

**An Assessment of the Effects of
Technology Transfer on Gender Roles
within a Community: The Development
of Tea and Coffee Production among
Smallholder Farmers in Kiambu District,
Central Province Kenya**

Winifred N. Karugu

ATPS Working Paper Series No. 44

Published by the African Technology Policy Studies Network, P.O. Box 10081, 00100 General Post Office, Nairobi, Kenya

© 2006 African Technology Policy Studies Network (ATPS)

PUBLISHED BY ATPS COMMUNICATIONS DEPARTMENT

Printed by Newtec Concepts
P.O. Box 00800, Westlands
14180 Nairobi, Kenya
Tel: 4449849, Fax: 4450399
newtec@mitsumi.net

ISBN: 9966-916-76-8

ABOUT THE AFRICAN TECHNOLOGY POLICY STUDIES NETWORK

The African Technology Policy Studies Network (ATPS) is a multi-disciplinary network of researchers, policymakers, actors in the private sector and other end users interested in generating, promoting and strengthening innovative science and technology policies in Africa. With a regional secretariate in Nairobi, the network operates through national chapters in 23 countries, with an expansion plan to cover the entire sub-Saharan Africa.

One of the objectives of the network is to disseminate research results to policy makers, legislators, the organized private sector, civil society, mass media and farmers' groups through publications, dialogue and advocacy. Among its range of publications are the Working Paper Series (WPS), Research Paper Series (RPS), Special Paper Series (SPS) and the Technopolicy Briefs.

Papers published under the Working Paper Series (WPS) are those produced from the ATPS small grants process or from regional projects. The WPS are not subjected to the strict requirements of the RPS but this does not suggest that they do not have significant policy or methodological contribution to make to the work of ATPS. The Board supports all efforts aimed at improving the WPS, such as building skills that will make most of the ATPS research outputs to be published under the RPS. Researchers are encouraged to produce their final drafts in a publishable manuscript form that is shorter and easier to read.

ATPS is supported by a growing number of donors including the International Development Research Centre (IDRC), the Carnegie Corporation of New York, the Rockefeller Foundation, the World Bank, the OPEC Fund, Ford Foundation, Coca-Cola Eastern Africa, the African Development Bank, *InfoDev* and the Royal Dutch Government.

Table of Contents

Abbreviations

List of Tables and Figures

Abstract

Chapter One: Background	1
1.1 Research Site	1
1.2 Statement of the Problem	4
1.3 Research Objectives	5
1.4 Justification	5
1.5 Assumptions	5
1.6 Limitations of the Study	6
1.7 Definition of Terms	6
Chapter Two: Literature Review	8
2.1 Theoretical Orientation	8
2.2 Women and Development	8
2.3 Gender and Development	9
2.4 Agricultural Technology and Gender	11
2.5 Gender Analysis	13
2.6 The Kikuyu People	14
2.7 General Statistics	15
2.8 General Information	17
Chapter Three: Research Methodology	18
3.1 Unit of Study	18
3.2 Data Collection Tools	18
3.3 Population and Sampling Techniques	19
3.4 Research Design	19
3.5 Data Analysis	20
3.6 Complementary Activities	21

Chapter Four: Analysis and Results	22
4.0 Introduction	22
4.1 General Characteristics of the Respondents	22
4.2 Economic Status	27
4.3 Gender Analysis	30
4.4 Socio-Economic Status by Type of Household	30
4.5 Division of Labour	32
4.6 Agricultural Extension vs Types of Households	34
4.7 Social Affiliation vs Sex	38
Chapter Five: Summary, Conclusions and Recommendations	40
5.1 Summary	40
5.2 Conclusions	40
5.3 Recommendations	42
Selected Bibliography	43
Appendix I: Questionnaire	47
Appendix II: Tables and Charts	59

Abbreviations

AFC	Agricultural Finance Corporation
CBK	Coffee Board of Kenya
FHH	Female-Headed Household
FOH	Female-Operated Household
KPCU	Kenya Planters Co-operative Union
KTDA	Kenya Tea Development Authority
MHH	Male-Headed Household

List of Tables and Figures

List of Tables

- Table 1:** Foreign trade in goods 1998 (K million pounds)
Table 2: Hectarage under coffee
Table 3: Hectarage under tea
Table 4: Distribution by crop
Table 5: Distribution by division
Table 6: Sex distribution
Table 7: Divisions - tea
Table 8: Divisions - coffee
Table 9: Sex distribution (both groups)
Table 10: Level of education
Table 11: Other economic activities
Table 12: Strongest responses for indicators of economic status (%)
Table 13: Type of household
Table 14: Kind of house * type of household cross tabulation (%)
Table 15: Task allocation between the sexes (percent)
Table 16: Where did you meet the extension agent? * type of household cross tabulation
Table 17: Type of household vs have you ever attended an extension demonstration?
Table 18: Opinion on the usefulness of the extension agent
Table 19: Do you keep farm records and accounts?
Table 20: Do you employ pickers?
Table 21: Sex vs. group membership (percentage of total)
Table 22: Sex vs Indicate how often you attend barazas (percentage)
Table 23: Sex vs Indicate whether farming issues are discussed in the following (percentage)
Table 24: Distribution by sex - tea
Table 25: Distribution by sex - coffee
Table 26: Sex * are you married? cross tabulation (%)
Table 27: Marital status - both crops
Table 28: Sex of respondent vs. marital status - tea
Table 29: Marital status - coffee
Table 30: Spouse location (both crops)
Table 31: Spouse location (tea)
Table 32: Spouse location (coffee)
Table 33: Age of respondents

Table 34: Level of education
Table 35: Level of education by sex
Table 36: Size of land
Table 37: Name in the title deed
Table 38: Age*Type of household cross tabulation
Table 39: Do you have children? * type of household cross tabulation
Table 40: Level of education * type of household cross tabulation
Table 41: other economic activity? * type of household cross tabulation
Table 42: Title deed name * type of household cross tabulation
Table 43: Do you own any of the following? * type of household cross tabulation (%)
Table 44: form of transport * type of household cross tabulation
Table 45: form of information? * type of household cross tabulation
Table 46: Source of water * type of household cross tabulation
Table 47: Other enterprises - who do them? * type of household cross tabulation
Table 48: Irrigation * type of household cross tabulation
Table 49: Fertilizer * type of household cross tabulation
Table 50: Pesticides * type of household cross tabulation
Table 51: Picking * type of household cross tabulation
Table 52: Post harvest activities * type of household cross tabulation
Table 53: Who does the land preparation? * type of household cross tabulation
Table 54: who does the planting? * type of household cross tabulation
Table 55: Pruning - who does it? * type of household cross tabulation
Table 56: Farmyard manure - who applies it? * type of household cross tabulation
Table 57: Knowledge of any extension agents * type of household cross tabulation
Table 58: Extension agent helpful *type of household crosstabulation
Table 59: When did you last talk to him or her about farming? * type of household cross tabulation
Table 60: Do you keep farm records and accounts? * type of household cross tabulation

List of Figures

Figure 4.1: Age of respondents
Figure 4.2: Number of children
Figure 4.3: Do you keep farm records and accounts?
Figure 4.4: Number of children
Figure 4.5: Dependants' location
Figure 4.6: Land size
Figure 4.7: Leisure activities
Figure 4.8: Crop cultivation
Figure 4.9: Child rearing
Figure 4.10: Other enterprises
Figure 4.11: Fertilisers application

- Figure 4.12:** Fetching firewood
- Figure 4.13:** Postharvest activities
- Figure 4.14:** Housework
- Figure 4.15:** Irrigation
- Figure 4.16:** Layout
- Figure 4.17:** Farm yard manure
- Figure 4.18:** Pesticides
- Figure 4.19:** Postharvest activities
- Figure 4.20:** Picking
- Figure 4.21:** Pruning
- Figure 4.22:** Land preparation
- Figure 4.23:** Crop cultivation
- Figure 4.24:** Purchase of Inputs for cultivating tea or coffee
- Figure 4.25:** Costs of the purchases

Abstract

Judged by the usual economic measures tea and coffee production have in the past been Kenya's most successful examples of transfer of technology among small scale farmers, but while ample technical, financial and legal information exists, there has been inadequate information about the effect that the adoption of this technology has had on gender roles within the communities concerned.

Kiambu District in the Central Province of Kenya was selected as the study site because it was among the first to pioneer tea and coffee production by African farmers, and also because it has typically heavy participation by female farmers in tea and coffee production. This study proposed to assess the effects of the adoption of an entire package of technology on gender roles in Kiambu District with the intention of positively influencing policy.

Specific objectives were to assess:

- The effect the adoption of agriculture technology has had on the socio-economic status of males, females and different age groups
- The impact that the adoption of this technology has had on division of labour
- The extent to which support services for this package of technology are gender sensitive
- The impact that this technology has had on gender roles with respect to post harvest activities.

This study used a survey instrument, literature search, and direct observation, to collect data from small scale farmers, regarding the effects of tea and coffee production on gender roles in the Kiambu district of the Central province of Kenya. Focussed group discussions and key informants were used to validate the data collected. During the survey 338 respondents were interviewed using purposive random sampling of the six divisions that make up Kiambu district. Of these 36% were women and 64% were men. The respondents were further broken down into three types of households, male-headed (77%), female-headed (18%) and female-operated households (4%), based on the *de jure* and *de facto* heads of the household. They were also broken down according to the two crops. Analysis was done for socio-economic status, division of labour, access to support services, social affiliation and marketing.

The results showed gender disparities among the sexes, age groups and types of household. Tea earnings are higher and more reliable than those of coffee, yet coffee farmers enjoy a higher standard of living than tea farmers. Participation in production by those under 30 years of age was negligible. Female-headed households have less access to resources, education, support services, and postharvest services. Such disparities need to be addressed if the performance of small-scale cash crop farmers is to improve.

Chapter One

Introduction

1.1 Research Site

Kiambu District is situated in Central Province of Kenya, and it is bordered by Nairobi Province and Kajiado District to the south, Thika and Machakos districts to the east, Murang'a and Nyandarua districts to the north and Nakuru District to the west. Kiambu used to comprise seven administrative divisions but two (Thika and Gatundu) were hived off to form part of Thika District in 1995. It now comprises five divisions, namely: Kiambaa, Limuru, Lari, Githunguri and Kikuyu. Vital statistics for the district are as follows:

General Statistics

Total area	1,458.3 sq. km
Agricultural land	1,422 sq.km
Population	768,175
No. of households	128,000
No. of farm families	105,175
Average family size	6
Average farm size	8 ha
No. of divisions	5
No. of locations	32
No. of sub-locations	105

Source: District Agricultural Office, July 1999
Population and related figures are projected from the 1989 census.

1.1.1 People

According to the 1989 census projections, the population of Kiambu is 768,175 people in 128,000 households that average 4.3 residents (GoK, 1994). This was lower than projected by the Central Bureau of Statistics (CBS) in 1980 - 2000 (GoK, 1980). Reasons for this may include a lowered birth-rate, migration due to population pressure on land, as well as normal rural-urban migration in search of jobs. Since Nairobi is generally less than an hour's journey away, rural-urban migration is relatively easy for Kiambu natives.

Roughly half the population in Kiambu is female, and roughly half again is under 15 years of age. The majority of people are members of the Kikuyu ethnic group, who as a result of agricultural activities in prime farmlands, and proximity to Nairobi (jobs, and access to domestic and international markets), have achieved a relatively high standard of living (Kershaw, 1976).

1.1.2 Climate

Rainfall in Kiambu ranges from an average of 1,466 mm in Kamae to 753 mm in Ruiru (Jaetzol and Schmidt, 1984). It is reliable in 6 out of 10 years with low years experiencing about 60% of the above figures.

However, casual observation suggests that the environment is changing for the worse as evidenced by the denuding of vegetation, particularly trees, as well as other climatic manifestations. These include: upward changes in temperatures; more frequent dry spells; and according to extension service personnel (Ngugi et al., 1982; Gichuki, 1999) over the last two decades, the air has changed from misty (thick fog in some seasons) to dry air. It is predicted that in the next decade, farmers in some of the previously most productive parts of Kiambu, such as Githunguri, will have to resort to irrigation. It appears that formerly prime farmland that was formally classed as zone 1 and 11 may be in the process of changing to zone 11 and 111 and perhaps worse.

1.1.3 Soils

Soils in Kiambu range from moderately fertile to highly fertile dark red clay, volcanic, weathered and dark brown loams (Jaetzol and Schmidt, 1984). In general, the uplands to the west are very fertile while fertility declines towards the east. But as mentioned in 1.1.2, as the environment degrades, it is likely that the soils are similarly being degraded.

1.1.4 Agriculture

The combination of good soils, suitable climate, well developed (if decaying) infrastructure and the proximity to the most important capital city in the region has all served to make Kiambu the most lucrative farming district in the country (Jaetzol and Schmidt, 1984). Farms range from less than 0.3 ha to large plantations of well over 1,000 ha. Over 90% of the total rural land mass is suitable for farming, which heightens the competitive edge Kiambu farmers enjoy over those in less well-endowed districts. However, this situation is probably in a state of change as: rapidly declining soils increasingly require special treatment in the form of organic manure, chemical fertilizers and pH balancing and conservation measures; rainfall is less predictable with more frequent crop failures; and the environment is changing as the area is built up, the natural vegetation denuded and the natural balance is upset. Agricultural activity has a major new competitor in the form of real estate as housing, trading centres and shopping malls offer more reliable dividends to investment than farming.

Horticulture, the growth industry of the last two decades appears capable of out-earning tea and coffee – the traditional cash crops of this region – but it is unlikely that tea and coffee will seriously decline in importance in the foreseeable future, despite serious problems such as global price fluctuations, unstable institutions, rising production costs, labour problems, and so on. Other agricultural activities include dairy farming, and growing of pyrethrum and subsistence crops such as maize, beans and locally consumed vegetables.

1.1.5 Agricultural Development and Growth

In the first decade after independence, agriculture experienced an average annual growth rate of 4.7% (FAO, 1992) mostly caused by expansion in cultivated areas as well as yield increases. Cropped land expanded by about 20% during this decade, alongside advances in agricultural technology such as high-yielding crop varieties that increased small-holder yields by between 47% and 300% (World Bank, 1986). At the same time, official prices were remunerative, while policies focused attention on extension, credit and input delivery systems that met smallholder needs. Agriculture also benefited from the maintenance of a consistent set of policies, stable institutions, marketing systems as well as a conducive macro-economic system.

However, agricultural growth slowed after 1972 to an average annual rate of 3.7% during the 70s and 3% during the 80s, led by a decline in food crops. Reasons for this decline include both exogenous and policy-related factors such as: shortage of arable land; lack of technical innovations; decline in world commodity prices (especially coffee); un-remunerative official prices; erratic price adjustments; decline in private and public investment; and the decline of essential agricultural services including extension, credit research, inputs, etc. Increasingly, the public sector was unable to manage its marketing and pricing role.

This trend worsened during the 1990s compounded by the fact that Kenya's population has almost quadrupled since independence, while the 20% of her land mass that is fertile has become overpopulated and overstretched agriculturally.

Kiambu, which forms part of that limited fertile landmass, has suffered from the same problems of population pressure, environmental degradation, and slow down in agricultural growth. At the end of the 1990s, Kenya's food security and economic well being were clearly threatened, necessitating urgent and multi-lateral action.

Within that context, this study attempts to look into ways of correcting any imbalances that may hinder improvement in production, by addressing the issue of the effects of transfer of agricultural technology on gender roles within rural communities.

1.1.6 Tea and Coffee Production

In Kenya, smallholders produce 70% of the tea (FAO, 1992). Tea, coffee and horticultural crops are the country's most important export commodities forming a significant part of her foreign exchange earnings.

In Kiambu, smallholders have 5,598 ha under coffee compared to plantations which have 9,794 ha. Similarly, smallholders have 7,147 ha under tea (GoK, 1998), compared to plantations which have 3,100 ha ((Jaetzol and Schmidt, 1985). Tea and coffee earned smallholders in the district Ksh. 76,111,230/- and Ksh. 1,705,463,354/91 respectively in 1997 (GoK, 1998). For the purposes of this study, acreage under both crops range from fractions of a hectare to medium sized cropping (up to 20 ha) among the smallholders.

However, official statistics and casual observation suggest that in the case of coffee, production is declining among smallholders despite improved prices over the last decade, raising questions as to why. Available literature and casual observation also suggest that glaring inequalities between the sexes and among other social strata have developed alongside the success of these two crops.

This implies that unless these inequalities are addressed, tea production among smallholders could also start to decline.

1.2 Statement of the Problem

A casual look through government reports and available literature reveals that tea and coffee production in Kenya initially recorded spectacular success among the usually luckless smallholders, and became a way of life over the last 40 to 50 years. Over the last decade, however, coffee production has declined while largely maintaining its position as a viable enterprise for smallholders.

Typically, the people in Kiambu District were traditionally agrarian, with farming historically carried out by women (Kenyatta, 1937; Hay and Stichter, 1984; White, 1984). The switch from subsistence to commercial farming did not change this in essence, but it necessitated the adoption of entire packages of agricultural technology, to ensure the success that followed.

Whereas ample information exists on technical, economic and legal aspects of tea and coffee production in Kenya, the effect of technology transfer on gender roles in such communities has hardly been addressed.

Reasons for this lack of information include the fact that development programmes are aimed at the total rural population and not at a particular sex or other social strata, and are therefore evaluated as such. Further, the unit of analysis is usually the household with the assumption that male heads of households are the principal decision-makers, and sources of information (Feldstein, Poats, Cloud and Norem, 1989). This ignores the specific skills, resources and priorities of adult women, senior men, and the young, that is, well over half the system in which decisions about farming are made. Yet, the application of gender analysis would help make researchers aware of the variety of constraints that must be overcome if the needs of farm families are to be met (*ibid*).

Because expanding technological capacity is the obvious way to achieve development in agriculture, it is of utmost importance to ensure that the technologies developed in agricultural research do not benefit some groups within the community at the expense of others. However, there is evidence that while such technological improvements may improve family welfare in the short term, in the long term they are often disadvantageous to women (Feldstein, Flora and Poats, 1989). Most likely, this is the case for other groups within communities. Appropriateness of technology is often gender-specific, based on the social context of who within the household actually uses it. If, for example, new technologies benefit men at the expense of women, they will not only create unacceptable economic and social differentials, but they will ultimately be rejected.

It therefore makes sense to assess the effect that agricultural technology has had on gender roles, to gauge if benefits are mutual among men, women and other social strata; as well as the overall effect on the welfare of communities, and the country as a whole. Then, where inequalities are detected, policy makers, extension personnel and other interested parties may be advised so that they can make adjustments accordingly. This was the aim of this study.

1.3 Research Objectives

The main objective of this study was to assess the impact of the adoption of an entire package of technology on gender roles within the farming communities, with the intent of determining any imbalances that need to be addressed. In this case, the package of technology under study is that embodied in the production of two cash crops – tea and coffee, and the community under study is smallholder farmers in Kiambu District, Kenya.

1.3.1 Specific Objectives

The specific objectives were as follows:

- 1) To determine whether the adoption of technology embodied in tea and coffee production has affected the socio-economic status of males and females in the area of study.
- 2) To determine the extent that the adoption of the technology embodied in tea and coffee production has affected division of labour along gender lines in the area of study.
- 3) To examine the extent to which extension and other support services for this package of technology are gender sensitive within the area of study.

1.4 Justification

The results of this study should be useful to researchers by assisting in the development of technologies that benefit entire households and communities rather than giving advantage to some subsections within these units while at the same time being disadvantageous to others. This necessitates greater focus on the needs of technology users to ensure they all benefit; which was a main aim of this study. Such information may help planners to formulate gender-sensitive policies in the future with a view to incorporating all members of households in any benefits that may accrue from agricultural development. Such policies may succeed not only in increasing and streamlining production but also in improving the gender status, which could positively affect over six million Kenyans whose livelihoods depend directly or indirectly on tea and coffee (GoK, 1997), as well as other Kenyans who depend on various other cash crops.

This study is also of interest to agricultural personnel who diffuse innovations and oversee production of these crops, as well as lawmakers in their ongoing task of reviewing and updating the legal framework in Kenya governing production in all sectors, including agriculture.

1.5 Assumptions

- 1) This study assumed that the agricultural technology in question (see description in 1.7) has been largely adopted as prescribed.
- 2) Although every precaution was taken during the survey to ensure veracity, it has been assumed that the responses given by interviewees are a true representation of the facts and of their opinions.

1.6 Limitations of the Study

As anticipated, finances were less than adequate, and at the same time a concerted attempt was made to complete this body of work in three years. Financial and time considerations necessitated fewer field staff than desired as well as limiting travel and other activities. However, despite these limitations, the researcher endeavoured to obtain data that is satisfactory both in quantity and quality.

1.7 Definition of Terms

Agricultural Technology

Agricultural technology may be defined as the 'specialised knowledge, skills and techniques' (Kaindeh, 1995) required in the production of agro goods and services. The technology embodied in worthwhile tea and coffee production is necessarily a package that embodies the timely and proper (recommended) use of improved farming practices such as soil conservation; land preparation; weeding, pruning, quality inputs such as properly constituted fertilisers and pesticides; modern farm equipment, harvesting and post harvest techniques. Both crops require more intensive labour than most other crops.

Gender

Gender issues refer to differentials among the sexes and age groups within communities. In most parts of the world, technological innovation has tended to disadvantage women relative to men (Feldstein, Flora and Poats, 1989), and the benefits also tend to have an age bias. For example, farm mechanisation is too often advantageous to males through easier tasks while at the same time disadvantageous to females through increased workloads. Further, benefits such as improved earnings will usually go to males directly but only indirectly seep to females. This is particularly pronounced in but not restricted to developing countries. However, women differ from one another in socio-economic behaviour depending on the presence of husbands, class and stage in life cycle.

Tea

Thea: Camellia sinensis, Family: Teaceae. Tea, like coffee is a beverage prized for the stimulant effects of the caffeine it contains. The exact origin of the tea plant is unknown but tea has been cultivated in China for over 4,000 years. It became popular in Europe in the 17th century. Tea is made from young leaves of the tea plant, a tropical broad-leafed evergreen that could reach 15 m if not pruned. It requires moist environments where annual rainfall is at least 1,500 cm and temperatures are between 21°C and 32°C. The best tea-growing locations are Assam (NE India) and Ceylon (Sri Lanka) which together account for over half the world's production. Other important producers include China, Japan, Indonesia and Kenya (Janick 1974; EIU, 1999; GoK, 1999).

Coffee

Coffea arabica, Family: Rubiaceae. Coffee is indigenous to Africa but has been introduced throughout the world wherever climate permits. It is grown from sea level to about 3,500 m. It thrives in mean temperatures of 20°C or higher and requires 1,000 to 1,700 cm of rain annually and well-drained

soils. Coffee became popular as a beverage during the 18th century, although there is evidence that the berry served as a stimulant and was 'medicinal' much earlier in the tribal culture of the Near East. Today, it is one of the leading international agricultural commodities. The beverage is processed from the hard seed of the fruit. About a quarter of the world's production comes from Brazil. Columbia is the next most important producer followed by several African countries including Kenya, Ivory Coast, Uganda and Ethiopia (Janick 1974; EIU, 1999; GoK, 1999).

Matatu

Public service vehicles of the semi-formal transport sector, usually 18 person capacity vans or larger capacity mini buses.

Debe

A bucket measure about an eighth ($\frac{1}{8}$) of a 90 kg bag.

Baraza

Routine public meetings regularly held by the local administration in an area. They are usually convened by the chief or sometimes a District Officer (DO). Chiefs and DOs head administrative locations and divisions respectively.

Chapter Two

Research Literature

2.1 Theoretical Orientation

This study draws from four main theoretical fields of study, women in development, gender and development, and gender and technology. It also draws from development theory which is widely subscribed to, and underlies most of the dealings of the developed world with the developing world, assuming that less developed countries can gradually but steadily be helped to achieve political and economic systems similar to those in the industrialised world (Escobar, 1997). This process can be gauged from:

“conditions that were supposed to characterise the more economically advantageous nations of the world – industrialisation, high degrees of urbanisation and education, technification of agriculture, and widespread adoption of the values and principles of modernity, including particular forms of order, rationality and individual-orientation” (Escobar, 1997: 497)

The “problem of development” was considered as one of bringing “backward” colonial people into the modern developed world. It was largely tackled by insights drawn from the neo-classical economists stressing econocentric and technocentric biases (Cernea, 1995). Models were duly developed (Rostow, 1960) explaining the “how” of development. As development experts searched for technology and capital -intensive ways by which to bring Third World countries to the “take-off” stage, they originally favoured the top-down, economically-oriented approach but by the mid-70s the emphasis shifted to the problem of “poverty” and how to solve it. Consequently, the major development agencies such as the World Bank, announced a shift in policy towards the “poverty-oriented” programming. Attention thus turned to the Third World “poor people” particularly “the rural poor”. The overt ideology became one of “putting people first” (Cernea, ed. 1985). The idea was that henceforth development projects would be socially relevant and culturally appropriate, and would involve the direct beneficiaries in a significant way. In this climate, the women and development school of thought evolved.

2.2 Women and Development

Studies on women originated in feminism but by the 1970s, feminism and development studies began to intersect. Prior to this, women were either “invisible” or they were considered an impediment to development, that is, tradition-bound and unwilling or unable to enter the modern period (De

Groot, 1991). Early development theory and practice accepted these assumptions uncritically, which meant that in the 1950s and 1960s, women were ignored in favour of men who were thought to be more progressively oriented. It was assumed that once the modernisation process had been set in motion, the women would be forced to adopt a more progressive stance.

By the late 60s, when early hopes for economic take-off were fading, women economists began to reconsider the issue of women. In her landmark study, "Women's Role in Economic Development", Ester Boserup (1970) showed that many development projects, rather than improving the lives of Third World women, had often deprived them of economic opportunities and status. Modernisation had displaced them from their traditional functions, particularly in agriculture, where they had played a crucial role in food production. Boserup's (1970) work inspired a new sub-field of development, Women in Development (WID). Pioneers in this field called for integrating women who were often marginalized, into the centre of male power structures, so that they could obtain a more equal share of the benefits of development. They advocated incorporating women into the decision-making and planning circles of the development machinery, so as to improve access for women to the benefits of development such as education, employment, land and credit.

The general shift towards poverty-oriented programmes enhanced the WID perspective, because women were regarded the "poorest of the poor" so that it gradually became adopted by development agencies. Thus women became a central concern of policy makers and development planners, and this culminated in the United Nations Declaration of 1976-1985 as the "Decade for the Advancement of Women". It was inaugurated by a world meeting in Mexico and concluded by a meeting in Nairobi, Kenya.

Meanwhile the 1970s saw the growing criticisms by Third World economists such as Andre Gunder Frank (1978), and Samir Amin (1974) who advocated Third World disengagement and self-reliance, blaming the development machinery of the developed world itself for the under-development of the Third World. The call for "self-reliant development free from the self-interest 'assistance' of capitalist elites and their indigenous henchmen" (Parpat, 1995), found listeners among feminists concerned with development and at the same time influenced by the radical feminist critique of patriarchy (Gilligan, 1982). This trend inspired a new approach called Women and Development (WAD), which suggested that since the attempt to bring women from the margins to the centre had not been effective enough, it would be better to focus on women as a separate group. This approach called for small-scale women-only projects that were designed to avoid male domination, both metropolitan and indigenous. Therefore while Women *in* Development called for the equal incorporation of women into the development process, Women *and* Development called for setting a separate development process for women. The latter found considerable support in non-governmental organisations (NGOs) and influenced many NGO activities. This set the stage for the development of Gender and Development (GAD).

2.3 Gender and Development

The concept of gender advanced the insight that womanhood is not simply a matter of sex in the naturalistic, biological sense but rather the cultural and social meanings which are attached to the female sex, and which can and do change from culture to culture, and from period to period.

“Gender” as a concept advances the notion that neither men nor women can be approached separately, yet the differences between them cannot be ignored. The GAD school maintains that both men and women must be approached, but in full knowledge of, and sensitivity to, the difference between them. This school also recognises that differences exist between age groups which must likewise be taken into account if development programmes are to succeed. Thus GAD differs from WAD in that it does not advocate addressing women because they have been neglected. Rather, GAD is for addressing both men and women, and paying attention to gender differences because society is gendered, and such differences are critical for understanding most, if not all aspects of society.

Thus, tracing its roots to Boserup’s (1970) work, research turned to the culturally-constituted division of labour between the genders in the targeted “undeveloped” areas: what men and women respectively do; what access to technology they respectively have; what technology they respectively used in agricultural production; what part they respectively have in decision-making, and so on. For example, Feldstein et al. (1989), Rao et al. (1991), and Overholt et al. (1985), advanced a gender-analysis framework for gathering gender sensitive data on agricultural production. The need for it was amplified by studies, following on from Boserup’s work, such as those of Staudt (1977), Pala (1980) and Ventura-Dias (1985), who argued for a strict gender division of labour in Africa. GAD had considerable influence in the developing world, and gender sensitivity became a requirement for general projects and programmes, as development institutions added gender analysis training to established WID programmes.

Meanwhile feminism was also developing as well as making new inroads into development studies. From the beginning the feminist critique had argued that the notion of women as a sex had always been defined by men as “other” to themselves within the concept of a male/female dyad. But over time criticism arose within the feminist camp among minority groups such as black and native women in North America, that this concern with women otherwise ignored the differences among women themselves (Gilligan, 1982; Spelman, 1990). The feminist body of work was grounded in generalisations drawn from the experiences of middle-class women in the North, and it consequently ignored race, and class differences within the female sex. The impact of these arguments on development studies was the criticism of sweeping generalisations about Third World women, and it encouraged study of the differences within this category. Many studies consequently became concerned with “class within gender” differences paying attention to women, but distinguishing women of different classes (Ahmed, 1985, Whitehead, 1985). Some writers concentrated on “social position within gender” differences regarding gender, distinguishing women in different types of households, especially female-headed, female-operated and male-headed households (Ventura-Dias, 1985, Paterson, 1980).

This research is anchored in the latter tradition, with its roots in the GAD tradition. It also entertains sensitivities and awareness stemming from the work of feminists from the South who have rejected the projection of Third World women as uniformly poor, powerless and vulnerable, while reinforcing the image of Western women as modern, educated and liberated (Mohanty, 1988). They doubted the ability of women from the North (who assumed global feminist solidarity, *and* considered themselves as experts on gender and development matters) to analyse and solve the problems of women in the Third World. Subsequent discussions culminated in the emphasis of the importance

of listening to and learning from women's diverse experiences and knowledge, and of maintaining commitment to long-range strategies dedicated to breaking down the structures of inequality among genders, classes and nations.

2.4 Agricultural Technology and Gender

This research sought to assess whether the "successful" transfer of agricultural technology benefits both sexes and different age-groups equitably. First a technology index was developed for both crops and used to gauge how successful the transfer had been. Then the researcher attempted to assess whether any benefits accruing from this technology trickled to women and the younger age groups, particularly those who were adult but not yet in possession of the family farm unit.

Kaindeh (1995) defines technology as the specialised knowledge, skills and techniques required in the production of goods and services. Using the Technology Atlas Project Team's (1987) analysis, agricultural technology can be embodied in people, tools, practices and equipment.

According to the Technology Atlas Team (*ibid*), technology can be desegregated into four totally interlocking embodiment forms:

1. Object embodiment form or "technoware" – tools, capital goods, intermediary goods, products, physical equipment, machinery, physical processes, etc. The impact of the adoption of cash crop technology on choice and source of technology was assessed.
2. People embodied form or "humanware" – understanding, capacity for systematic application of knowledge, know-how, human capability, human labour, specialised ideas, skills, problem solving capacity, etc. The impact of the development of cash crops farming on the technological capabilities of this community was studied.
3. Document embodied form or "infoware" – knowledge about physical relationships, scientific and/or other organised knowledge, principles of physical and social phenomena, technical information, specifications, standards, computer software, etc. The focus here will be on the development of accessibility to technological information.
4. Institution embodied form or "orgaware" – organisational work assignment, day-to-day operation of production, social arrangements, means of using and controlling factors of production, organisation of products, processes, tools and devices for use by people. The focus here will be these farmers' ability to organise the technological capability at their disposal.

Kaindeh (1995) says that a farmer is considered to have adopted technology if they use it to any extent. He goes on to define technological capability as "the ability to harness reason and scientific knowledge to solve particular problems". This usually involves the ability to:

- identify the problem
- identify the most relevant technology
- acquire the technology on the best possible terms
- assimilate the technology
- modify and adopt the technology to suit the local situation (i.e. develop an indigenous technology).

Technology is essentially for the development of technological capability. Those who acquire technological capability can engage in technical change or innovation. In the case of small-scale farmers this would include minor and major modifications of the technology to suit their environments. As farmers become more familiar with a new technology they will alter inputs or other components to exploit its advantages. They learn the various outcomes associated with various decisions linked to technology. Such changes (multiple simultaneous innovations) can be complex and variable over time and space. Once farmers have internalised the technology, they can modify it to suit their own needs, that is, they can effect technological change proving that they have acquired technological capability.

Collingbridge contended in 1981 that technical competence vastly exceeds understanding of the social effects of technology and went on to agree with Marstrand's (1979) comments on the shortcomings of the green revolution to the effect that "unless governments deliberately counteract the tendency of new technology to increase inequalities among groups in society, such introductions may increase food production but will not prevent malnutrition or even famine".

Stamp (1995) develops on this theme, and starts by quoting Chinua Achebe who in 1983 noted that "technology is a state of mind not an assemblage of artefacts". She goes on to say that the last 25 years have proved the wisdom of that sentiment, as the massive transfer of technology both as artefact and information has often been accompanied by misuse, misallocation or misunderstanding in recipient countries. In particular, it has generated negative consequences for women, children and communities – nowhere more so than in Africa (ibid).

Stamp (1995) believes that the reason for these problems probably lies in the fact that unlike what happened in the West, technology has been "forced" on Africa. In the Developed World, new technology has usually arisen from the political and economic needs of a particular era of development in a particular society. It is now widely recognised that since women constitute half of humanity, it follows that gender relations are as fundamental a shaping force in society as economic relations or political structure.

Stamp (1985) poses a key question: "Is the outcome envisaged (in technology transfer) really development? Unless the women and children are unequivocally served, society itself has not been served". In Africa, agriculture, health and nutrition are primarily the responsibility of women. Therefore, successful technology transfers in these fields are those that empower women, strengthening rather than weakening their community involvement and their decision-making authority in the family and the community. However, too often the reverse has been true with profoundly negative consequences. Rather than the desired effect, new technology often has the following effects on African women: (i) increased workloads; (ii) a more subordinate position within the family; (iii) attenuated communal life with other women; and (iv) lost rights to resources. These circumstances necessarily compromise women's abilities to fulfil their traditional production, health and nutrition responsibilities, as well as their new development-linked responsibilities.

This may well be the reason that planning efforts supported by development agencies have so often failed. Attempts to sensitise planners to increase women's participation has not yielded significant results whereas training women for local-level decision making and planning has had surprisingly quick and strong impact (ibid).

Raeburn (1984) pointed out that the quality of decision making depends on how well equipped an individual is. Economic and technical decisions which have to be made concerning farming include choice of enterprise, quantum, factor proportions, level of investment, use of credit vs. savings, level and source of factor purchase, and timing. Some of these decisions are long term and not easily reversible, and quite often, major decisions cannot be made by women because of cultural, religious, legal and educational reasons, among others.

Norton and Alwang (1993) acknowledge technological progress to be one of the sources of economic growth, alongside labour availability, natural resources, capital accumulation, scale and specialisation, and efficiency improvements. They take note of the fact that women play the greatest role in farming in Africa due to culture and male outmigration, yet this female employment is largely “invisible” and has led to policies that at best ignore women, and at worst affects them adversely. Determinants of the role of women in agriculture (social, cultural off-farm job activities, colonial history, etc.) change over time and thus change the role of women. However, even if new technology is gender neutral, females usually experience inadequate access to credit due to lack of collateral or even mere prejudice, which tends to make many new technologies gender-biased.

2.5 Gender Analysis

Mullings (1976) used Engel’s perspective to analyse gender relations thus: “equality derives from all members of society having the same relationship to the resources of society, particularly the means of production. Inequality occurs when such resources are appropriated by particular strata of society as “private property”.

Mullings (1976) describes the inequality as different access and rights to the means of production or resources of society. This is in contrast to asymmetry where access to means of production may be equal but where men and women may not have access to the same roles and status, and sex roles may be differentially evaluated, that is, distribution of resources may be egalitarian but males may have formal control over distribution, which means female roles are often underestimated.

Mullings (1976) notes that division of labour occurred earliest along gender lines when in hunting and gathering societies, men hunted while women practised hoe agriculture. However, even when agriculture comprised most of a society’s welfare, female roles were underplayed.

Feldstein, Flora and Poats (1989) state five basic facts about gender and agriculture namely:

1. Many households in developing countries have different income streams – his and hers with different sources and different destinations within the household.
2. Even when there are wholly separate income streams, there are socially assigned differences in men’s and women’s roles and resources.
3. Increasing household income does not benefit all members equally.
4. In most parts of the world, technological innovation has tended to disadvantage women relative to men.
5. Women farmers are as productive as male farmers when given access to similar resources.

Feldstein et al. (1989) go on to formulate the goal of agricultural research as “development of technologies that farmers will use to improve their welfare and that of their country”. They contend

that technologies must improve farm family welfare in the long run, rather than just in the short run as is often the case. For example, technologies should not ease tasks for males while they disadvantage females through greater workloads as often happens in farm mechanisation. They also point out that “the appropriateness of a technology is frequently gender-specific based on the social context of who within the household uses it”.

Feldstein et al. (1989) further analyse patterns of gender responsibility to range from separate enterprises, to separate fields, to separate tasks, to shared tasks, to women managed farms. Regarding the women-managed farms, they cite Cloud’s observation that many Kenyan women manage farms during the week (*de facto* system) while their husbands work in the cities. On the other hand, *de jure* (legal) female-headed households are rapidly increasing, but they tend to be among the poorest farming households with few resources and severe labour constraints.

Implications for research abound such as: research on both male and female crops; on-farm trials under both his and her conditions; analysis of the effects of technologies on level and timing of male and female tasks; as well as evaluating any increase in task against benefits, effects of technology on separate tasks and evaluating the availability of resources necessary for technology adoption on these types of farms.

Feldstein et al. (1989) further point out that women differ from one another in socio-economic behaviour depending on the presence of husbands, class and stage in life-cycle, among other things.

2.6 The Kikuyu People

According to Jomo Kenyatta (1937), historically among the Kikuyu, both women and men traditionally performed agricultural activities, although labour was divided along gender lines. For example, men cleared virgin land while women did the actual cultivation. Crops were also divided between the sexes, with men growing sugar cane, bananas, yams and sweet potatoes while women grew maize, millet, beans and potatoes. However, several factors including polygamy and warfare ensured that women did the lion’s share of agricultural production, on top of their household and community duties. Kenyatta (1937) asserts that each woman had complete control over her agricultural production (as long as she provided for her family), and could dispose of her surplus as she pleased, that is, she could give it away, or sell it to pay hut taxes, or buy other goods, or even turn it over to her husband for the purchase of livestock. This implies that women were not allowed to own livestock – which represented a much-valued stock of wealth.

White (1984) adds that Kikuyu women traditionally worked on their own gardens as well as those allocated to men. Both White (1984) and Kenyatta (1937) agree that men made all major decisions concerning social, political and legal affairs, which necessarily includes all major decisions concerning agricultural production.

Kershaw (1975) contends that Kikuyu women tend to perform the role of “farm manager” for their spouses, often having influence but no authority. Kershaw (1975) contends that “they have been reduced to a position of second- in- command”.

White (1984) argues that while labour migration and rural poverty have increased women’s workloads, they have also increased the options under female control. White contends that among

the poor and landless Kikuyu in Kiambu, women routinely seek wage labour on top of cultivating subsistence crops on hired, borrowed or illegally occupied land.

These women not only supplement their husbands' incomes – even though the men generally resent it despite being unable to manage without wifely incomes – but they are also often the main source of financial support within the household. On the other hand, the more affluent land-owning Kikuyu grow cash crops which men control. Cash crops have perpetuated the wealth of this landed class over the decades, enabling hired labour and high standards of living. However, the women have paid a high price for this affluence by losing much of their economic independence. In real terms, women in the landless class have greater economic independence.

2.7 General Statistics

The importance of tea and coffee to Kenya's economy can be illustrated by the fact that together with horticulture they constitute over half of Kenya's total export earnings from trade (Republic of Kenya, 1999; EIU, 1999). They also exceed the earnings from tourism which is the other major foreign exchange earner in Kenya.

Table 1: Foreign trade in goods – 1998 (K million pounds)

Tea	1,649
Horticulture	747
Coffee	641
Petroleum products	456
Cement	72
Total	6,059

Source: Economic Intelligence Unit, 1999

Tourism earned Kenya 875 million pounds in 1998, a figure which has declined by 30% since 1995.

Farming (together with forestry and fishing) accounts for 26% of the GDP, 18% of employment in the formal sector, while it remains the main source of employment in the informal sector (EIU, 1999). Almost half of all agricultural output is for subsistence and is not marketed. Tea, coffee and horticultural produce provided 53% merchandise export revenue in 1998.

In 1999, Kenya produced 248,820 metric tonnes of tea which earned 1.49 billion K pounds, while coffee production came in at 64,293 metric tonnes which in turn earned 514 million K pounds.

According to the Ministry of Agriculture's annual report in 1998, Kiambu produced 3,245.2 metric tonnes of clean coffee as well as 544.8 metric tonnes of clean *mbuni* which earned Ksh 105.4 million. Tea production stood at 76,185.4 metric tonnes which earned a total of Ksh 1.7 billion. Hectarage under tea and coffee are as follows:

Table 2: Hectarage under coffee

Division	Small holder(ha)	Estates(ha)	Total
Githunguri	4364	-	4364
Kiambaa	1225	5764	7019
Kikuyu	9	-	9
Total	5598	5794	11392

Source: Republic of Kenya, Ministry of Agriculture, 1998

Table 3: Hectarage under tea

Division	Small holder(ha)	No. of Growers
Gatundu	3967.41	10180
Lari	1525.59	5018
Githunguri	1698.98	3909
Limuru	153.23	286
Total	7345.21	19393

Source: Republic of Kenya, Ministry of Agriculture, 1998

Tea production has grown tremendously to the extent that Kenya is now the World's leading supplier of black teas. Despite relatively low prices in the world markets, revenue from tea has expanded rapidly over the 90s, culminating in a record production during the El Nino rains of 1997/1998 of 264,000 tonnes (EIU, 2000).

In contrast, coffee production has declined dramatically over the last decade, registering a 50% drop since 1990. High domestic taxes, low world prices and better returns on other crops have all contributed to the collapse. The El Nino rains had a disastrous effect on coffee production bringing it down to a record low of 52,000 tonnes (EIU, 2000).

2.7.1 Development of Tea and Coffee Production in Kenya

The British Government began active intervention in East Africa in the 1870s to protect trade routes to Uganda and took over direct responsibility for administering the territory in 1893 – a move which led to a frantic search for ways of generating sufficient tax revenues, and stimulating trade so that the territory could become self-financing (Smith, 1976; Brett, 1973). This situation was made urgent by the decision to build a railway from the Coast to Kisumu on Lake Victoria. Many tribes in Kenya already practised crop agriculture although abundant land encouraged shifting agriculture with new land being settled as populations expanded. Pastoralist tribes moved their herds around recognised clan or tribal lands. All tribes engaged in the trading of crops and livestock with each other, as well as with traders coming up from the coast. Unfortunately, during the crucial time in the 1890s when decisions were being made which were to affect the long-term future of indigenous agriculture, the Kikuyu, Kamba and Maasai were all badly disorganised as a result of a series of famines, epidemics and cattle diseases. Thus, the British imposed direct rule on Kenya territory (as opposed to indirect rule in Uganda where a centralised and stable government already existed, raising hopes of increased

trade through expansion), and plantation and settler agriculture began to be viewed as a serious proposition.

From the turn of the 19th century to the early 1930s, agricultural development policy was settler oriented and African agriculture was largely ignored (Smith, 1976). From the early 30s to the mid-50s, settler interests still dominated the formation of agricultural policy although increasing attention was paid to African agriculture. The Second World War increased the demand for food which brought prosperity to the agricultural sector after the depression years and signalled the start of a continuous expansion of the sector which was to last until the 1960 Lancaster House announcement of self-government.

Before the war, most of the emphasis for African agriculture was on the development of good husbandry in a narrow technical sense. During the war African agriculture was called upon to increase production, but it was not until the mid-50s that sufficient economic incentives were provided to initiate a major and sustained increase in African agricultural output. The most important of these incentives were probably the removal of restrictions on the production and marketing of cash crops including tea and coffee, and dairy products; as well as increased access to certain resources, which had been until then, the exclusive preserve of European settlers.

Independence itself brought little change in overall strategy other than a partial redistribution of land in the former scheduled areas. By the late 60s to early 70s, agricultural development policy hesitantly started a broadly based development strategy involving a much larger proportion of the farmers in all parts of the country as compared to previous phases. (However, in all the phases, policy initiatives have reflected the interests of pressure groups dominating policy making. Interestingly, some of these views became elevated to conventional wisdom, and thus not only survived but continue to affect policy).

2.8 General Information

The importance of tea and coffee to Kenya's economy can be further illustrated by the fact that together they constitute over half of Kenya's total export earnings and over 70% of Kenya's total agricultural export earnings (Economic Survey, 1994). They also exceed the earnings from tourism which is the other major foreign exchange earning industry in Kenya. According to the Ministry of Agriculture's annual report (1992) Kiambu produced 34,500 tonnes of coffee which earned 85.163 million K Pounds (US\$ 51.8 m). A total of 51,087 tonnes of tea were produced which earned a total of 121,125 million K Pounds (US\$ 73.4m). About 5,000 ha of tea is farmed by small-scale holders (Farm Management Handbook, 1983) while 3,100 ha is farmed on large plantations.

Tea is grown in Gatundu, Lari, Githunguri and Limuru divisions. Coffee on the other hand is grown in Kiambu, Kikuyu and Thika divisions (Annual Report, Kiambu, 1993). Small holders control 3,100 ha while the plantations account for 16,000 ha under coffee.

Chapter Three

Research Methodology

3.1 Unit of Study

The unit of study was the farm household which refers to a group of people living together, contributing in a drawing from a common source (Chambers, 1967). The farm household is a suitable unit of analysis because it is the centre of agricultural activity and the main respondents – men and women – are found within it.

3.2 Data Collection Tools

The data collection methods employed in this study were as follows:

- a) A survey instrument administered in the form of interviews. The survey was structured, that is, each respondent went through the same experience, to facilitate comparable data. There was an emphasis on gender analysis tools such as those developed by Feldstein et al. including calendars, activity analysis, tables and gender-specific questions. This made purposive sampling necessary. The questionnaires elicited information regarding background information, production activities, and division of labour, extension and post harvest activities. They were administered by research assistants and the principal researcher.
- b) The Key Informant technique was utilised in each division sampled to elicit information that was not possible to obtain with the questionnaire. More detailed information regarding time dimension, actual vs. perceived gender realities, the workings of local collection points and relevant organisations, etc. was elicited by the principal researcher and a research assistant. Key informants included Ministry of Agriculture personnel, local administration personnel, co-operative union officials and selected male and female farmers. This data was collected by the principal researcher.
- c) Direct observation was used to record actual rather than idealised gender behaviour. This served to validate the survey. Activities observed this way included farm operations, harvesting and factory operations.
- d) Focussed group discussions were held in each community sampled to obtain in-depth information and validate the survey. These centred on gender dynamics, economic and social benefits vs. problems, perceived solutions and the way forward. They were conducted by the principal researcher and a research assistant.

3.3 Population and Sampling Techniques

The population under study consists of tea and coffee farmers in Kiambu District, Central Province of Kenya.

Kiambu District consists of six administrative divisions, three of which produce coffee while the other four divisions produce tea. These divisions are subdivided as follows:

Division	Main Cash Crop
Kiambaa	Coffee
Kikuyu	Coffee
Githunguri	Tea and Coffee
Limuru	Tea
Gatundu	Tea
Lari	Tea

The locations in Kiambu are further subdivided into a total of 142 sub-locations.

It was originally intended that for each division that grows coffee, three locations should be selected through stratified randomisation according to geographical positions, agro-ecological zones and farming activities. Likewise for each division that grows tea, three locations were to be selected in Limuru and Gatundu and two each in Lari and Githunguri using the same criteria.

3.4 Research Design

During the proposal writing stage it was intended that 306 farmers would be surveyed, and that roughly half the number of respondents would be coffee farmers while the other half would be tea farmers. But the reality on the ground negated this intention when the research team found that there were far more coffee farmers in the district than tea farmers so the researcher opted to reflect this in the sampling. The intended focus on locations also changed as it became evident that agro-ecological zones were greater determinants of which crop is grown where than geographical limitations.

In retrospect this was not surprising since tea requires higher agro-ecological zones than coffee, and more of the coffee-friendly zones are to be found in the district. Interestingly, several agricultural officers in the district expressed the opinion that the agro-ecological zones have been down grading slowly but surely over the last three decades, as population pressure puts strain on the natural environment, especially vegetative cover. Those who grew up in the district can remember colder, wetter, foggier weather that supported various crops, which can no longer grow in most parts of the district.

In the end this study surveyed 338 respondents in the district, 40% of whom were tea farmers while 60% were coffee farmers.

Table 4: Distribution by crop

Crop	No	Percentage
Tea	136	40.24
Coffee	202	59.76
Total	338	100

Source: Field Data

The intention had been to sample purposively along the number of locations in each division but this could not work in practice because some divisions registered heavy agricultural activity while others had very little especially with regard to these two crops.

For example, in Kikuyu Division which is a coffee growing area, there was very little coffee to be found because farmers have turned to other enterprises that bring about better returns.

Table 5: Distribution by division

Division	No	Percentage	Cumulative %
Lari	60	17.8	17.9
Githunguri	97	28.7	46.4
Gatundu	62	18.3	64.8
Limuru	19	5.6	70.4
Kikuyu	18	5.3	75.7
Kiambaa	82	24.3	100.0
Total	338	100.0	100.0

Source: Field Data

On the other hand some divisions registered a heavy presence of smallholders while others had relatively few. An example is Limuru, which is a tea growing area but most of the tea is under large plantations or estates such as those belonging to the Brook Bond Company. Smallholder tea farmers did exist but they were in the minority as most small-scale farmers seemed to prefer annual field crops, horticulture and livestock farming to tea. In these two divisions, the samples were necessarily small. Githunguri Division had the largest sample because both crops are grown there so there was a sample for both coffee and tea.

3.5 Data Analysis

Both inferential and descriptive statistical methods have been used to analyse the data collected. Statistics were broken down by gender to avoid distorting the knowledge base. In a few cases, correlation and regression were used for interpretation.

3.6 Complementary Activities

Complimentary activities for this study included:

1. The research assistants gained by undergoing training and experience in fieldwork. At least two went on to do further field work for other researchers.
2. The principal researcher gained by enhancing her data collection and analysis skills and by the fact that this body of work will form the basis for her PhD studies.
3. On completion of this project, workshops and seminars will be held for researchers, extension staff, and planners to disseminate information and formulate strategies for the future.

Intended outcomes include a report, a PhD dissertation, several papers and a book. The results will be disseminated to research institutions, the Ministry of Agriculture, university libraries and policy makers.

Chapter Four

Results and Analysis

4.0 Introduction

This chapter describes the data obtained through the field work. Some of the tables and diagrams are in the text while additional statistics can be found in Appendix II.

4.1 General Characteristics of the Respondents

Contrary to expectations almost twice as many males were found working in the farms (and therefore interviewed) as females. Literature, casual observation and conventional wisdom had led the researcher to expect farming in Central Province to be done mainly by women. Since this was something of a surprise, the researcher not only noted it but also made an effort to explore and explain it as will be seen later in this chapter.

Table 6: Sex distribution

Sex	No.	Percentage	Cumulative %
Female	122	36.1	36.1
Male-female	3	0.9	37.0
Male	213	63.0	100.0
Total	338	100.0	100.0

Source: Field Data

In three instances two respondents answered the questions together i.e. husbands and wives answering as a team. The researcher decided to treat this category separately because although it was not statistically significant, it was interesting to see whether joint answers differed substantially from those of single respondents.

Table 7: Divisions – tea

Division	No.	Percentage	Cumulative %
Lari	60	44.1	44.1
Githunguri	30	22.1	66.2
Gatundu	27	19.9	86.0
Limuru	19	14.0	100.0
Total	136	100.0	100.0

Source: Field Data

The research team found the strongest concentration of small scale farmers in Lari Division, therefore the largest sample came from Lari, and as shown in Table 7, the smallest concentration of small scale tea farmers was found in Limuru, and therefore the smallest sample came from that division. A total of 136 tea farmers were sampled who comprised twice as many men as women. Of these, there were two instances of husbands and wives answering the questions together.

Table 8: Divisions – coffee

Division	No.	Percentage	Cumulative %
Githunguri	67	33.2	33.2
Gatundu	35	17.3	50.5
Kikuyu	18	8.9	59.4
Kiambaa	82	40.6	100.00
Total	202	100.0	100.0

Source: Field Data

In the case of coffee, Kiambaa Division had the highest concentration of coffee followed by Githunguri. Kikuyu Division had the lowest concentration of coffee farmers. The samples reflected this.

The research team found significantly more men working on the farms than women, that is, 63% of the respondents were men as opposed to 36% women. The male-female ratio was slightly lower in the case of coffee with 62% of the respondents being male. When broken down by crops, the results showed almost twice as many men as women at home in the tea farms, while in the case of coffee this difference was not so wide, yet still striking. Thus the sample had significantly more men than women.

Table 9: Sex distribution (both groups)

Sex	Frequency	Percentage	Cumulative %
Female	122	36.1	36.1
Male-female	3	0.9	37.0
Male	213	63.0	100.0
Total	338	100.0	

Source: Field Data

This does not imply that the women were not at home, but rather that when the men were at home they were more likely to answer the questions than the women. And while the research team went out of its way to avoid gender bias during data collection, it cannot be denied that when both the man and woman of the house were at home it was more likely to be the man who answered the questions. In only three homesteads did a man and a woman answer questions jointly. Tea had two instances, while coffee had one. The researcher acknowledges that this could have inadvertently skewed the results in that a male respondent might view reality differently from a female respondent and vice versa, while a female respondent might not be entirely open to an outsider in the presence of her husband. However, every effort was made to avoid this, and to validate results through observation, the use of key informants as well as during group discussions.

4.1.1 Marital Status

When asked about marital status the overwhelming majority described themselves as married with 95% of the female respondents and 93% of the males making this assertion. Of the three joint male and female respondents, two were husband and wife, while one consisted of mother and son. The son was unmarried. When broken down for the two crops, the results for tea showed that 91% of the females were married as opposed to 92% of the males. When analysed by gender and crop, a higher percentage of both male and female respondents in the coffee sector was married than was the case in the tea sector.

However, this result is tempered by the fact that some of those who described themselves as married were actually widowed or living apart either amicably (urban employment) or due to marital discord.

In this regard, only 46% of the females actually lived with their husbands. A large percentage, that is, 37% was widowed while 6.6% had spouses who were urban migrants and 5% were single. The situation for the men was completely different with 86% living with their wives, 3% widowed, 6% single and an interesting 2% had wives who were urban migrants. The reasons for such drastic differences in marital status between male and female respondents were unclear, although it could be that it is easier for men to remarry after being widowed than it is for women.

When marital status was compared for the two crops, there was not much difference, although a greater percentage of female tea farmers lived with their spouses than was the case for coffee, and fewer of the female tea farmers were widowed. Conversely, a greater percentage of the male coffee farmers were married and the urban migrant wives existed only among the coffee farmers.

4.1.2 Age

The respondents were all full adults with less than 1% being under 20 years of age. Five percent were in their 20s with another 13% being in their 30s, but an overwhelming 81.4% were above 40 years of age. Over 51% were above 50 years of age. A minute 1.5% did not know when they were born, and from casual observation these tended to be over elderly.

The age trend held true for both crops in that the overwhelming majority of farmers were over 30 with the heavy skewing above 40 years of age. Figure 4.1 illustrates these findings.

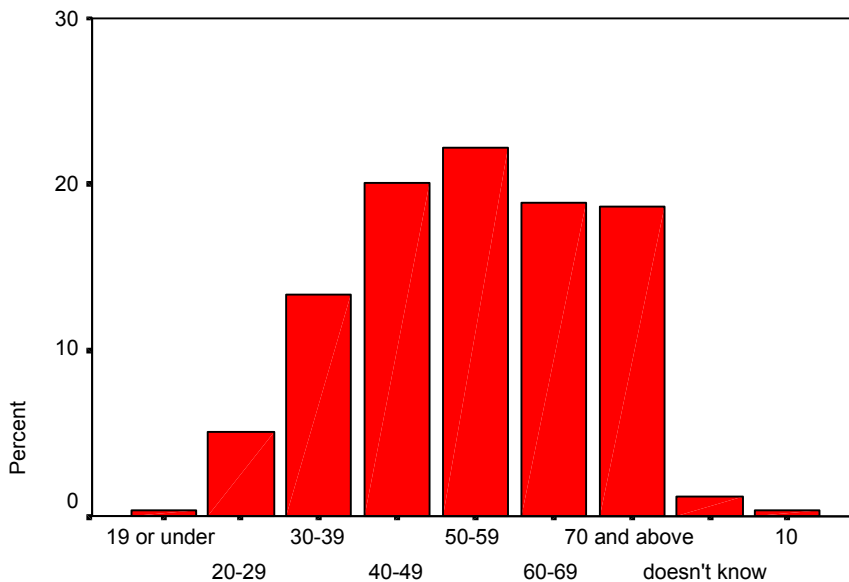


Figure 4.1: Age of respondents

4.1.3 Number of Children

Almost all the respondents (95%) had children, the mode being 3 and the mean 3.47%. Figure 4.2 illustrates the distribution of number of children among the respondents. About 60% had 5 children or less. About 5% had no children. Most of the children, about 60%, were in the school system with another 25% in the job market. Of those who had children, the mean number was 3.47 with the mode being 3 and the standard deviation 2.03. Most of the children were in the school system, that is, 52% while another 25% was working. Otherwise, some were away from home for various reasons such as post secondary school training, marriage and even illness.

4.1.4 Level of Education

Almost all the respondents (over 97%) described themselves as belonging to a Christian religion, with less than 1% claiming atheism. Virtually all of the respondents were members of the Kikuyu tribe, although a negligible two respondents refused to specify their tribe. The level of education was just as the researcher expected, with over 80% having had some level of formal education. Almost 16% admitted to not having had any education whatsoever, and a further 4% refused to answer this question. The researcher assumed that this latter group had had no education, so that 20% were illiterate. As expected, the greater majority (44%) had had primary school education with a further 28% having had secondary level schooling. Almost 7% had post secondary school education.

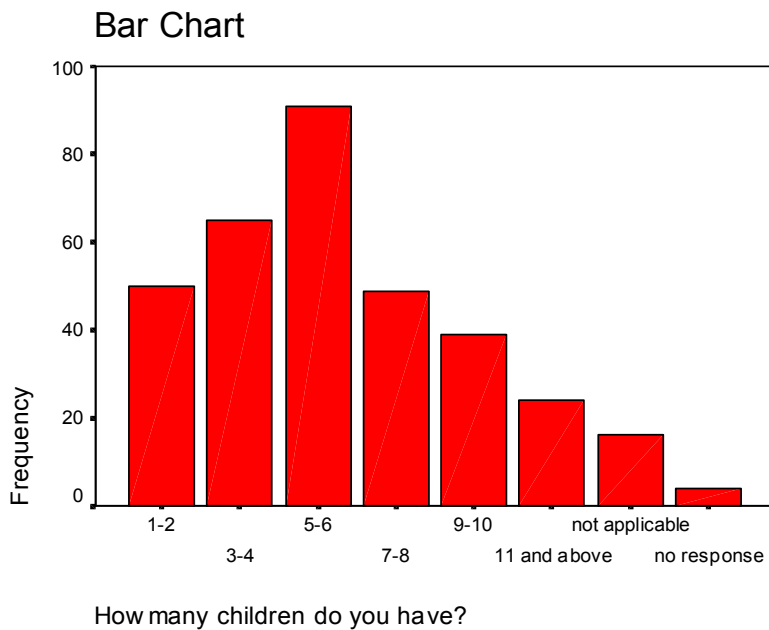


Figure 4.2: Number of children

Table 10: Level of education

Level	Frequency	Percent	Cumulative %
Adult education	2	0.6	0.6
Primary	150	44.4	45.0
Secondary	96	28.4	73.4
Certificate	13	3.8	77.2
Diploma	7	2.1	79.3
Degree	3	0.9	80.2
None	53	15.7	95.9
No response	14	4.1	100
Total	338	100	

Source: Field Data

There were surprises, however, when level of education was analysed by sex and age. Twice the percentage of women was illiterate when compared to men, while 33% of the men went to high school as compared to 21% of the women. And while only 4% of the women had post-secondary education, over 8% of the men had post-secondary school qualifications. Also, while only one woman had higher than certificate level education and a diploma at that, nine of the men similarly had a higher level, including three who had attained university degrees.

Also surprising was the fact that with the exception of those aged 70 and above, the older age groups were as well educated as that of 20 – 29 years. The researcher had expected a direct relationship between age and the level of education, that is, the younger the age, the higher the level

of education. But the correlation between them was not strong, at 0.239 (Pearson). For example, more than half the respondents between 40 and 49, and 20 and 29 had secondary school education. The three people with university degrees were in their 30s, 40s and 50s respectively, while diploma and certificate holders were represented in the 20s, 30s, 40s and 50s age group. However, as expected, those in their 70s were less well educated than those in younger age groups, and the level of illiteracy rose with age especially among those who were 50 and above, peaking among those above 70.

4.2 Economic Status

Just over 50% of the respondents said that they did not engage in any economic activity other than farming, which is an indication that farming must be taken very seriously indeed if it is to meet the needs of farm families. Twenty percent of the respondents were in formal employment while another 20% were self-employed as shown in Table 11. Seven percent chose not to reply to this question.

Table 11: Other economic activities

Activity	Frequency	Percent	Cumulative %
Employed	68	20.4	20.4
Self-employed	68	20.1	40.5
Casual Labourer	3	0.9	41.4
None	175	51.8	93.2
No response	24	7.1	100
Total	338	100	

Source: Field Data

When broken down for the two crops, the main difference is that 57% of the tea farmers had no other economic activity as opposed to 49% of the coffee farmers. This makes sense when it is considered that tea is a more reliable crop earnings-wise than coffee, so coffee farmers probably have more of an incentive to look for other sources of income than tea farmers. Otherwise the levels of self-employment and formal employment for the two crops were not significantly different.

4.2.1 Land Size

Overall the average size of the land was 2.28 acres or just above a hectare. The mode was 1 acre (0.48 ha), and the standard deviation was 1.65 acres. A total of 73% of the respondents had between 1 and 4 acres. Another 20% had between 5 and 10 acres while only about 5% had 11 acres or above. All of the respondents in this category had less than 20 acres.

When broken down for the two crops, 77% of the tea farmers had between 1 and 4 acres, while 3% had above 10 acres. When it came to coffee, 70% had between 1 and 4 acres while 7% had above 10 acres. This makes sense in that it is still profitable to farm tea intensively, while this no longer appears possible in the case of coffee. It would also account for the fact that more than twice

the number of coffee producers had land above 10 acres when compared to the tea producers in this sample.

On average the farmers set aside 1 acre or so for the homestead and other buildings, and for recreational or other family use. Such space was commonly used for entertaining, children play or simply to define the homestead. In most cases the homestead was fenced off from the farming area by simply constructed or planted fences.

4.2.2 Title Deeds

Overall the greater majority of the farmers (93%) had title deeds to their land, and of those who did not the title was in the process of being registered by dint of inheritance or in a few cases, sale of land. This was as expected since land demarcation in this district was completed several decades ago, and a few of the holders of title deeds are third generation from the one that originally received the titles in the late 50s and early 60s. Of more interest was the issue of who actually owned the land, that is, whose name was on the title deed.

Table 42 (Appendix II) illustrates the response to the question of whose name appeared on the title deed. A total of 57% said self while a variety of other answers were also given – mostly parents or grandparents. In two cases the land belonged to a local school and the head teachers were the respondents. When cross-tabulated for sex of the respondent, a surprising 27% of the female respondents said that the title was theirs, as opposed to 75% of the male respondents. More surprising still is the fact that, not only were 20% of the single respondents title-holders but that more than half of these were female. Follow-up questions elicited the fact that traditionally, single women are often bequeathed land by their fathers (unlike their married sisters who rarely are). Again, single women are more likely to buy land of their own, than married women are, probably because the single women feel like stakeholders to whatever their husbands own.

4.2.3 Standard of Living

The researcher attempted to establish the contribution of the two crops to standard of living using an index whose key components were cooking and lighting appliances, source of fuel, source of water, mode of transport, source of information, and housing.

About 30% of the respondents admitted to having access to other land apart from the one the research team found them working on. Of these, most owned them outright with only 5% leasing from the real owners, and another 2% being allowed access free of charge, mostly by relatives. This additional land was mostly used for farming although 30% was idle and a negligible amount was leased out or used for rental housing.

An impressive 48% of the respondents lived in permanent housing, while 38% lived in semi-permanent housing, and 14% in temporary housing. Forty percent of the respondents said they had built their houses with money from farming, 31% from formal employment and 12% from self-employment off the farm. A residual 17% had obtained the money through casual labour, financial assistance from parents or even bank loans.

Over 90% of the respondents described the radio as their most reliable form of information, with 4% relying on other people, a tiny 1% on newspapers and a negligible 0.3% on television. When it came to lighting, almost 90% used hurricane lamps powered by kerosene, with 6.5% using electricity,

2.4% using solar power and 1.5% using gas. The cooking method of choice was the earthen three-stone fireplace (60%), followed by the *jiko* (21%) and the stove (10%). The majority of the people had bore holes or wells as their source of water (68%), followed by the river (11%) and piped water (10%). Rainwater came a distant third at 6%. On how they paid for the water, the respondents were almost evenly divided along formal employment, self-employment and farming, all at about 20%. Eleven percent said that no expense was involved and 4% said they obtained their source of water through casual labour.

When asked which of four furniture or appliance items they had in their houses, 64% owned a sofa set, 20% owned a sewing machine and 7% owned a water tank. Only one of the respondents possessed a fridge. For transport, 83% used public means while 8% had their own vehicles. Nine percent depended on bicycles or motor cycles to get around. The above information is summarised in Table 12 according to the strongest tabulated category of responses.

Table 12: Strongest responses for indicators of economic status (%)

Item	Overall	Coffee	Tea
Title	93	93	91
Land size (1-4 acres)	77	71	77
Additional land	30	29	30
Other economic activity	48	40	42
Permanent house	48	58	30
Main source of information - radio	90	92	86
Main source of light - hurricane lamp	90	91	82
Main source of water - boreholes/wells	68	91	32
Main source of transport - public	83	82	84
Main cooking method - three stone earthen	60	34	81
Sofa set	64	65	62
Bicycle/Motor cycle	0.6	0.5	1
Personal vehicle	8	8	7
Water tank	7	1.5	7
Refrigerator	0.003	0	0.01

Source: Field Data

For most of the indicators there was not much difference between the two crops. But when it came to permanent housing, bore-holes or wells and cooking methods, the coffee farmers scored significantly higher than the tea farmers, despite the fact that tea has earned consistently better prices than coffee for more than a decade. When asked how they obtained money to build their houses or install water, more coffee farmers cited formal employment and self-employment than farming. But tea farmers were evenly divided between employment (formal and self) and farming. The reasons for this disparity could lie in the fact that coffee was a good earner for several decades before it began to decline and in those days it could have made farm families more economically stable than those who depended on tea. Also, the fact that more coffee farmers engage in other economic activities besides farming than is the case with tea farmers is probably a contributing

factor. This reliance on alternative sources of income is probably because coffee farmers cannot rely on their crop to make ends meet.

However, tea farmers scored higher than coffee farmers when it came to possession of water tanks. But it must be acknowledged that most coffee farmers had a sure source of water in boreholes or wells, and therefore probably do not see a need for enhanced water storage capacity.

It can be concluded that the adoption of modern agricultural technology (embodied in tea and coffee production) positively affected the socio-economic status of farm households. Furthermore, these gains were spread among men and women as exemplified by the fact that increasing numbers of women actually own title deeds to land. The economic indicators tested also show that the families are much better off than they would have been if they had not adopted this technology.

4.3 Gender Analysis

The households surveyed in this study were broken down into three categories: male headed households (MHH), female-headed households (FHH) and female-operated households (FOH). An overwhelming 75% of the households were male-headed meaning that a man was heading the household. Nineteen percent of the households were headed by a woman, in most cases because she was a widow, but there were also a few cases of divorce and some where the woman had never been married. Less than 4% of the households were female operated, meaning that the husband lived away from home usually for reasons of employment. In four cases it was the wives who were urban migrants while the husbands did the farming. This situation is very different from that found in other parts of the country, for example in Machakos (Bird, Karugu et al., 2000) and Kitui (Oduol and Karugu, 1993) where up to 40% of the adult male population is absentee as urban migrants. Perhaps the proximity of Kiambu to the city of Nairobi pre-empted the need for rural-urban migration in that people can commute to their places of work in the city if need be. The households fell into the above categories as follows:

Table 13: Type of household

Type	Frequency	Percent	Cumulative %
Female-headed household (FHH)	64	18.9	18.9
Female-operated household (FOH)	12	3.6	22.5
Male-headed household (MHH)	262	77.5	100.0
Total	338	100	

Source: Field Data

4.4 Socio-Economic Status by Type of Household

The FOH category was the most striking in that 75% of the respondents were less than 40 years of age, while on the other hand the FHH category had the highest mean age. This was largely as expected because the FHH group is skewed towards widows, who were heads of households because their spouses had died. The MHH group was more evenly distributed among the age

groups 30s to 70s with 40s to 60s being best represented. There were very few farmers below 30 in any of the categories. Table 26 (Appendix II) depicts the age spread. The really glaring gender disparity here though is the poor representation of the younger generation (under 30s) in farming in this district.

4.4.1 Number of Children

There was no significant difference between the three categories in whether or not they had children. All the FOH respondents had children while 4% of the MHH and 6% of the FHH households were childless. This had less meaning in the MHH category, however, as these were men who were as yet unmarried, while childless FHH respondents were at an age when they could not reasonably expect to have children.

4.4.2 Level of Education

The level of education brought out sharper differences between the different types of households. The FHH households had a significantly lower level of education than the other two categories, with 31% actually being illiterate. The FOH group had 50% with a high school education but the MHH category did not fare badly with almost 50% having primary level education and 29% attaining high school education.

4.4.3 Other Economic Activities

The FHH households likewise scored lower than the other two when considering additional economic activities to supplement earnings from farming in that 54% had none at all. Again the FOH households scored highest on this in that almost 60% had alternative sources of income. This agrees with results found in a similar type of study in Machakos District (Bird-David, Karugu et al., 1998) where the FOH category of farm households is better off economically than the other two categories. The earlier study validates these findings in that the FOH category was much larger in Machakos than was the case here yet the outcome appears to be similar. FOH households have more access to financial resources than the other two types of households by their very nature – an absentee income earner supplementing that which comes from farming.

4.4.4 Land Ownership

The picture changes when land ownership is considered in that the MHH households fare better than the other two. Seventy seven percent of the male household heads had the title deeds in their own names, which gave them peace of mind as well as access to credit if needed. This when compared to FHH 39% and FOH 25% shows that women have much lower access to landed property than do men. An unexpected result was the 15% of MHH respondents who said that the title deeds were in their wives' names. Further investigation revealed that some of the wives had inherited land from their fathers, while others had bought land through various schemes including women's group activities.

4.4.5 Standard of Living

For once the FHH category fared best when it came to type of housing, with a greater percentage of them being decently housed than either FOH or MHH. Still, as expected the FOH category had the highest percentage with permanent housing. The following table shows this information.

Table 14: Kind of House * type of household cross-tabulation (%)

House	FHH	FOH	MHH
Permanent	50	58	45
Semi-permanent	36	25	38
Temporary	14	17	17
Total	100	100	100

Source: Field Data

When it came to household possessions, FOH again scored highest followed by MHH households. The FHH households scored well if not as well as the other two. However, more of the latter households had water tanks – a pricey but very useful appliance in a rural household.

By far the majority of the respondents in any category utilised public means of transport for their routine activities, but 25% of the FOH, 9% of the MHH and 7% of the FHH households had a private vehicle.

An overwhelming majority of all respondents owned a radio and relied on it for credible information. Very few relied on any other source of information – in fact it was interesting to note that some of the farmers who owned television sets did not rely on them for news. However, 7% of the FHH farmers relied on relatives, friends and neighbours to keep them up-to-date, as did 3% of the MHH farmers. In both types of households, it was the elderly farmers who did so.

As in most other socio-economic issues, the FOH households scored higher than the other two types of households when it came to source of water. In these types of households, 92% either had a bore-hole, or water piped into their homes, while a respectable 78% of the MHH, and 67% of the FHH had such access to water.

All in all, the FOH category fared better than the rest when the above socio-economic indicators were considered.

4.5 Division of Labour

Drawing on “Women in Development” literature the researcher assumed a strict division of labour between men and women, and extended this further to assume a strict division of labour between different age groups. The results from the study were mixed. For example, it was clear that children of both sexes played very little part in farming, which was perhaps to be expected since children

spend most of the time in school and doing schoolwork. But probing questions further elicited reluctance on the part of the farmers to point their children towards farming. Education is still seen as a way for children to better themselves as compared to their parents. This attitude appears to have entrenched itself in the younger adults so that as mentioned earlier, the younger adults are not attracted to farming (this is attested to by the fact that over 80% of the farmers are above 40 years of age).

But from the focussed group discussions, the researcher also detected another dimension to this lack of interest in farming by the younger adults. They felt somewhat alienated from it by the fact that their parents were firmly in control; that there was no role for them to play at present, and that their ideas or other input were not appreciated by a conservative older generation. Admittedly the younger people were also drawn to industries that offer quicker returns, glamour of sorts and more money, such as public transport vans and buses, brokerage services for various contractors and suppliers, and of course white collar jobs when available.

Two educators (one male and one female) complained that young men often fail to finish high school in favour of joining the matatu industry. The educators voiced the opinion that young men drop out of school more or less voluntarily, while young women experience problems of another sort, in that their parents will not exempt them from household and farm chores in favour of their academic work. Their opinions directly contradicted the findings of the survey where the respondents claimed that very little work (both house and farm) was done by children, and what little was done was skewed towards the male children.

But direct observation and casual conversation disagreed with this result, as children did undertake quite a lot of work ranging from ordinary household chores, to milk delivery, to picking tea and coffee during weekends and school holidays, to actual farm labour. The researcher was at a loss to explain this anomaly and thinks that perhaps the explanation lies in perception. For example, a parent who has spent the whole day in hard physical labour is likely to discount that which is done after school or perhaps considers what the children do to be light tasks. At any rate despite the opinions of the parents (the respondents), the researcher gathered enough evidence to be able to conclude that children do engage in a fair amount of household and farming tasks.

But the assumption that division of labour was strictly divided along sexual lines among male and female children was discounted. True to expectations, female children engaged in more household tasks than male children, although the male children did carry out more household tasks than expected. When it came to the farm there was no significant difference in the type of tasks that male and female children engaged in. But when it came to the adults, this changed. Table 15 illustrates how tasks are shared between the adults of both sexes. Housework, fetching firewood and child rearing were almost exclusively done by women, while post harvest activities and land preparation were almost exclusively done by men.

Apart from that, crop picking was carried out equally by all sexes while cultivation was more equitably distributed although skewed towards the men. The most interesting finding was that post harvest activity was perceived to be carried out by men to the exclusion of women. This response was patently erroneous to the researcher as direct observation and casual conversation as well as the focus group discussions pointed to heavy female participation in sorting, grading, delivery, etc.

Post harvest follow-up elicited the fact that this question was seen to refer to follow-up of deliveries and payments, which indeed was almost exclusively a male domain.

Table 15: Task allocation between the sexes (percent)

Task	Female	Male
Child rearing	92	0.6
Housework	89	3
Fetching firewood	67	4
Picking	50	50
Layout	3	37
Crop cultivation	37	47
Land preparation	8	82
Post harvest activities	1	99

Source: Field Data

This probably reflects the fact that the person whose name appears on the title deed of the farm is the person who is recognised by societies that process and sell coffee on behalf of the farmers.

Further analysis was done to point out any differences that might exist between the different types of households with respect to division of labour. As expected, female-headed households and female-operated households had a dearth of adult males capable of performing most tasks. When necessary, adult male relatives or employees were recruited. Surprisingly, even in those households where women shied away from certain tasks such as irrigation, land preparation and post harvest activities (see appendix II), some activities such as pruning, picking and farmyard manure application were shared among four categories, namely adult males, adult females, male child and female child.

4.6 Agricultural Extension vs. Types of Households

About two thirds of the respondents knew that an extension agent worked in their area, and almost all of them knew the agents by sight. When analysed according to gender, some differences emerged, for example 57% of the respondents knew of the existence of the agent compared to 51% and 50% of the female headed households and female operated household respectively.

When asked whether they had ever talked to the extension agent, and if so what issues they had discussed with them, the respondents gave a wide range of answers. They included crop rotation, fertiliser and manure application, crop spacing, planting methods, soil conservation, disease and pest control, fruit farming, farm preparation, spacing, vegetable farming, crop improvement and general agriculture. In addition, tea farming featured for about 20% of the respondents, but not one mentioned coffee, which was unexpected. Follow-up questions elicited the fact that coffee farmers are so unhappy with the crop that they would prefer to discuss other enterprises with farm experts. However, just over half the respondents (51%) said that they had never discussed farm issues with the extension agent.

When asked for details, 31% of the respondents said that they had talked with the extension agent within the last year, and another 12% had talked with the agent during the last five years. But a lesser 41% said that they had never talked with an extension agent. Gender differences began to emerge more strongly here with 70% of the male-headed households having a good opinion of the extension agent (and the extension service) while a lesser 51% and 66% of the FHH and FOH thought positively of the service or the agent. When it came to talking with the extension agent, the female-headed and -operated households scored consistently lower than the male-headed households. For example, 40% of MHH respondents said that they had talked with the extension agent about farming within the last year and this went up to 54% in the last five years. In comparison, only 26% of the FHH respondents had talked to the extension agent during the last year, which increased to 36% over the last five years. FOH respondents scored lowest on this with only 25% having talked to the agent over the last year or during the last five years.

By far the most official encounters with the agent took place on the respondent's farm (41%), with another 5% taking place on contact farms. A few encounters took place in the local market, the chief's baraza, the processing factory, or by the roadside.

Table 16: Where did you meet the extension agent? * type of household cross-tabulation (percentage of total)

	FHH	FOH	MHH	Total
On my farm	6.5	1.2	33.7	41.4
Contact farm	1.5		3.6	5.0
Baraza			0.6	0.6
The market	0.3		1.5	1.8
Not applicable	9.5	2.4	33.7	45.6
No response	0.9		2.1	3.0
On the road	0.3		0.9	1.2
KTDA Factory			1.5	1.5
Total	18.9	3.6	77.5	100.0

Source: Field Data

The respondents were also asked if they would like to hold discussions on farming with the extension agent and if so, on what issues. Over 80% replied favourably with only 18% saying they were uninterested. They cited much the same issues that were frequently discussed with extension agents as recorded in 4.6. To these they added proper use of herbicides, and organic farming. Coffee farming was again notable by its absence in the list of issues the farmers wanted to discuss. The responses to this question showed no gender bias.

The respondents were also asked when they had last attended an extension demonstration, and the results were quite encouraging. Fifty percent of the FHH households had attended such demonstrations as had 43% of the MHH and 33% of the FOH. Furthermore, a third of both FHH and MHH households had attended such demonstrations within the last two years.

Table 17: Type of household vs. have you ever attended an extension demonstration? (percentage)

Response	FHH	FOH	MHH
Yes	50	33	43
No	45	58	51

Source: Field Data

When asked what they had observed in such demonstrations, they cited tea farming, tillage, crop improvement, horticulture, pest and disease control, soil conservation, soil improvement and livestock management. Again coffee was notable by its absence.

The farmers were also asked to voice their opinion of the local extension agent, to which agents got a decisive vote approval with two thirds of all respondents saying they thought them helpful. Just fewer than 5% had a negative opinion with a substantial 21% not being sure.

Table 18: Opinion on the usefulness of the extension agent

Response	Frequency	Percentage
Helpful	225	66.6
No	14	4.1
Do not know	99	20.9
Total	338	100

Source: Survey Data

In conclusion, the extension service is well-known and generally well thought of by the farmers sampled here. However, it was a bit disappointing to note that the agents had contact with relatively few farmers on a regular basis. But even more disappointing was the fact that there appears to be little gender sensitivity within the service which appears content to allow female-headed or -operated households to be served at a rate significantly lower than that of male-headed households.

4.6.1 Record Keeping and Accounts vs. Type of Household

The researcher was also interested in whether the farmers kept farm records and accounts. It was not strictly speaking an extension-related question but the researcher thought that it fitted rather better here than anywhere else in this report. Thirty four percent of the respondents said that they kept some form of farm records and accounts although few had any actual knowledge of book keeping or accounting. Although below the half way mark, this compares very favourably with results obtained from other studies elsewhere in the country where hardly any farmers kept any records (Karugu and Oduol, 1994; Bird-David, Karugu et al. 1998). Table 19 and Figure 4: 3 illustrate this.

Table 19: Do you keep farm records and accounts?

Response	Frequency	Percent	Cumulative %
Yes	115	34.0	34.0
No	213	63.0	97.0
No response	10	3.0	100.0
Total	338	100.0	

Source: Survey Data

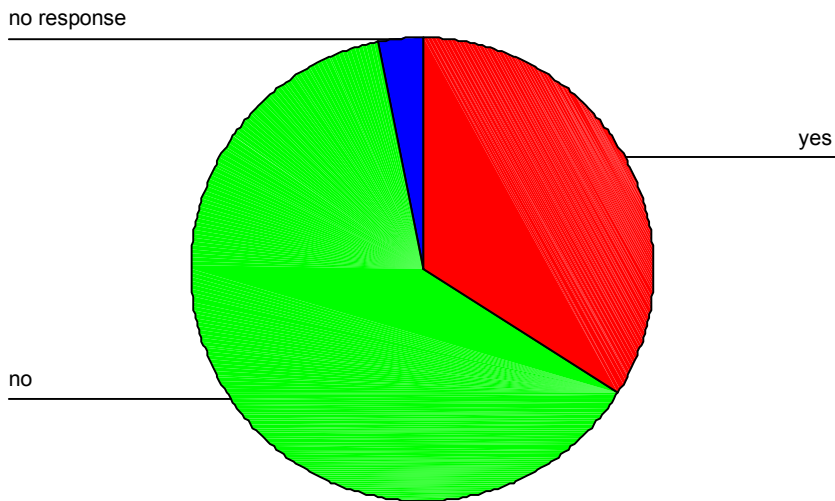


Figure 4.3: Do you keep farm records and accounts?

When analysed along gender lines, the results showed that a surprising 42% of FOH respondents kept farm records and accounts, compared to only 20% of the FHH and 37% of the MHH. It was perceived that these FOH households might have more incentive to keep such records than the FHH, because there is an absentee spouse to account to for use of resources. This may be one aspect of farming that the extension service has had a significant impact on. However, when followed up, most of the farmers said that they kept rough records according to their own ideas and needs. A couple of farmers had had some formal training in accounting but the vast majority had none.

Table 20: Do you employ pickers?

Response	Frequency	Percent
Yes	260	76.9
No	78	22.1
Total	338	100.0

Source: Field Data

Both tea and coffee farmers said that they pay an average of Ksh 50/- per person per day to these pickers. Pay is pegged to per unit picked – for coffee the unit is a *debe* (bucket) of cherry, and for tea the unit is a kilogramme of leaf.

4.7 Social Affiliation vs. Sex

A comparison was made between men and women to gauge the extent of group affiliations and to see if there were any differences between them. The results are summarised in Table 21.

Table 21: Sex vs. group membership (percentage of total)

Type of Group	Female	Male
Women's groups	34	-
Church groups	16	20
Farm Co-operatives	34	65

Source: Field Data

A surprising aspect of the responses to this question was the low percentage of female respondents who admitted to being members of women's groups. The researcher was unconvinced and followed it up during the focus group discussions and from key informants as well as casual conversation with officials in the district administration as well as female farmers themselves. The researcher finally concluded that it is rare for a woman in this district not to belong to at least one women's group. It appeared that the female respondents understood this question to refer to formal registered groups such as land buying companies and business units. But the question had been meant to elicit all membership to any women's group, formal and informal, and unfortunately it did not do this. Information regarding access to such memberships is important because this is a common method of bulking money (saving) for such women, and even the financial markets are beginning to recognise such groups as a significant source of investment funds. However, those who did respond to this question furnished the research team with a run down of the activities of their groups. Such activities in this district include: real estate acquisition and management; business activities such as poultry projects; savings and credit services; merry-go-rounds; home improvement and collective effort in farming or other activities.

Almost twice as many men as women were members of farming co-operatives, which tallied with earlier results pertaining to post harvest activity being performed almost entirely by men.

The same analysis was also applied to the question regarding attendance of barazas (regular public meetings usually convened by the chief). The results are presented in Table 22.

Table 22: Sex vs. indicate how often you attend barazas (percentage)

Sex	Every meeting	Frequently	Seldom	Never
Female	41	24	25	10
Male	54	17	19	10

Source: Field Data

The baraza is used by the local administration to keep the public informed about issues that affect them. Government officers such as agricultural, veterinary, health social services, etc., routinely address the public accordingly at such fora. In return the government can obtain feedback and gauge public reactions to various programmes or issues. The results revealed that men were keener to participate in public affairs than women, and this was held up by direct observation of such meetings. This question was followed up by another asking whether farming issues were discussed in various fora. The results are shown in Table 23.

Table 23: Sex vs. indicate whether farming issues are discussed in the following (percentage)

Sex	Women's groups	Church	Co-operatives	Barazas
Female	18	7	40	4
Male	3	8	56	16

Source: Field Data

More of the respondents thought that farming issues are tackled in the co-operatives than in any other forum. Surprisingly most of the respondents did not think that the barazas address farming issues but those that the researcher attended, were invariably addressed by government agricultural personnel. The anomaly here could be one of perception, that such meetings are not suitable for in-depth messages, and the officers restrict themselves to general pronouncements, warnings, etc. Consequently the farmers may not consider the baraza a serious forum for agricultural matters. Another factor may be that the barazas tackle other issues such as security, which may more readily attract the attention of listeners, than mundane issues.

Chapter Five

Summary, Conclusions and Recommendations

5.1 Summary

This study used a survey instrument, literature search, and direct observation, to collect data from small-scale farmers, regarding the effects of tea and coffee production on gender roles in Kiambu District of Central Province of Kenya. Focussed group discussions and key informants were used to validate the data collected. During the survey 338 respondents were interviewed using purposive random sampling of the six divisions that make up Kiambu District. Of these, 36% were women and 64% were men. The respondents were further broken down into three types of households — male-headed (77%), female-headed (18%) and female-operated households (4%), based on the *de jure* and *de facto* heads of the household. They were also broken down according to the two crops. Analysis was done for socio-economic status, division of labour, access to support services, social affiliation and marketing. The original intention of analysing the above for different age groups was shelved because very few younger people were found engaging in tea or coffee production.

5.2 Conclusions

The production of tea and coffee in this district over the last four or five decades has had a positive effect on the households of the farmers.

Coffee production is on the decline in the district mostly as a result of low world prices, but tea appears to be attracting new producers. Coffee farmers invest minimal resources in it's production and do not seek advice from the extension service, but tea farmers still invest substantially in production, as well as seek support from extension agents. However, coffee farmers enjoy a higher standard of living than tea farmers, probably built on the past success of the crop, as well as the necessary alternative sources of income.

The results of this study pointed to a confirmation of the results of numerous other studies on the effects of technology transfer on gender roles in farming communities. Most of the earlier studies had focussed on instances where technology transfer had been unsuccessful, the premise being that subsequent or potential inequalities had led to rejection. This study dealt with two cases where the transfer of technology has clearly been successful, yet not only had inequalities arisen, but they do not appear to be the main reason for rejection in the short run. In the long run, however, such rejection is tied to gender imbalances as younger generations simply refuse to engage in productive activities that are to their disadvantage. Therefore the life cycle of a technology might be more at risk from gender disparity than from normal obsolescence.

The objectives of this study were as follows:

The main objective was to assess the impact of the adoption of an entire package of technology on gender roles within the farming communities, with the intent of determining any imbalances that need to be addressed. In this case, the package of technology under study was that embodied in the production of two cash crops – tea and coffee, and the community under study was smallholder farmers in Kiambu District, Kenya.

The specific objectives were as follows:

- 1) To determine whether the adoption of technology embodied in tea and coffee production has affected the socio-economic status of males and females in the area of study.
- 2) To determine the extent that the adoption of the technology embodied in tea and coffee production has affected division of labour along gender lines in the area of study.
- 3) To examine the extent to which extension and other support services for this package of technology are gender sensitive within the area of study.

The researcher made the following conclusions from this study:

- 1) The adoption of this package of technology has had effects on the gendered socio-economic status of these farmers in the following ways:
 - a) Young people do not appear to be attracted to cash crop farming in this district as only 5% were under 30 years of age and 19% were under 40.
 - b) Three quarters of the households sampled were male-headed, with 19% being female-headed and 4% being female-operated.
 - c) Education level of the head of the household was highest for both MHH and FOH households while that of the FHH was significantly lower.
 - d) The FHH respondents registered a higher mean age than the others while the FOH respondents had the lowest mean age. MHH respondents had a wider age spread than the other two.
 - e) The FOH type of households enjoyed the highest standard of living when compared to the other two. They had more access to alternative sources of income, and scored higher than the other types of households on all the indicators used in the study apart from housing. Only on the housing indicator did the FHH households score better than the other two.
- 2) The findings showed a distinct division of labour between adult males and females when it came to crop production and normal household activities. However, there was no such distinction between male and female children.
- 3) On extension and other support services:
 - a) There was a significant gender disparity in access to extension and other support services, with male respondents enjoying more of these services than the female respondents. The implication is a male (and age) bias in the delivery of these services.

- b) A third of all respondents kept farm records and accounts but while this held true for the MHH respondents, only a fifth of the FHH respondents kept such records.
- c) Voluntary group affiliation appeared to appeal only to females who revealed membership to various women and church organisations. The men were attracted to more official organisations such as farming co-operatives. Men also attended barazas in larger numbers and more frequently than women.
- d) The farmers were generally well informed about the general trends in their respective crops but they were ignorant on the finer details. Over half the respondents had access to credit (mostly from their co-operative societies). But men had greater access to such credit than women. The respondents cited numerous problems that hinder and discourage the production and marketing of the two crops stressing low prices, transport problems, expensive and inadequate labour, expensive inputs, inefficient co-operatives and lack of alternative markets.

5.3 Recommendations

From this study and the conclusions, the researcher makes the following recommendations:

- 1) That further studies need to be done on the effects of technology transfer on gender roles with respect to farmer communities, to investigate the relationship between success or failure (acceptance or rejection) of technology and its effect on men, women and different age groups. Such studies can be done on different farm enterprises, other communities and on medium or large-scale producers.
- 2) That gender equality be internalised at the policy level so as to pre-empt situations in which gender inequalities occur. This may ensure that technologies enjoy a normal life cycle rather than being rejected pre-maturely by disadvantaged groups.
- 3) That the policies surrounding tea, coffee and other cash crops in Kenya be urgently reviewed to take into account the interests of women and young people. Current policies protect the interests of the land owners at the expense of other stakeholders in their families to the extent that, the family is expected to do what amounts to back-breaking work for the sole benefit of the holder of the title deed. And while the assumption is that any benefits will filter down to these groups, this is not always the case. There is growing evidence that this situation is not acceptable especially among the younger people, and this must necessarily threaten the future of cash crop production unless suitably addressed.
- 4) Policy makers also need to address the lack of equal access to education, support services and marketing for women. It is not clear how the national goals of poverty alleviation, food security and accelerated development can be achieved if any section of the society is deprived. Equal access to the resources of society appears to be a surer, more logical path to national goals. This might mean affirmative action in the (near) future to enable disadvantaged groups to catch up with the rest.

Bibliography

- Ahmed, I. 1985. (Ed) *Technology and Rural Women: Conceptual and Empirical Issues*. London: Allen and Unwin.
- Amin, S. 1974. *Accumultion on a World Scale: A Critique of the Theory of Underdevelopment*. 2 vols. New York and London: Monthly Review Press
- Bird-David, N., Karugu, W. N., and Oduol, W. A., 2001. Technological Change and Rural Third World Women. Report submitted to the Netherlands-Israel Research Project. The Hague.
- Boserup, E. 1970. *Women's Role in Economic Development*. London: Alec and Unwin.
- Cernea, M. 1995. 'Social organisation and development anthropology'. 1995 Malinowski Award Lecture, Society for Applied Anthropology. Washington D.C.: The World Bank.
- Cernea, M Ed. 1985. Putting people first. New York: O.U.P.
- Collingbridge, D. 1981. "The Social Control of Technology". Open University Press, Milton Keynes.
- De Groot, J. 1991. 'Conception and misconceptions: the historical and cultural context of discussion on women and development'. In: *Women, Development and Survival in the Third World*. (Ed. Afshar, M) London: Longman.
- Economic Intelligence Unit, 2001. Kenya Report 2000.
- Escobar, A. 1997. "Anthropology and development". In: *International Social Science Journal* 154 pp 497-517.
- Escobar, A. 1995. *Encountering Development :The making and unmaking of the third world*. Princeton: Princeton University Press.
- Feldstein, Flora and Poats, 1989. "The Gender Variable in Agricultural Research" IDRC/CRDI/CID. Manuscript Report 225e, Ottawa.
- Feldstein, H., Poats, S., Cloud, K. and Husinga, N., 1989. *Working Together: Gender Analysis in Agriculture*. West Hartford, Conn.: Kumarian Press.
- Feldstein, Poats, Cloud & Norem, 1989. "Conceptual Framework for Gender Analysis in Agriculture" pp 7-37 Vol. 1 Kumarian Press.
- Frank, A. G. 1978. *Dependent Accumulation and Underdevelopment*. London: Macmillan.
- Gilligan, C. 1982. *In a Different Voice*. Cambridge Mass.: Harvard University Press.
- Guyer, J. I. 1984. "Women in the Rural Economy". African Women South of the Sahara. Longmans.
- Hay, J. & Stichter, S. 1984. African Women South of the Sahara. Longmans.
- Jaetzol, J. & Schmidt, H. 1984. "Farm Management Handbook of Kenya Vol. II Central Kenya Part B". Ministry of Agriculture, GAT & GTZ, Nairobi.
- Kaindeh, P. 1995. "Technology Transfer from the Crop Research & Extension Project in Sierra Leone". *Technology and Practice in Africa* (Ed. Ogbu, O., Oyeyinka, B., & Mlawa, H.) IDRC.

- Kenyatta Jomo. 1937. "Facing Mount Kenya: Tribal Life of the Gikuyu". New York: Vintage Press.
- Ker, Moore, Watts & Gill. 1978. "Agriculture in East Africa". ELBS, London.
- Kershaw, C. 1975. "The Changing Roles of Men and Women in the Kikuyu Family by Socio-Economic Status". Rural Africana Vol. 29, pp 173-194.
- Lewis, Barbara. 1984. "The Impact of Development Politics on Women". African Women South of the Sahara. Longmans.
- Marstrand, P. 1979. "Shadow on the 70s: Indicative World Plan, Protein Gap & the Green Revolution" (Whiston, T. Ed.) Macmillan.
- Mohanty, C. 1988. "Under western eyes: Feminist scholarship and colonial discourses". In: *Feminist Review* 30:61-88
- Mullings, Leith. 1976. "Women and Economic Change in Africa". Women in Africa. Stanford University Press, California. Hafkin and Bay, Eds.
- Ngugi, Karau & Nguyo. 1982. "East African Agriculture". Longmans.
- Norton, G. W. & Alwang, J. 1993. "Introduction to the Economics of Agricultural Development". New York: McGraw-Hill.
- Oduol, W. A. & Karugu W. N. 1994. "The Improved Sorghum and Millet Programme: Its Social-Economic Implications for Women Farmers in Kitui District, Eastern Kenya". Report submitted to the Carnegie Corporation.
- Overholt, C. A., Anderson, M. B., Cloud, K., Austi, J. E., 1985. *Gender Roles in Development Projects*. West Hartford, Conn.: Kumarian Press.
- Pala, A. O. 1980. "Daughters of the lakes and rivers: Colonization and the land rights of Luo women (Eds. Etienne, M & Leacock, C.). *Women and Colonisation: Anthropological Perspectives*. New York: Praeger.
- Parpart, L. J. 1995. "Postmodernism, gender and development". In: *Power of Development* (Ed. Crush, J.) London: Routledge. Pp 253-265.
- Paterson, D. 1980. "Coping with land scarcity: the pattern of household adaptation in one Luhya community WP 360, U O N, Institute for Development Studies, January.
- Raeburn, J. R. 1984. "Agriculture: Foundations, Principles & Development". John Wiley & Sons Ltd., Chichester, etc.
- Rao A., Anderson, M. B., and Overholt, C. A., 1991. *Gender Analysis in Development Planning: A Case Book*. West Hartford, Conn.: Kumarian Press.
- Report (IDRC). 1995. "Gender and Development: Equity for All. Vol. 23 No. 2 July 1995.
- Republic of Kenya. 1993. "Annual Report: Kiambu". Ministry of Agriculture, Government Printer.
- Republic of Kenya. 1993. "Economic Survey". Central Bureau of Statistics, Government Printer.
- Republic of Kenya. 1994. "Economic Survey". Central Bureau of Statistics, Government Printer.
- Republic of Kenya. 1994. "Kenya Population Census". Central Bureau of Statistics, Government Printer.
- Rostow, W. 1960. *The Stages of Economic Growth*. Cambridge: Cambridge University Press.
- Smeltser, N. J. 1963. "The Sociology of Economic Life". Prentice-Hall.
- Spelman, M., 1990. *Inessential Woman*. London: Woman's Press.
- Stamp, Patricia. 1995. "Technology, Gender and Power in Africa". Ottawa: IDRC.

- Staudt, K. 1977. Women farmers and inequities in agricultural services. In: *Rural Africana*. East Lansing Michigan State University, African Studies Center No 29, Winter.
- Economic Review October 18-24, 1993. "Tea: Brewing Storm", pp 4-11.
- Economic Review November 1st-7th, 1993. "Tea: Record Bonus", pp 20.
- Economic Review 5th-14th August, 1994. "Three New Districts", pp 30.
- White, Luisa. 1984. "Women in the Changing African Family". African Women South of the Sahara, Longmans.
- Whitehead, A. 1985. Effects of Technological Change on Rural Women: A Review of Analysis and Concepts. In: (Ed. Ahmed, I), *Technology and Rural Women: Conceptual and Empirical Issues*. London: Allen and Unwin.

Appendix

DATE: RA

CROP:

QUESTIONNAIRE

BACKGROUND INFORMATION

- 1) What is your name?
- 2) What is the name of your: -
 - a) Village
 - b) Sub-location
 - c) Location
 - d) Division
- 3) What is your tribe?
- 4) Are you married?
 - a) Yes
 - b) No
 - c) Other (specify)
- 5) If the answer to question 4 is yes, where is she/he?
- 6) How many people live here?
- 7) What is your relationship with them?
- 8) What is your age?
- 9) What is your religion?
- 10) What is the level of your education: -
 - a) Primary Std
 - b) Secondary form
 - c) Certificate in
 - d) Diploma in
 - e) Degree in
 - f) Other (specify)
- 11) Do you have children?
 - a) Yes
 - b) No
- 12) How many children do you have?
- 13) Where are they and why?

	Sons	Daughters
a) Living at home because		
b) At school - Primary level
Secondary level
College (where)
c) Working (what & where)		
d) Other (specify)		

ECONOMIC STATUS

- 14) Apart from farming, what other economic activities do you engaged in : -
 a) Formal employment (specify) Where? since when?
 Permanent?
- b) Self-employment (specify) Where? since when?
- c) Other (specify)
- 15) What is the size of your land?
- 16) How much of it do you utilise for agricultural production?
- 17) Is there a title deed for your land?
 a) Yes
- b) No
- c) other (specify)
- 18) If the answer to question 17 is yes, in whose name is the title deed?
- 19) How is the owner related to you?
- 20) Who uses the land?
- 21) Who used it before you?
- 22) Who will use it after you?
- 23) Can you dispose of this land? (sell, give, bequeath, etc.)
- 24) If not, who can?
- 25) Do you utilise other pieces of land apart from this one?
 a) Yes
- b) No
- 26) If yes, how many?
- 27) If yes, do you
 a) Own them?
- b) Rent them?
- c) Other (specify)
- 28) How do you utilise them?
- 29) What kind of house do you live in?
 a) Permanent (describe) (i) roof (ii) walls (iii) floor (iv) windows
- b) Semi-Permanent (describe) (i) roof (ii) walls (iii) floor (iv) windows
- c) Temporary (describe) (i) roof (ii) walls (iii) floor (iv) windows
- 30) Describe the homestead and sketch it
- 31) How did you obtain money to build your house?
- 32) What do you cook with?
 a) Earthen cooking place using
- b) Stove using

- c) Jiko using
- d) Cooker using
- 33) What form of lighting do you use?
 - a) Hurricane lamp
 - b) Gas
 - c) Electricity
 - d) Other (specify)
- 34) Do you own: -
 - a) Sofa set
 - b) Fridge
 - c) Sewing machine
 - d) Water tank
- 35) What is your usual mode of transport?
 - a) PSV
 - b) Bicycle
 - c) Motor cycle
 - d) Own vehicles (describe)
- 36) What is your most usual form of reliable information?
 - a) Radio
 - b) Newspaper
 - c) TV
 - d) Other (specify)
- 37) What is your access to water?
 - a) Borehole
 - b) Piped water
 - c) Rain water
 - d) River Source
 - e) Spring source
 - f) Lake source
 - g) Other (specify)
- 38) How did you obtain money to pay for
 - a) Borehole
 - b) Piped water
- 39) Indicate the amount of produce you sold last season?

Name of Product	Amount Sold per Unit Time	Price per Unit
a).....
b).....
c).....
d).....
e).....
f).....
g).....

40) Do you have livestock

- a) Yes
- b) No

41) If the answer to question 40 is yes, indicate the type of livestock and the number

Type of Livestock	Number
a).....
b).....
c).....
d).....
e).....
f).....
g).....

42) How did you obtain money to buy these livestock?

43) Indicate the livestock or livestock product sold this year

Type of Livestock	Product Sold	Amount per Unit Time	Price per Unit
a).....
b).....
c).....
d).....
e).....
f).....
g).....

CASH CROP PRODUCTION

44) Indicate the crops you grow now and hectarage

Crops Grown	Hectarage
a).....
b).....
c).....
d).....
e).....
f).....
g).....

Sketch Farm Plan here

45) What variety do you grow?

- 46) What is the size of your hectarage under this crop?
- 47) When did you start growing it?
- 48) Where did you get the idea of growing it?
- 49) How many bags/*debes* did you harvest last season?
- 50) What problems do you face when producing this crop?
 - a).....
 - b).....
 - c).....
 - d).....
 - e).....
 - f).....
 - g).....
- 51) Suggest solutions to these problems.
 - a).....
 - b).....
 - c).....
 - d).....
 - e).....
 - f).....
 - g).....
- 52) Do you consume the following in your household?
 - a) Tea
 - b) Coffee
- 53) In what form do you consume them and how often?
 - a) Tea Frequency
 - b) Coffee Frequency

DIVISION OF LABOUR

- 54) Do any member of your family stay away from home?
 - a) Yes
 - b) No
 - c) Other (specify)
- 55) If your answer to the above question is yes, indicate the following: -

Whom	Where Living	Reason
a).....
b).....
c).....
d).....
e).....
f).....
g).....
- 56) Who performs their tasks during their absence?

Counteract														
Picking	Family Labour													
	Hired Labour													
Other Operations	Describe													
Harvest														
Post harvest														

KEY

Adult female Adult Male

Female child Male child

59) (b)

Activity	Male H/h head	Female H/h head	Sons	Daughter	Other relative (sp)	Employee	Other persons (sp)
Formal Employment							
Self employment							
Herding livestock							
Crop cultivation							
Fetching firewood							
Fetching water							
Selling livestock							
Selling produce							
Housework							
Child bearing							
Shopping							
Leisure							

Key:

Adult Male Male child

Adult female Female child

EXTENSION AGENT - FARMER CONTACT

- 60) Do you know whether there are extension agents who work in this sub-location?
- 61) When did you last talk to her/him about farming?
- 62) What did you talk about?
- 63) Where did you meet him/her?
 - a) On your farm
 - b) Contact farm
 - c) Baraza
 - d) Other (specify)
- 64) Has the extension agent ever advised you on farming matters?
 - a) Yes
 - b) No
 - c) Other (specify)
- 65) Why?
- 66) Do you keep farm records and accounts?
 - a) Yes
 - b) No
 - c) Other (specify)
- 67) Indicate membership in-groups and when last attended.

Member	Last Attended
a) Women group
b) Church group
c) Farm co-operatives
d) Other (specify)
- 68) Indicate how often you attend Barazas
 - a) Every meeting
 - b) Frequently
 - c) Seldom
 - d) Never
- 69) When did you last attend a Baraza?
- 70) Indicate whether farming issues are discussed in the following: -

Forum	Frequency of Discussion	Last Discussed
a) (Farming)		
b) Women's Group
c) Church group
d) Co-operative
e) Baraza
- 71) Have you ever attended a course at F.T.C.?
 - a) Yes
 - b) No
 - c) Other (specify)
- 72) If not, why?

- 88) Where did you sell your tea/coffee?
- 89) To whom did you sell it?
- 90) How was the produce transported from your farm?
- On foot
 - By bicycle
 - By vehicle (specify - hired/own/PSV/borrowed)
 - By donkey
 - Other (specify)
- 91) Indicate costs for this transport
- | Who Paid | Cost Ksh/Unit |
|----------|----------------|
| |per |
- 92) What prices did you received for your produce last season?
- 93) Do you know the final destination for your produce?
- Yes
 - No
- 94) If yes, where?
- 95) Has there been any change in the marketing of this crop in the last five years?
- Yes
 - No
- 96) If yes, what changes?
- 97) Is there any grading for this produce?
- Yes
 - No
 - Do not know
- 98) If yes, how was your produce graded last season?
- 99) Do you have any form of credit now?
- Yes
 - No
 - Other (specify)
- 100) If yes, from where did you obtain credit?
- Co-operative
 - AFC
 - Local bank
 - Trader
 - Friend
 - Other (specify)
- 101) Are you a member of the local co-operative society?
- 102) If so, in whose name is the membership?
- 103) In what form did you obtain credit?
- Direct loan
 - Bank overdraft

c) Inputs

d) Other (specify)

104) What problems did you experience when marketing this crop?

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

105) What solutions do you suggest for these problems?

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

APPENDIX II: TABLES AND CHARTS**Table 24:** Distribution by sex - tea

Sex	Frequency	Percentage	Cumulative Percentage
Female	46	33.8	33.8
Male-female	2	1.5	35.3
Male	88	64.7	100.0
Total	136	100.0	100.0

Table 25: Distribution by sex - coffee

Sex	Frequency	Percentage	Cumulative Percentage
Female	76	37.6	37.6
Male-female	1	0.5	38.1
Male	125	61.9	100.0
Total	202	100.0	100.0

Table 26: Sex * are you married? cross tabulation (%)

Sex	Yes	No	Total
Female			
% within sex	95.1	4.9	100.0
% of Total	34.3	1.8	36.1
Male			
% within sex	93.4	6.6	100.0
% of Total	58.9	3.8	63.0

Table 27: Marital status - both crops

Sex	Are your married		Totals	% within sex		% of Total		Totals
	Yes	No		Yes	No	Yes	No	
Female	116	6	122	95.1	4.9	34.3	1.8	36.1
Male-Female	2	1	3	66.7	33.3	0.6	0.3	0.9
Male	199	14	213	93.4	6.6	58.9	3.8	63.0
Total	317	20	338			93.8	5.9	100.0

Table 28: Sex of respondent vs. marital status - tea

Sex	Are your married		Totals NA	% within sex		% of Total		Totals
	Yes	No		Yes	No	Yes	No	
Female	42	4	46	91.3	8.7	30.9	2.9	33.8
Male-Female	1	1	2	50	50	0.7	0.7	1.4
Male	81	7	88	92	8	59.6	5.1	64.7
Total	124	11	1	136		91.2	8.1	100.0

Table 29: Marital status - coffee

Sex	Are your married			Totals	% within sex		% of Total			Totals
	Yes	No	NA		Yes	No	Yes	No	NA	
Female	74	2		76	97.4	2.6	36.6	1.0	0.6	37.6
Male-Female	1		1	2	100.0		0.5			0.5
Male	118	6	1	125	94.4	4.8	58.4	3.0	0.5	61.9
Total	193	8	1	202			95.5	4.0	0.5	100.0

Table 30: Spouse location (both crops)

Sex	Home	Urban	Dead	Divorce	N/A	No response	Total
Female	57	8	45	2	6	4	122
% within Sex	46.7	6.6	36.9	1.6	4.9	3.3	100.0
% of Total	16.9	2.4	13.3	0.6	1.8	1.2	36.2
Male/Female	1	1			1		3
% within Sex	33.3	33.3			33.3		100.0
% of Total	0.3	0.3			0.3		0.9
Male	183	4	7		13	6	213
% within Sex	85.9	1.9	3.3		6.1	2.8	100.0
% of Total	54.1	1.2	2.1		3.8	1.8	63.0
Total Count	241	13	52	2	20	10	338
% within Sex	71.3	3.8	15.4	0.6	5.9	3.0	100.0
% of Total	71.3	3.8	15.4	0.6	5.9	3.0	100.0

Table 31: Spouse location (tea)

Sex	Home	Urban	Dead	N/A	No response	Total
Female	23	3	15	4	1	46
% within Sex	50	6.5	32.6	8.7	2.2	100.0
% of Total	16.9	2.2	11	2.9	0.7	33.8
Male/Female	1			1		2
% within Sex	50			50		100.0
% of Total	0.7			0.7		1.4
Male	72	2	3	7	4	88
% within Sex	81.8	2.3	3.4	8	4.5	100.0
% of Total	52.9	1.5	2.2	5.1	2.9	64.7
Total Count	96	5	18	12	5	136
%	70.6	3.7	13.2	8.8	3.7	100.0

Table 32: Spouse location (coffee)

Sex	Home	Urban	Dead	Divorce	N/A	No response	Total
Female	34	5	30	2	2	3	76
% within Sex	44.7	6.6	39.5	2.6	2.6	3.9	100.0
% of Total	16.8	2.5	14.9	1.0	1.0	1.5	37.6
Male/Female	1					1	2
% within Sex	100.0						100.0
% of Total	0.5						0.5
Male	2	4		6	2	125	
% within Sex	88.8	1.6	3.2	4.8	1.6		100.0
% of Total	55.0	1.0	2.0		3.0	1.0	61.9
Total Count	145	8	34	2	8	5	202
% within Sex	71.8	4.0	16.8	1.0	4.0	2.5	100.0
% of Total	71.8	4.0	16.8	1.0	4.0	2.5	100.0

Table 33: Age of respondents

Sex	19	20-29	30-39	40-49	50-59	60-69	70 plus	Don't know	Total
Female	-	4	20	24	29	21	21	3	122
% within Sex		3.3	16.4	19.7	23.8	17.2	17.2	2.4	100
% of Total		1.2	5.9	7.1	8.6	6.2	6.2	0.9	36.1
Male/Female	1			1			1		3
% within Sex	33.3			33.3			33.3		100.0
% of Total	0.3			0.3			0.3		0.6
Male	1	12	25	43	46	43	41	2	213
% within Sex	0.5	5.6	11.7	20.2	21.6	20.2	19.2	0.9	100.0
% of Total	3	3.6	7.4	12.7	13.6	12.7	12.1	0.6	63.0
Total Count	1	17	45	68	75	64	63	5	338
% of Total	0.3	4.0	13.3	20.1	22.2	18.9	18.6	1.5	100.0

Table 34: Level of education

Level	Frequency	Percent	Cumulative Percent
Adult education	2	0.6	0.6
Primary	150	44.4	45.0
Secondary	96	28.4	73.4
Certificate	13	3.8	77.2
Diploma	7	2.1	79.3
Degree	3	0.9	80.2
None	53	15.7	95.9
No response	14	4.1	100
Total	338	100	

Table 35: Level of education by sex

Sex	Adult Edu.	Primary	Sec.	Cert.	Dip.	Degree	None	No Resp	Total
Female	1	56	36	4	1	27	7		122
% within Sex	0.8	45.9	21.3	3.3	0.8	22.1	5.7		100
% of Total	0.3	16.6	7.7	1.2	0.3	8.0	2.1		36.1
Male/Female	1	1					1		3
% within Sex	33.3	33.3					33.3		100
% of Total	0.3	0.3					0.3		0.9
Male	1	93	69	9	6	3	26	6	213
% within Sex	0.5	43.7	32.4	4.2	2.8	1.4	12.2	2.8	100
% of Total	0.3	27.5	20.4	2.7	1.8	0.9	7.7	1.8	63.0
Total Count	2	150	96	13	7	3	53	14	338
% of Total	0.6	44.4	28.4	3.7	2.1	0.9	15.7	4.1	100

Table 36: Size of land

Acres	Frequency	Percent	Cumulative Percent
1-2	128	37.9	38.0
3-4	119	35.2	73.3
5-6	38	11.2	84.6
7-8	16	4.7	89.3
9-10	9	2.7	92.0
11 and above	18	5.3	97.3
Does not know	6	1.8	99.1
No response	3	0.9	99.7
Missing	1	0.3	100
Total	338	100	100

Table 37: Name in the title deed

	Frequency	Percent	Cumulative Percent
Self	193	57.1	57.1
Spouse	68	20.1	77.2
Parents	40	11.8	89.1
Landlord	4	1.2	90.2
Government	1	0.3	90.5
Grandparents	1	0.3	90.8
Brother	1	0.3	91.1
No response	30	8.3	99.4
School	2	0.6	100
Total	338	100	

Table 39: Do you have children? * type of household cross tabulation

Age	FHH	FOH	MHH	Total
19 or under			1	1
20-29	2	3	12	17
30-39	5	6	34	45
40-49	13	1	55	69
50-59	11	1	61	74
60-69	15		49	64
70 and above	17		46	63
Does not know	1		3	4
No response			1	1
Total	64	12	262	338

Table 40: Level of education * type of household cross tabulation

Response	FHH	FOH	MHH	Total
Yes	60	12	249	321
No	4		13	17
Total	64	12	262	338

Table 42: Title deed name * type of household cross tabulation

Level	FHH	FOH	MHH	Total
Adult education	1		1	2
Primary	23	3	123	149
Secondary	13	6	77	96
Certificate	3	3	8	14
Diploma	1		6	7
Degree	1		2	3
None	20		33	53
No response	2		12	14
Total	64	12	262	338

Table 41: other economic activity? * type of household cross tabulation

Economic Activity	FHH	FOH	MHH	Total
Formal employment	11	4	54	69
Self employment	14	4	54	72
Casual labourer			3	3
None	35	5	134	174
No response	7		16	23
Total	64	12	262	338

Table 42: Title deed name * type of household cross tabulation

Name	FHH	FOH	MHH	Total
Self	25	3	165	193
Spouse	25	5	38	68
Parents	8	2	30	40
Landlord			4	4
Government	1			1
Grandparents	3	2	24	29
Brother			1	1
School	2			2
Total	64	12	262	338

Table 43: Do you own any of the following? * type of household cross tabulation

Items	FHH	FOH	MHH
Sofa Set	56	67	65
Sofa set & sewing	3		7
Sewing machine	27	25	17
Water Tank	6		3
None of the above	6	8	7
Total	100	100	100

Table 44: form of transport * type of household cross tabulation

Type of Transport	FHH	FOH	MHH	Total
PSV	59	9	237	305
Bicycle			1	1
Private vehicle	5	3	24	32
Total	64	12	262	338

Table 45: form of information? * type of household cross tabulation

Information Source	FHH	FOH	MHH	Total
Radio	56	12	242	310
Newspapers	2		6	8
TV			1	1
People	5		10	15
Total	63	12	257	332

Table 46: Source of water * type of household cross tabulation

Water Source	FHH	FOH	MHH	Total
Borehole	40	10	175	228
Piped water	3	1	30	34
Rain water	10		24	34
River	8	1	28	37
Spring	3	-	2	5
Total	64	12	262	338

Table 47: Other enterprises - who do them? * type of household cross tabulation

	FHH	FOH	MHH	Total
Adult male			2	2
% of Total			0.6	0.6
Male Child	15		38	74
% of Total	4.2		11.3	15.7
Female child	1	3		4
% of Total	0.3	0.9		1.2
Adult female	48	12	219	279
% of Total	14.2	3.6	64.8	82.5
Total	64	12	262	338
% of Total	18.9	3.6	77.5	100

Table 48: Irrigation * type of household cross tabulation

	FHH	FOH	MHH	Total
Adult male	38	7	156	201
% of Total	11.2	2.1	46.2	59.5
Adult female	14	2	54	70
% of Total	4.1	0.6	16.0	20.7
Male child	2	1	12	15
% of Total	0.6	0.3	3.6	4.4
Female child	10	2	40	52
% of Total	3.0	0.6	11.8	15.4
Total	64	12	262	338
% of Total	18.9	3.6	77.5	100

Table 49: Fertilizer * type of household cross tabulation

	FHH	FOH	MHH	Total
Adult male	3		10	13
% of Total	0.9		3.0	3.9
Adult female	3	1	13	17
% of Total	0.9	0.3	3.8	5.0
Male child	1		8	9
% of Total	0.3		2.4	2.7
Female child			3	3
% of Total			0.9	0.9
	2			2
	0.6			0.6
	1		2	3
	0.3		0.6	0.9
	3		18	21
	0.9		5.3	6.2
No response	11	2	61	77
% of Total	3.3	1.5	18.0	22.8
Not applicable	40	6	147	193
% of Total	11.8	1.8	43.5	57.1
Total	64	12	262	338
% of Total	18.9	3.6	77.5	100

Table 50: Pesticides * type of household cross tabulation

	FHH	FOH	MHH	Total
Adult male			1	1
% of Total			0.3	0.3
Adult female			2	2
% of Total			0.6	0.6
Male child			1	1
% of Total			0.3	0.3
Not applicable	50	11	225	286
% of Total	14.8	3.3	66.6	84.6
No response	14	1	33	48
% of Total	4.1	0.3	9.8	14.2
Total	64	12	262	338
% of Total	18.9	3.6	77.5	100

Table 51: Picking * type of household cross tabulation

	FHH	FOH	MHH	Total
Adult male	1		4	5
% of Total	0.3		1.2	1.5
Male Child	13		37	50
% of Total	3.8		10.9	14.8
Adult female	2		1	3
% of Total	0.6		0.3	0.9
Female child			1	1
% of Total			0.3	0.3
No response			1	1
% of Total			0.3	0.3
Not applicable	48	12	218	278
% of Total	14.2	3.6	64.5	82.2
Total	64	12	262	338
% of Total	18.9	3.6	77.5	100

Table 52: Post harvest activities * type of household cross tabulation

	FHH	FOH	MHH	Total
Adult male	62	12	261	335
% of Total	18.3	3.6	77.2	99.1
Adult female	2		1	3
% of Total	0.6		0.3	0.9
Total	64	12	262	338
% of Total	18.9	3.6	77.5	100

Table 53: Who does the land preparation? * type of household cross tabulation

	FHH	FOH	MHH	Total
Adult male	51	10	219	280
% of Total	15.2	3.0	65.2	83.3
Adult female	4	1	21	26
% of Total	1.2	0.3	6.3	7.7
Male child	1		5	6
% of Total	0.3		1.5	1.8
Female child	2		9	11
% of Total	0.6		2.7	3.3
No response	3		2	5
% of Total	0.9		0.6	1.5
Not applicable	2	1	5	8
% of Total	0.6	0.3	1.5	2.4
Total	63	12	261	336
% of Total	18.8	3.6	77.7	100

Table 54: who does the planting? * type of household cross tabulation

	FHH	FOH	MHH	Total
Adult male	46	8	183	237
% of Total	13.6	2.4	54.1	70.1
Adult female	17	4	69	90
% of Total	5.0	1.2	20.4	26.6
Male child	1		6	7
% of Total	0.3		1.8	2.1
No response			1	1
% of Total			0.3	0.3
Not applicable			3	3
% of Total			0.9	0.9
Total	64	12	262	338
% of Total	18.9	3.6	77.5	100

Table 55: Pruning - who does it? * type of household cross tabulation

	FHH	FOH	MHH	Total
PRUNING				
Adult male	4		10	14
% of Total	1.3		3.3	4.7
1	1		5	5
% of total	0.3		1.3	1.7
1			2	2
% of Total			0.7	0.7
1	2	1	4	7
% of Total	0.7	0.3	1.3	2.3
2	4		8	12
% of Total	1.3		2.7	4.0
2			1	1
% of Total			0.3	0.3
Adult female	4	1	18	23
% of Total	1.3	0.3	6.0	7.7
2			5	5
% of Total			1.7	1.7
2	2		6	8
% of Total	0.7		2.0	2.7
3	3	3	38	44
% of Total	1.0	1.0	12.7	14.7
3	2		9	11
% of Total	0.7		3.0	3.7
Male child	2			2

% of Total	0.7			0.7
3			1	1
% of total			0.3	0.3
4			1	1
% of Total			0.3	0.3
Female Child			8	8
% of Total			2.7	2.7
5	1		2	3
% of Total	0.3		0.7	1.0
5			1	1
% of Total			0.3	0.3
5	3		16	19
% of Total	1.0		5.3	6.3
6	1		1	2
% of Total	0.3		0.3	0.6
6	2	1	10	13
% of total	0.7	0.3	3.3	4.3
7	3		19	22
% of Total	1.0		6.3	7.3
9	8	2	35	45
% of Total	2.7	0.7	11.7	15.0
10	17	1	33	51
% of Total	5.7	0.3	11.0	17.0
Total	59	9	232	300
% of Total	19.7	3.0	77.3	100.0

Table 56: Farmacyard manure - who applies it? * type of household cross tabulation

	FHH	FOH	MHH	Total
FARMYARD MANURE				
Adult male	2		6	8
% of Total	0.6		1.8	2.4
1	4	1	14	19
% of total	1.2	0.3	4.1	5.6
1			3	3
% of Total			0.9	0.9
1	1		4	5
% of Total	0.3		1.2	1.5
2	6		5	11
% of Total	1.8		1.5	3.3
2			1	1
% of Total			0.6	0.6
Adult female	4		15	19
% of Total	1.2		4.4	5.6

2	1		19	20
% of Total	0.3		5.6	5.9
2	3		13	16
% of Total	0.9		3.8	4.7
3	5	4	45	54
% of Total	1.5	1.2	13.3	16.0
3	2		17	19
% of Total	0.6		5.0	5.6
Male child	1	1	1	3
% of Total	0.3	0.3	0.3	0.9
3	2		2	4
% of Total	0.6		0.6	1.2
4			1	1
% of Total			0.3	0.3
4			3	3
% of Total			0.9	0.9
Female Child	1		6	7
% of Total	0.3		1.8	2.1
5	1		4	5
% of Total	0.3		1.2	1.5
5			2	2
% of Total			0.6	0.6
5	4	1	20	25
% of Total	1.2	0.3	5.9	7.4
6	2		2	4
% of Total	0.6		0.6	1.2
6	3	1	15	19
% of total	0.9	0.3	4.4	5.6
7	1		12	13
% of Total	0.3		3.6	3.8
8			1	1
% of Total			0.3	0.3
9	4	1	8	13
% of Total	1.2	0.3	2.4	3.8
10	18	2	42	62
% of Total	5.3	0.6	12.4	18.3
Total	64	12	262	338
% of Total	18.9	3.6	77.5	100.0

Table 57: Knowledge of any extension agents * type of household cross tabulation

Responses	FHH	FOH	MHH	Total
Yes	33	6	163	202
% of Total	9.8	1.8	48.2	59.8
No	28	6	93	127
% of Total	8.3	1.8	27.5	37.6
Not sure	3	-	6	9
% of Total	0.9	-	1.8	2.7
Total	64	12	262	338
% of Total	18.9	3.6	77.5	100.0

Table 58: Extension agent helpful *type of household cross tabulation

Response	FHH	FOH	MHH	Total
Yes	33	8	184	225
% of Total	9.8	2.4	54.4	66.6
No	4	2	8	14
% of Total	1.2	0.6	2.4	4.1
Do not know	10	1	43	54
% of Total	3.0	0.3	12.7	16.0
Not applicable	1		5	6
% of Total	0.3		1.5	1.8
No response	16	1	22	39
% of Total	4.7	0.3	6.5	11.5
Total	64	12	262	338
% of Total	18.9	3.6	77.5	100.0

Table 59: When did you last talk to him or her about farming? * type of household cross tabulation

Response	FHH	FOH	MHH	Total
Yes	33	8	184	225
% of Total	9.8	2.4	54.4	66.6
No	4	2	8	14
% of Total	1.2	0.6	2.4	4.1
Do not know	10	1	43	54
% of Total	3.0	0.3	12.7	16.0
Not applicable	1		5	6
% of Total	0.3		1.5	1.8
No response	16	1	22	39
% of Total	4.7	0.3	6.5	11.5
Total	64	12	262	338
% of Total	18.9	3.6	77.5	100.0

Table 60: Do you keep farm records and accounts? * type of household cross tabulation

Response	FHH	FOH	MHH	Total
Yes	13	5	97	115
% of Total	3.8	1.5	28.7	34.0
No	48	6	159	213
% of Total	14.2	1.8	47.0	63.0
No response	3	1	6	10
% of Total	0.9	0.3	1.8	3.0
Total	64	12	262	338
% of Total	18.9	3.6	77.5	100.0

NB: The source of all the tables in Appendix II is **Field Data**