

Drylands Research Working Paper 10

MAKUENI DISTRICT PROFILE: INCOME DIVERSIFICATION AND FARM INVESTMENT, 1989-1999

John Nelson

2000

Drylands Research
Crewkerne
Somerset UK

This paper was first presented at a workshop on Policy Requirements for Farmer Investment in Semi-Arid Africa, held on 16-17 November, 1999 at Wote, Makueni District, Kenya

ISSN 1470-9384

© Drylands Research 2000

Typeset at Drylands Research and printed at Press-tige Print, Crewkerne.

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without the prior written permission of the publishers.

The research reported in the working paper forms a part of a study on ***Policy requirements for farmer investment in semi-arid Africa***, which was funded by the Natural Resources Policy Research Programme of the Department for International Development (DFID), United Kingdom (Project R 7072 CA). DFID can accept no responsibility for any information provided or views expressed.

Preface

Drylands Research Working Papers present, in preliminary form, research results of studies carried out in association with collaborating researchers and institutions.

This working paper is part of a study which aims to relate long-term environmental change, population growth and technological change, and to identify the policies and institutions which are conducive to sustainable development. The study builds upon an earlier project carried out by the Overseas Development Institute (ODI) in Machakos District, Kenya, whose preliminary results were published in a series of *ODI Working Papers* in 1990-91. This led to a book (Mary Tiffen, Michael Mortimore and Francis Gichuki, *More people, less erosion: environmental recovery in Kenya*, John Wiley, 1994), which was a synthesis and interpretation of the physical and social development path in Machakos. The book generated a set of hypotheses and policy recommendations which required testing in other African dryland environments. Using compatible methodologies, four linked studies are now being carried out in:

Kenya	Makueni District	
Senegal	Diourbel Region	
Niger	Maradi Department	(in association with ODI)
Nigeria	Kano Region	(in association with ODI)

For each of these study areas, there will be a series of working papers and a synthesis, which will be reviewed at country workshops. An overall synthesis will be discussed at an international workshop in London in 2000.

The Kenya series updates the previous study of Machakos District (which included the new Makueni District) and examines this more arid area in greater depth. The Research Leader for these studies is Michael Mortimore. The Leader of the Kenya Team is Francis Gichuki of the University of Nairobi. Michael Mortimore, Mary Tiffen or Francis Gichuki may be contacted at the following addresses.

Michael Mortimore
Cutters Cottage, Glovers Close, Milborne Port
Somerset DT9 5ER, UNITED KINGDOM

Mary Tiffen
Orchard House, Tower Hill Road,
Crewkerne, Somerset TA18 6BJ,
UNITED KINGDOM

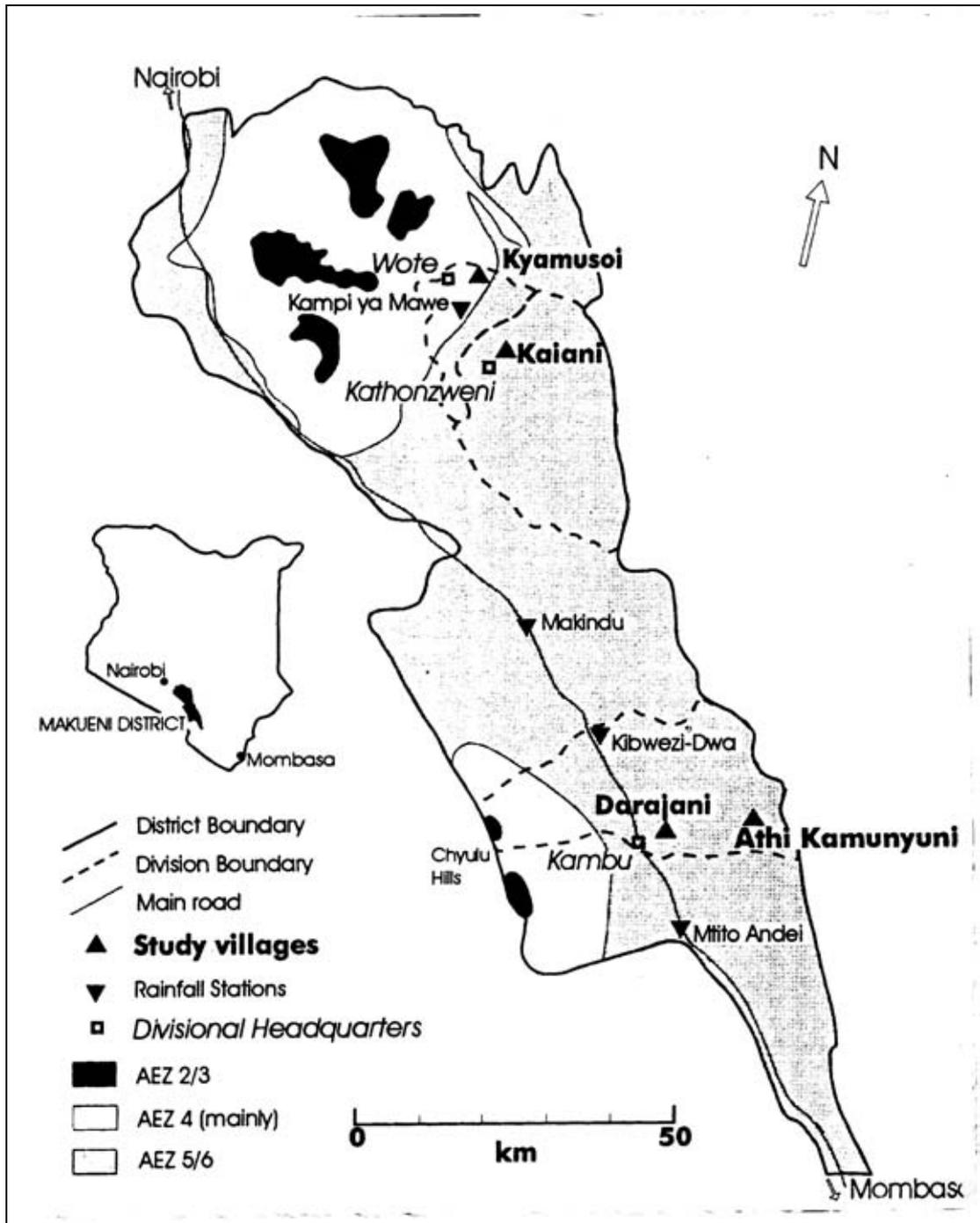
Email:
mikemortimore@compuserve.com
mary@marytiff.demon.co.uk

Website:
www.drylandsresearch.org.uk

Francis Gichuki
Department of Agricultural Engineering
UNIVERSITY OF NAIROBI
PO Box 30197
Nairobi
KENYA

Email:
fgichuki@cgiar.org

Preface map



Abstract

This paper sets out the results of a household survey carried out in Makueni District, Kenya, in 1998, that investigated the degree to which households have been involved in income diversification activities, and whether or not income from these activities has supported household investment during the past ten years. The 45 households in the four villages surveyed are spread across a zone that faces climatic risk, and the villages experience the wide range of market, resource and infrastructural constraints typical of the zone. Data on households' engagement in income diversification and investment is presented, and the way these investments have been financed is analysed. The data suggests that most households in the four villages are actively involved in a wide range of income diversification activities, and that the income from these activities is not used solely for consumption, as is often assumed, but is also channelled into investment. A key finding of this paper is that the income derived from diversification activities has been one of the principal sources of finance for the wide range of farm investments that have been undertaken in the four villages surveyed since 1988.

Résumé

La présente étude débute par un examen de la littérature couvrant la diversification des revenus des ménages en Afrique, et plus particulièrement au Kenya. L'auteur présente ensuite les résultats d'une enquête menée en 1998 dans le district de Makueni, au Kenya, sur les activités entreprises par les ménages pour diversifier leurs revenus et sur la contribution éventuelle des revenus tirés de ces activités aux investissements réalisés par les ménages au cours des dix dernières années.

Les 45 ménages des 4 villages couverts par l'enquête sont répartis dans 2 divisions du district de Makueni. Le climat de cette région est caractérisé par une pluviométrie faible et variable, avec des sécheresses périodiques. Les ménages sont confrontés à de nombreuses autres contraintes touchant aux débouchés commerciaux, aux ressources et aux infrastructures. La région est éloignée des grands marchés urbains tels que Machakos et Nairobi, et le transport des produits agricoles à ces marchés s'avère difficile et coûteux en raison de la médiocrité du système routier. Bien que la plupart des villages de l'enquête soient situés près de petits marchés, l'un des villages se trouve à plus de 20 km du marché le plus proche. Comme les ménages du district de Makueni souffrent très souvent de pénuries d'eau potable, le commerce de cette eau s'est développé. La plupart des exploitations ayant participé à l'enquête obtiennent le plus gros de leurs revenus de l'agriculture.

Des données sur les investissements et les efforts de diversification des revenus déployés par les ménages sont présentées. Elles sont fondées sur les résultats des enquêtes menées auprès des ménages et sur des chiffres sur les revenus issus d'enquêtes officielles plus vastes (tableaux 1, 2 et 5). Ces données suggèrent qu'au cours des dix dernières années, en dépit de contraintes ponctuelles touchant aux ressources et à la pluviométrie, les exploitations du district de Makueni ont réalisé de gros investissements pour améliorer la production agricole et le bien-être du ménage. La plupart des ménages des quatre villages ont participé à des activités non agricoles très variées pour diversifier leurs revenus, comme la prestation de main-d'œuvre, la production et la commercialisation de bien non agricoles ainsi que la migration (tableaux 6, 7 et 9). Dans plus de 40 pour cent des ménages interrogés, au moins une

personne avait récemment migré à la recherche de travail. Ces résultats corroborent les résultats d'autres études de ce type menées dans des régions voisines.

Les données montrent que les ressources obtenues de ces activités de diversification des revenus ne sont pas utilisées par les ménages uniquement pour la consommation, comme le supposent souvent les chercheurs, mais qu'elles ont également été utilisées pour des investissements (tableau 14). Un résultat clé est le fait que les revenus tirés d'activités de diversification ont constitué l'une des principales sources de financement pour les nombreux investissements agricoles réalisés dans les quatre villages de l'enquête depuis 1988 (tableau 15). Il semblerait ainsi que les ménages du district de Makueni comptent sur la diversification de leurs revenus pour financer leurs investissements agricoles, ce qui démontre l'existence d'un lien important entre les investissements privés au sein du district de Makueni et l'économie kenyane plus englobante.

CONTENTS

Author's acknowledgements	viii
1 INTRODUCTION	1
2 INCOME DIVERSIFICATION IN THE LITERATURE	2
3 STUDY AREA AND DATA SOURCES	5
4 THE SCALE AND RANGE OF INCOME DIVERSIFICATION	10
5 THE RANGE AND SCALE OF FARM INVESTMENT	14
6 LINKAGES BETWEEN INCOME DIVERSIFICATION AND FARM INVESTMENT	16
7 LINKAGES BETWEEN EDUCATION AND INCOME DIVERSIFICATION	19
8 CONCLUSION	20
REFERENCES	21

Author's acknowledgements

The author would like to thank the people of Kyamusoi, Kaiani, Darajani and Athi Kamunyuni for welcoming us into their villages and onto their farms, and for their frank and honest answers to our nosy questions. Their great ability and optimism in the face of a difficult environment provided me with much inspiration.

About the author

John Nelson's association with Africa began in the late 1980s when he worked as a Peace Corps Volunteer in Mali. Since 1991 he has been based in the UK, where he has worked for a number of UK-based institutes as an environmental economist on a wide range of policy-related research projects. He worked with Drylands Research on studies of long term change since the organisation's inception in 1998. He also acts as policy advisor for the UK-based Forest Peoples Programme, and coordinates their community-based projects to support African indigenous peoples to secure their rights to traditional lands affected by conservation and development projects.

Contact address: 34 Weymouth Rd, Frome, Somerset, UK.

Email: johnnelson@blueyonder.co.uk

List of acronyms and abbreviations

ADEC	African Development and Economic Consultants
AEZ	Agro-ecological zone
ALDEV	African Land Development [programme]
CBS	Central Bureau of Statistics
SSA	Sub-Saharan Africa

1 INTRODUCTION

This document presents a profile of income diversification strategies employed by farmers in Makueni District, Kenya over the past ten years and explores how the income from these activities has impacted upon the level of farm investment in the zone. This is one of eleven profiles forming part of a study that is attempting to understand better the impact of long-term changes in population density and environmental variables on natural resource management, farm investment and household income strategies in semi-arid areas. In addition, this study explores the impact of national policies on farm investment and rural incomes.

The change profile sets out to explore four hypotheses related to income diversification and its impact upon investment. These hypotheses are principally derived from the 'Machakos Hypothesis' set out in Tiffen *et al.* (1994), which places increased investment by farmers in Sub-Saharan Africa (SSA) within a virtuous cycle of causative factors that links together population growth, rising education levels, diversifying income systems and increasing output per unit of land.

The first hypothesis that is explored in this profile says that income diversification is a strategy employed by farming households in Makueni District, and its incidence is widespread. This is hardly a controversial proposition, particularly for farmers operating in risky dryland agricultural systems. There is ample evidence to suggest that in dryland Africa farmers have long engaged in a variety of strategies to diversify their income (e.g., Heyer, 1996; Berry, 1993). The integration of different crops, and crops and livestock is often employed by farmers in risky environments in order to reduce the risks posed by the failure of one or more crop or livestock combinations, as well as to maintain long-term soil fertility through the cycling and recycling of nutrients through the system. Similarly, the extent to which farming households engage in short and long-term migration in order to provide remittances to support families facing agro-climatic constraints, to maintain incomes or simply to reduce risk generally, is well documented (Bigsten and Kayizzi-Mugerwa, 1995; Dercon and Krishna, 1996; Stark and Levhari, 1982; Carter, 1997). And the incidence of rural non-farm and off-farm employment in many of these systems is also well documented (e.g. Reardon, 1997; Meyers, 1982).

The second hypothesis says that funds derived from income diversification activities are used by households to finance both consumption *and* farm investment. It is sometimes suggested that farmers in SSA engage in income diversification because farming does not provide adequate subsistence income, so the principal goal for household members who engage in income diversification activities is to maintain consumption levels for themselves and their households. This is often seen as a sign of failing livelihoods, due to agro-climatic uncertainty (e.g., Davies, 1996) and may be associated with a more general process of what has been termed as a 'de-agrarianisation' of rural SSA (Bryceson, 1996). Other authors are more optimistic about this process, suggesting that income diversification may allow farmers to initiate risky changes to their production systems, and that income from diversification activities like migration, for example, are important avenues to increasing agricultural productivity (Evans and Ngau, 1991; Stark, 1978)

A third and central hypothesis with which this profile is concerned says that, in African dryland agriculture systems, diversification income is a key source of finance for investment by farming households. In particular it is suggested here that for many rural households in Makueni District, diversification income is a *principal* source of farm investment finance. In a previous study in the Machakos District (Tiffen, 1994) it was found that rural producers engaged in a wide variety of income diversification activities, and that these activities accompanied a sustained period of farm investment. It was also found that remittances and other sources of non-farm diversification income were key sources of total household income. This profile explores the linkages between this income and investment in farms in a more explicit way, using data collected from farmers in Makueni District who were asked to explain how they financed various farm investments.

The fourth and final hypothesis that is briefly considered in this profile says that involvement in income diversification is associated with higher levels of education. Heyer (1996) sets out a framework that links income diversification activities and access to health and education to rural household incomes, arguing that access to education and health were important conditions for sustained rises in rural household incomes. Some of these linkages between income diversification, education levels and capital generation in Machakos were set out in some detail in Tiffen *et al.* (1994), and this profile will explore these relationships further, using data collected from farmers in Makueni District.

This paper is organised as follows. In the following section some terms are defined and the typology of livelihood diversification employed for this analysis is briefly set out, followed by a short overview of the literature concerning income diversification in SSA. A description of the study areas and the main data sources used for this profile is then set out. This is followed by a number of sections exploring the scale and range of income diversification in the study areas, how this income feeds into the household, and the scale and range of farm investment observed in the field. Finally, some of the linkages between education, farm investment household income and income diversification are explored and then various issues relating to the other change profiles coming out of this study for Makueni District are highlighted.

2 INCOME DIVERSIFICATION IN THE LITERATURE

Rural household income is composed of farm income, off-farm income, and non-farm income. Farm income includes revenue from the sale of crops, livestock, and livestock products. Off-farm income is the income derived from working for others on their farms, and includes wage, exchange labour, and in-kind payments for work done for others. Non-farm income includes income from local non-farm wage employment, local non-farm self-employment, and migration (Reardon, 1997). Strategies to diversify incomes include off-farm and non-farm activities, namely local non-farm income-generating activities, local sale of labour, and migration of all kinds.

Rural households engage in income diversification for a number of reasons. They may do so in order to maintain incomes by rationally allocating labour in order to gain access to high urban wages (Bigsten and Kayizzi-Mugerwa, 1995). They may diversify in

order to overcome problems posed by the lack of credit (Taylor and Wyatt, 1982), or to reduce or spread general risk (e.g., Stark and Lucas, 1988; Stark and Levhari, 1982; Carter, 1997, Murton, 1997), especially in the face of pressing climatic constraints (e.g., Davies, 1996). Or they diversify for a wide range of reasons: to reduce general risk; to maintain food security in the face of low farm productivity, income and climatic shocks; and; to finance farm investments (Reardon, 1997; Ellis, 1998). Both push factors (e.g., environmental risk, falling incomes) and pull factors (e.g., changing terms of trade, rural-urban wage differentials, or new opportunities) play a part, and it is useful to think of income diversification activities as simply a part of the overall portfolio of activities pursued by rural households which are often operating in low resource, risky environments (Adams and Mortimore, 1997; Dercon and Krishnan, 1996; Schoonmaker Freudenberger, 1994).

Rural household involvement in income diversification is not new, nor is it an aberration from what is normally expected of African farming households. Rather, it has been prevalent across SSA for some time (e.g., Heyer, 1996; Berry, 1993). A recent review of the rural non-farm labour market in SSA (based upon data derived from case studies covering the past 20 years across 18 countries in SSA) emphasised the dominant nature of non-farm incomes with respect to overall household income profiles (Reardon, 1997). This work determined that the share of total rural income that was made up of non-farm income in these case studies ranged between 22 and 93 percent, and suggested that the overall share was growing (*op. cit.*)¹. In Kenya, Tiffen (1994), using data from studies conducted in the late 1970s, found that the share of total income derived from off-farm income in areas comparable to Makueni District, ranged from 20 to 51 percent. The data suggests, therefore, that diversified incomes are the norm in SSA, and Kenya fits this mould.

The degree to which income diversification contributes to farm investment, however, is not a settled question. It is often suggested that diversification income is not a significant source of farm investment in SSA because most of it is used for consumption (e.g., Delgado *et al.*, 1994). Some authors also suggest that income diversification represents mainly a coping response to, for example, drought (e.g., Davies, 1996), and that diversification of this nature represents a negative trend for agriculture generally (e.g., Bryceson, 1996). This point of view is not new. An analysis of urban-rural remittances carried out in the late 1970s concluded that there was little evidence to suggest that remittances were significant means to rural economic development, and that there was a net outflow of resources from rural areas to urban centres via the financing of education and consumption for rural people (Rempel and Lobdell, 1978).

But others have long suggested that diversified incomes from, for example, remittances, are key to increasing agricultural productivity in rural areas, especially when migrants return from an extended period of absence (e.g. Stark, 1978). It has also been argued that diversified incomes generally provide a form of insurance that allows farming households to take economic risks, through investment, to improve their production systems (Evans and Ngau, 1991). Diversification income can therefore support the process of technological change and may lead to long-term increases in agricultural productivity (Griffin, 1976; Taylor and Wyatt, 1996; Murton, 1997).

¹ This wide range is a useful warning against making generalisations.

Some problems confronting this debate include (after Ellis, 1998):

- (a) the lack of data on the composition of total rural household incomes;
- (b) the fact that much of the household income data that is available is not comparable over long time periods and between geographical regions because of its site- and time period-specific nature, and;
- (c) the different ways various research traditions have defined the various components of household income.

Additionally, few studies have examined the linkages between the different sources of rural household income and the various investments that households have made, both on- and off-farm.

The apparent lack of farmer investment assumed by many researchers may also be the result of the way in which different types of investments are perceived in relation to one another. For example those investments requiring high inputs of labour may be neglected by expenditure studies in favour of those which require primarily cash investment. And investments by households in health and welfare are rarely highlighted within the rubric of total household investment generally.

This profile employs a view of investment that is broader than that generally applied in past studies, and includes four main types of investments made by farming households:

1. *Farm investments created by family or shared labour*: field boundaries and enclosures; tree planting and protection; manure making and composting; field distribution of organic materials (which have residual effects after the target crop has grown); field ridging and other micro-conservation practices;
2. *Investments combining family or shared labour with purchased inputs of skills or components*: storage structures; stables and chicken houses; houses and other domestic capital; stone walls or terraces; drainage structures, etc. This type includes the substitution of hired labour for family labour.
3. *Cash investments*: improved seeds; tools and components made by local blacksmiths or industrially; animal harnesses, yokes; fencing; granary roofs, breeding animals; draught animals; transport animals; fowls; small ruminants; animals for fattening.
4. *Off-farm and social investments*: education, businesses. These are important because farmers' livelihood strategies include their non-farm activities.
(adapted from Mortimore, 1999)

It is important to acknowledge the fact that farmers in dryland SSA are obliged to invest in their farms to some extent in order to survive; at the very least, to clear land for farming. Once farms have been established, farmers invest a combination of labour and cash to produce crops and livestock for consumption and sale; to maintain and build up farmland and farm infrastructure, and; to maintain household health and long-term welfare (e.g., education and housing), which have long-term impacts on household's capacity to invest. Many farming households also invest in other non-farm income-generating activities in order to supplement and stabilise overall household income. The degree to which (a) local non-farm income, (b) income from the sale of labour and (c)

migration income have contributed to farm investment in Makueni District over the past ten years will be explored below.

3 STUDY AREA AND DATA SOURCES

This report is based upon data concerning Makueni District, which used to be part of Machakos District until it was carved out in 1993. It lies just to the south of Machakos District. Fieldwork was carried out during 1998 in two divisions of the District: Wote Division in northern Makueni Location, and Kibwezi Division in southern Ngwata Location. These two divisions vary centrally according to the degree of agro-climatic risks that they face, and the dates when most settlement began. Wote Division lies at a higher altitude and experiences slightly higher rainfall than Kibwezi Division, which is generally low-lying with a gently sloping plane that extends southwards towards Tsavo National Game Reserve (ADEC, 1986; Kenya, MPND, 1994).

The 1989 census indicates that the population density in Makueni Location ($85/\text{km}^2$) was almost twice that of Ngwata Location ($45/\text{km}^2$), where the population density was amongst the lowest in Makueni District (Kenya, MPND, 1994). Divisional population projections for Makueni and Kibwezi between 1979 and 1990 reflect a similar pattern (Kenya, MPND, 1989).

Much settlement in Wote Division occurred during the late 1940s and 1950s by retired Akamba soldiers who were allocated large plots of land under the ALDEV programme. Land was also given out to other landless Akamba. Wote Town is a growing urban and market centre, with part of its vigorous growth attributable to the fact that in 1992 it became home to the District Headquarters. Settlement in Kibwezi Division first began in the late 1920s when Akamba who were evicted from the Ngulia Hills and Mukuku areas moved into the area, and this accelerated after independence, when settlement in this zone was formally recognised by the state (Mbithi and Barnes, 1975).

Although some small-scale irrigation exists near the Athi river and its tributaries, primarily in the south of the District, most of Makueni farmland is rainfed, with a bimodal rainfall pattern made up of the short rains' from March to April and the long rains' from November to December (Kenya, MPND, 1994b). Five year running averages for the long rains in Wote Division are higher than in Kibwezi Division (around 300 mm, as compared with 250 mm), although Kibwezi has an average rainfall for the short rainy period that is higher than in Wote (around 400 mm, as compared with 350 mm) (Tiffen *et al.*, 1994).

The level of infrastructural development in Makueni District is generally low, with unpaved roads throughout the area, and generally poor access to water for many households. The exception is the main Nairobi-Mombasa road which crosses Kibwezi Division. The majority of people draw water directly from the rivers, dams, water pans and springs, as well as from roof catchments and tanks that some households have constructed. Many people travel a long distance to gain access to drinking water, especially in Kibwezi (Kenya, MPND, 1994). A market has developed around the provision of water, and one can observe a significant level of bike and cart traffic on the roads and tracks in the area to serve this.

For this study two villages each were chosen from Wote and Kibwezi Divisions, for a total of four. Three of the villages are within three hours' walk of a market. These include Kyamusoi, which is near to Wote Town centre, Kaini, near Kathonzweni market, and Darajani, which, while possessing a small market of its own, is also near to Kambu, a busy market town along the Nairobi-Mombasa highway. The fourth village chosen, Athi Kamunyuni, was settled in the early 1970s, and borders the Athi River over 20 kilometres east of Kambu Town. From Athi weekly transport to the Darajani or Kambu market is available.

Visits to each village lasted two days. On the first day group discussions were conducted and 12 farming households were randomly chosen to make up the sample to be interviewed. Informants from these households were interviewed by researchers over the course of the following day, when farm visits were also undertaken. Across the four villages, three households from the original sample were not interviewed, due to time constraints, so the final sample consists of information from 45 households, spread across the four villages.

During analysis the households were organised into three groups:

1. As one full group;
2. By division. This involved two groups comprised of two villages each (those from Wote and those from Kibwezi). A key difference between the two divisions is the level of rainfall (see above);
3. By differential access to markets. There are two groups, one with three villages that are relatively close to markets (Kyamusoi, Kaini, and Darajani), and Athi village, which is remote from Darajani and Kambu markets.

In these villages data on both off-farm and non-farm income diversification activities was collected, with a primary focus on those activities which generated cash revenue that could be made available for consumption or for investment in land, labour, or other farm-related infrastructure. The three areas of income considered in the survey included: (a) local non-farm income-generating activities; (b) local sale of labour and; (c) migration of all kinds.

No data was collected on exchange labour and in-kind payments, although it is assumed that some respondents will have incorporated these types of payments when they responded to questions about wage rates and their involvement in the local labour market. Other profiles will consider data on labour sharing or *mwethya* arrangements (Nzioka, 2000).

Across all of the study sites, 63 percent of households reported that the farm was the single largest source of income for the household, with most (58 percent) suggesting that more than half of total household income (food and money) came from the farm (see Table 1). This compares with data obtained for agro-ecological zone (AEZ) 5 in 1986 which indicated that, for 83 percent of households' in AEZ 5, the main economic activity was crop and/or livestock production (ADEC, 1986). Overall household incomes in Makueni District, however, are based upon a number of different elements, including income from cash and food crops, wages/salaries, crafts, honey, and charcoal (Table 2).

Table 1: Percentage of households receiving more than half of total income (food and money) from the farm

Village(s)	Percentage response
Across all villages	58
Kyamusoi	63
Kaini	40
Darajani	66
Athi	60

Source: Field interviews, November, 1998.

Table 2: Sources of household income, AEZ 5

Source of income	Percentage households reporting
Cash crops	53
Food crops	58
Wages/Salaries	49
Crafts	36
Honey	17
Charcoal	14

Source: ADEC, 1986.

Because of a lack of comparative data, it is impossible to say with any degree of certainty whether or not the overall share of income from these activities has grown for households in the study area. However, if one examines income data from the old and new Machakos Districts for the period 1960-1994, then there is an apparent growth in the proportion of total income that comes from non-farm sources. (Table 3)

Table 3: Farm and non-farm income shares (percentages) for old and new Machakos District and Makueni District, 1960 - 1994

Date	Farm income share	Non-farm income share	Area covered
1960	80	20	Old Machakos District
1981-2	51	49	Old Machakos District
1994	31	69	New Machakos District
1994	41	59	Makueni District
1994	63	37	National Rural Average
1994	70	30	National Average

Sources: Tiffen *et al.*, 1994, Table 10.5, p. 170, for 1960-82. CBS, 1996, for 1994 data.

In the villages where surveys were undertaken, household holdings tend to be large (>10 ha), with the exception of Darajani, where holdings are smaller (< 4 ha) (Table 4).

Table 4: Average farm size by village

Village	Average size (acres*)	Average size (ha)
Kyamusoi	22.3	9.0
Kaini	37.1	15.0
Darajani	8.3	3.3
Athi	30.3	12.3

Source: Gichuki, 2000a.

*Farmers' estimates in acres.

Due to time and resource constraints, it was decided not to attempt to collect detailed income data from each household. However, in all sites informants were asked to estimate their annual income from crop and livestock sales only. Their responses are set out in Table 5 below.

Table 5: Estimated annual income from crop and livestock sales, as reported by analytical group (percentage response)

Income categories (Ksh/year)	Full sample	Kibwezi Division	Wote Division	Market-close	Athi
1: >50,000	4.4	0	8.6	5.7	0
2: 25,000-50,000	11.1	9.0	13.0	14.2	0
3: 5,000-25,000	57.7	50.0	65.0	60	50.0
4: 1,000-5,000	22.2	31.8	13.0	17.1	40.0
5: 0-1,000	4.4	9.0	0	2.8	10.0

Source: Field interviews, November, 1998.

This data suggests that households in Wote Division, and those close to a market may earn more from crop and livestock sales than those in Kibwezi Division, especially in Athi. These figures are based upon estimates by informants across the four sites, from a very small sample (n=45), so are merely illustrative of the general picture and the variation between the four sites. Additionally, for farmers in semi-arid areas agricultural income is highly variable. Data obtained from surveys and group discussions makes it clear that, for many households in Makueni District, the relative importance of the different income streams generated through crop sales, livestock sales, wages for casual labour, or public sector salaries may vary greatly from year to year. The evidence also suggests that this variability is strongly linked to fluctuating rainfall conditions across the district. Hence income information covering only one year should be viewed with some caution. Mbogoh (2000) indicates farmers in 1997-8 regarded crop income as more important than livestock income. This was in contrast to a 1994 finding.

The national Welfare Monitoring Survey II (which was larger and statistically sounder than our sample) collected its data in July 1994 and estimated that the mean monthly household income from the sale of crops, livestock and livestock products in Makueni District was Ksh 1,387.80. The bulk of this, Ksh 1,090, came from livestock sales, in a period which followed a bad harvest. Farmers have somehow to match their cash incomes and their cash needs, and Fall (2000) and Mbogoh (2000) both show how they regard livestock as important for this. If the figure for June-July 1994 is accurate and representative for the whole year, this translates to a mean annual household income from the sale of crops, livestock and livestock products of Ksh 16,653 (Kenya, CBS, 1996, Tables 6.3). Crops and livestock or livestock products consumed were worth Ksh 824, so total farm income from sales and consumption totalled Ksh 2,178 on a monthly basis or Ksh 26,136 on an annual basis (see also Table 10 in Mbogoh 2000). On a monthly basis, the CBS survey found an average total income from all sources of Ksh 5,520, matching an average monthly expenditure of Ksh 5,065. The difference between farm income and total income in that year points up the importance of non-farm and off-farm income, particularly in bad crop years. The national rural monthly income and expenditure averages were respectively Ksh 8,508 and Ksh 6,365 (Table 6.8) showing Makueni to be clearly amongst the poorer districts in income terms. No relationship between farm size and levels of income from crops and livestock was found using our village survey data.

Seven of the 16 farmers attending the Wote workshop in 1999 provided some detail on their incomes in good and bad years. While this cannot be taken as representative, and was not comprehensively checked, it can illustrate some of the extremes. If we take one of the poorer farmers from the driest village, she reported harvesting 18 bags of maize, six bags of millet and seven bags of beans in 1997, all from one season (the other yielding nothing). That year she did not need to buy any food, and indeed was able to sell grains for Ksh 4,320. She got another Ksh 1,500 from the sale of chickens and earned Ksh 6,000 from casual labour. Thus, she had approximately Ksh 12,000 in cash, plus food for the family. In 1998, there was no harvest from either rains, and she had to buy 18 bags of maize and two of beans. This compelled her to sell five of her goats, which normally provided some milk for the family. She had to seek more casual work, to earn Ksh 9,600 in order to buy food. Her strategy is to cut expenditure as much as possible in bad years, and to buy goats and chickens in good years to be able to sell when harvests fail. A farmer in Kaiyani, with a good non-farm job as a teacher, experienced less income variability, but it was still considerable. In 1997 he produced 35 bags of maize and 11 of beans, getting a big harvest in the short rains and a small one in the long rains. He fed his family, kept some in the granary, and was still able to sell ten bags of maize and four of beans for Ksh 11,000. His two cows yielded 300 litres of milk, giving him Ksh 3,000. His cash farm income was thus Ksh 14,000, mainly from crops. He got Ksh 180,000 from his salary. In 1998 he produced only nine bags of maize and three of beans. The milk output fell by half, to Ksh 1,500, which represented his total cash income from farming. Because of his salary, he was able to avoid livestock sales, although he was obliged to buy eight bags of maize and three of beans. His strategy is to try to manage on his salary in bad years, and to invest in the good years in something he feels will generate income.

4 THE SCALE AND RANGE OF INCOME DIVERSIFICATION

Involvement in income generation activities in SSA is widespread, and this also applies to Kenya. Tiffen (1994) reviewed over 20 years of data from case studies in the Machakos District and determined that non-farm income made a significant contribution to total household income over the period, providing an important proportion of total cash resources.

Data from the late 1970s and early 1980s indicates that in Kenya, between 20 and 50 percent of total household incomes in AEZ 4 could be attributed to earnings off-farm (Heyer, 1990; Mukhebi, 1981; Pollard, 1981; Rukandema *et al.*, 1981). Data from the 1980s also showed this characteristic. For example, in Nzau, Pollard (1981) found that 30 percent of income of their sample population gained income from the sale of charcoal or honey, or the hiring out of draft animals, and over 40 percent of households received income from the regular employment of a resident household. Neunhaser *et al.* (1983) found that in North Yatta just under half of farming households had one alternative income source, while 17 percent had two or more. The 1985 African Development and Economic Consultants (ADEV) survey found that 41 percent of households reported some income from wages and salaries (ADEC, 1986). The 1985 ADEC survey showed that in both AEZ 4 and 5, the range of activities in which households were involved was extensive (see Table 6).

Table 6: Household income sources: percentage mentioning (district level)

	AEZ 4	AEZ 5
Wage/salary	41	46
Hides/skins	34	40
Crafts	43	36
Beer	2	3
Honey	9	18
Charcoal	11	14
Firewood	5	5

Source: ADEC 1986, Table 3.10

Other survey data from semi-arid areas of Kenya indicates that 50 percent of households earn income from non-farm jobs, and 75 percent were involved in charcoal making and selling (Lubega, 1987). Survey data from Machakos District indicates that only 50 percent of the income of farming households was derived from the farm operating surplus, the rest being made up from salaries, wages, off-farm enterprises (Ondiege, 1992). A survey carried out during 1992/3 in Lower Embu, Eastern Kenya, found that 84 percent of households reported at least one subsidiary non-farm income source and just over one third reported that their non-farm income was their primary income source (Hunt, 1994). Similarly in Mbooni, Murton (1997) found that household incomes were highly diversified.

The data from Wote and Kibwezi Divisions collected in 1998 reflects a similar situation. Three areas of income diversification were examined in the survey covering (a) local non-farm income-generating activities; (b) local sale of labour, and; (c)

migration of all kinds. Although some local variation exists, and will be explored further below, across all sites over 40 percent of households reported being involved in local non-farm income-generating activities, over 45 percent were involved in migration of some sort, and over 50 percent had someone in the household who sold labour locally (Table 7).

Table 7: Involvement in income diversification (percentage response)

	Full sample	Kibwezi Division	Wote Division	Close to Market	Athi
Local non-farm income	42.2	54.5	30.4	28.5	90.0
Local labour sale	54.7	9.2	60.0	56.2	50.0
Migration (in household)	48.8	42.8	54.5	51.5	40.0

Source: Field interviews, November, 1998.

Activities under local non-farm income generation include such activities as running a shop, basket making, rope making, charcoal making, trading in the market, and honey production and sale. Many of these activities rely on the farm to supply basic materials (e.g., sisal), and many of the products are sold locally. For example, handmade four ply ropes three metres long fetch Ksh 10 each in local markets in Wote Division, while in Kibwezi Division, coloured handbag baskets are produced on a contract for dealers for Ksh 600 each.

During data collection it was found that some non-farm income-generating activities tended to be underreported. Farm visits after interviews, for example, led to the discovery that rope making was much more widespread than initially admitted during interviews. When questioned afterwards, respondents who had engage in rope making (almost all female) indicated that they had not considered it in the same way as other non-farm income-generating occupations because the revenue from this activity was low, and was often contributed directly to savings groups. Group discussions and field visits confirmed that savings groups were primarily used to finance 'little things', and that women often contributed their earning of this type to them in order to provide for such things as dowries, household utensils, small livestock, and other 'lumpy', periodic expenditures (also see Nzioka, 2000). Other activities for which evidence was found in the field, and that may also have been underreported for similar reasons, include calabash, beer, and honey production and sale.

Table 8: Constraints to non-farm income generation (percentage response)

Key constraint	Full sample	Kibwezi Division	Wote Division	Market	Athi
Capital	31.8	14.3	40	33.3	0
Labour	68.2	85.7	60	66.4	100

Source: Field interviews, November, 1998.

Households that had not engaged in on-farm income generation were asked if there was a major constraint preventing them from doing so. Most of these (68 percent) indicated that they did not take up these activities due to a shortage of labour, especially in Athi, where farms are large, and the population density is very low (Table 8).

For migration the story is more uniform across the district. For each of the aggregated samples at least 40 percent of households had at least one person who had recently migrated to find work. This was found to be the case in spite of the view, expressed by many informants, that it was becoming more difficult to find work in the towns and cities. This may have been due to falling urban wages, which in Kenya declined during the 1980s and have remained stagnant since then (Azam and Daubree, 1997), or because of a general stagnation in the market for ‘casuals’ that was highlighted by a small number of informants who had tried and failed to find work outside their home areas.

Much of the migration identified was long-term and, in many cases, very long-term (i.e., more or less permanent), especially for those who had attained a high level of education and who had been able to find professional work in a town or city. For example, some households had sons who had done well at school, migrated to Nairobi, engaged in further training, and then became accountants. Many of these had obtained permanent work with businesses in one of the large cities, and it was generally assumed by informants in the villages that they would not be returning to their home villages to live for a number of years - if at all.

Seasonal migration by others was also very common. The main areas where individuals migrated to were the larger cities, including Nairobi and Mombasa, but there was also some migration to Machakos Town, Wote, Kambu, and other smaller towns in the zone. Recent evidence suggests that smaller towns in Kenya could provide better prospects for migrants seeking work than Nairobi and Mombasa, where the growth in the number of jobs was less than the population growth during the 1980s (Narman, 1995). However, it was reported by many informants that the prospect for finding work in these smaller towns was not very good, and in many informants’ view, getting worse.

Table 9: Occupations undertaken by migrants (no. of responses, n = 21)

Occupation	Number of responses
Shop attendant/clerk	3
Accountant	3
Teaching/tutoring	2
Armed forces	1
Mechanic	1
Driver	3
Trading/business	3
Technician	1
Hospital staff	1
Hotel work	2
Craft	1

Source: Field interviews, November, 1998.

Those individuals who had had a successful, that is profitable, migratory experience, became engaged in a wide variety of occupations. A count of occupations in which migrants were engaged was obtained from individuals who had migrated, and this is summarised in Table 9.

With regard to the sale of labour locally, the story is much more mixed. Fifty-four percent of all households reported that at least one of their members sold their labour locally at some point in the year, but there was wide variation with regard to when people worked for others. Individuals sold their labour during all periods of the year, although this was less common during rainy periods when cultivation of their own fields took top priority. People had carried out a variety of tasks for others, including building houses, clearing bush, terracing, harvesting, and charcoal making. There are differences between the wage rates that applied to different tasks reflecting, among other things, the different skills required. Some of these wage rates are summarised in Table 10.

Table 10: Reported daily wage rates for different tasks

Task	Wage (Ksh/day)	Place
Masonry	200	Kaini
Cultivation	79.5	*
Charcoal making	100	Darajani
Uprooting cowpeas	125	Athi Kamunyuni
Clear bush	150-200	**
Building terraces	100-300	**

Source: Field interviews, November, 1998.

*Average across all sites

**Across all sites

There were also differences reported for cultivation wage rates for different areas, the biggest differences being found between wetter and drier areas. Average rates for the different samples are summarised in Table 11.

Table 11: Reported wage rates for cultivation (n=23)

Sample	Wage (Ksh/day)
Full sample	79.5
Wote Division	101.3
Kibwezi Division	59.6
Market Close	87.4
Market Distant	51

Source: Field interviews, November, 1998.

The evidence collected during this survey supports the hypothesis that in Makueni District income diversification is a strategy that has been employed by the majority of farming households, and comparison with other survey data suggests that this is typical

for the zone. In Makueni District diversification income is composed of income gained from local non-farm income generation, migration and the local sale of labour, and most households have access to at least one of these forms of income. There has been an active market for non-farm products and local labour and this is continuing to play a key role. In Makueni District, income from migration of all kinds has been an important component of households' overall income profile, and all indications are that this will continue to be the case. Although respondents expressed a growing concern that migration is not generating as much income as it has in the past, most households have someone who has worked or is working outside the local area, and over two thirds have some source of emergency finance from a family member working outside the local area.

5 THE RANGE AND SCALE OF FARM INVESTMENT

A central objective for this profile is to illustrate the linkages between income diversification activities and the scale and range of farm investment in the study area over the past ten years. The data generated during fieldwork in Wote and Kibwezi Divisions suggests that many different investments in farms in the zone have been undertaken over the past decade, and that significant cash resources have been used to purchase some or all of the labour, tools or materials needed to complete them.

Data on expenditure patterns for June 1994 suggests that in Kenya in general, and Machakos and Makueni Districts in particular, between one sixth and one fifth of total household income is spent on education, other non-food purchases, and expenditure on durables (Kenya, CBS, 1996). The proportion of other non-food expenditures that may be regarded as investments may be low, but some of the inputs into crop production could be investments. In addition, monthly CBS expenditure data may not be fully representative, due to the fact that many expenditures (e.g. education) are lumpy, and rural incomes vary according to the rainfall and harvests of previous periods. Rainfall records show that 1994 was a dry year (Gichuki, 2000c), and educational expenses are low in June.

Table 12: Mean monthly household expenditure by broad categories, June 1994 (percentage of total household income)

District	Machakos	Makueni	Rural Average	National Average
Education	2.9	4.0	2.5	2.6
Medical care	2.7	2.9	2.9	3.6
Food	37.0	64.0	41.8	40.8
Own crop production	11.2	8.0	14	10
Other non-food	18.9	12.0	12.9	17.8
Durables	0.7	0.4	0.7	1.3
Education and other non-food, and durables	22.5	16.4	16.1	21.7

Source: Calculated from CBS (1996) data, Table 6.8.

In order to establish how household income was channelled into investment, in all of the study areas households were asked to list the top three investments that they had made in the past 10 years. This was meant to elicit the three investments that households considered to be most important to their overall welfare - these were not necessarily the three largest or most recent investments. Those mentioned included both farm and non-farm investments. Concurrent field surveys were carried out which helped researchers to assess the scale and quality of these investments (Gichuki, 2000a&b). Many of the conclusions set out below must subsequently be set against these assessments. The data on investments is set out in Table 13 (below).

Table 13: Top three household investments (percentage response)(n=122)²

	Full Sample	Kibwezi Division	Wote Division	Close to Market	Athi
Terracing	23.7	20.6	26.5	23.9	23.0
Plant fruit or shade trees	19.6	18.9	20.3	19.7	19.2
Clear bush	13.1	10.3	15.6	11.4	19.2
Build house	12.2	12.0	12.5	12.5	11.5
Education	10.6	18.9	3.1	9.3	15.3
Purchase goats, sheep or cattle	7.3	8.6	6.2	8.3	3.8
Build dam	4.9	0.0	9.3	6.2	0.0
Fencing	1.6	1.7	1.5	2.0	0.0
Shop	1.6	3.4	0	1.0	3.8
Invest in poultry production	1.6	1.7	1.5	2.0	0.0
Grain store	0.8	1.7	0.0	0.0	3.8
Vegetable production	0.8	0.0	1.5	1.0	0.0
Cart	0.8	0.0	1.5	1.0	0.0

Source: Field interviews, November, 1998.

Information gathered from informants suggests that few of the investments set out in Table 13 were the result of investments of only labour or only cash. Most involved some combination of both. For example, terrace construction on farmland was often initiated by households by hiring someone to lay them out and begin construction. Once this process had been started, many households had undertaken to finish the terracing themselves - evidence of this was observed in at least two of the sites. Bush clearance also often involves a combination of purchased inputs of hired labour, and/or investments in tools, and is rarely completed without the input of household labour as well.

² Maximum number of responses was 3 investments per household x 45 households, or 135. Some households listed less than three top investments.

The data in Table 13 demonstrates little variation between the investment profiles for the four analytical groups. Farm investments that were made, such as terracing, tree planting and bush clearance, were rated as highly important, but so was education.

The low degree of variation in the type of investments cited may reflect the relative homogeneity of these sites culturally and agro-ecologically, and also the fact that most settlement in these area happened relatively recently - within the last 50 years in Wote Division, and within 30 years in Kibwezi Division. The process of farm establishment, which includes building houses, constructing *bomas* to confine animals, clearing bush and establishing initial farm fields, cultivating, and constructing granaries, is necessarily labour and capital intensive, and many of these settlers were capital poor when they arrived. For example, for various reasons including disease risk, many settlers had left their cattle temporarily in the areas from which they had emigrated, arriving with little or none (Fall, 2000). The higher climatic risk facing farmers in AEZ 5, combined with capital scarcity, has meant that most have followed a similar development path, planting similar types of crops (Mbogoh, 2000). These factors leads one to expect a low degree of variation around the main investment priorities during the past ten years, and this is supported by the evidence gathered.

The evidence from this survey suggests that households in Makueni District have invested heavily over the past ten years in improving both household welfare and agricultural production. This suggests that they have committed an important proportion of their total household income to investments in the farm. In the next section we explore further how income from diversification activities has fed into these investments.

6 LINKAGES BETWEEN INCOME DIVERSIFICATION AND FARM INVESTMENT

Thus far we have summarised the extent to which households in Makueni District participate in generating off-farm and non-farm income, and reviewed the range of investments made over the past ten years which were considered to be most important for farming households. In this section we explore whether or not the income gained from diversification activities has supported farm investments, and to what extent.

At the beginning of this profile we summarised the view held by many researchers that off-farm and non-farm income are insignificant sources of farm investment for farmers in SSA. This is also the opinion of some district officers, who during discussions suggested to us that most farmers used any available surpluses they obtained through agriculture or otherwise for consumption or to invest in off-farm enterprises. However, there is some evidence to suggest that non-farm and off-farm earnings can contribute to investment into farm-productive assets (e.g., Haggblade *et al.*, 1989). This is also true for Kenya where, for example, it has been shown how migration may help relieve credit constraints faced by those farming households wanting to invest in their farms and adopt agricultural innovations (Collier and Lal, 1980). The fact that off-farm and non-farm income contributes to agricultural investment is true for Makueni District as well.

The survey data collected in Wote and Kibwezi Divisions suggests that many individuals who have diversified have also provided some of the diversification income to their households in the study areas. A separate sample (n=43) was obtained of individuals who had started a local enterprise, who worked locally for others for a wage, or who had migrated in search of income, then a targeted questionnaire was used to elicit more in-depth responses about these so-called ‘diversifiers’. Eighty-one percent of ‘diversifiers’ reported that over the past ten years they had made contributions of a proportion of their diversification income to their households in the sample areas.

The same set of data reveals that some of these contributions were used by households to invest in their farms. In the targeted questionnaire, diversifying individuals were asked how they thought their contributions had been used by their household. For the full sample around 19 percent of respondents suggested that an unspecified proportion of these contributions was used for investment purposes, and over half suggested that a proportion of it was used for either education or investment in the farm. Only 8.3 percent suggested that investment was the only use of these household contributions. In addition to investment in agriculture and farm infrastructure, respondents claimed that their household contributions were used to finance only consumption (30.5 percent), only education (19.4 percent), or only cultivation, mainly to purchase labour (just over 2.5 percent) (Table 14). Hence, households in the Makueni area use diversification income remittances for a multitude of purposes, including farm investment.

Table 14: Use of individual contributions by household (percentage response, n=36)

Use of contribution	Percentage response
Consumption only	30.5
Farm investment only	8.3
Education only	19.4
Cultivation* only	2.7
Consumption and farm investment only	2.7
Farm investment and education only	5.5
Consumption and education only	27.7
All of these	2.7

Source: Field interviews, November, 1998.

*Mainly to purchase labour.

The main household survey, which was administered across all of the households from the four villages, also revealed a connection between diversification income and farm investment. Respondents were asked to list and rank the top three investments that their household had made in the last ten years, and the extent to which diversification income had helped to finance these investments. These investments were subsequently grouped and sorted by households’ own rankings.

This data suggests that around three-quarters (78.6 percent) of the top investments cited by households³ were partly financed by the income derived from diversification activities. That is, an unspecified proportion of the finance required for over half of the investments came from diversification activities. This was lowest in Athi, and highest in the three villages near to markets.

This means that over half of the investments listed in Table 14 (above) were partly financed using income gained through non-farm activities, migration, or selling labour.

The household-level data also suggests that, for 45 percent of these investments, diversification income contributed *more than half* of the finance that was required for the investment (see Table 15).

The implication of this data is that up to one quarter of the most important investments that households in Makueni District have made over the past ten years have relied upon diversification income for more than half of the required finance. The top three most important investments made by households over this same period were investments in agriculture, namely, terrace construction, tree planting and bush clearance (also see, Mbogoh, 2000). The evidence strongly suggests, therefore, that, over the past ten years, diversification income has made a significant contribution to agricultural investment in Wote and Kibwezi Divisions.

Table 15: Contribution of diversification income to top investments (percentage response)

Response	Full sample	Kibwezi Division	Wote Division	Close to market	Athi
Some, but less than ½	33.6	20.4	13.1	22.9	10.6
Some, greater than half	45.0	21.3	23.7	38.5	6.5
Some contribution	78.6	41.7	36.8	61.4	17.1

Source: Field interviews, November, 1998.

The data gathered in Makueni also suggests that farmers will continue to invest in agriculture. Eighty-one percent of household report plans to invest in the farm, and 88 percent of respondents would prefer to increase their cash income from the farm.

The evidence gathered in Makueni District therefore supports the hypothesis that diversification income is one of the principal sources of farm investment finance. It also suggests that its importance may be related to the proximity of markets. The evidence suggests that farm investment in Athi relies less on diversification income as a source of investment finance, and Athi is geographically remote from a large market. However,

³ There was a possible maximum of three investments per household (maximum possible = 135)- some households listed less than three top investments.

there may be other reasons to explain this - for example, a shortage of labour may hinder investments requiring inputs of both cash and household or shared labour (e.g., terracing, clearing bush), and many of the households in Athi interviewed were labour-poor.

7 LINKAGES BETWEEN EDUCATION AND INCOME DIVERSIFICATION

Tiffen *et al.* (1994) suggest that investments in farms in Machakos District may have been limited by alternative expenditures on education and food. For example, survey data from Machakos obtained during the 1980s suggest that 12 percent of total household income went to pay school fees (Tiffen, 1994, modified from ADEC, 1986). More recent data suggests that for Makueni District this is lower, comprising only four percent of the total (Kenya, CBS, 1996), at least in the month of July.

That a proportion of household income was used to finance education was also found to be the case in the study sites. It is clear from the data presented above that, in the four study sites, over the past ten years households have invested some proportion of available surplus income in education. Education consistently falls into the list of the most important household investments made, and we have shown how diversification income contributes to all of these investments in a substantial way (also see Mbogoh, 2000, and Gichuki, 2000a&b).

Even though many households agree that there are now declining returns from diplomas because of the increasing risk of unemployment amongst graduates⁴ many households in Makueni District still regard education as a long-term investment. Recent research in the zone has shown a significant linkage between education and higher incomes (Hunt, 1994), and households in Makueni District recognise this link. During group interviews respondents expressed the view that although education was expensive, it was important in helping young people to take care of themselves, and most hoped that in the long-term it would lead to a higher income (also see Nzioka, 2000 for a longer discussion).

The reverse linkage is also true; in Kenya, higher educational levels within households contribute to the level of income diversification (Evans and Ngau, 1991; Mbithi, 1971). Collier and Lal (1980) determined that the probability that an adolescent who had completed four years of secondary school would emigrate was fifteen times that of a young person who had only finished primary school. This corresponds with the situation in Makueni District. Information gathered during group discussions suggested that those children who completed secondary school were likely to try to obtain work in a town or city. Survey data supports this finding but also indicates that this is more true for boys than for girls.

⁴Other work highlights the process of urban wage level stagnation, evident since the 1980's (Azzam and Daubree, 1997).

8 CONCLUSION

The data obtained in Makueni District for this profile supports most of the hypotheses set out at the outset of this profile.

First, over the past ten years, households have been engaged in a wide range of income diversification activities. There is no doubt that most households in Makueni District are involved in a host of different on- and off-farm income-generating activities.

Secondly, it is clear from this study that the funds earned by households from income diversification activities have been used by them to finance both consumption and investment. Data collected by the Kenya government and our own survey data supports this conclusion.

Thirdly, and most importantly, the data suggests that the income generated from income diversification activities has been one of the principal sources of finance to support the wide range of farm investments that have been undertaken by households - localised resource and rainfall constraints have not prevented households within the zone from making significant investments. Hence private investment within Makueni District is strongly linked to the wider economy of Kenya.

And finally, income diversification activities interact with the education of those involved, particularly with respect to increasing the likelihood that educated young people will engage in some form of migration in order to find income.

It is also clear from this survey that households in Makueni District are not unique in the constraints they face or in the strategies they employ. The production systems put in place by households in Makueni District are not very different from those in Machakos District, although higher rainfall constraints have necessarily impacted upon farmers' choices of crops, and the technologies that they have employed. The evidence from other studies also suggests that these households in Makueni District have been pursuing a strategy of income diversification that is typical in Kenya and in other parts of SSA.

The nature of this profile requires that further work be done to integrate its conclusions with those from other profiles concerning the level of investment made by households over the past decade, the nature of migration, and the impact of education upon the development and adoption of new production technologies. This report has already made reference to these other profiles, based upon an initial synthesis. Further work should follow.

REFERENCES

- Adams, W.M. and Mortimore, M. (1997) *Agricultural intensification and flexibility in the Nigerian Sahel*. Mimeo, University of Cambridge.
- ADEC (1986) *Machakos integrated development programme socio-economic survey: final report, vol. 1/main report*. Mimeo from African Development and Economic Consultants, Nairobi, to MIDP, Machakos.
- Azzam, J.P. and Daubree, C. (1997) *Bypassing the state: economic growth in Kenya, 1964-1990*. OECD, Paris.
- Berry, S. (1993) *No condition is permanent: The social dynamics of agrarian change in sub-Saharan Africa*. University of Wisconsin Press, Madison.
- Bigsten, A. and Kayizzi-Mugerwa, S. (1995), 'Rural sector responses to economic crisis in Uganda', *Journal of International Development*, 7/2: 1423-1441.
- Bryceson, D. (1996) 'Deagrarianization and rural employment in sub-Saharan Africa: a sectoral perspective', *World Development*, 24/1: 97-111.
- Carter, M. (1997) 'Environment, technology, and the social articulation of risk in West African agriculture', *Economic Development and Cultural Change*, 45/3: 557-591.
- Collier, P. and Lal, D (1980) 'Poverty and growth in Kenya', *World Bank Staff Working Paper 389*. The World Bank, Washington DC.
- Davies, S. (1996) 'Adaptable livelihoods: coping with food insecurity in the Malian Sahel', *Science, Technology and Development*, 14/1: 144-156.
- Delgado, C., Hazell, P., Hopkins, J., and Kelly, V. (1994) 'Promoting intersectoral growth linkages in rural Africa through agricultural technology and policy reform', *American Journal Agricultural Economics*, 76: 1166-1171.
- Dercon, S. and Krishnan, P. (1996) 'Income portfolios in rural Ethiopia and Tanzania: choices and constraints', *Journal of Development Studies*, 32/6: 850-875.
- Ellis, F. (1998) 'Household strategies and rural livelihood diversification', *The Journal of Development Studies*, 35/1: 1-38.
- Evans, H. and Ngau, P. (1991) 'Rural-urban relations, household income diversification and agricultural productivity', *Development and Change*, 22/3: 519-545.
- Fall, A. (2000) 'Makueni District profile: Livestock management, 1990-98', *Drylands Research Working Paper 8*. Drylands Research, Crewkerne, United Kingdom.
- Gichuki, F. (2000a) 'Makueni District profile: Farm development, 1946-99', *Drylands Research Working Paper 1*. Drylands Research, Crewkerne, United Kingdom.
- Gichuki, F. (2000b) 'Makueni District profile: Soil management and conservation, 1989-98', *Drylands Research Working Paper 4*. Drylands Research, Crewkerne, United Kingdom.
- Gichuki, F. (2000c) 'Makueni District profile: Rainfall variability, 1950-97', *Working Paper 2*. Drylands Research, Crewkerne, United Kingdom.
- Griffin, K. (1976) 'On the emigration of the peasantry', *World Development*.
- Haggblade, S.; Hazell, P. and Brown, J. (1989) 'Farm-non-farm linkages in rural sub-Saharan Africa', *World Development*, 17/8: 1173-1201.
- Heyer, J. (1990) 'Kenya: Monitoring living conditions and consumption patterns', *UNRISD report 90.2*. United Nations Research Institute for Social Development, Geneva
- Heyer, J. (1996) 'The complexities of rural poverty in sub-Saharan Africa', *Oxford Development Studies*, 24/3: 281-297.
- Hunt, D. (1994) *Rural livelihood systems and non-farm linkages in Lower Embu, eastern Kenya: 1972/4 to 1992/3*. End of project report to the Overseas

- Development Administration,' Project No R4186, Mimeo, Department for International Development, London.
- Kenya, CBS (1996) *Welfare monitoring survey II: Basic Report 1994*. Central Bureau of Statistics, Ministry of Planning and National Development, Nairobi.
- Kenya, MPND (1989) *Machakos District Development Plan, 1989-93*. Ministry of Planning and National Development, Nairobi.
- Kenya, MPND (1994) *Makueni District Development Plan, 1994-1998*. Ministry of Planning and National Development, Nairobi.
- Lubega, A.M. (1987) *Economic feasibility of rural projects in semi-arid areas of developing countries: a case study of agroforestry in Kenya*. PhD dissertation, State University of New York, Binghamton.
- Mbithi, P. (1971) 'Non farm occupation and farm innovation in marginal, medium and high potential regions of eastern Kenya and Buganda', *IDS Staff Paper 114*. University of Nairobi, Nairobi.
- Mbithi, P. and Barnes, C. (1975) *The spontaneous settlement problem in Kenya*. East African Literature Bureau, Nairobi.
- Mbogoh, S. (2000) Makueni District profile: Crop production and marketing, 1988-1999', *Drylands Research Working Paper 7*. Drylands Research, Crewkerne, United Kingdom.
- Meyers, L. (1982) *Socio-economic determinants of credit adoption in a semi-arid district of Kenya*. PhD dissertation, Cornell University, Ithaca.
- Mortimore, M. (1999) *Guideline on investment*. Mimeo. Drylands Research, Crewkerne, United Kingdom.
- Mukhebi, A., Knipscheer, H. and Sullivan, G. (1981) 'The impact of foodcrop production on sustained livestock production in semi-arid regions of Kenya', *Agricultural Systems*, 35: 339-351.
- Murton, J. (1997) *Coping with more people: population growth, non-farm income and economic differentiation in Machakos District, Kenya*. PhD thesis, University of Cambridge.
- Narman, A. (1995) 'The dilemmas facing Kenya school leavers: surviving in the city or a force for local mobilisation?' in Baker, J. and Aina, T.A. (eds.) *The migration experience in Africa*. Nordiska Afrikainstitutet, Sweden.
- Neunhaser, P., Bayreuther, H., Engel, M., Friesenegger, M., Magelassa, A., Neves, A., Renneke, V. and Salzer, W. (1983) *Appropriate land use systems for smallholder farms: a survey of ecological and socio-economic conditions in the Machakos District(Kenya)*. Centre for Advanced Training in Agricultural Development, Technical University of Berlin, Berlin.
- Nzioka, C. (2000) 'Makueni District profile: Human resource management, 1989-98', *Drylands Research Working Paper 9*. Drylands Research, Crewkerne, United Kingdom.
- Ondiege, P.O. (1992) 'Local coping strategies in Machakos District, Kenya.' in Taylor, D. and F. Mackenzie (eds.) *Development from within: survival in rural Africa*. Routledge, London.
- Pollard, S. (1981) *Report on the Nzau/Machakos farming systems study, November 1980 to February 1981*. Agricultural Economics Unit report. Ministry of Agriculture, Land Development Division, Agricultural Mechanisation Station Nairobi.
- Reardon, T. (1997) 'Using evidence of household income diversification to inform study of the rural non-farm labour market in Africa', *World Development*, 25/5: 735-747.

- Rempel, H. and Lobdell, R. (1978) 'The role of urban-rural remittances in rural development', *Journal of Development Studies*: 324-41.
- Rukandema, M.; Mavua, J. and Audi, P. (1981) 'The farming system of lowland Machakos, Kenya: farm survey results from Mwala District', *Farming Systems Economic Research Programme Technical Report (Kenya) 1*. Ministry of Agriculture, Nairobi.
- Schoonmaker-Freudenberger, K. (1994) 'Challenges in the collection and use of information of livelihood strategies and natural resource management', in Scoones, I. and Thompson, J. (eds.) *Beyond farmer first*. Intermediate Technology Publications, London.
- Stark, O. (1978) *Economic-demographic interactions in agricultural development: the case of rural-to-urban migration*. UN Food and Agricultural Organisation, Rome.
- Stark, O. and Levhari, D. (1982) 'On migration and risk in less developed countries', *Economic Development and Cultural Change*, 31: 190-196.
- Stark, O. and Lucas, R. (1988) 'Migration, remittances and the family', *Economic Development and Cultural Change*, 36:465-481.
- Taylor, E. and Wyatt, T. (1996) 'The shadow value of migrant remittances, income and inequality in a household-farm', *Journal of Development Studies*, 32/6: 899-912.
- Tiffen, M. (1994) 'Environmental change and dryland management in Machakos District, Kenya 1930-90': farming and incomes systems', *ODI Working Paper 59*. Overseas Development Institute, London.
- Tiffen, M.; Mortimore, M. and Gichuki, F. (1994) *More people, less erosion: Environmental Recovery in Kenya*. John Wiley and Sons, Chichester, United Kingdom.