure 30: Annual expenditure.

Data: own field work 2010.

For all three the majority spends less than 10,000 KSH per year.⁴⁸ With the exception of education, where four households do not spend anything on education, these are more than two thirds of all households. Despite limitations to judge merely on basis of the amounts mentioned, it does show, how little cash whole households are dealing with. Looking at the sources for the expenditure on non-food items, education and health a similar picture for all three categories evolves (see figure 31). It shows the importance of income generated by on-farm activities, followed by off-farm income. One should not neglect, however, the role that social networks are playing, in the sense of e.g. family networks and community groups.

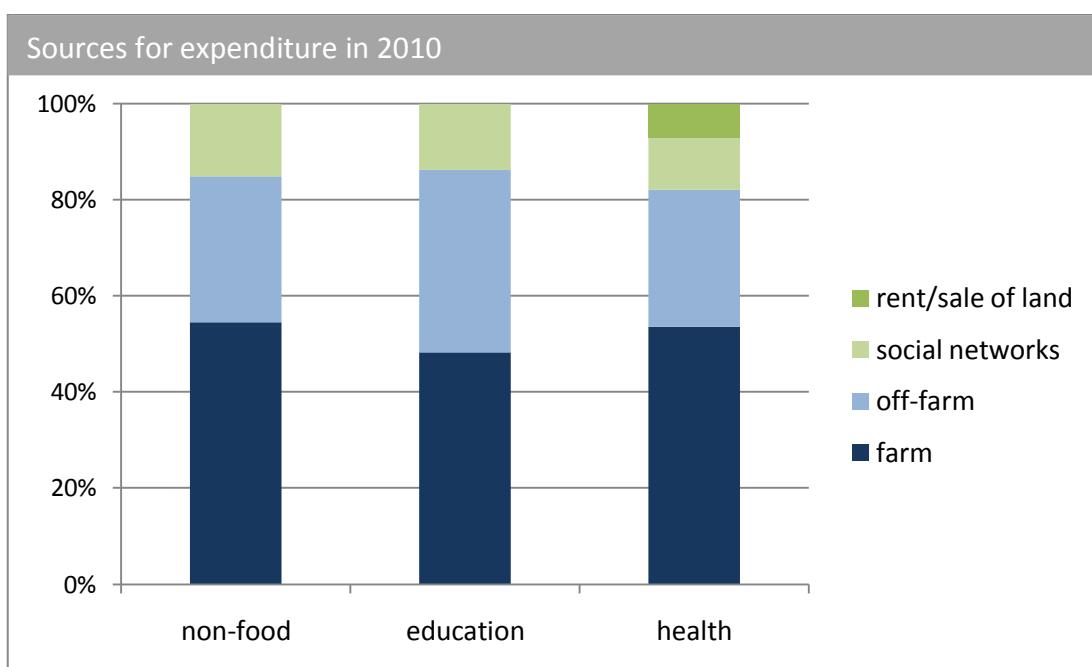


Figure 31: Sources for expenditure.

Data: own field work 2010.

⁴⁸ Interviewees referred to 2009.

5.6. Physical capital: accessibility and investments

In the light of increasing interest among development economist in asset analysis to complement income and consumption based measures of wealth in developing countries (Carter and May 2001; Filmer and Pritchett 2001), physical capital in the form of equipment, infrastructure and productive resources are of significant importance. Moser and Felton (2007) point out, that assets may give a better idea about long-term living standards compared to income or expenditure snapshots, as they have been accumulated over time and last longer. With the limited low or very low level of financial resources it is interesting to see in what assets smallholders (can) invest and what consumer durables are available to them.

To start with, investment in housing is examined. While in 1997 only two households had a stone house, the number increased up to seven in 2010 (see figure 32). This is a considerable step as resources needed to convert their houses into - in the local context as permanent considered - stone houses are quite high. However, the majority is still living in wooden houses that are considered as semi-permanent. The number of households living in mud houses (non-permanent) stayed almost the same. This suggests different priorities for investment for different social groups. It seems easier for comparably better-off households to convert a wooden into a stone house than it is for poorer households to build a wooden house. The latter need to put their strength and limited financial resources into other spheres of action, that are considered more important for their livelihood (e.g. securing food security).

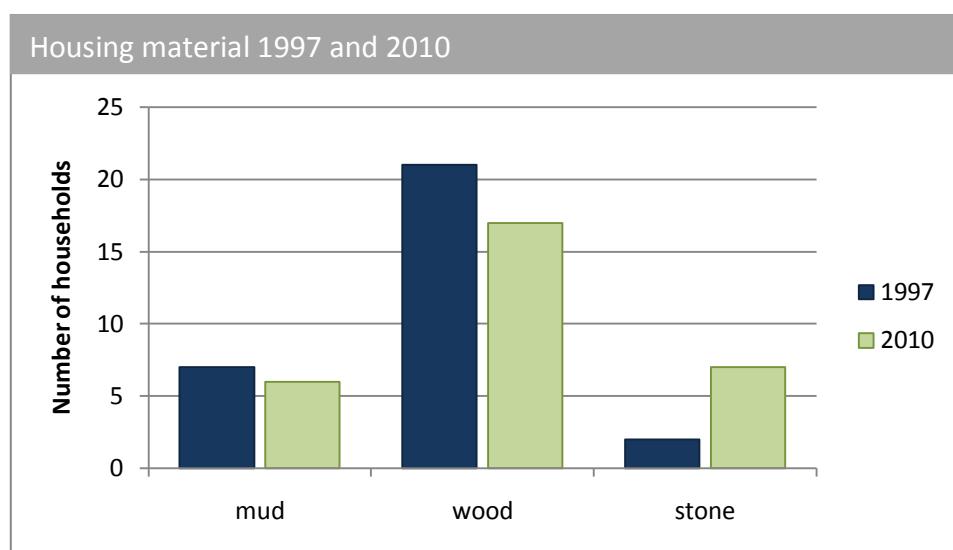


Figure 32: Housing material.

Data: Wiesmann Survey 1997 and own field work 2010; own illustration.

Despite the lack of data for 1997 it is interesting to see what consumer and productive durables households own. These assets are seen as an important indicator for well-being in the sense that they are less volatile than income. Radios can be considered as a standard asset, as 90 percent of all households own a radio. Livestock seen as an asset constitutes the second most important asset as 25 households had at least some livestock. Nineteen households have a TV and eighteen own a bike. Whereas only two households own a motorbike, one owns a car and one owns a tractor. Other assets owned were e.g. water tanks or solar panel.

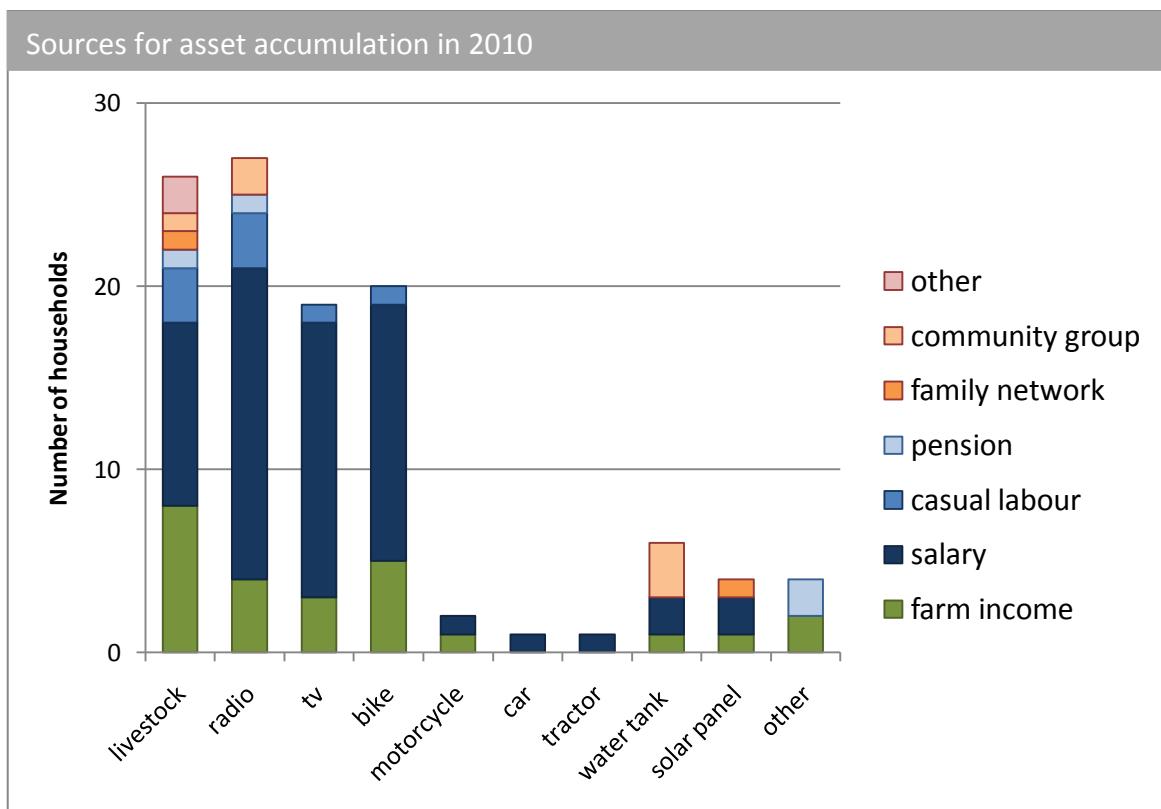


Figure 33: Sources for asset accumulation.

Data: own field work 2010.

Figure 33 shows assets owned and the sources for each investment. It reveals that most important for asset accumulation is by far permanent employment as the salary (and pension) allows for more than half of all investments listed above. Altogether off-farm activities account for 68 percent of all investments. Other resources are coming from on-farm activities (23 percent). The role of community groups is most apparent with regard to investment in water tanks, whereby for this investment all of them were women groups. Family networks seem to play only a minor role.

Access to facilities such as health facilities, the distance to the next tarmac road or to the next school gives important insight into different conditions household live in. The average distance to the next school is 2.2 km (sd. 1.4) and to the next tarmac road 3.9 km (sd. 2.4), whereas the next health centre is on average 6.3 km (sd. 2.7) and the next

market 6.9 km (sd. 3.8) away. Roads can get quite nasty in the rainy season and so muddy that even a four wheel drive has difficulties to come across. Similar it becomes very tedious for people to travel, as also experienced during the field trip. This gets particularly precarious in times of an emergency especially considering the distance to the health facilities, which most people have to go to by foot or if they are lucky by bike. Furthermore, regular walks such as going to school every day or going to the market can become a burden due to far distances and/or bad roads.

Considering the substantial impacts that the supply of electricity has on the diversity options of rural activities, how well are the rural households connected? Despite some developments in the electricity supply in rural areas around Nanyuki,⁴⁹ none of the interviewed smallholders has electricity. The connection fee (30,000 KSH) constitutes a constraint too high. Four households had invested in a solar panel to generate power, others work with car batteries.

The availability of water in semi-arid regions is crucial to secure livelihoods. But reliable water supplies are very difficult to encounter and are the primary constraints to economic and social development (Lovell et al. 2002 cited in Campbell et al. 2002). Access to water has been recognised as being a prerequisite for poverty reduction (Sullivan et al. 2003). The availability and quality of water is crucial to satisfy basic needs and enhance the productivity of land, labour and other productive inputs. Rural households depend on activities that require water, be it subsistence agriculture, small scale vegetable gardening or handicrafts etc. Improved water access for domestic and agricultural use is likely to lead to improved livelihood outcomes. How access to water has changed for smallholders in Laikipia can only be answered very limited within this study - despite its importance. But one third of households were found *not* having access to piped water (see figure 34).

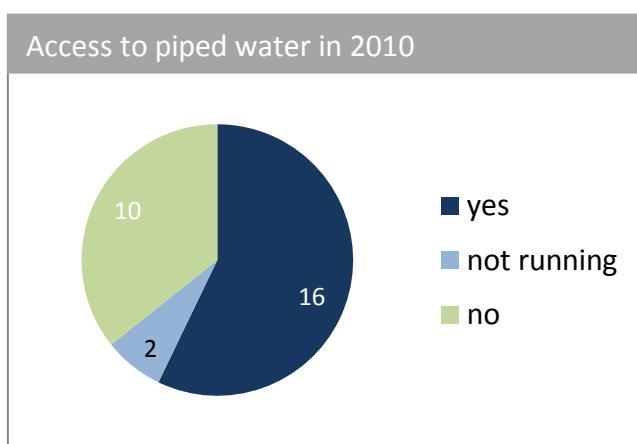


Figure 34: Access to piped water.
Data: own field work 2010.

⁴⁹ Very few households have theoretically access to electricity means.

The majority does not irrigate their fields, although the number of smallholder that irrigate increased slightly from five in 1997 to seven in 2010. Not all that irrigated back then can still do so. Due to the drought periods in the three years prior to investigation, two more farmers had to stop irrigation. The number and amount used for irrigation thus is likely to vary quite substantially depending on rainfall and river levels. Considering the rather low number of households that irrigate might question the impact of smallholders on river flows as stated in chapter 3. Means for irrigation were most often sprinklers, once a high drum pump, once pipes and once gravitation irrigation. The acres irrigated are between 1/16 and 2 acres. At least three households get their water through local water projects; others may get it directly from the river.

5.7. Social capital

The decline in perceived importance of family networks and establishment of community groups to raise money or build consensus about natural resources raises the question about the role social capital plays for smallholders in Laikipia. Reciprocity and the culture of sharing is a distinctive feature of peasant societies (Ellis 1988). It mediates lack of labour, of livestock and of cash, and health aspects (Campbell et al. 2002). Berry (1993 cited in Ellis 2000) observed that households in sub-Saharan Africa invest in social capital setting up complex but informal systems of personalized networks with specific rights and obligations. Social capital is emphasized as investment in future livelihood security. Tomich et al. (1995) and Berry (1993) (cited in Campbell et al. 2002) state that the prevalence of reciprocity as a social norm is declining. Thus Campbell et al. (2002:34) concludes that "*Reciprocity is still part and parcel of social norms but is not as strong as it was 10 to 20 years ago.*" The size of networks is decreasing and with it its buffer capacity (Künzi et. al. 1998). The chapter therefore looks into aspects of social capital.

5.7.1. Family networks

In order to find indicators for the significance of social networks for rural households, in a first step the remittance made from family members towards the household is examined. Two thirds stated that they *rely on* remittance (see figure 35). Remittance was mainly in form of food (for all households), for some additionally in the form of cash (five households) or other (like livestock, medicine, education). Similarly, all except two households *give* remittance, most often to their children. The remittance given is almost without exception only in the form of food.⁵⁰ Kohler (1988) found that cash and foods were still equally mentioned as from of remittance. Thus despite the prevalence of reciprocity, the level of remittance seems to decline and can be considered as generally low. Almost one third of the households said that they can only give remittance in a good year. Considering the occurrence of droughts in the last years and the predicted frequency of such extreme events, it is questionable how much remittance people can actually give, particularly as those events usually hit all households at the same time.

⁵⁰ One mentioned cash, one mentioned medicine.

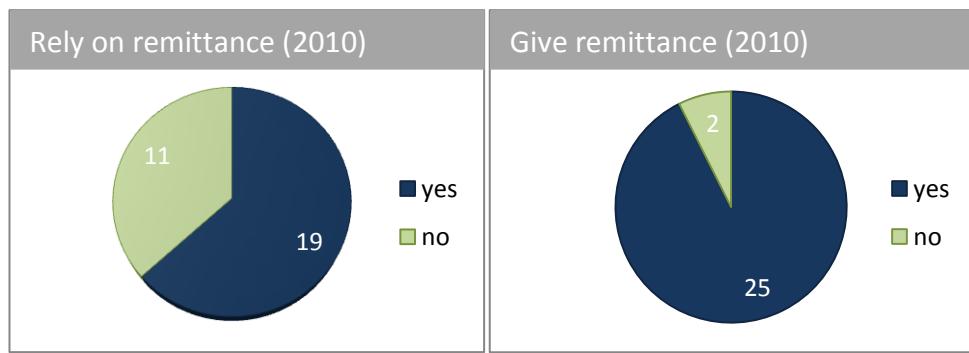


Figure 35: Remittance from and to family members.

Data: own field work 2010.

Considering the prevalence of food insecurity interviewees judged on how much they can rely on help from outside. Most people can rely on their children or other relatives in tough times (see figure 36). However, almost one third of all households constituted that they cannot rely on anyone at all. The lack of family or community support puts households in an uneasy and risky position regarding the threats for their livelihoods. This problem is emphasized as only five households could rely *well* on help from outside whereas thirteen said that they cannot *fully* rely on such help even in times of hardship.

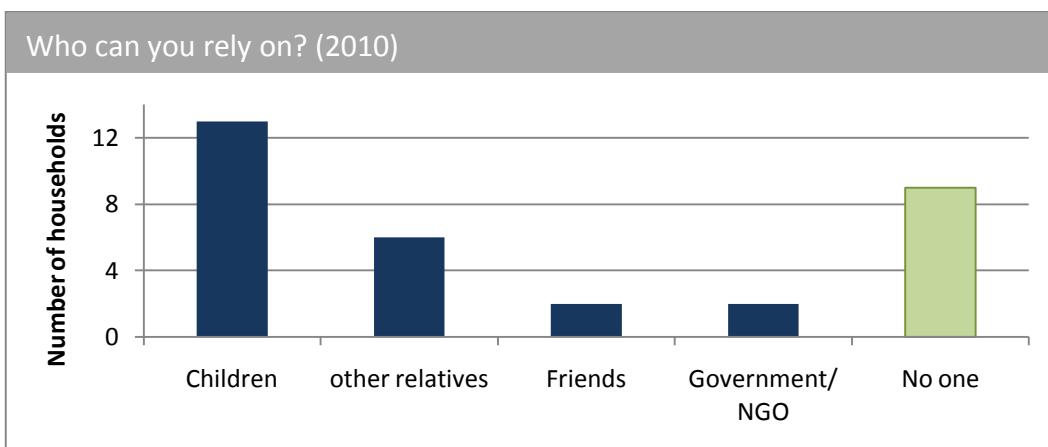


Figure 36: Reliance on help from others.

Data: own field work 2010.

More than two thirds of the sample has been given relief aid. The last time to receive relief aid was for all of them within the last six months and was in each case due to the occurrence of drought. The majority has received relief aid more than once. This does on the one hand express the precarious situation in the region where food security is not achieved. It may on the other hand also show a reaction in the development community evoked by the development crisis. As Wiesmann (1998) puts it, the prevailing view of Africa as the "*lost continent*" has been leading to the substitution of development co-operation by humanitarian aid.

5.7.2. Community networks

Another important factor for social capital is the network people have built up within their community. The number of community groups that household members are involved in, is used as an indicator to measure community participation.⁵¹ Through membership in social networks and structures at different levels it generates and provides benefits to the household and/or individual (Moser and Felton 2007:13). There is a tendency towards more participation in community groups in 2010 compared to 1997. Most important is here, that the number of households where no one used to be part of a community group halved from eleven to only six. Women are part of a community or self-help group twice as often as men (see figure 37). The majority of both are head of the household (all except two).

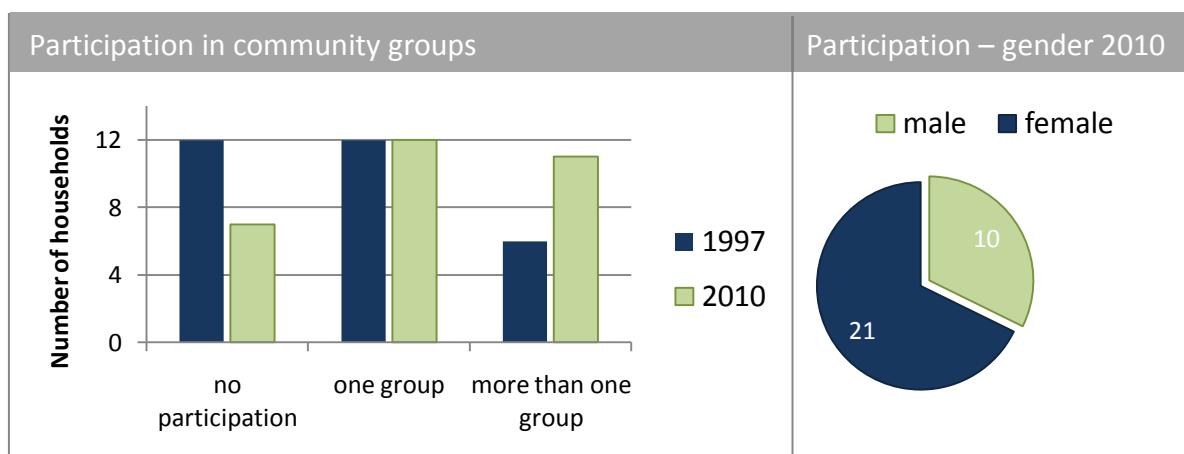


Figure 37: Participation in community groups.
Data: Wiesmann Survey 1997 and own field work 2010; own illustration..

Inconsistent with the observed increase is the perception of households regarding community participation. Two thirds mentioned that they have less community participation today than a decade ago (see figure 38). The interpretation is rather difficult and does not lead to a conclusive judgment. On the one hand it could mean that community groups are perceived as being of less importance today. On the other hand it could mean that the groups households participate in do not represent community participation as there are other means to be socially active among a community, that are not captured. However, in smallholders perception the community participation has quite noticeable been decreasing.

⁵¹ This has also been used as an indicator for community participation by Moser et al. (2007).

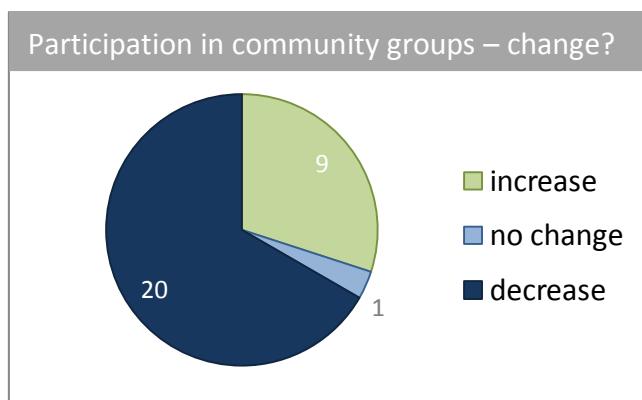


Figure 38: Perception of participation in community group.
Data: own field work 2010.

The reasons mentioned for less community participation were by far lack of financial capital.⁵² Other reasons include health status on the one hand and the strict regulations for participation on the other hand. For those who increased their participation, gains in assets as well as assistance were the major reasons.⁵³ Aims and objectives of community groups have also been changing. In 1997 the main focus has been clearly on water projects. It was a time, where water user associations and water groups were built up to engage actively in the water issues. Water projects seem to play a minor role for households with regard to community participation today. The focus has shifted towards the opportunity to gain assistance and credit (see figure 39).

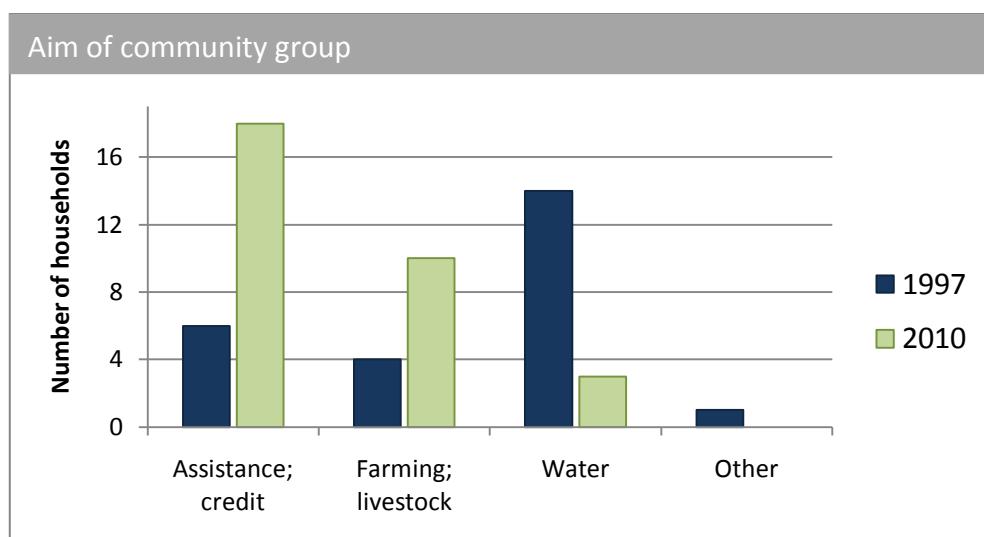


Figure 39: Aim of community group.
Data: Wiesmann Survey 1997 and own field work 2010; own illustration.

The majority of the groups are so called “*merry-go-round*” self-help groups, where the aim is to provide members with savings for investments. These are almost always women groups; most often kitchen utensils or water tanks were items mentioned for investment.

⁵² Lack of financial capital was mentioned by nineteen households.

⁵³ These reasons were mentioned by seven households.

Campbell et al. (2002) describes such formation of saving clubs as an important part of social networking. Everyone gives a small amount of money each month and takes turns to receive the amount of collected money. This way they are enabled to buy larger items that they could not save up to themselves. The informal networks are used to support each other in times of need and for investment. It is thus not surprising to find the “merry-go-round” concept being popular throughout the country. It is an answer to difficulties the poor and especially women face in accessing credit through commercial banks. Considering the input needed in form of cash to be part of self-help groups (e.g. merry-go-round; water projects) where a monthly fee is collected, it is not surprising to see that the major constraints for participation named by many was the money needed to join self-help groups.

When looking more closely at water projects it becomes clear, that not only financial inputs pose great constraints to the projects. Only three farmers are *very or quite satisfied* with their local water project. For three others it is *not fully satisfying*, but ok. The rest - twenty-three farmers - are *not or not at all* satisfied with local water projects. Critique on the water projects is shown in figure 40; mentioned are lack of running water, unreliability of water running, water rationing, or cost. Seven households are not connected to water projects; two out of them do not have any water projects in the area.

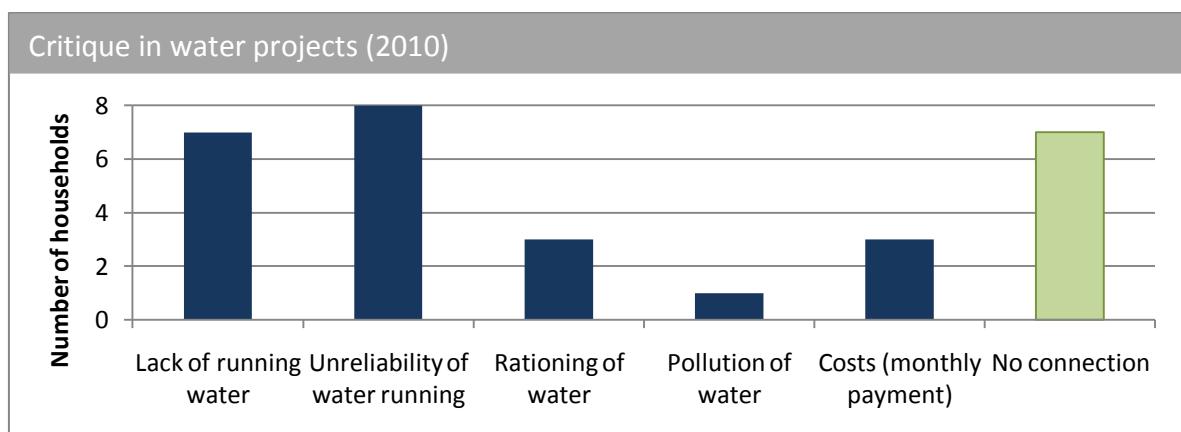


Figure 40: Critique on water projects.

Data: own field work 2010.

All except two smallholders mentioned that the water availability is limited due to other users. As explanation twenty-three farmers argued that upstream users close the river flow. Other reasons were misuse by upstream users, pollution, population growth and general lack of water.⁵⁴ Sixteen out of thirty households have access to piped water. Two households have pipes, which are not running. Thus the accessibility of water is limited for many smallholders putting constraints on development.

⁵⁴ Multiple answers were possible.

5.8. Smallholders' perception on development

How do smallholders judge their own situation in comparison to the mid-nineties? More than half of the interviewees said that the household's overall situation has become worse (see figure 41). Despite limitations for interpretation due to its subjectivity, some interesting facts can still be retrieved from the answers. Reasons named for a negative development are most often aspects on human capital: death, lack of education for children, health and children that are still dependent. Second were financial aspects, namely the lack of capital, and natural resources in the form of drought. On the other hand, explanations for improvements, are also mainly with regard to human capital, as five households mention great improvements due to independent children, one mentions education. Others argue that farming goes well, or that there are more loan possibilities. For some, improvements might be little. But these little improvements sometimes show the thin line between survival and decline into poverty as one household stresses that today they at least have enough to eat.

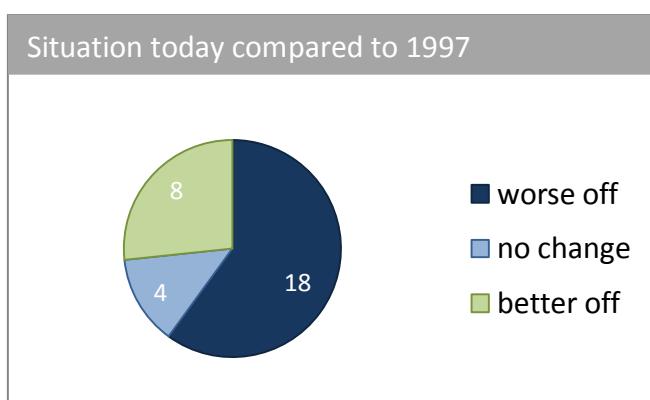


Figure 41: Situation today compared to 1997.
Data: own field work 2010.

When asked about the biggest obstacles that they face for development, the answer seems quite clear. Half of the respondents mentioned lack of water as the main obstacle, strengthening findings of Wiesmann (1998). One third named lack of capital, while two mentioned health. Other aspects mentioned only once were soil degradation, price fluctuation and lack of market, political instability and livestock theft or lack of storage capacity.

Half of the respondents have been consciously targeted or influenced by development interventions. Targeted was mainly education through sponsorship of children or the construction of a classroom, farming practices through the transfer of technology and methods or the improvement and accessibility of water through tanks and pipelines. The scope as well as the effectiveness of these interventions is not known. But it is striking that five out of six water tanks constructed or purchased with the help from outside, are *not* running.

When asked about their aims and dreams for the future, the priority for most smallholders lay on farming (new practices, e.g. dairy livestock) and farming related issues such as the purchase of land or securing irrigation. Many also mentioned off-farm in the sense that they would like to start a new business. Others name education or permanent housing as shown in figure 42.

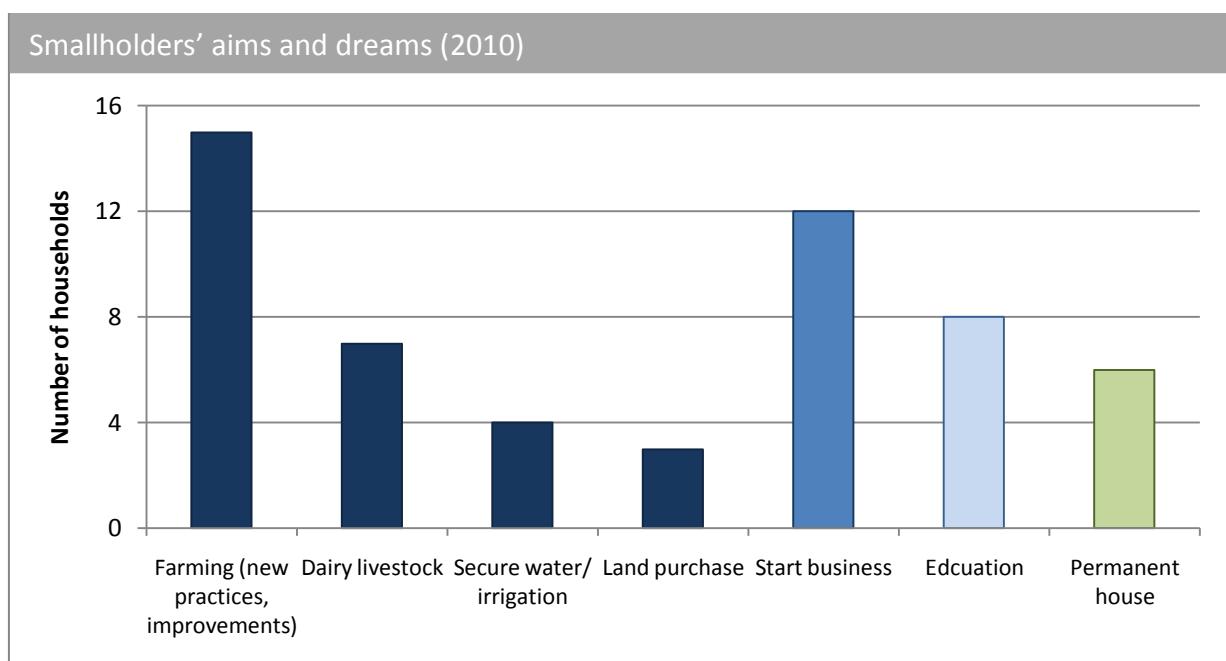


Figure 42: Smallholders' aims and dreams.

Data: own field work 2010.

5.9. Livelihood portfolios: patterns in livelihood development?

This chapter looks at livelihood aspects discussed above in a more integrative way. A schematic approach is followed to look at smallholders' asset base. Presentation of livelihood portfolios and the differentiation into groups with regard to their well-being help identify continuity and/ or change in smallholders' livelihood assets and strategies.

As suggested by Ellis (2000) livelihood strategies will be compared between groups of households belonging to different wealth status in order to compare livelihood strategies of the poor with those that are relatively better off. Using the sustainable livelihoods framework for analysis Carney (1998) proposes a schematic approach where the asset statuses of different social groups are compared. Asset status is hereby plotted on a star graph. This is typically done in the livelihood pentagon with each corner representing one of the five asset capitals (Ellis 2000). As transfer and change does not only happen between capitals but also or even more so within capitals (e.g. shift from livestock to crop production) and as not all assets are solely to be associated with only one capital (e.g. livestock as natural, financial but also physical capital), here it is differentiated between selected eight indicators representing major aspects of smallholder livelihoods.⁵⁵

The axes represent the selected indicators. The overall asset status is - descriptive rather than quantitative - represented by the central area bounded by the lines joining the points on each axis (Ellis 2000). Different shapes within the portfolio portray different asset endowment, priorities and/or needs. The gain or lack of each indicator is thus shown graphically. The center represents a minimum and the outside margin represents the maximum of access. The same classification as used for the well-being index is used to scale each indicator. Thus households may reach between a minimum of one and a maximum of five points accordingly. This has the advantage that outliers do not deform the average scale.

Despite the attempt to scale the indicators in relation to the local context considering what is regarded as generally poor or generally better-off,⁵⁶ the different axes cannot be directly compared to each other. The graph thus remains abstract, as there is no common scale for the axis.⁵⁷ The order of the indicators within the octagon resembles the order within the livelihood pentagon to enable a best possible comparison with other studies.

The average asset basis for households in 1997 and 2010 is shown in figure 43. The portfolios display the changing composition of household assets over time – in size and shape. At this aggregated level no change can be detected for the level of education, land

⁵⁵ For a thorough description and reasons for selection of the indicators refer to chapter 4.5. Data analysis

⁵⁶ Refer to chapter 4.5. Data analysis.

⁵⁷ See Carney (1998) and Ellis (2000).

size, subsistence, and farm income. A general increase is noted for the level of off-farm employment, housing material and community participation, whereas livestock decreased.

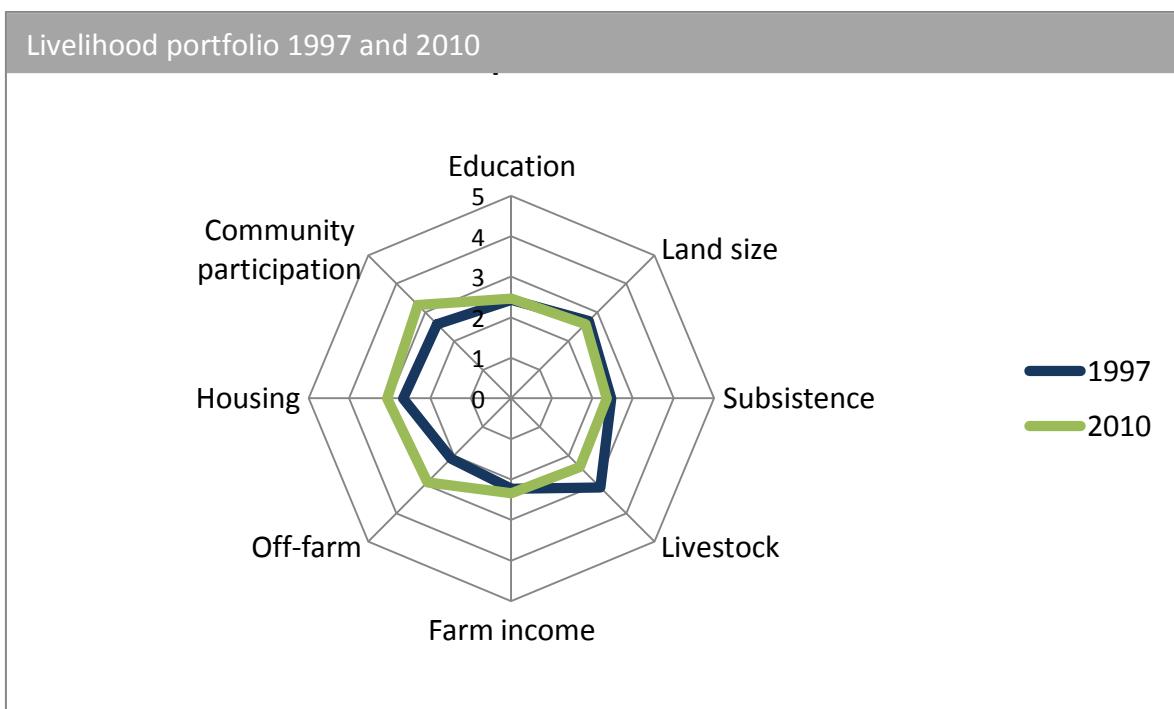


Figure 43: Livelihood portfolio 1997 and 2010.

Data: Wiesmann Survey 1997 and own field work 2010; own illustration.

In an attempt to differentiate between different income groups and their potentially different livelihood strategies households are categorized. This is done using the well-being index derived in chapter 4.5. Data analysis According to the point system that was derived with local knowledge on the regional context, the distinction is made between (1) households that are comparably better off and receive three or more points in the well-being index, (2) households that are comparably worse off and rest below two points in their weighted average of well-being indicators and (3) those who might be considered average and lie in between two and three points on the scale.⁵⁸ The analysis of those who successfully could escape poverty may offer crucial impulses for development interventions, as well as the possibility and options to substitute between assets (Auch 2005). As Moser and Felton (2007) argue, these asset indices are important in complementing pure income data. They show a clearer picture of strategies that households of different income groups have pursued – as well as what different types of assets have been acquired and thus might provide clues to poverty alleviation.

⁵⁸ Refer to 4.5. Data analysis.

Figure 44 and 45 show household portfolios with regard to their performance in the well-being index for 1997 and 2010.

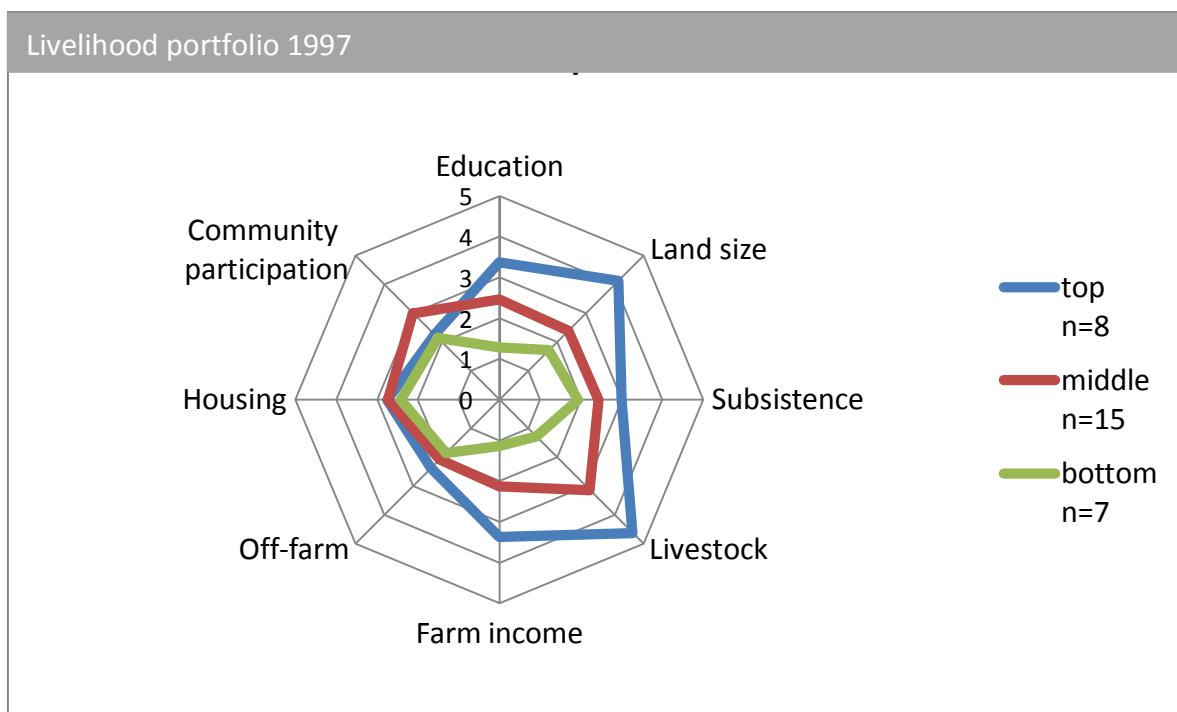


Figure 44: Livelihood portfolio 1997.
Data: Wiesmann Survey 1997 and own field work 2010; own illustration.

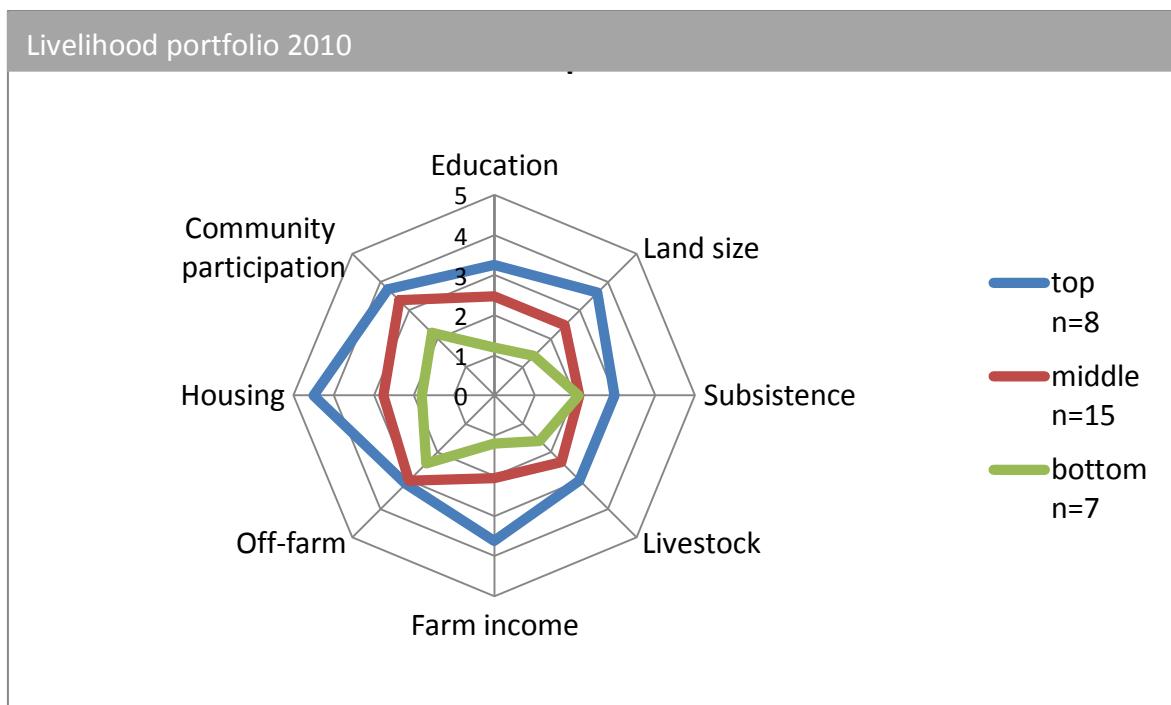


Figure 45: Livelihood portfolio 2010.
Data: Wiesmann Survey 1997 and own field work 2010; own illustration.

Figure 44 shows households' priorities and the distinction in asset endowments depending on the well-being classification through the shape of the portfolios in **1997**. The biggest differentiation between wealth groups is in natural resource related activities such as land size, livestock units and farm income. The *bottom* ranked households were particularly poor in farm income, livestock and education, while there was almost no variation with regard to housing material and level of off-farm remittance. Those households hardly comprise a minimum standard as the majority has less than one livestock unit, has less than 10,000 KSH income from their farm annually and no one in the household completed secondary school. For households that were relatively better-off priorities lay on education and natural resource related activities. Those households classified as somewhat in the *middle* seem to have particularly invested in community participation and livestock.

The situation in **2010** is illustrated in figure 45. Generally, the gap between social groups seems to have widened, particularly for housing material and community participation. An exception to this is subsistence farming and livestock. These are aspects where all households achieve a similar level, that is however, still low. This suggests, that better-off households are also constrained to expand in these livelihood aspects. All three categories could only improve with regard to the level of off-farm activities. The biggest change took place with regard to livestock where only *bottom* ranked households have more, whereas the *middle* and *top* ranked households have by far less livestock.

Table 3: Development in indicators depending on well-being category.
Data: Wiesmann Survey 1997 and own field work 2010; own illustration.

	<i>Bottom</i>	<i>Middle</i>	<i>Top</i>
Education			
Land size	-		--
Subsistence		-	
Livestock	+	--	--
Farm income			+
Level of off-farm	++	++	++
Housing material	--		++
Community participation		+	++

Change between +/- 0,2 counted as no change

+ Increase between 0,2-0,5; ++ Increase by more than 0,5

- Decrease by 0,2-0,5; -- Decrease by more than 0,5

Top ranked households have now better houses, more farm income, more community participation, and a higher level of off-farm, but at the same time they have less land and less livestock (see table 3). *Bottom* ranked household on the other hand could increase their livestock and level of off-farm remittance, but have a decline for housing material and in land. The households that are ranked in the *middle* persist in land, education,

housing material and farm income, while they have better off-farm activities, more community participation, but less livestock and less production for subsistence. Education stayed the same for all three categories over this period of time.

Livelihood portfolios show the combination of household activities. Ellis (2000) argues that their composition has policy relevance as households differ on which activities they depend and that policies need to consider or facilitate substitution options for households or communities involved. As the portfolios presented here only show two points in time and cannot be used to interpret any trends, one can hardly give policy recommendations (further considering the small sample size). However, what it does show is a noticeable shift towards more off-farm that probably stems from both push and pull-factors. Push factor are e.g. the constraints on farming in semi-arid areas and the increasing pressure on natural resources leading to the necessity to balance these risk factors with other sources of income. Pull factors are opportunities of off-farm employment that are seized. It is important to note that despite this shift towards off-farm activities the level of associated remittance has stayed low. For the majority of households this can hardly be a pathway out of poverty given the low pay and insecurity associated with the jobs.

Further, a shift towards more community participation compared to other aspects can be observed, particularly for the better-off households. At the same time it indicates severe restrictions for relatively poor households to use this type of assistance that is particularly important for many to be able to make investments. Additionally, the portfolios reveal that physical capital in form of housing material is increasingly differentiated for different wealth categories. Those categorised as relatively poor have even worse housing conditions as this was the case in 1997.

On a national level, poverty levels have stayed virtually unchanged in Kenya (Krishna et al. 2004). From an aggregated perspective this seems to be the case in Laikipia as well. With a mean of 2.57 in 1997 and 2.61 in 2010 the net numbers with regard to the well-being index stay surprisingly stable. This would suggest that policy changes, interventions and economic conditions have barely affected poverty (Krishna et al. 2004). However, looking at the micro level reveals a different conclusion, where dynamics contrast this picture of persistence in poverty status.

In order to capture the dynamics, change or persistence in smallholders' well-being figure 46 shows the development for the households in 2010 compared to 1997. The x-axis shows households performances in 1997, whereas the y-axis shows it in 2010. Households that have not changed in their performance with regard to the well-being index therefore lie on the diagonal red line.

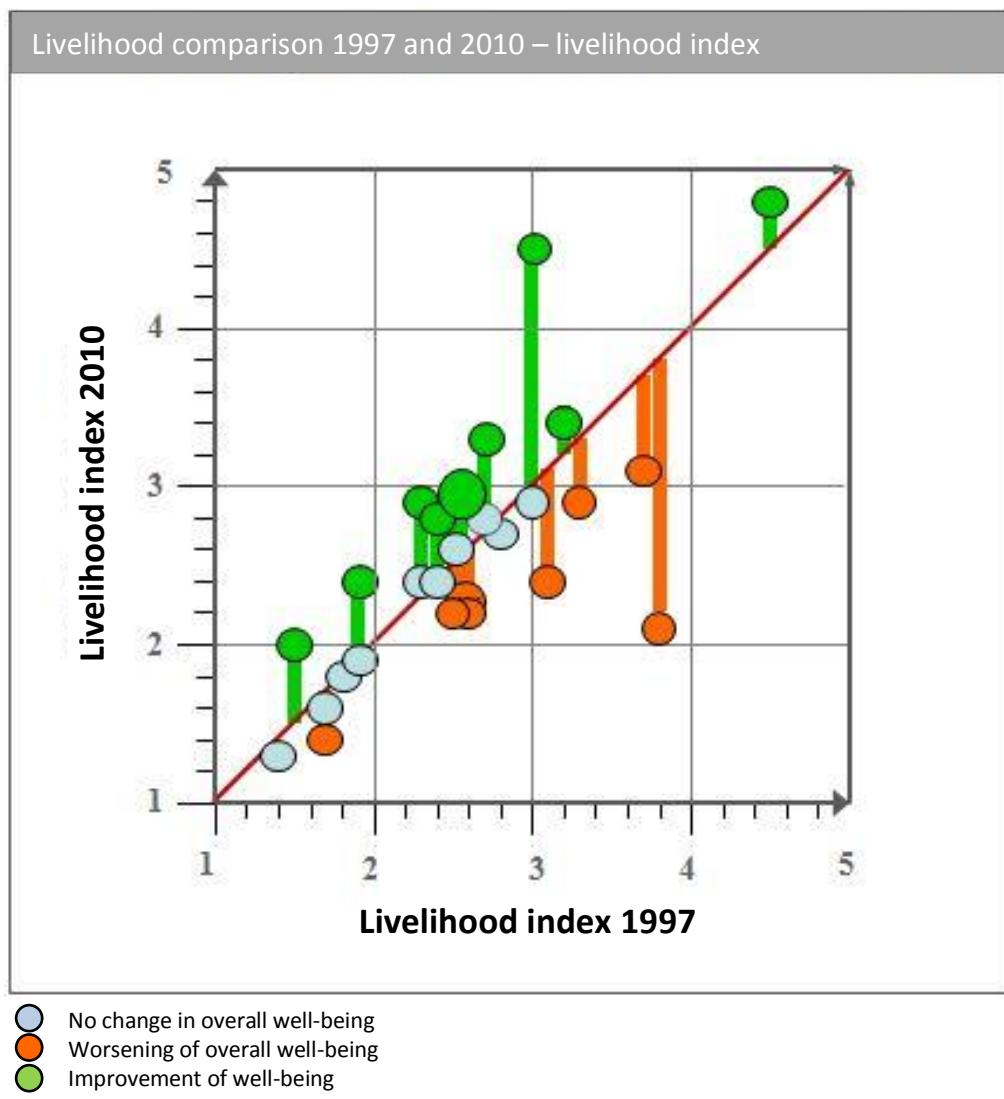


Figure 46: Inter-household comparison 1997 and 2010 using the livelihood index.
Data: Wiesmann Survey 1997 and own field work 2010; own illustration.

The graph emphasises the dynamics for smallholders. Approximately one third of the households have not improved, neither worsened. At the same time one third improved their situation, whereas the situation got worse for the rest (one third). Thus, it is striking that almost the same number of households did not change, improved or worsened respectively. There seem to be pathways in *and* out of poverty – households have fallen into and others managed to escape from poverty. Krishna et al. (2004) argues the same phenomena in a study of twenty villages in Western Kenya,⁵⁹ where 19 percent ($n=1706$) of all households managed successfully to escape from poverty and another 19 percent fell into poverty in the same period (1978 – 2003). These dynamics may be interpreted as one main problem for development, as livelihood assets can too easily be lost. There seems to be a lack for “secure” investment and options for smallholders. Shocks and stress (e.g. due to drought, diseases) happen too often, unemployment is high,

⁵⁹ 1706 households in 20 villages in Vihiga and Siaya districts, Western Kenya

infrastructure is poor and corruption hinders many developments on the national and local level.

A pathway that could possibly help leading towards a substantial development is off-farm employment, but *not* under the conditions that are found for the smallholders in Laikipia. For off-farm activities to sustain development and substantially improve livelihoods employment must be permanent to secure a living and the pay must be adequate. For the interviewed households this does not hold.

Despite the dynamics seen in the graph, there is a shocking persistence in smallholders' standard of living. The graph emphasises that the majority of households do not reach to a basic level in their respective assets (which is measured in the form of three points in the index). In 1997 as well as in 2010 there are eight households that may be considered as relatively well off. The graph illustrates that these households are not the same. Despite their initial better situation in 1997 only half of them could expand or stay the same in their assets. It emphasizes again how fragile these livelihoods are and questions resilience in the long run. Similar have Place et al. (2007)⁶⁰ found that households, that were relatively high on welfare indicators initially, experienced the greatest loss due to adverse shocks and cultural obligations (such as wealthier households were found to contribute to animals for slaughter at funerals).

The present study does not deliver reasons per se why households fell into or came out of poverty. Further investigation with more qualitative data on the one hand and a bigger sample size to test for correlations is needed. It is reasonable to consider the reasons found in Krishna et al. (2004). In rural actors' perception poor health and health-related expenses were the single most important aspect why households fall into poverty.⁶¹ Other reasons found responsible were expenses related to funerals (e.g. slaughter of livestock) as well as large family size in combination with subdivision of plots. On the other hand reasons to escape out of poverty was dominated by diversification of income sources, such as obtaining a job, setting up a trade or craft in the city or establishing a small business.

In consequence it is argued in line with Krishna et al. (2004) that one needs to distinguish between policies to help households get out of poverty and policies that prevent others to fall into poverty. *"Identifying these pathways can help generate more precise knowledge about reasons for escape from and descent into poverty in specific contexts."* (Krishna et al. 2004:223).

⁶⁰ Study period 1997-2001, n=1600 households.

⁶¹ 73% out of all households that have fallen into poverty (n=205) mentioned sickness, poor health, healthcare expenses as primary reason. AIDS does play a crucial role, but not only.

6. Conclusion and further research suggestions

Winding up the present study this chapter summarizes the answers found to the research questions formulated in the beginning of the study and suggests where further research is deemed necessary. With the availability of longitudinal data the development within human, natural, financial, physical and social capital was discussed. Focus was laid on these livelihood assets, and from there conclusions were drawn on livelihood strategies. As discussed in the analysis and shown graphically in the livelihood portfolios, the asset endowment and strategies of smallholder livelihoods in the semi-arid Laikipia district show both continuity and change. The main findings are presented below.

Household size has not changed significantly and education level of households continues to be low with the majority not having completed secondary school. Indeed, opportunities for a medium to higher level of education seem to be less. The negative tendency merits further attention from researchers and policy makers considering the importance of education for development on individual as well as national level.

Plot sizes do not show significant change and are generally too small to secure sustainable subsistence in the semi-arid region. Despite unreliability of rain and lack of water for domestic and agricultural purposes subsistence farming continues to be the basis for smallholder livelihoods. One third of households work their farm for subsistence only with no additional cash from farm products. The basic mixture of maize, beans and potatoes as discussed in the literature prevails, despite constraints due to low agro-ecological potential. Findings of Wiesmann (1998) where smallholders try to secure a minimum basic mix and additionally expand within strategies can be confirmed. All households diversify on-farm, growing basic crops and keeping at least some livestock. Looking at asset portfolios, there seem to be constraints for expanding in natural-resources related activities, as indicated with the loss in subsistence cropping and particularly livestock.

Within on-farm activities livestock keeping has seen a tremendous decline that can be related to drought, livestock theft, social obligation and constraints of available grazing lands. The loss of livestock on the one hand - and its acknowledged importance in arid and semi-arid areas together with the fact that many farmers expressed their wish to invest in dairy farming on the other hand - calls for further research into the causes and consequences arising from the loss for the majority of households.

Farming remains the backbone of a family. It is the most important source for expenditure on non-food, education and health and particularly livestock sale is identified as most important strategy to cover insufficient food periods. Despite the loss, livestock is as important as crop production for the generation of additional cash. The income from

farm products has shown peculiar persistence at the low level, while at the same time looking at the household level reveals substantial transitions in and out of low and medium income.

Given the constraints on land resources and increasing pressure on natural resources in Laikipia, the income and production that can be generated from on-farm activities is limited. The study further shows that two thirds of households do not have access to piped water with the majority of established water projects not running. It is suggested to look further into this issue to identify possible solutions to further the sustainability of such projects.

With this in mind the poor have little choice but to diversify out of farming into off-farm activities to generate additional income. In the study all except two households diversify their sources of income with at least some sort of off-farm activities. The analysis outlined a discrepancy in smallholder perception of off-farm activities. On the one hand, off-farm activities are not only prioritised over farm activities, but are also most important in terms of investments e.g. in consumer durables. The growing number of household members, particularly women, engaged in off-farm activities further indicates an increasing importance within household strategies. On the other hand, remittances from off-farm activities are not only very low or low, but are perceived as being even less significant than in 1997.

Off-farm activities are important to balance the risks smallholders are facing. The literature points to an increasing role of off-farm incomes for poverty reduction in developing countries.⁶² Karugia (2004) argues that improved access to off-farm opportunities (such as self-employment or formal employment) can provide poor households with a means to secure their livelihoods and climb the income ladder. But this study shows that a growing number of off-farm activities and self-employment does not per se improve livelihoods. Households are confronted with severe constraints. Not only is there a lack of employment opportunities, but the job undertaken are mainly casual with very low or low income and high insecurity. This is particularly the case for relatively poor households. As Barrett et al. (2001) point out unskilled labour does little to reduce risk exposure or increase in expected income for households. Thus for an improvement of smallholder livelihoods and their resilience to adverse effects, increasing profitability and security of off-farm activities are needed. More employment opportunities and foremost a fair salary and terms of employment are inevitable.

⁶² Bryceston 1996 cited in Karugia et al. 2006:1; Barrett et al. 2001

The low level of income and resulting food insecurity is highlighted by the increasing relevance of relief aid in the area. While family networks seem to loose importance, new mechanism established, e.g. community groups that enable investments and assistance through a monthly saving and distribution scheme. However, particularly poorer households seem to experience constraints to participate in these groups due to low financial assets.

Household portfolios for 1997 and 2010 show different priorities of households depending on their classification in wealth categories. These differences in asset endowment and thus possibilities available to households are difficult to identify into causes and effects. But the study reveals a striking persistence in low asset endowment for the majority of households. Poverty and food insecurity are persistent when looking from an aggregated perspective. From a household perspective, however, transitions into and out of better livelihood conditions become evident. It seems that households can easily slip back into poverty. These transitions in and out of poverty that strengthen findings in Western Kenya (Karugia et al. 2004) call for different policy interventions respectively.

Pathways for improved well-being vary and are highly uncertain. Due to the small sample size ($n=30$) it cannot be argued, which strategies might be leading to increasing well-being or vice versa. Taking a bigger sample in the area would enable statistical tests on correlations. Thus a more in-depth analysis of development patterns, causalities and dynamics of change could be realized. It would be interesting to see from the insights gained so far, if there are common characteristics of households escaping from and/or falling into poverty. Quantitative data should then be cross-checked with perceptions of smallholder. The well-being index should be tested and improved to optimize indicators for future livelihood analysis with regards to local contexts.

Major constraints for smallholders in Laikipia are access to natural resources and threats to their livelihoods in form of adverse shocks and events, whereby not only drought but also health correlated issues seem to play a major role. Further research is suggested to look into these aspects in a more qualitative way through e.g. group discussion to identify major constraints and security options.

The main conclusions are:

(1) Considering how easy smallholders can slip back into poverty shows that the options open to the rural poor do not balance their risks sufficiently. Smallholders need some sort of insurance and security against hazards. National and local government needs to improve in providing basic needs i.e. improve education, provide affordable health care, secure smallholders against volatile prices and dependency etc.

6. Conclusion and further research suggestions

(2) There is a need for the expansion of rural off-farm employment opportunities and foremost a need for fair pays and terms of employment. Under the current conditions for the majority working off-farm, the employment is clearly often held non-permanent and on minimal wages that are shown cannot secure livelihoods or build up resilience.

Unless opportunities are available to obtain jobs additional to farming with improved conditions and income on the one hand and support from the community and government building up security against adverse events on the other hand, the poor will most likely continue to remain poor.

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8. Appendices

Appendix 1: Excursus: Commercial horticultural farms - their impacts on smallholders

Excursus: The expanding horticulture industry in Laikipia and its impacts on smallholder livelihoods - opportunities and constraints.

The horticulture sector has shown dynamic, market driven growth in Kenya (IFAD). Between 1991 and 2003, 24 large commercial horticulture farms were established in the area north-west of Mount Kenya with a total area of 1085 ha in 2003 (Kiteme et al. 2008). It has often been proposed that horticulture can contribute to poverty alleviation in developing countries, mainly due to its labour intensive and land intensive production (Weinberger and Lumpkin 2005). McCulloch and Ota (2002) argue that the horticulture industry generates employment, that it is an important source of foreign exchange and that it contributes towards an upgrading of agricultural skills. And yes, in Laikipia, the industry employs between 4,700 and 7,400 people and large-scale horticulture has turned to be the single most important formal generator of employment (Kiteme et al. 2008). But at the same time there is no doubt that the large farms increase the pressure on already scarce water resources. The opportunities and problems the development poses for smallholder therefore merits further attention.

To gain insights into opportunities and constraints that arise from the increasing commercial horticultural farms in the area, fifteen interviews were done with employees from one of the farms. The questionnaire was structured and semi-structured covering aspects such as type of employment, duration, general conditions of employment, opportunities and constraints. Furthermore, five interviews were conducted with farmers that are contracted out-growers for one of the big horticultural farms to get insights into contract conditions and again the opportunities and problems arising. The interviews were semi-structured. Insights into the perspective of smallholders on the economic development semi-structured interviews were conducted with thirty smallholders on their opinion. Further more, one rather informal interview with the Water Resource Management Authority (WARMA), Nanyuki.

In a study in Kenya comparing income for households participating in horticultural production with others that do not, McCulloch and Ota (2002) show that horticultural smallholders have more land, use more irrigation and are better equipped. The study could not show, however, whether these smallholders initially have been already better off, which suggests that the poor may be considerably constrained to take advantage of the growing industry. The extent to which horticulture industry can reduce poverty depends on the wage and the availability of alternative sources of incomes (McCulloch and Ota 2002). Although unemployment is high and alternative sources of income are rare, very low wages prevail. Half of the interviewed workers said that the wage can not

sustain their living alone despite of them working six days a week and often working overtime.

The seasonality of horticultural consumption creates another problem leading to large numbers of temporary workers at times of peak demand (Hughes 2001). In the study area, casual employment account for 47 percent of total employment in high season and 41 percent in low season (Schuler 2004). Nine out of fifteen workers interviewed are employed on a seasonal basis. This unreliability of employment and hence income, was criticized by many. Workers are laid off without notice, which could happen even if you are employed permanently as one worker states. The unreliability of income goes further as workers point out that one is not sure to get another engagement after six months of seasonal employment. The use of casual and seasonal labour within the industry is emphasized talking to two workers who have been working at one of the farms since 1994 and 1997 respectively and yet do not have a permanent job.

Further more, the period of high demand in the horticultural sector (European autumn and wintertime) corresponds largely with dry seasons in the study area. Thus, Schuler (2004:30) highlights a “[...] *strong opponent pattern between the scarcity of the natural resources and the profitability of the use of the same resources for horticultural purposes.*”. Kiteme et al. (2008) emphasises that the industry created a “[...] *new dimension of water demand in the area*” (Kiteme and Gikonyo 2002:333). The contribution of riparian commercial horticulture farms for river depletion of the median February flow in the period 1981-1990 and 1993-2002 was estimated to vary from 3 to up to 70 percent (Schuler 2004). Reasons for this substantial difference were identified to be lack or insufficiency of floodwater storage capacities (Schuler 2004). Wiesmann et al. (2000) found that these water related conflicts between smallholder communities and the large scale commercial water users are rarely expressed. In an informal interview with someone working at WARMA, Nanyuki, it was admitted that while everyone has to apply for permits for water abstraction, the large farms are usually given these permits right away. Thus, although there are water user associations established it is questioned whether smallholders' rights are heard in the same way, as the large farms are clearly more powerful.

With 97 percent of the production being exported to the European Market the sector is tying the region into global markets for the first time (Kiteme and Gikonyo 2002). The farms mainly supply UK supermarkets. Hughes (2001) and Weinberger and Lumpkin (2005) argue that UK retailers increasingly control and manipulate the supply networks in the horticulture industry. They dictate conditions and are putting greater stress on the production processes. For smallholder, who initially have been the primarily producers, these are increasing barriers for participation, leading to increased production through large-scale farms (McCullock and Ota 2002). As Weinberger and Lumpkin (2005:2) point

out: "*To ensure that small-scale and resource-poor farmers stand a chance to participate in these expanding markets, policy makers and researchers have to place a greater attention toward their needs.*" Further more, a response to the imposed pressure from regularities in the agro-food chain is the increasing use of pesticides. Pesticide use effects on farmer health. This issue was raised by several farmers and workers interviewed. Two thirds mentioned also cold as common health problem, often due to working in cold packing rooms. Other disadvantages were seen in water depletion through the farms and even more so water and air pollution through the use of chemicals, the latter was mentioned by half of the interviewees. Other problems associated with the farms are new diseases and the reduction in disease resistance of crops. Three farmers also pointed towards the problem that kids are dropping out of school to seek employment in the farms.

However, the horticultural industry is seen by the majority (37 out of 45) as important for the area. Main reasons for this are the employment opportunities and the source of income. Further more, assets could be gained through the employment in horticultural farms, this included many different aspects from Radio, TV and furniture, to house construction, payment for education and investments in a bicycle and even in a car or a tractor. More than two thirds said that the large farms enable technology transfer. Examples mentioned were the construction of a greenhouse, new farming and irrigation methods, the planting of horticultural crops in general and the usage of chemicals. Other benefits that were mentioned by at least ten interviewees were new business opportunities or markets, and curbing security due to less idleness.

In summary, the commercial horticultural farms in Laikipia both provide opportunities and constraints for smallholders. Without strengthening smallholder rights, be it with regard to water quality and availability or in terms of employment the industry is doubted to provide poverty reduction as suggested in some literature. As the insights are limited so far, further research is suggested.

Appendix 2: Participatory development of well-being index.

Source: own field work.

Constructing a well-being index: weights for indicators given by researchers and farmers.

Indicator	Farmer in Kenya					Researcher in Kenya			Total
	Halima Hassan	Gilbert Gichogo	Peter	Solomon Karuri	Lawrence Karuri	Boniface Muriuki	Wanjiru	Elsie Lewison	genau
Land size	15	20	20	20	10	20	20	15	17,5
Education	15	20	10	6	8	15	15	20	13,625
Housing Material	20	10	12	7	10	15	15	15	13
Farm income	17	10	8	10	15	10	10	10	11,25
Livestock	10	15	15	9	10	10	10	5	10,5
Production in a good year	5	5	9	15	10	10	10	5	8,625
Level of off-farm remittance	5	5	5	5	10	5	5	5	5,625
Community Participation	3	3	9	3	5	3	3	5	4,25
Estimated Income Level*	5	10	6	10	12	5	5	15	8,5
Irrigation*	5	2	6	15	10	7	7	5	7,125
Total	100	100	100	100	100	100	100	100	100

* Estimated income level and irrigation were both not included in the final index due to unreliability of data. The weights for the other eight indicators were calculated accordingly.

Appendix 3: Performance in well-being index of each household in 1997 and 2010.

Source: own field work.

Performance in the well-being index of each household in 1997 and 2010

Q1997	%	27	22	2	16	26	23	25	19	3	29	28	7	20	17	21	30	9	11	1	15	4	24	6	13	8	18	12	10	14	5	
Land Size	21	1	2	1	2	2	1	3	2	2	4	2	3	2	2	2	1	2	4	1	4	3	2	4	4	4	5	4	4	4		
Education	16	2	1	1	1	2	1	1	3	3	2	1	3	5	1	1	1	3	1	4	3	2	4	4	3	4	2	3	2	4	5	
Housing	15	1	1	3	3	3	3	3	3	1	1	3	3	3	3	3	3	3	3	3	3	3	3	3	1	3	1	1	3	5	3	5
Farm income	13	1	2	1	1	1	1	1	1	2	2	4	1	1	3	3	3	1	4	3	1	1	2	1	1	4	4	2	5	5	5	
Livestock	13	1	1	2	2	1	1	1	1	1	3	5	3	2	5	5	5	3	1	3	3	5	2	5	5	3	4	5	5	5	5	
Prod. good year	5	2	3	2	2	3	4	4	4	3	4	4	4	2	4	4	4	4	4	4	4	3	4	4	4	4	4	4	4	4	4	
Prod. a bad year	5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	1	1	1	1	3	1	1	4	2	1	2	1	2
Off-farm	7	2	2	2	1	1	4	1	4	2	1	2	1	1	1	1	4	4	1	2	1	2	4	2	2	1	1	5	2	2	4	
Com. Part.	5	3	1	3	1	1	5	1	3	5	3	3	1	5	3	3	3	3	1	3	1	3	5	1	1	1	5	1	1	3	5	
TOTAL weighted	100	1,4	1,5	1,7	1,7	1,8	1,9	1,9	2,3	2,3	2,4	2,4	2,5	2,5	2,5	2,5	2,6	2,6	2,6	2,7	2,7	2,8	3,0	3,0	3,1	3,2	3,3	3,7	3,8	4,5		

Q2010	%	27	16	2	26	23	22	14	9	30	1	11	25	19	28	8	7	24	29	15	3	6	12	20	17	21	10	4	18	13	5
Land size	21	1	2	1	2	1	1	1	2	1	1	4	3	2	2	2	4	2	3	4	2	4	4	2	2	3	4	3	5	5	5
Education	16	1	1	1	2	1	2	3	3	1	3	2	2	3	1	3	2	4	1	3	3	2	4	5	3	2	1	3	2	5	5
Housing	15	1	1	3	1	3	3	3	3	3	1	3	3	3	1	3	5	1	3	3	3	3	3	5	5	5	3	5	5	5	
Farm income	13	1	1	1	1	2	1	1	1	4	1	2	1	3	2	3	1	1	4	2	4	3	1	3	2	2	3	4	5	5	5
Livestock	13	1	1	1	2	3	2	1	1	3	3	2	3	1	3	4	2	1	4	1	3	2	4	2	3	3	4	2	2	3	5
Prod. good year	5	3	2	3	5	3	1	4	4	4	2	4	2	2	4	4	4	3	5	2	4	4	1	5	4	5	4	4	4	5	4
Prod. bad year	5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	3	1
Off-farm	7	2	2	3	2	3	4	4	4	1	3	2	2	3	3	1	4	3	4	4	2	4	3	4	3	3	1	4	3	4	3
Com. Part.	5	3	3	3	1	1	5	5	1	3	5	1	3	3	5	3	1	5	5	3	3	3	1	1	5	5	3	3	3	5	5
TOTAL weighted	100	1,3	1,4	1,6	1,8	1,9	2,0	2,2	2,2	2,2	2,3	2,3	2,4	2,4	2,4	2,4	2,6	2,7	2,8	2,8	2,9	2,9	2,9	3,0	3,0	3,1	3,1	3,3	3,4	4,5	4,8

Appendix 4: Household questionnaire.
Source: Wiesmann Survey 1997 and own field preparation.

Household questionnaire 2010

Date of Interview

Name of Interviewers

Name of the estate

Number of sampled HH

Plot number according to the map

Respondent: Alphanumeric code.....

Respondent: Sex

Respondent: Age class.....

1. FAMILY TREE

1.1 Name of the respondent

1.2. Family Information

1.2. Draw household tree (incl. members not living on the plot)

Mark all members with alphanumeric code, starting from top

1.3. Circle members living permanently on the plot (or plots)

If the household is divided onto more plots mark which members are living on
which plot

If applicable, mark different sub-households and indicate which one was
interviewed

1.4. Age-class (for every member)

1.5. Highest level of education (for every adult member)

1.6. Main activity (for every member)

1.6. Ethnic group:

2. OBSERVATION/ HOUSING

2.1. Actual number of houses for living

2.2. Types of construction materials (main house) for

(i) Walls

(ii) Floor

(iii) Roofing

3. FARMING**3.1. Size of land available to the household in number of acres**

.....acres

3.2. What crops do you grow and acres, indicate intercropping

- () maizeproduction:
- () beans production:
- () potatoesproduction:
- () wheat production:
- () other list: production:

3.3. Information on Farming practice

	Crop farming	Fruits & Veg. & Trees	Livestock
Size of land (acre)			
Do you sell? -> To whom/ where?			
Estimated cash income from selling in a «normal year»			
Who is mainly doing the work			
Importance*			

* Importance: How important is THAT source to secure a living?

- 1= not at all important
 2= not very important
 3= important
 4= very important

3.4. Do you water or irrigate some of the farm products

- () yes () no

If yes, (1) with what means/ Technologies? (2) How many acres? (3) Where does the water come from?

.....
.....**3.5. Taking the overall production of the farm: For how many months could the
household live FULLY on the own production in a:**

- (1) BAD YEAR (refer to experiences)
- (2) GOOD YEAR (refer to experience)

3.6. How do you cover months with insufficient own food.....
.....**3.7. Do you rely on remittance? (1) Where does the additional remittance come from?
(2) And how much (per year)?**

- () yes () no
- (1)
- (2)

3.9. Do you give remittance?

yes no

If yes, how much (per year)?

3.10. Has your family ever relied on Relief Aid?

yes, once

yes, more than once

no

If yes, when (date, years) and why?

3.11. Livestock

Number of milk cows

Number of bulls, oxes

Number of heifers

Number of calves

Number of dairy goats

Number of other goats

Number of sheep

Number of donkeys or horses

Number of pigs

Number of chicken (mature or almost mature)

Number of rabbits (mature or almost mature)

Number of occupied (!) bee hives

Number of not occupied bee hives

Others, Specify

3.12. Do you experience any security issues in this area?

yes no

If yes, specify

3.12. Do you experience any wildlife conflicts in this area?

yes no

If yes, specify

4. INCOME GAINING ACTIVITY (off-farm activity)**4.1. Information of persons working for an income?**

	1. Person	2. Person	3. Person
Who is working for an income/ off-farm? (use alphanumeric code)			
Where is the income/ off-farm activity? <i>If employed in Horticulture please specify farm!</i>			
<i>If applicable</i> , since when is he/her in the SAME job			
How & for which expenses does the person make remittances			
How reliable is that income?*			
Who of persons working off-farm makes the highest remittances in 2009			

* Reliability: To what extend can the household rely on THAT source of income?

- 1= not at all reliable
- 2= not very reliable
- 3= reliable
- 4= very reliable

4.2. Has anyone worked with horticulture in the past?

() yes () no

If yes, please specify:

- (i) Who?
- (ii) When and how long?
- (iii) (1) Why he took the work and (2) why he stopped working?
.....
.....
- (iv) Opportunities or benefits from that employment?
.....
- (v) Disadvantages from that employment?

4.3. Do the off-farm remittances (income) cover the cash needs of the household for:

.... daily expenditures

0 = not applicable, as no off-farm income

1 = not at all

2 = partly (other sources needed)

3 = almost (with "struggling" it is enough)

4 = Yes, it is just enough

.... education

5 = Yes, fully (there might even be a surplus, so that we
can live well and realize our plans)

.... investments

4.4. What is more important for the household: Remittances from income activities/ off-farm or from relatives (home area or others) – circle:

- () Both are not important at all
- () Both are not important
- () Both have a low importance
- () Off-farm is much more important
- () Off-farm is more important
- () Both are equally important
- () Remittances from relatives are more important
- () Remittances from relatives are much more important

4.5. Priority of income/ off farm activities compared to on farm activities (opinion) – circle:

- () Respondant has no opinion to this question
- () If there is an opportunity for a member of the household for a off-farm activity this off-farm opportunity would IN ANY CASE have higher priority than the on-farm activity
- () If there is an opportunity for a member of the household for a off-farm activity this opportunity would only have priority when the job secure and well paid
- () If there is an opportunity for a member of the household for a off-farm activity this opportunity would only have priority when the person concerned does not play a very important role in on-farm activities
- () If there is an opportunity for a member of the household for a off-farm activity this opportunity would only have priority when the household could still keep the on-farm activities on the same level
- () If there is an opportunity for a member of the household for a off-farm activity the on-farm activities would still have priority in any case

4.6. Are there any health issues that prevent household-members from work?

() yes () no

If yes, explain

4.7. Which of the following do you have access to? Please tick

- Piped/Tap Water
- Extension service
- Electricity

What is the distance to the nearest (in km):

- Primary school
- Health facility
- Tarmac or Marram Road
- Market

5. HOUSE ECONOMICS

5.1. How much money do you spend YEARLY on the following and what are the sources?

- (i) Non-food (clothes, shoes, household commodities) KSH
Sources:
- (ii) Education of children (fees, harambee, uniforms, books etc.) KSH
Sources:
- (iii) Health KSH
Sources:

5.2. List assets owned by household and source

Asset	Tick	Source
Livestock		
Radio		
Television		
Sewing Machine		
Cart and other tools		
Bisycle		
Motorcycle		
Car		
Others: (multiple answer possible, specify)		

6. COMMUNITY PARTICIPATION

6.1. Who is member of a self-help group and/or a water project

- Who within HH
- Name groups aim
- aim
- aim

6.2. Did the degree of community participation change in the last decade?

- more community participation today
- no change in community participation
- less community participation today

Reasons:

6.3. Who do you rely on in times of hardship (drought, diseases, etc.)?

.....
How much can you rely on their help? (Safety Net)

- can fully rely on their help in hard times
- can rely on their help
- can not rely on their help very much
- can not rely on their help in hard times at all

6.4. How satisfied are you with local water projects? Circle

- No opinion, no answer
- Very satisfied
- Quite satisfied
- not fully satisfied, but it is o.k.
- not satisfied
- not satisfied at all

Explain:

6.5. In your opinion, is the water availability for your uses affected by other water users?

- yes
- no

Explain

7. BALANCES

7.3. How do you judge the balance between manpower available and the amount of labour that needs to be done?

- No opinion, no answer
- Throughout not enough manpower available for amount of labour
- At times not enough manpower available for amount of labour
- Normally enough manpower available for amount of labour
- At times too much manpower available for amount of labour
- Throughout too much manpower available for amount of labour

7.4. How do you judge the distribution of responsibilities, labour among the members of the household

- No opinion, no answer
- Good
- Fair, some members have a too heavy load
- Bad, some members have a much too heavy load

7.5. How satisfied are you overall with your crop farming and vegetable farming. Circle

- No opinion, no answer
- Very satisfied
- Quite satisfied
- not fully satisfied, but it is o.k.
- not satisfied
- not satisfied at all

7.6. How satisfied are you overall with the off-farm income (give points see above). Circle

- No opinion, no answer
- Very satisfied
- Quite satisfied
- not fully satisfied, but it is o.k.
- not satisfied
- not satisfied at all

7.7. If you look back ten years - how would you judge your families' situation?

- better off
- no change
- worse off

Explain:

7.8. What are for you the biggest obstacles for development?

.....
.....

7.9. In the last ten/ fifteen years, have you experienced development interventions?

- yes
- no

If yes, please specify (what kind? When? What was the impact for your household?)

.....
.....

7.10. What are your aims and dreams for the future?

.....
.....

8. OPINION ON HORTICULTURE INDUSTRY IN THIS AREA

8.1. Has he/she experienced any health problems that might be related to the work?

Which problems?

Explain why related to HC?

8.2. What was his/her job before starting in the horticulture sector?

- still in education
- working on the farm ... his job was
- working for income ... his job was:

Why did he/she start that job?

.....
What opportunity/ benefits does this job give?

.....
What are the disadvantages?

.....

8.3. How do you judge the working conditions?

- very good
 - good
 - not good, but ok
 - poor
 - very poor
- Explain

8.4. Are there assets you have accumulated as a result of cash flow from the employment in the horticulture industry? List them.

.....
.....

8.5. Can you think of knowledge or a technology that people have adopted that comes from the horticulture companies?

() yes () no

Explain
.....

8.6. How do you judge their impact on the environment?

() overall positive impact

() slight positive impact

() no impact

() slight negative impact

() overall negative impact

Explain
.....

8.7. How do you judge the importance of horticulture industry in terms of employment opportunities and income for local households? (1)

How about your own household? (2)

1 2

()() very important

()() important

()() indifferent

()() not very important

()() not important

Explain
.....

8.8. In your opinion, what else other than employment comes from the development of export-oriented middle- and large-scale farms in this area? (*market, infrastructure, technology, knowledge, business opportunities, insecurity, migration, etc.*) Mark positive with (+) and negative with (-).

.....
.....
.....

Do you know a farmer who is contracted (out-grower) to one of the middle-/large-scale farms? *If yes, maybe you can show us on the map where that farmer lives?*

Plot # and/or Name