

**POLICY AND INSTITUTIONAL INCENTIVES AND DISINCENTIVES
ON CONSERVATION AGRICULTURE WITH TREES
IN KIBWEZI AND MERU COUNTIES, KENYA**

Mary Ng'endo Kanoi (BSc.)

**A Thesis Submitted in Partial Fulfillment of the Requirements for the Degree
of Master of Environmental Science of Kenyatta University**

Kanoi, Mary Ng'endo
*Policy and
institutional*



2013/422753

OCTOBER, 2012

DECLARATIONS

Declaration by candidate

This thesis is my original work and has not been presented for a degree in any other University or any other award. No part of this thesis work should be reproduced without prior permission of the author and/or Kenyatta University.

Signature: .....

Date: 07/11/2012

Mary Ng'endo Kanoi
(N50/21024/2010)

Declaration by Supervisors

We confirm that the work reported in this thesis was carried out by the candidate under our supervision.


Prof. James Kung'u

Signature: .....

Date: 7/11/2012

Department of Environmental Sciences,
School of Environmental Studies, Kenyatta University

Dr. Judy Kariuki

Signature: .....

Date: 07/11/2012

Department of Environmental Sciences,
School of Environmental Studies, Kenyatta University

Dr. Delia Catacutan

Signature: .....

Date: 7/11/2012

Environmental Services (GRP6), World Agroforestry Centre

DEDICATION

To my cherished family and friends without whose love, support and encouragement I would not have accomplished this exemplary research work in recordtime.

ACKNOWLEDGEMENTS

Sincere gratitude goes to Professor James Kung'u, Dr. Judy Kariuki, Dr. Delia Catacutan and Dr. Jonathan Muriuki for reading through the thesis, for their expert guidance, academic assistance and encouragement through all stages of this research work. Many thanks to the World Agroforestry Centre (ICRAF) for the research fellowship that enabled this research undertaking to be a reality. The African Union (A.U) is also acknowledged for their funding during the second half of my Msc. course work studies. Also highly acknowledged are Felix Ngetich and Dorice Situma who put effort and time into reading draft manuscripts and for their useful insights. Special thanks go to many colleagues who provided valuable guidance and support that facilitated field work, data entry and analysis: Sammy Carsan, Andrew Sila, Ronald Muchelo, Nancy Oseko, Rose Onyango and Sallyannie Muhoro. The timely field work would not have been possible without the contribution of expertise, advice and logistical support by David Muchiri and Gilbert Muthee in the two study areas. Special thanks go to the key informants, farmers, local administration and extension staff who participated in this study. Warm gratitude goes to my colleagues in East Africa Region, GRP6 and the entire ICRAF staff for their friendship, encouragement and support that has made my stay at ICRAF a memorable and enjoyable experience. Thank you all very much!

TABLE OF CONTENTS

DECLARATIONS	i
DEDICATION	ii
ACKNOWLEDGEMENTS	iii
LIST OF TABLES	vii
LIST OF FIGURES	viii
ACRONYMS AND ABBREVIATIONS	ix
ABSTRACT	xi
CHAPTER 1: INTRODUCTION	1
1.1 Background	1
1.2 Problem Statement and Justification	3
1.3 Research Questions	5
1.4 Research Hypothesis	5
1.5 Objectives	5
1.5.1 Overall Objective	5
1.5.2 Specific Objectives	5
1.6 Conceptual Framework	6
1.7 Definition of Terms	8
1.8 Scope of the Study	8
CHAPTER 2: LITERATURE REVIEW	9
2.1 Introduction	9
2.2 Conservation Agriculture Practices in Africa	10
2.3 Conservation Agriculture With Trees Practices	10
2.4 Policy Context and Framework in Kenya	11
2.5 Policy Incentives and Disincentives in CAWT	15
2.6 Summary, Gaps Identified and Focus of Study	16
CHAPTER 3: METHODOLOGY	17
3.1 Description of the Study Area	17
3.2 Sampling	19
3.3 Research Design	20
3.4 Methods of Data Collection	21
3.4.1 Secondary Data	21
3.4.2 Primary Data Sources	21
3.4.2.1 Open-ended Key Informant Interviews	21
3.4.2.2 Semi-structured Interview Schedules	22
3.5 Data Analysis and Presentation	23
CHAPTER 4: RESULTS AND DISCUSSION	24
4.1 Introduction	24
4.2 Sample Characteristics	24

4.2.1 Demographic Characteristics	24
4.2.2 Farm Characteristics.....	26
4.3 Socio-economic Characteristics.....	27
4.3.1 Level of Formal Education.....	27
4.3.2 Land Ownership Security.....	29
4.3.3 Indicators of CA Practice	32
4.4 Policy Incentives and Disincentives in CAWT	34
4.4.1 Policy Incentives and Disincentives at the Small Scale Farmer Level ..	34
4.4.1.1 Evidence for the Study Hypothesis.....	34
4.4.1.2 Selected Rules in the Forestry Sector.....	36
4.4.1.2.1 Implications of the Selected Forestry Sector Rules on CAWT Adoption.....	39
4.4.1.3 Selected Rule in the Land Sector	39
4.4.1.3.1 Implications of the Selected Land Sector Rule on CAWT Adoption	40
4.4.1.4 Selected Rules in the Agriculture Sector	40
4.4.1.4.1 Implications of the Selected Agriculture Sector Rules on CAWT Adoption.....	41
4.4.2 Policy Incentives and Disincentives at the National Level.....	42
4.4.2.1 General Policy Analysis.....	42
4.4.2.2 Policy Incentives and Disincentives	43
4.4.2.2.1 Agriculture Act (Chapter 318)	44
4.4.2.2.2 The Agriculture (Basic Land Usage) Rules	46
4.4.2.2.3 The Agriculture (Farm Forestry) Rules, 2009.....	47
4.4.2.2.4 Forest Act, 2005	49
4.4.2.2.5 Sessional Paper No.3 of 2009 on Kenya National Land Policy.....	50
4.4.2.2.6 Agricultural Sector Development Strategy (ASDS) 2010-2020.....	54
4.5 Institutional Incentives and Disincentives	59
4.5.1 Institutional Frameworks Governing CAWT at the Small Scale Farmer Level.....	59
4.5.2 Institutional Frameworks Governing CAWT at the National Level.....	61
4.5.3 Awareness on CAWT Related Policies at the Local Level	63
4.5.4 Policy Frameworks Governing CAWT at the National Level	66
4.6 The Policy Making Process	67
4.6.1 Policy Making Process at the Small Scale Farmer Level	67
4.6.2 Policy Making Process at the National Level	67
4.6.3 Implications of the Policy Making Process on CAWT Adoption.....	69
4.7 National and Regional Development Initiatives.....	72
4.7.1 Existing Initiatives at the Local Level	72
4.7.2 Existing Initiatives at the National Level.....	73
4.7.3 Existing Initiatives at the Regional Level	76
4.8 Small Scale Farmers' Policy Propositions.....	78
4.9 Summary of Results on Policy incentives and Disincentives.....	82
CHAPTER 5: CONCLUSIONS AND RECOMMENDATIONS	85
5.1 Conclusions.....	85
5.2 Recommendations.....	88

5.3 Areas of Further Research	90
REFERENCES.....	91
APPENDICES.....	98
Appendix I: Study Framework	98
Appendix II: Small Scale Farmer Interview Schedule	99
Appendix III: Key Informant Checklist.....	107
Appendix IV: List of Key Informants Interviewed	112

LIST OF TABLES

Table 1: Age Characteristics of Kibwezi and Meru Respondents (as of July 2011)	25
Table 2: Willingness to practice CA in Respect to Education Level	27
Table 3: Reasons for CA Practice	29
Table 4: Integration of Trees on Farms for CA Promotion	29
Table 5: Land Ownership Forms	30
Table 6: Possession of Land Title Deeds Among Respondents	30
Table 7: Benchmarks of CA Practice	32
Table 8: Farm Preparation Methods	33
Table 9: Influence of the Various Policies on Small Scale Farmers	35
Table 10: Chi-square test on Statistical Significance of the Policy Influence	35
Table 11: Respondent Opinions on the Need for a Permit	36
Table 12: Respondent Opinions on the 10% Farm Forest Cover	37
Table 13: Respondent Opinions on Restriction of Tree Cutting and Transportation	38
Table 14: Respondent Opinions on Lack of Restriction on Minimum Land Sizes	39
Table 15: Respondent Opinions on Promotion of Irrigation Agriculture	40
Table 16: Respondent Opinions on Extension Officer-Farmer Trainings	41
Table 17: Awareness on Existing Formal Organizations Promoting CA	60
Table 18: Awareness on Existing CBOs Promoting CA	60
Table 19: Awareness of Local Community Rules	63
Table 20: Awareness of Local Government Agricultural Rules	64
Table 21: Awareness of the Various National Policies	65
Table 22: Existing Initiatives at the Local Level	73
Table 23: Rating of Different Policy Motivations	80
Table 24: Recommended CA Motivations at the Local Level	81
Table 25: Overview of six key national policy incentives and disincentives	82

LIST OF FIGURES

Figure 1: Conceptual framework showing incentives (direct and indirect) as dependent variables of CA adoption.....	7
Figure 2: Map of Meru Central District in Kenya.....	18
Figure 3: Map of Kibwezi District in Kenya.....	19
Figure 4: Types and examples of incentives (and disincentives).....	98

ACRONYMS AND ABBREVIATIONS

ACT	African Conservation Tillage Network
AEZ	Agro Ecological Zone
AFC	Agricultural Finance Corporation
AFLEG	Africa Forest Law Enforcement and Governance
AGRA	Alliance for a Green Revolution in Africa
ARD	Agriculture and Rural Development
ASAL	Arid and Semi Arid Land
ASDS	Agricultural Sector Development Strategy
CA	Conservation Agriculture
CAADP	Comprehensive Africa Agriculture Development Program
CABI	Centre for Agricultural and Biosciences International
CASARD	Conservation Agriculture for Sustainable Agriculture and Rural Development
CAWT	Conservation Agriculture With Trees
CBO	Community Based Organization
CFA	Community Forest Association
DAC	District Agricultural Committee
DAO	District Agricultural Officer
EACFE	Eastern Africa Coastal Forests Ecoregion
ERS	Economic Recovery Strategy for Wealth and Employment Creation
FAO	Food and Agriculture Organization of the United Nations
GAA	German Action Aid
GDP	Gross Domestic Product
GoK	Government of Kenya
GTZ	German Technical Corporation
ICRAF	World Agroforestry Centre
IFAD	International Fund for Agricultural Development
IMF	International Monetary Fund
INRMU	Integrated Natural Resources Management in Ukambani

KAPAP	Kenya Agricultural Productivity and Agribusiness Project
KAPP	Kenya Agricultural Productivity Programme
KARI	Kenya Agricultural Research Institute
KEFRI	Kenya Forestry Research Institute
KENDAT	Kenya Extension Network for Dissemination of Agricultural Technologies
KENVO	Kijabe Environment Volunteers
KES	Kenya Shillings
KFS	Kenya Forest Service
LSFs	Large Scale Farmers
MDG	Millenium Development Goal
MKEPP	Mount Kenya East Pilot Project
MoA	Ministry of Agriculture
NAAIAP	National Accelerated Agricultural Input Access Programme
NALEP	National Agriculture and Livestock Extension Programme
NASEP	National Agricultural Sector Extension Policy
NEPAD	New Partnership for African Development
NGO	Non- Governmental Organization
NLP	National Land Policy
SACCO	Savings and Credit Co-operative Organization
SFI	Soil Fertility Initiative
SHG	Self Help Group
SHOMAP	Small Holder Horticulture and Marketing Porgramme
SPSS	Statistical Package for Social Sciences
SRA	Strategy for Revitalizing Agriculture
SSFs	Small Scale Farmers
TIST	International Small Group and Tree Planting Program
WWF	World Wide Fund for Nature

ABSTRACT

Conservation Agriculture With Trees (CAWT) is an approach that combines the practices of Conservation Agriculture (CA) with those of agroforestry. One of the knowledge gaps that must be addressed to fully exploit the potential of CAWT pertains to policies favouring or discouraging the adoption of CA practices among small scale farmers. This study hypothesized that policy incentives are needed to stimulate adoption of CAWT by small scale farmers in Kibwezi and Meru Counties, Kenya. The study identified and analyzed existing policy incentives and disincentives promoting or hindering large scale adoption of CAWT in Kenya by reviewing six agricultural policies related to CAWT. In addition, participatory policy analysis was utilized in purposive sampling of key informants at the national level and stratified random sampling of small scale farmers at the local level. At the national level, twenty-six national government officials and technical people were interviewed and at the local level, 120 farmers were surveyed in both Kibwezi and Meru Counties. The study found that policy compliance has more to do with inherent benefits associated with adopting the policies than the incentives or benefits directly provided. Further, the policies are either (i) poorly implemented or (ii) not exclusively targeted to small scale farmers. Farmers believe that 'indirect enabling incentives' such as security of land tenure (67%), market development (67%) and provision of improved extension services (45%) could offer the best motivation for them to adopt CAWT. Based on the study findings, the key policy recommendations for promotion of CAWT are that (i) CA techniques need to be tailor-made to suit local community's social and cultural context (ii) the primary focus should be on enhancing the 3 key CA principles simultaneously (iii) CA is most successful when particular agro-ecological zones are targeted.

CHAPTER 1: INTRODUCTION

1.1 Background

One of the key impacts of climate change and continuous cropping on agricultural land has been soil fertility decline (Cobo *et al.*, 2010). It is most intense in East Africa, next in coastal West Africa and Southern Africa, and least intensive in the Sahelian Belt and Central Africa (Smaling *et al.*, 1997). One of the main causes of soil degradation identified in many parts of Africa is the practice of inappropriate methods of soil preparation and tillage (FAO, 2000), characterized by intensive soil preparation by hoe or plough combined with removal or burning of crop residues (Rockström *et al.*, 2009). Tillage-induced soil erosion is responsible for 40 per cent of land degradation worldwide and it entails soil losses exceeding 150 tonnes/hectare annually in developing countries (FAO, 2001). It also results in mining soils of plant nutrients by removing crop residues and leaching (Smaling *et al.*, 1997; Quinones *et al.*, 1997). Thus, the intensive and continued use of the plough has proven to be unsustainable in several climatic zones (FAO, 2001). Over the years, due to poor farming practices in Kenya, the soil fertility has drastically gone down (Wangungu *et al.*, 2010; Smaling *et al.*, 1997).

Conservation Agriculture (CA) is gaining acceptance as an alternative to both conventional agriculture and organic agriculture as a means of ensuring sustainability of land management practices (FAO, 2009). CA is a toolkit of agricultural practices that combines, in a locally adapted sequence, the simultaneous three CA principles of reduced tillage or no-till; soil surface cover and crop rotations and/or associations. It is an approach that advocates the concept of sustainable intensification of production (FAO, 2009). It is based on optimizing yields and profits, to achieve a balance of agricultural, economic and environmental benefits (Dumanski *et al.*, 2006).

Small scale farmers face daunting challenges in their soil replenishment efforts (Sanchez *et al.*, 1997). Farmers who are willing, or obliged by circumstances, to re-assess their farming practices and follow the path to more sustainable

agriculture, embark on a long journey that takes them several years or even longer and no journey appears to be linear. This is because there are various factors that motivate farmers to try specific CA practices, or prevent them from trying the practices or from achieving success with them (Shetto and Owenya, 2007).

Constraints facing small-scale farmers need to be considered, since these challenges may not be experienced by large-scale farmers. An equally special category of small-scale farmers are women. The constraints facing women smallholders may be an important part of the problem as women represent on average 46 per cent of the agricultural labor force in Africa (Gladwin *et al.*, 1997). The alleviation of constraints hindering adoption of CA through improved government policies can provide small scale farmers with more incentives to undertake soil replenishment investment. These policies may not, however, address the urgent short-term needs of resource-poor farmers (Sanchez *et al.*, 1997). A practice such as agroforestry that promotes soil cover and crop rotation greatly promotes CA (FAO, 2009; FAO, 2010). Conservation Agriculture With Trees (CAWT) is an approach that combines the practices of CA with those of agroforestry. CAWT would add to the fourth principle of CA- that of tree-crop intercropping, hence promoting good land management practices (Mowo and Kiwia, 2009). CAWT may hold the short term key and for adoption to be successful, enabling policies and institutional framework need to be in place.

There are several knowledge gaps that must be addressed to fully exploit the potential of CAWT. One of these pertains to existence of policies favouring or discouraging the adoption of CA (Shetto and Owenya, 2007) and agroforestry practices among small scale farmers. The focus of this research study was to identify, analyze and document existing policies and institutional incentives and disincentives promoting or hindering adoption of CAWT in Kenya.

1.2 Problem Statement and Justification

Although conservation interventions aimed at halting and reversing degradation as well as boosting agricultural productivity have gained increasing interest in Africa and the world at large, there has been a generally low adoption rate of CA in Africa. The total area of coverage is estimated to be less than 1% of the continent's land (FAO, 2009). Further, agroforestry approaches to maintaining soil fertility have met with limited success, especially where poverty and hunger force farmers to employ desperate short-term survival strategies that take precedence over longer term sustainability practices (Quinones *et al.*, 1997).

A sustainable practice, such as CAWT, can be identified as an option to meet the short-term needs of small scale farmers for adequate food and income, while addressing the long-term considerations of sustainable resource management (Ajayi *et al.*, 2007), yet CAWT adoption has been low, especially among the low-capital endowed small scale farmers. Specifically for small scale farmers, shifting from conventional ploughing to conservation farming is a major step, both financially and in terms of perceptions (Rockström *et al.*, 2009). Farmers believe in working their soils as it is believed it buries seeds and weeds, and aerates the soil. It is also well accepted that a clean farm is synonymous with hard work and is the opposite of laziness. Lack of knowledge on how to undertake conservation agriculture and its benefits is the most common reason for its low adoption (FAO, 2009). Its adoption is also not free of cost, nor particularly simple (FAO, 2001). While some benefits of conservation agriculture can be obtained in one to two years, full realization requires four to five years (Shetto and Owenya, 2007). During the two or three transition years to CA, there are extra costs for some tools or equipment. The weed incidence, albeit rapidly diminishing, may induce farmers to apply herbicides in the first two years or so (FAO, 2001). Where tenure is insecure farmers have little motivation to sustainably manage crop, livestock and land resources, their main concern being day to day survival and maximum extraction. Small scale farmers willing to practice conservation measures need

entitlement to land for more than one season to see improved soil fertility (Shetto and Owenya, 2007).

Most cases where changes towards sustainable intensification have occurred are still only islands of success (FAO, 2001). In Kenya, CA is mainly practiced where CA organizations had projects in place. Instead of the practices spreading to other areas, they are done on a minimal scale. Projects and organizations preferred to use similar sites, leading to duplicating techniques in particular areas with little spreading to other parts of the area (Kaumbutho and Kienzle, 2007). What has been achieved so far at community level represents what is possible in spite of the existing constraints (FAO, 2001).

Institutional weakness and inappropriate policy formulations seem to be the key constraints to getting agriculture moving. With that, Kenya is not so different from many other countries in Sub-Saharan Africa (GTZ Sustainet, 2006). It is assumed that the low adoption rates are partly because policy environments are not favourable. Most agricultural policies still actively encourage farming that is relying largely, often almost exclusively, on external inputs and technologies, discriminating against locally adapted technologies and practices. In some cases, these policy frameworks are the principal barriers to the spread of more sustainable and productive agricultural systems (FAO, 2001).

Farmers' adoption decisions are strongly influenced by the policy and institutional context within which technologies are disseminated to potential users. As part of 'getting the policy right', there is a need to evaluate existing national and regional policies to determine whether they have inadvertently created direct and/or indirect incentives and/or disincentives to the adoption of soil replenishment technologies (Ajayi *et al.*, 2007). There exists a knowledge gap on how institutional and policy support influence adoption of CA, and it must be addressed to fully exploit CAWT. It is against this background that the research study was conducted to

determine existing policy and institutional incentives and disincentives promoting or hindering adoption of conservation agriculture with trees in Kenya.

1.3 Research Questions

1. Are there specific policy incentives and disincentives existing for small scale farmer investment in CAWT in Kenya?
2. How do the current policy and institutional frameworks in forestry, agriculture and land sectors relate to adoption of CAWT in Kenya?
3. How do the agriculture, forestry and land policy making processes in Kenya influence efforts to promote CAWT?
4. What are the major national and regional agricultural development initiatives that can integrate a CAWT focused intervention among the small scale farmers?

1.4 Research Hypothesis

There exist policies in Kenya that offers incentives for Conservation Agriculture With Trees (CAWT) to small scale farmers.

1.5 Objectives

1.5.1 Overall Objective

To determine existing institutional and policy incentives in Kenya that promotes or hinders widespread adoption of CAWT among small scale farmers.

1.5.2 Specific Objectives

1. To explore specific policy incentives and disincentives existing for small scale farmer investment in CAWT in Kenya.
2. To analyze the implications of the agriculture, forestry and land policy making processes for nationwide promotion of CAWT in Kenya.
3. To identify major existing national and regional agricultural development initiatives that can integrate a CAWT focused intervention among small scale farmers in Kenya.

1.6 Conceptual Framework

There are various policy and institutional weaknesses that contribute to the low adoption rate of CAWT in Kenya. It is therefore important to examine the policy and institutional environment of CAWT, in order to reverse its weaknesses. One of the ways of reducing the weaknesses is by incorporating institutional incentives such as provision of extension services and regular farmer trainings on CAWT to the small scale farmers. Policies that offer incentives to small scale farmers have the potential to increase adoption of CAWT. For this study, I used the concept of incentives and disincentives as the underlying factors affecting poor uptake of CA. Incentives are defined as external prompts of many forms provided by the government through policies and programmes to which farmers respond, either positively or negatively whereas disincentives refer to those that discourage, hinder or deter positive responses or actions to occur (Catacutan and Piñon, 2009). In the context of CA, direct incentives are those that have the potential to lower investment cost of CA practice for instance by lowering input costs while indirect economic incentives are those that increase returns on a farm, for example, by increasing profit margins. Indirect enabling incentives are those that influence a farmer's decision to practice CA. Direct incentives such as cost-sharing arrangements and indirect economic incentives such as price controls could act as enabling incentive policies with the aim of increasing adoption of CAWT. Indirect enabling incentives such as market development where output prices offer higher profit margins as compared to input prices, as well as resource security including land tenure also have the potential of motivating SSFs to adopt CAWT (Figure 1).

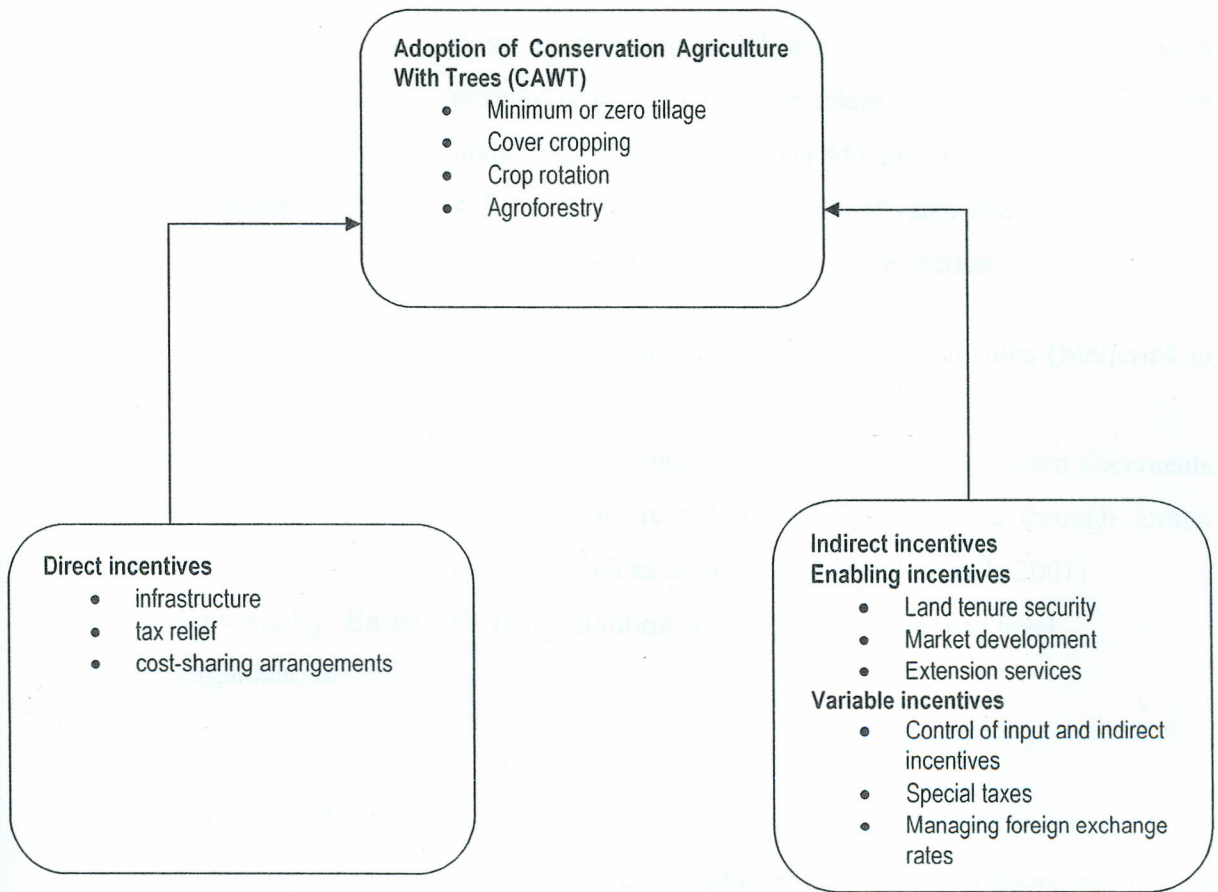


Figure 1: Conceptual framework showing incentives (direct and indirect) as dependent variables of CA adoption

(Adopted from Enters et al., 2004; Catacutan and Piñon, 2009)

1.7 Definition of Terms

Bill	Draft proposed legislation (CiteHR.com, no date).
Act	Adopted and operationalized legislation (CiteHR.com, no date).
Policy	A set of decisions which are oriented towards a long-term purpose or to a particular problem and they may or may not involve specific legislation (FAO, no date).
Incentive	A factor that induces action or motivates effort
Disincentive	A factor that prevents or discourages action
Institution	An organization that administers formal rules (Meijerink <i>et al.</i> , 2007)
Formal institution	Rules that are readily observable through written documents or rules that are determined and executed through formal position, such as an Authority (Zenger <i>et al.</i> , 2001)
Community Based Organization	Formal institution at the local (community) level

1.8 Scope of the Study

The study focused on the policy and institutional incentives and disincentives as a potential strength or weakness in the scaling up of conservation agriculture with trees. This was not overlooking the other aspects that may contribute to the low adoption of conservation agriculture, such as the extra financial cost implications, the persistent mindset on conventional tillage and the existing competition for crop residues. Though all these are important, time and financial constraints did not allow for an extensive study into varied biophysical, cultural and socioeconomic factors contributing to low CA adoption. The geographical scope was limited to two study sites which represented humid and arid agro-ecological zones of the country.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

This chapter introduces CA practices and explains the policy context and frameworks governing Conservation Agriculture With Trees (CAWT). It also aims at highlighting the various policy incentives and disincentives for CAWT among the small scale farmers. On the basis of the existing national and regional agricultural development initiatives, it seeks to integrate how their different mandates can promote a CAWT focused approach among small scale farmers. Finally, it will attempt to identify the existing gaps and hence zero in on the focus of the study.

Much of the published work on the deteriorating food situation in Africa highlights increasing nutrient depletion as a cause of declining soil fertility (Cobo *et al.*, 2010; Hailelassie *et al.*, 2005; de Jager *et al.*, 2001; van den Bosch *et al.*, 1998; Smaling and Fresco, 1993). Other studies suggest that the deteriorating African food situation at this stage may not be so much a problem of soil nutrient depletion and declining soil fertility but of low external inputs accompanied by a rapidly growing population hence the need to scale-up fertility replenishment practices from tens of thousands to millions of African farm families (Sheldrick and Lingard, 2004). Land-related problems are often seen in terms of specific issues such as desertification, deforestation, nutrient depletion, pollution, biological diversity or climate change. The use and husbandry of land are complex and multi-faceted, which demands a holistic and integrated approach to address the broad range of goals and objectives of the multiple users that are perceived to be important (FAO, 2001). Many projects and teams tend to focus on technical issues such as tillage, cover crops, weed control and implements at the field scale. This focus often implies less attention is given to non-technical issues, for example rural finance, marketing, value chain development, organizational and policy issues (Shetto and Owenya, 2007).

2.2 Conservation Agriculture Practices in Africa

Conservation Agriculture (CA) is being practiced in a number of countries as traditional soil and water conservation practices by specific communities or at pilot project scale throughout Africa. The three CA principles entail permanent soil cover, minimum or no soil tillage and crop rotation. The simultaneous application of the three principles of CA started recently and has emerged in several places, most notably in South Africa, Zimbabwe, Zambia, Kenya and Tanzania. CA has spread rapidly in Ghana from a handful of farmers in 1996 to 350,000 by 2002 through the Monsanto and GTZ support. Malawi is beginning to have renewed interest and has currently 47,000 hectares under “some form” of Conservation Agriculture involving 5,407 groups of farmers. Out of the 47,000 hectares at least 1,000 hectares can be said to be truly under conservation agriculture (FAO, 2009). In Tanzania, conservation agriculture is being promoted especially in the Arusha region, as a combination of crop and crop–livestock production practices that make land more productive even as it improves the resilience of natural resources. Conservation Agriculture for Sustainable Agriculture and Rural Development (CASARD) was a 2 year project between June 2004 and June 2006. Funded by the German Trust Fund through the Food and Agriculture Organization of the United Nations (FAO) and the Governments of Kenya and Tanzania, it was put into operation in three districts in Tanzania- Arumeru, Bukoba and Karatu Districts, and five districts in Kenya -Bungoma, Laikipia, Mbeere, Nakuru and Siaya (Kaumbutho and Kienzle, 2007).

2.3 Conservation Agriculture With Trees Practices

The vision now is of agroforestry as an integrated land use policy that combines increases in productivity and income generation, with environmental rehabilitation and the diversification of agro-ecosystems (Sanchez and Leakey, 1996). Conservation agriculture should be integrated with previous practices, such as soil and water conservation and agroforestry (Shetto and Owenya, 2007). Some components of agroforestry have been fully compatible with conservation agriculture. The “fertilizer tree”, *Faidherbia albida*, is remarkable in that it sheds

its leaves, which are rich in nitrogen, at the start of the rainy season, just when the crop will benefit most from the added nutrients. In the growing season the tree is bare, therefore it does not block light and warmth from the crops. The roots of the tree reduce soil erosion. Its pods are used for fodder, the thorny branches are used for firewood and fencing, and it is even used as medicine (FAO, 2010). In Tanzania, agroforestry and contour construction is traditionally widely used, especially near Mt Meru. They have been practised since colonial times and integrate well with conservation agriculture in conserving water and soil (Shetto and Owenya, 2007). In Meru Central District in Kenya, farmers are willing and able to plant a wide variety of tree species, particularly when their direct benefit to the household is clear. There is a heavy reliance on *Grevillea robusta* and other exotics such as *Eucalyptus* to respond to market demands for firewood and timber. Farmers' tree planting activities are also limited by lack of coordination of germplasm supply, leading to a limited diversity and quantity available at farm level (Carsan and Holding, 2006).

2.4 Policy Context and Framework in Kenya

Since CAWT encompasses agriculture, land and forestry sectors, policies in these three sectors were examined.

Kenya's agricultural sector is governed by over 130 pieces of legislation. However, many of these are out of date with the current economic realities and are in need of updating, amendment or repeal (Argwings-Kodhek, 2005). In 2006, a number of policies, legal and institutional reforms were carried out by the Ministry of Agriculture (MoA) and new management systems adopted, nine of which are discussed herein. Firstly, the Ministry's Strategic Plan (2006-2010) was revised in order to embrace new strategies that address emerging issues and constraints. Eight strategic issues and corresponding objectives were flagged out together with their implementation strategies. Secondly, the Pyrethrum Industry Policy and Amendments of the Pyrethrum Act Chapter 340 is aimed at facilitating the liberalization of the pyrethrum industry and separation of the commercial from regulatory functions of the Pyrethrum Board of Kenya. Thirdly, the National Seed

Industry Policy gives a clear direction for the development of a sustainable seed industry in order to avail high quality seed and planting materials to farmers and harmonize all seed related activities and legislation. Next, the National Agriculture Sector Extension Policy (NASEP) aims to guide and regulate the provision of agricultural extension service in Kenya hence giving it a sector-wide dimension and representation. Fifthly, the Sugar Policy and Amendment of Sugar Act No. 10 of 2001 aims at restructuring the sugar industry to make it more efficient and competitive in view of increased regional and global trade. Subsequently, the amendment of the Coffee Act No. 9 of 2001 intends to provide a second window for direct coffee sale and marketing, establishment of Coffee Development Fund to finance the industry, and restructuring the key industry institutions for efficient and effective service delivery. Next, the Cotton Policy and repeal of Cotton Industry Act Chapter 335 aims at reviving the cotton industry through policy interventions that address production, processing and marketing. Following that, the draft Potato Policy and strategy have been finalized having incorporated comments for stakeholders. Legal Notice No. 44 of 27th May 2005 on potato standards has been produced and is being implemented. Lastly, the Draft national Food and Nutrition Policy is also ready and it focuses on food availability, food access, food utilization and stability of access (MoA, 2008).

In the context of land policies, at independence in 1963, the Government of Kenya enacted the Registered Land Act (Cap. 300), which was to govern land formerly under the customary law. This law, which was an embodiment of the English law, was to encourage individualization of tenure in line with the agronomic arguments rooted in the Swynnerton Plan. The plan was instituted to guide intensified agricultural development in the reserves by encouraging individualization of tenure and to provide security of tenure through an indefeasible title. The land reform programme in the reserves had three key stages of adjudication, consolidation and registration. After five years of independence, the Land Adjudication Act (Cap. 284) was amended to cater for group rights particularly in pastoral and nomadic areas where individualization had little success. The group

Over the last two or three decades, Kenya witnessed the responsibility for forest law enforcement and governance, including those touching on technical issues, gradually being assumed by the provincial administration, so that the line of authority between the forestry administration and the latter became blurred. Further, the forest protection workforce, particularly the forest guards, was weakened by retrenchment occasioned by the International Monetary Fund (IMF) driven Structural Adjustment Program (SAP) conditions. Gibbon *et al.*, (2005) indicated that between 1993 and 2003, the number of staff in forest stations dropped from 8,096 to 4,216, a 50% decrease.

The Forests Act (1957), formulated during the colonial times, did not reflect the needs or interests of today's society (Gibbon *et al.*, 2005) and it was revised in 1968 (Sessional Paper No.1). This policy focused on conservation and management of forest resources on Government land. One of its main weaknesses was that it did not adequately recognize or reflect the role, rights or responsibilities of communities adjacent to or living in the forests (Mathu, 2007). Under the 1994 Forestry Master Plan development process, shortfalls in the policy and legislation were recognized and work began on re-drafting. In early 2004, the revised policy and legal documents were submitted to parliament but unfortunately owing to a number of politically sensitive areas in the Bill, it was not ratified. Further revisions were made and it was re-submitted to parliament in 2005 (Gibbon *et al.*, 2005), hence the genesis of the Forests Act (2005). As a result of continuing uncontrolled selective cutting of rare tree species, a new presidential ban on harvesting of East Africa Sandalwood was put in place in February 2007 and it was consistent with the Forests Act 2005 (Mathu, 2007). In addition to the Forests Act (2005), Kenya has over 77 statutes that touch on forestry and key among these are the Draft Land/Land Use Policy, Environmental Management and Coordination Act (1999), the Water Policy/Water Act of 1999, the Wildlife (Conservation and Management) Act (Cap 376) and the Agriculture/National Food Policy Sessional Paper No.2 of 1994 (Mathu, 2007).

2.5 Policy Incentives and Disincentives in CAWT

The agricultural development strategy in Kenya has the primary goal of self-sufficiency in basic food needs. The focus of agricultural policy reforms has been to produce more food to enhance food security, and then to alleviate poverty. The reforms improved conditions for the market to perform, but there has been insufficient support to allow the huge number of small scale farmers to use the new opportunities (GTZ Sustainet, 2006). Small scale farmers can be an asset rather than a liability when supported by appropriate policies (Sanchez and Leakey, 1996). Both structural and policy factors contribute to the generally poor performance of the agricultural sector and the rapid rise in poverty and food insecurity.

Sustainable agriculture offers solutions to many of the problems facing agriculture in Kenya. For these solutions to be effective, policy changes are needed (GTZ Sustainet, 2006). In the long-run, the alleviation of these constraints through improved government policies will provide farmers more incentives to undertake soil replenishment investment, such as cost-sharing and local access to credit with affordable interest rates (FAO, 2001). Policies include support to market information and access to rural finance systems, better and enforced environmental legislation, efficient agricultural services, and improved physical infrastructure (Reij and Smaling, 2008). In the context of the small scale farmer, some of the targeted policies that have the potential of improving their asset value include improvements in land tenure, infrastructure, marketing information, credit, research, extension and access to inputs and markets at reasonable prices (Sanchez and Leakey, 1996). Policies that influence prices, for example by raising farm-gate prices, can influence increased farmer investment in land management, especially in smallholder areas with secure tenure (Koning and Smaling, 2005). Liberalisation of Kenya's fertilizer market induced a vigorous privatised fertilizer distribution sector following abolition of import licensing, quotas and removal of price controls (Sheldrick and Lingard, 2004).

2.6 Summary, Gaps Identified and Focus of Study

Policy reforms have the potential of contributing to widespread change, especially to small scale farmers who experience immense challenges. When these constraints are addressed, it is highly likely that the small scale farmers will be able and willing to scale up sustainability practices, such as conservation agriculture with trees. Analysis of the policy and institutional incentives and disincentives will play a role in identification of constraints as well as contribute to improved Government policies for the small scale farmers.

Few attempts have been made to analyze the policy environment of CA or to advocate CA technologies in national policy processes regarding agriculture and natural resource management (Shetto and Owenya, 2007). The approach should be more on increased policy debate in which uncertainties are recognised, complexities appreciated and the combination of views from different stakeholders sought as a central plank in planning for the future (Sanchez *et al.*, 1997). In African countries, it has not been determined what impact, if any, government policies have had on conservation agriculture, since the concept is at an early stage (Shetto and Owenya, 2007). This information gap can certainly be overcome through studies. In the longer term, the information generated could result in increased food security and reduced poverty (Sanchez *et al.*, 1997). The focus of this study is to identify institutional and policy incentives and disincentives that promote or hinder scaling up of conservation agriculture with trees among small scale farmers in Kibwezi and Meru Counties, Kenya.

CHAPTER 3: METHODOLOGY

3.1 Description of the Study Area

At the local level, the survey was carried out between May to August 2011 in two divisions in Meru Central District in Meru County and two divisions in Kibwezi District in Kibwezi County. These sites were selected as they formed part of a larger research project that was being carried out by the World Agroforestry Centre (ICRAF). Further, they represented contrasting sites with different agro-ecological zones hence an attempt to capture local views representative of districts in semi- arid and humid areas.

Meru Central District lies between latitudes 0° 22' South and 0°19' North and between longitudes 37° 5' and 37°55' East. The district predominantly lies in the Upper Highland (UH), Upper Midland (UM) and Lower Midland (LM) agro-ecological Zones (Jaetzold *et al.*, 2007) with annual mean temperature of 17.8°C and total annual rainfall ranging from 400 to 2200 mm. The rainfall is bimodal with long rains from March to June and short rains from October to December. These rains make it possible to harvest major crops twice a year. The soils are mainly humic Nitisols (Jaetzold *et al.*, 2007). Figure 2 below shows the map of Meru Central District.

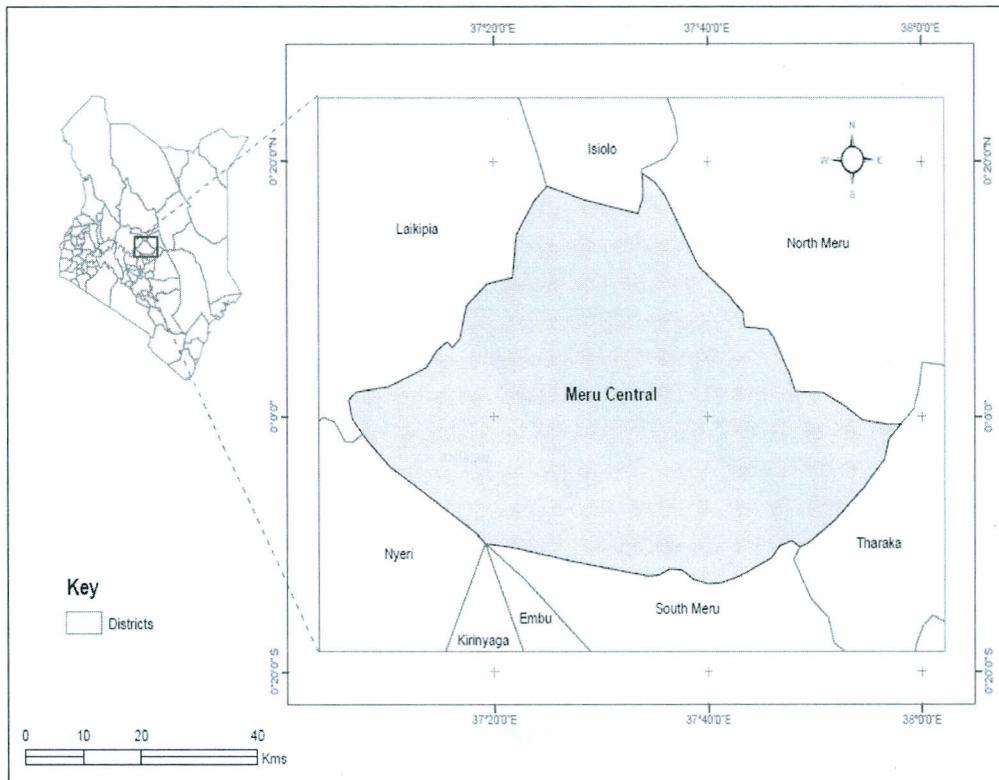


Figure 2: Map of Meru Central District in Kenya

Kibwezi District lies in the Lower Midland (LM) Lower Highland (LH) and Inner Lowland (IL) agro-ecological zones between latitude 2° 24'S and longitude 37°59'E (Jaetzold *et al.*, 2007). It has an annual mean temperature of 22.6°C and annual average rainfall of about 600 to 900 mm. The rainfall is bimodal, hence two seasons per year with long rains season starting from March to July and short rains season from October to December. The soils are predominantly luvisols and ferrasols (Jaetzold *et al.*, 2007). Figure 3 below shows the map of Kibwezi District.

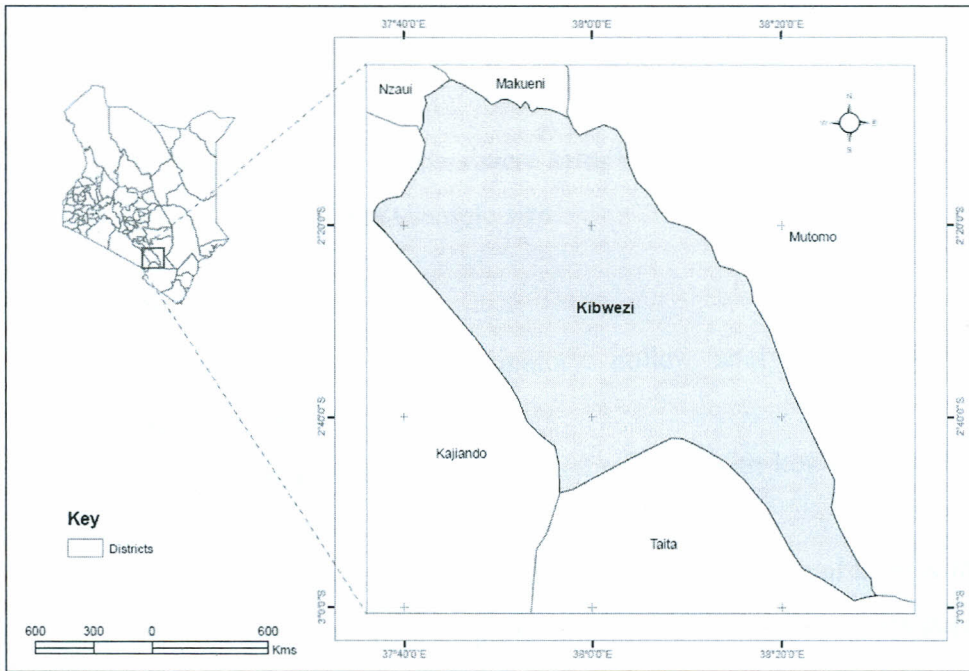


Figure 3: Map of Kibwezi District in Kenya

3.2 Sampling

Twenty six key informants including Government officers and Non-Governmental Organization (NGO) officers at the national level were sampled during the study. This represented 21.7% of the total population sampled..

Based on the 2009 Census, the population of households in Meru County was 37,209 while the population of households in Kibwezi County was 52,979 (KNBS, 2009). The sample size was calculated according to Wonnacott and Wonnacott (1997) using the equation below:

$$n = \frac{1.96^2 \pi(1 - \pi)}{c^2} = \frac{1.96^2 0.5(1 - 0.5)}{0.126^2} = 60$$

Where:

1.96 is the z-value for a 2-sided 95% confidence interval,

$c=0.103$ is the desired maximal half-width of the confidence interval, and

$\pi=0.5$ is the population proportion that results in the widest confidence interval for a given sample size (worst-case for a conservative estimate of sample size).

n =number n required to estimate population proportions π with 95% confidence level.

In each of the Districts, 60 farmers were sampled. Hence in the 2 districts, a total of 120 farmers constituted the sample size.

3.3 Research Design

This study was mainly a participatory policy analysis that utilized the methodological framework below:

- (i) Policy-problem framing at the national level with key informants with an emphasis on incentives and disincentives.
- (ii) Policy-response framing at the small scale farmers' local level with a focus on propositions to increase policy incentives and reduce policy gaps.

This thus entailed national level policy review and local level policy perspectives where the latter necessitated local level data collection.

Purposive sampling was used to sample 26 key informants in the agriculture, forestry and land sectors that were conversant with conservation agriculture and policy issues including Government and NGO officers so as to get expert opinions on the aforementioned issues.

Stratified random sampling was utilized in the household survey at the local level. Based on purposive sampling of two key agro-ecological zones per district guided by local knowledge and the existence of organized farmer groups, one division in each agro-ecological zone was purposively selected. Purposive sampling was opted as opposed to random sampling at the agro-ecological zone level since knowledge of CAWT issues was limited when random sampling was utilized, as evidenced during the pilot study phase. A list of farmer households from the farmer groups formed the sampling frame from which simple random sampling of 30 households was done. A bigger random sample of 35 households in each village was selected to cater for failed interviews due to relocations, deaths and other unforeseeable factors (Carsan and Holding, 2006). To further cater for

increased failed interviews within the limited study period, a back-up for each respondent was again randomly selected. Location Extension Officers assisted in logistics to reach and arrange for interview schedules with the respondents as per the schedule. Hence, 30 households were randomly selected for interviews from each of the two divisions per district, totaling to 60 households in each district and 120 households in the two districts.

3.4 Methods of Data Collection

The study data collection methods were for both primary and secondary data.

3.4.1 Secondary Data

Data was collected through a desk review. To gather information on documented case studies on major existing national and regional agricultural development initiatives in agroforestry and conservation agriculture, relevant internet websites were utilized. Other sources of information utilized to gather information on conservation agriculture practices, the policy and institutional frameworks and the policy making process in Kenya were policy briefs, working papers, manuals, books, journals and reports from the Agriculture, Land and Forestry Ministries. In order to capture policy incentives and disincentives, a review of official policy documents in the agriculture, forestry and land sectors was undertaken.

Based on previous studies on the policy context (Catacutan and Piñon, 2009), the variables of focus were the CA practices and policy making process in Kenya. By use of policy analysis questions (Bullen, no date), relevant policies on agriculture, forestry and land in Kenya were analyzed.

3.4.2 Primary Data Sources

3.4.2.1 Open-ended Key Informant Interviews

With the aim of getting expert views at the national level and due to inadequate documentation on policy making processes, key informant interviews, being the most feasible and informative start-up strategy, was employed in the study. Checklists were used to gather data from 26 key informants at both the national

and local level knowledgeable on conservation agriculture, agroforestry and policy issues. This sample formed 21.7% of the total population (N=120). They included NGO personnel dealing in Conservation Agriculture programs (1 female, 5 males), personnel in research institutes (1 female, 2 males), Community Based Organizations (1 male) and farmer organizations (2 females). Farmers (2 males) at the local level deemed as key informants were also interviewed. Policy implementers interviewed were technical persons in the Agriculture and Land ministries (2 females, 5 males) while policy makers in the Agriculture, Forestry and Land sectors were also interviewed (3 males). One policy enforcer in the forestry sector was interviewed (1 male) and a decision maker at the provincial level was also interviewed (1 male).

Not many key informants were well versed with the policy related issues addressed in the checklist. Gitau *et al.*, (2009) experienced a similar challenge on availability of knowledgeable people to interview especially for policy processes. Interviews with three key policy implementers in the lands, forestry and agriculture sectors were successful and the interview times shortened by focusing only on the key policy related questions. Further, other stakeholders, especially policy implementers in the Government Ministries, were also interviewed on the same issues. Appendix IV shows a list of the key informants interviewed while Appendix III shows the checklist utilized for the key informant interviews. In the checklist, an explanation of how the incentives or disincentives promoted or hindered scaling up of conservation agriculture was based on the framework shown in Appendix I. From the key informant interviews, the top three incentives in each of the three categories were what were utilized at the small scale farmer level with the aim of scoring the most important incentives.

3.4.2.2 Semi-structured Interview Schedules

At the local level, 120 household interview schedules were conducted with farmers to discuss the issues on agriculture, land and forestry policies. In total, 121 small scale farmers were interviewed but one had to be rejected due to poor knowledge of the study content, as evidenced by the responses obtained during the interview.

Appendix II shows a sample of the interview schedule utilized for the small scale farmer.

3.5 Data Analysis and Presentation

Data gathered on major institutional and policy incentives and disincentives at the small scale farmer level was first of all checked for accuracy after which data entry and cleaning was done, by use of MS Excel and the data exported to Statistical Package for Social Sciences (SPSS 17.0) for analysis. Simple descriptive statistics such as means, frequency counts and percentages was done. The relationship between the two dependent variables (the incentives and disincentives), was analyzed by the Chi-square nonparametric test. The analyzed data was presented using bar charts, pie charts and tables, which served as a useful means of bringing out various comparisons in the data collected.

CHAPTER 4: RESULTS AND DISCUSSION

4.1 Introduction

In view of enhancing adoption of sustainable agricultural practices such as Conservation Agriculture, creative strategies such as integration of agroforestry in conservation agriculture systems or the converse, in the framework of this study known as Conservation Agriculture With Trees (CAWT), can provide an entry point. For this to be a reality, a prerequisite entails analysis and documentation of the existing Government support structures, such as policies and institutional incentives and disincentives need to be undertaken. The results presented in this chapter relay information on the existing incentives and disincentives in selected policies, the policy making process, the policy and institutional frameworks governing CAWT in Kenya and finally a look at the various regional and national initiatives that can integrate a CAWT focused approach.

4.2 Sample Characteristics

4.2.1 Demographic Characteristics

In Kibwezi, 35% of the respondents were between 50 and 59 years while only 3% of the respondents interviewed were aged between 20 and 29 years. In Meru, 32% of the respondents were aged between 40 and 49 years while 6% of the respondents were between 20 and 29 years (Table 1). This showed that agricultural activities were mainly left for the retired and older members of the community. Mwangi *et al.* (1996) agrees that farming has been left to older members of the family while the youth have probably opted for white collar jobs or otherwise unwilling to engage themselves in agriculture. This trend may shed some light on the low uptake of newly introduced farming techniques by respondents, since the older people may not be willing to engage in 'trial and error'. Further, it has serious ramifications, especially when the food insecurity is a major concern yet sustainable agricultural practices are still not widely practiced.

Table 1: Age Characteristics of Kibwezi and Meru Respondents (as of July 2011)

Age (Years)	Kibwezi					Meru				
	Male		Female		Total	Male		Female		Total
	N	%	N	%	%	N	%	N	%	%
20-29	0	0	2	3	3	2	3	2	3	6
30-39	7	12	3	5	17	7	12	4	7	19
40-49	3	5	4	7	12	10	17	9	15	32
50-59	14	23	7	12	35	6	10	5	8	18
60-69	12	20	0	0	20	9	15	3	5	20
Above 70	6	10	2	3	13	3	5	0	0	5
Total	42	70	18	30	100	37	62	23	38	100

With regard to gender, out of the 35% Kibwezi respondents, 23% were male and 12% were female. A similar trend was observed in Meru, with 17% male and 15% female respondents in the 40-49 age bracket. For purposes of this study, the respondent interviewed was the one found present at the scheduled time of the interview. It was interesting to note, though the wives were present, the interview schedules were left to the husbands as they were deemed to be more knowledgeable of the farming systems. For example in Kibwezi, sometimes the female household member declined to be engaged in the interview and preferred an alternative interview date when the male household member was available. As to regards Conservation Agriculture (CA) uptake, this could mean that skill intensive practices can take longer to be implemented as the female household, who in most cases is the more active in farming activities, is unavailable for dissemination of skills and knowledge of these sustainable agricultural practices to be passed. Further, a technology intensive practice such as CA is subject to a high financial burden, yet where the male household is largely considered as the financial decision maker, CA may not be given a high priority or even further discussions may not be deliberated upon with the female household members.

In Kibwezi District, 47% of the respondents were from the drier areas of Kibwezi and Mtito Andei Divisions and they belonged to Mukau Respondents'Co-

In Kibwezi District, 47% of the respondents were from the drier areas of Kibwezi and Mtito Andei Divisions and they belonged to Mukau Respondents' Cooperative Society Limited. It is important to note that 'Mukau' is the local name for *Melia volkensii*, an indigenous tree that thrives in the region. Fifty three per cent of the respondents were from the wetter areas of Mtito Andei and Kibwezi Divisions and they belonged to Chyullu Fruit Growers and Kuithethia Mango Groups, of which the latter, when translated, means 'self-help'. In Meru region, 50% of the respondents were sampled from the wetter Abothoguchi and Katheri Divisions where most of the respondents were involved in sustainable agriculture practices such as agroforestry and soil and water conservation while the remainder 50% were from the drier Buuri Division, most of whom were aware of conservation agriculture as the practice of using the 'conservation agriculture chisel', a fabricated hand-held form of the direct seeding tool. The use of the 'chisel', a locally fabricated approach to CA farming, is encouraged by a study by Ajayi *et al.* (2007), where they suggest that several modifications of introduced technologies help to ensure they are continuously relevant and appropriate to farmers, and they provide useful hints for their implementation and/or implementation (Ajayi *et al.*, 2007).

4.2.2 Farm Characteristics

The average farm size in Kibwezi was 26.03 acres at a median of 13.5 acres and 10% of respondents with a mode of 40 acres of land. In Meru, the average farm size was 4.46 acres at a median of 2 acres and 21.7% of respondents with a mode of 2 acres of land.

It was interesting to note that crops harvests had not been experienced equally in the two study areas. Specifically for Kibwezi, on average the last harvest the farmer had received had been in the last two years, with 20% of them totaling to five years. Considering the most important crops as those that provided the highest income to their households, the 3 most important crops in Kibwezi were greengrams (60%), maize (48%) and cowpeas (23%). In Meru, maize (68%),

types of crops. For instance, 11% of the respondents in Meru, from Katheri and Abothoguchi Divisions, considered cabbages as the most important crop. They were hesitant to practice minimum or no soil turning, a key CA principle, because the cabbages needed transplanting hence involved soil turning as opposed to minimal soil turning that could be applied to seeds.

4.3 Socio-economic Characteristics

In this section, socio-economic factors that had been considered to influence respondents' adoption rate of CAWT were subjected to descriptive analysis to observe trends and probable reasons for this.

4.3.1 Level of Formal Education

The levels of formal education considered in this study were primary, secondary and college education. Generally, the results indicated that the respondents at all levels of education were willing to practice Conservation Agriculture (CA), 77% in Kibwezi and 93% in Meru (Table 2).

Table 2: Willingness to practice CA in Respect to Education Level

Willing?	Kibwezi				Meru			
	No	Yes	No	Yes	No	Yes	No	Yes
	N	%	N	%	N	%	N	%
No	3	5	1	2	0	0	2	3
Primary education	7	12	17	28	3	5	33	55
Secondary	2	3	18	30	1	2	17	28
	2	3	10	17	0	0	4	7
Total	14	23	46	77	4	7	56	93

In Kibwezi and Meru, 40% (12% and 28%) and 60% (5% and 55%) of the respondents, respectively had obtained primary education level closely followed by secondary education level: 33% in Kibwezi and 30 % in Meru (Table 2). In Kibwezi, 20 % of the respondents had obtained tertiary education, compared to a mere 7% of respondents in Meru. This was a contradictory finding, as it would have been expected that there would be a generally lower education level in arid and semi-arid areas as compared to the humid areas. It could be that due to a

mere 7% of respondents in Meru. This was a contradictory finding, as it would have been expected that there would be a generally lower education level in arid and semi-arid areas as compared to the humid areas. It could be that due to a possibility of varied agricultural income generating activities in humid areas such as Meru, basic education was considered adequate, as 60% of the Meru respondents had primary education as compared to 40% of Kibwezi respondents. Acquisition of higher levels of education in Kibwezi may have been probably catalyzed by presence of focal organizations in such areas that promote, among other things, knowledge and skills enhancement. The results showed that 33% of Kibwezi respondents as compared to 30% of Meru respondents had obtained secondary education, and a further 20% of Kibwezi respondents had tertiary education, compared to 7% of Meru respondents. This difference may be an indicator on the perception of benefits of CA among the respondents in the two areas. On a broader scale, the difference between the level of education of small scale farmers and large scale farmers may have a bearing on the challenges confronting small scale farmers. Birner and Resnick (2010) argue that as a large, spatially dispersed group with heterogenous interests and limited access to education, small scale farmers in developing countries face numerous obstacles to engage in collective action and defend their interests while large scale farmers are in a better position to overcome these obstacles and become effective political interest groups. Further, interest groups approaches also help to explain why industrialized countries tend to protect agriculture (Birner and Resnick, 2010).

In Kibwezi, 45% of the respondents were willing to practice CA because they thought it would increase productivity, while 23% felt it was economical. In Meru, 32% and 27% suggested it would increase productivity and it would be economical, respectively (Table 3). Ajayi *et al.*, (2007) suggest that in the aim of targeting soil replenishment technologies, farmers' perception of need for the technologies should be taken into consideration.

Table 3: Reasons for CA Practice

Reasons for CA practice	Kibwezi		Meru	
	N	%	N	%
Not labour intensive	4	7	1	2
Increase productivity	27	45	19	32
Economical	14	23	16	27
For soil conservation	3	5	8	13

Respondents were also asked whether integration of trees on farms would promote CA among small scale farmers for which respondents in both Kibwezi (92%) and Meru (83%) were of the opinion that it would, provided the trees would have additional benefits for them (Table 4).

Table 4: Integration of Trees on Farms for CA Promotion

Would trees on farms promote CA	Yes		No	
	N	%	N	%
Kibwezi	55	92	5	8
Meru	50	83	10	17

These included trees that would provide firewood, income, mulching, among other benefits. Carbon credits were also of concern to respondents in Meru where they mentioned that they are paid Kshs.1.50 for each tree by an NGO, The International Small Group and Tree Planting Program (TIST), for planting trees on their farms.

From these observations, it was clear that small scale farmers of varying education backgrounds were willing to engage in CAWT so long as immediate benefits were guaranteed. In order to benefit small scale farmers keeping livestock, Ajayi and Kwesiga (2003) suggest that diversification of land use options such as trees for multipurpose uses and the use of fodder species to feed their animals could help in reducing competition.

4.3.2 Land Ownership Security

There were various forms of land ownership identified in the study areas. In Kibwezi, 73% of the respondents had bought their land, 12% had received it as a gift, 10% of them had inherited their land while 3% and a further 2 % respectively

had land ownership in form of communal and hired land, respectively. In Meru, 80% of the respondents had inherited their land while only 10% had bought the land. Of the respondents interviewed, 8% of them received their land as a gift and 2% had borrowed the land (Table 5).

Table 5: Land Ownership Forms

Land ownership form	Kibwezi		Meru	
	N	%	N	%
Borrowed	0	0	1	2
Bought	44	73	6	10
Gift	7	12	5	8
Inherited	6	10	48	80
Communal land	2	3	0	0
Hired land	1	2	0	0
Total	60	100	60	100

For purposes of this study, land tenure security was regarded as possession of a title deed. For their land security, 55% of the Kibwezi respondents had land allotment letters, 25% had a title deed to their land and another 20% did not have any form of legal document guaranteeing their land security. In Meru, 53% of the respondents had title deeds while 45% of them did not possess a land title deed. A further 2 % of the respondents had an allotment letter as a form of land security (Table 6).

Table 6: Possession of Land Title Deeds Among Respondents

Land title deed	Kibwezi		Meru	
	N	%	N	%
No	12	20	27	45
Yes	15	25	32	53
Land allotment letter	33	55	1	2
Total	60	100	60	100

In an interview with key informants at the Ministry of Lands, the following statements were highlighted in the context of land allotment letters.

[Key Informant interview held on 20th June with an Assistant Director at the Ministry of Lands]

'Land allotment letters can be regarded as 'vouchers' where upon receipting a farmer is entitled to receive a title deed, hence it is not a fool proof land security document'.

[Key Informant interview held on 17th August with a Land Surveyor at the Ministry of Lands]

'Land allocation in previous settlement schemes is in form of a land allotment letter where the land owner pays up 10 per cent of the land value and 90 per cent is cleared in 28 years. Upon payment of the 10 %, a Letter of Offer (also known as Land Allotment Letter) is sent to the land owner by the Ministry of Lands and within 30 to 60 working days, the land owner is required to write to the Commissioner of Lands acknowledging acceptance of the offer. As soon as the 10 per cent is paid up, a file is opened and the remaining 90 per cent can now be paid up.'

The fact that 55% of the respondents in Kibwezi (Table 6) have allotment letters may indicate lack of knowledge of the procedure entailed in acquisition of title deeds. The respondents may not attach as much value to 'papers' as they do to physical land. On the other hand, respondents in Meru may be quite knowledgeable about land rights and even if 80 % of them had inherited their land (Table 6), 53% of them have obtained land title deeds. For a long-term investment such as CAWT, land security would be an important consideration before a farmer embarked on long-term farm investments. Although Ajayi *et al.*, 2007 agree that the adoption of certain soil replenishment technologies is affected by land tenure especially where there is considerable time lag between initial investment and accrual of benefits of maintaining sustainable agricultural practices, they also acknowledge that there is no consensus on the extent to which land tenure rights influence the adoption of such technologies. This suggests that the relationship

between land tenure and farmer adoption may not be straight forward (Ajayi *et al.*, 2007).

4.3.3 Indicators of CA Practice

Fifty one per cent of respondents in both Kibwezi and Meru were unaware of ‘Conservation agriculture’ as only 49% of them had ever heard of the concept. More notably, out of these, the respondents had varied perceptions of the meaning of CA where 23% interpreted it to mean use of organic inputs, while 22% thought it entailed minimum or no soil turning, while a further 15% regarded it to mean trees on farms.

Once the concept was made more explicit by expounding on its principles, it was revealed that actually most of the respondents engaged in at least more than one of the CA principles, specifically crop rotation and cover cropping, hence the only CA practice that had not been adopted was minimum or no soil turning (Table 7).

Table 7: Benchmarks of CA Practice

	Kibwezi				Meru			
	No		Yes		No		Yes	
CA practice	N	%	N	%	N	%	N	%
Minimum or no soil turning	55	92	5	8	38	63	22	37
Cover cropping	15	25	45	75	24	40	36	60
Crop rotation	10	17	50	83	4	7	56	93

Majority of respondents in both Meru (93%) and Kibwezi (83%) practiced crop rotation while cover cropping was more widely practiced in Kibwezi (75%) as compared to Meru (60%) (Table 7). Cover cropping could be a water and soil conservation strategy in such arid areas. The practice of minimum or no soil turning was widely practiced in Meru (37%) and this could be as a result of the NGO efforts in Buuri area, Meru Drylands Initiative Project, that have promoted conservation agriculture and other soil conservation methods in the area due to the excessive water shortage in the area. It was noted that existing CA practices were predominantly carried out in the drier areas as a method of coping with the harsh climatic conditions. The concept of minimum or no soil turning had a very low

adoption rate (8% in Kibwezi and 37% in Meru) and this could be attributed to the technology-intensive approach that necessitates use of specialized equipment that are either unavailable, inaccessible and a general lack of knowledge on how to utilize the equipment.

The farming preparation methods also played a contributory role to the low adoption rate of minimum or no-soil disturbance, a key CA principle. Most of the respondents in Kibwezi utilized animal drawn ploughs due to their big farm sizes while in Meru, manual digging was the most common farm preparation method (Table 8). Most of the respondents had engaged in these farming practices for more than 10 years hence changing to a new practice would be quite a challenge. This finding concurs with a study by Ajayi *et al.* (2007) which suggests that when making decisions to adopt a technology or not, farmers are influenced by key attitudinal issues such as the perceived usefulness and perceived ease of use. Ajayi and Kwesiga (2003) suggest that widespread adoption of an agricultural technology, despite demonstrating high biophysical performance, is constrained by other aspects, such as cultural factors. Results also suggest that constraints to successful adoption of such technologies are rarely just technical or economic in nature (Ajayi *et al.*, 2007).

Table 8: Farm Preparation Methods

Farm preparation method	Kibwezi			Meru		
	N	%	Number of years	N	%	Number of years
Manual digging	22	37	6	38	63	11
Animal drawn plough	55	92	14	35	58	8
Tractor	41	68	7	2	3	0.15
Use of chemicals	1	2	0	3	5	0.16

Use of chemicals, an approach encouraged in CA so as to control weeds in the first few years, was the least adopted farm preparation method. This could be attributed to the high costs associated with purchasing farm chemicals, especially due to the low capital endowment of small scale farmers.

4.4 Policy Incentives and Disincentives in CAWT

4.4.1 Policy Incentives and Disincentives at the Small Scale Farmer Level

Small scale farmers in Kibwezi and Meru were interviewed with the aim of establishing influence of specific Government policies and adaptation to CAWT. In the forestry sector, policy on the need for a permit while cutting down trees, restriction on cutting and transporting timber products and the need to have at least 10 per cent tree cover on their farms were examined. In the land sector, the lack of restriction of minimum land size was investigated. In the agriculture sector, policies on promotion of irrigation agriculture, and the extension officer-farmer trainings were examined. The responses gathered from these selected policies formed the basis for the acceptance or rejection of the study hypothesis.

4.4.1.1 Evidence for the Study Hypothesis

The study hypothesis stated that there existed more disincentives than incentives in the existing policies for the promotion of CAWT among small scale farmers. A cross-tabulation was carried out where the various influences on the policies were evaluated. Generally for all the six rules investigated, more respondents were encouraged by the rule that stipulated the need for a permit (55%), the 10 per cent tree cover rule (88%) and the tree cutting restriction (72%). In the land sector, the selected rule was the lack of restriction on minimum land size, which proved to be an encouragement to 70 % of the respondents. Lastly, in the selected agriculture sector rules, 89% of the respondents were encouraged by the promotion of irrigation agriculture and 85% of them were also encouraged by the extension officer-farmer trainings. The results are presented in Table 9.

Table 9: Influence of the Various Policies on Small Scale Farmers

Policy	Influence					
	Discouragement (Disincentive)		Encouragement (Incentive)		Total	
	N	%	N	%	N	%
Need for permit	53	44	66	55	119	99
10% farm forest	14	12	105	88	119	99
Tree cutting restriction	28	23	86	72	114	95
No minimum land size limit	33	28	84	70	117	98
Irrigation agriculture	13	11	107	89	120	100
Extension officers	6	5	102	85	108	90

In order to establish whether the results obtained were by chance or statistically significant, a Pearson chi-square test of independence was done (Table 10). Since the significance level (0.000) was less than the p-value (0.05), it showed that the results did not occur by chance hence the research hypothesis was rejected.

Table 10: Chi-square test on Statistical Significance of the Policy Influence

Description	Value	Degrees of freedom	Asymptomatic significance (2-sided)
Pearson Chi-square	73.161 ^a	5	.000
Likelihood Ratio	73.397	5	.000
Linear-by-linear Association	36.939	1	.000

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 22.78.

The finding that existing policies offered more incentives than disincentives agrees with the study by Yatich *et al.* (2007) which notes that there is a myriad of supportive policies and legislation already in place and implementation of innovative natural resource management approaches, in this case CAWT, will not be inhibited by the existing policy framework, neither will it require a new policy backing. Catacutan and Pinon (2009) suggest that, even if in theory the policy environment is conducive for the development of Vegetable Agroforestry Systems in the Philippines, the benefits to small scale farmers remain limited. In the same framework, although the study concluded that there existed more policy incentives for CAWT practice, a more nuance question was whether the small scale farmers

benefitted from the existing policy incentives, and if that was not the case, it further sought to suggest reasons for that. This was done by further examination of the responses provided by the small scale farmers for each of the selected policies in the forestry, land and agriculture sectors.

4.4.1.2 Selected Rules in the Forestry Sector

Of the respondents interviewed on how the need for a permit would influence their practice of CAWT, 55% of them (Table 9) viewed it as an encouragement because it controlled tree cutting. This view was predominant in Kibwezi where 46.7% (Table 11) of the respondents agreed with that view as compared to 21.7% of respondents in Meru.

Table 11: Respondent Opinions on the Need for a Permit

Reason	Kibwezi		Meru	
	N	%	N	%
Limiting as it requires consulting others	7	11.7	16	26.7
Controls tree cutting	28	46.7	13	21.7
Environmental conservation	2	3.3	4	6.7
Time consuming and cumbersome	4	6.7	20	33.3
No Response	19	31.7	7	11.7
Total	60	100	60	100

Forty-four per cent (Table 9) of the respondents were discouraged by the policy, as they found it time consuming and cumbersome, especially for 33.3% of the Meru respondents as compared to only 6.7% in Kibwezi (Table 11).

Some respondents (31.7% in Kibwezi and 11.7% in Meru) considered the policy as neither encouraging nor discouraging (Table 11). It is likely that the respondents, especially in Kibwezi, did not benefit from the rule, since no incentives extended to them for controlling the cutting of trees were mentioned. It may have been inherently beneficial to them probably because they personally experienced the various tree benefits, as opposed to any external incentives. Secondly, the respondents that considered the rule as neither an encouragement nor a discouragement may have been because the rule had not yet been

implemented at the local level hence they could not relate to it. Further, the mere fact that the need for a permit, which limited tree harvesting, seemed encouraging could mean that the disincentive was not effective at the grassroots since it had not been fully enforced. A study on awareness and understanding of the exact provisions of bylaws on adoption of improved fallows among farmers in Eastern Zambia reveals that the level of awareness of agroforestry farmers regarding the existence of the bylaws is generally poor and that there is also a poor understanding of the exact provisions of these laws (Ajayi and Kwesiga, 2003). On the converse, 33.3% and 26.7% of the Meru respondents (Table 11), a proportion higher than that of the Kibwezi farmers, cited frustrations that were associated with the need for a permit, namely, its time consuming nature and the need to consult others before a personal decision can be made, respectively.

The respondents were also asked on their view as regards the 10% farm forest cover rule. Of the respondents, 88% viewed it as an encouragement as majority of them (48% in Kibwezi and 70% in Meru) related to the various benefits of trees while in Meru, 17% found it as a discouragement mainly due to small land sizes. Table 12 summarizes the other responses given by the respondents.

Table 12: Respondent Opinions on the 10% Farm Forest Cover

Reason	Kibwezi		Meru	
	N	%	N	%
Benefits of trees	29	48	42	70
Environmental conservation	9	15	1	2
Land is small	2	3	10	17
No response	20	33	7	12
Total	60	100	60	100

The overriding responses of the benefits of trees further show that the small scale farmers did not depend on external incentives to comply with the 10% farm forest rule. The non-reliance on external incentives is not surprising, but the rationale for compliance may vary from region to region. Enforcement of the bylaws relating to improved fallows in Eastern Zambia is based essentially on moral persuasion-encouraging persuasion by appealing to the moral conscience of members of the

community (Ajayi and Kwesiga, 2003). The respondents (33% in Kibwezi and 12% in Meru) who did not find the rule as neither an encouragement nor a discouragement may signify that the impacts of the 10% farm forest rule have not been felt at the local level. This may be due to the fact that the respondents had not been provided with incentives, such as seedlings, to enable them plant trees on their farms hence they had not been impacted by the rule.

Respondents were also asked on their view as regards restriction on cutting and transportation of specific trees that were deemed to be endangered. Seventy two per cent of the respondents viewed the policy as an encouragement where 33% of the Kibwezi respondents cited it was emphasizing environmental conservation whereas 27% of the Meru respondents mentioned that the rule controlled tree cutting (Table 13).

Table 13: Respondent Opinions on Restriction of Tree Cutting and Transportation

Reason	Kibwezi		Meru	
	N	%	N	%
Controls tree cutting	8	13	16	27
Environmental conservation	20	33	7	12
Benefits of trees	6	10	6	10
Limiting as it involves consulting others	0	0	13	22
No response	26	43	18	30
Total	60	100	60	100

The highest proportion of respondents (43% in Kibwezi and 30% in Meru) considered the rule as neither discouraging nor encouraging. Since the rule was punitive, it may suggest that there were 'escape routes' that the respondents could utilize to circumvent the rule, hence the reason why majority of them neither considered it as an encouragement nor a discouragement. Further, this clearly showed that the implementation of this rule was very poor or non-existent.

4.4.1.2.1 Implications of the Selected Forestry Sector Rules on CAWT Adoption

The views of respondents on rules of trees on farms showed that most of the small scale farmers are aware of the benefits of trees thus incorporation of agroforestry practices would meet little or no resistance, and the practice would offer an incentive if the trees would offer additional benefits to them, as shown by the 70% and 48% of the respondents interviewed in Meru and Kibwezi, respectively. Some of the benefits that Ajayi and Kwesiga (2003) suggest include use of multipurpose and fodder trees (Ajayi and Kwesiga, 2003). The results also indicated that the small scale farmers did not benefit from the existing policies, instead they relied on their personal benefits as a motivation to maintain trees on farms. Ajayi and Kwesiga (2003) report that reliance on moral persuasion alone for compliance with bylaws related to improved fallows has not worked well, a factor that may need to be taken into consideration if sustainability of CAWT practices was to be attained.

4.4.1.3 Selected Rule in the Land Sector

The Kenya National Land Policy envisages an approach of restricting the minimum land according to the different agro-ecological zones, but as of now there is no rule restricting land sizes (GoK, 2009b). The study aimed at examining the influence of this lack of restriction on a CAWT small scale farmer where 70% of the respondents were encouraged by this status quo. In both study areas, the respondents (33% in Kibwezi and 48% in Meru) were encouraged because it now offered no limits on land sizes (Table 14).

Table 14: Respondent Opinions on Lack of Restriction on Minimum Land Sizes

Reason	Kibwezi		Meru	
	N	%	N	%
Not economical	14	23	1	2
High production	9	15	0	0
No limits on land sizes	20	33	29	48
Controls land subdivisions	1	2	1	2
Offers security and independence	0	0	18	30
No response	16	27	11	18
Total	60	100	60	100

4.4.1.3.1 Implications of the Selected Land Sector Rule on CAWT Adoption

Section 122a of the Kenya National Land Policy that aims to put in place a system to determine economically viable minimum land sizes for various zones may meet a lot of resistance from many respondents, most of whom have inadequate land as of now, hence proving to be a disincentive to a CAWT small scale farmer. In Meru, a high potential area where land sizes are limited, only 2 % of the respondents interviewed were of the view that the current lack of restriction of minimum land size is uneconomical as compared to 23% of the Kibwezi respondents (Table 14). Ajayi *et al.*, (2007) suggest that in areas where land holding size is small, the possibility of leaving part of the farm fallow is low because of high human population density and hence tree-crop intercropping system is more appropriate, which was the case in Meru, even in a one acre farm size.

4.4.1.4 Selected Rules in the Agriculture Sector

Eighty nine per cent of the respondents interviewed were encouraged by the policy on encouragement of irrigation agriculture. The main reason cited by respondents was that it would offer them increased yields (52% in Kibwezi and 55% in Meru) and 13% in both Kibwezi and Meru were of the opinion that it would offer them flexibility in planting (Table 15). In reality, irrigation agriculture has not yet been implemented in most areas by the Government hence the respondents (32% in Kibwezi and 30% in Meru) did not consider its influence as either positive or negative as its impact had not been felt by the local people.

Table 15: Respondent Opinions on Promotion of Irrigation Agriculture

Reason	Kibwezi		Meru	
	N	%	N	%
Increased yields	31	52	33	55
Flexibility in planting	8	13	8	13
Increased income	2	3	1	2
No response	19	32	18	30
Total	60	100	60	100

Eighty five per cent of the respondents were motivated by the extension officer-farmer trainings where 62% in Kibwezi and 58% in Meru attributed it to the fact that a farmer acquired knowledge and skills (Table 16). On the other hand, about a third of the respondents (30% in Kibwezi and 27% in Meru) were neither encouraged nor discouraged by the rule and this could be primarily due to the ‘demand-driven’ extension approach that limited a farmer’s individualized access to the extension officer. Ajayi *et al.*, 2007 suggest that there is degradation of the extension services and delivery systems in most parts of Africa. The structural adjustment in most African countries has involved serious setbacks in governments’ budgets that they have been unable to offer such market-supportive investments when they are most needed (Jayne *et al.*, 2002). A study carried out in Southern Zambia revealed that state agricultural extension services and education curricula had little or no content on soil replenishment technologies due probably to low confidence in handling such topics (Ajayi *et al.*, 2007).

Table 16: Respondent Opinions on Extension Officer-Farmer Trainings

Reason	Kibwezi		Meru	
	N	%	N	%
Farmer acquired knowledge & skills	37	62	35	58
Farmer got assistance	5	8	9	15
No response	18	30	16	27
Total	60	100	60	100

4.4.1.4.1 Implications of the Selected Agriculture Sector Rules on CAWT Adoption

The promotion of irrigation agriculture would enable small scale farmers to practice CAWT, especially in the arid areas where the need for increased crop yields is a key concern. In addition to that, an added benefit to the small scale farmer in humid areas would be that it may play a key role is the increased flexibility in planting. Extension officer-farmer trainings also seemed to be quite encouraging to the respondents, hence an entry point for promotion of CAWT. This may be a challenge especially in view of the background of the ‘demand-driven’ extension delivery service that lead to reducing of extension staff at the

grassroots. At the national level, Yatich *et al.* (2007) note that in Government ministries and departments there is frequently a communication gap between field officers, planners and policy makers at headquarters, which can have serious implications for policy implementation. Specifically for CA, a technology intensive approach that requires intensive training and frequent follow ups, lack of adequate extension services may lead to lack of uptake of the technique. The Sixth Prime Minister's Roundtable Committee Matrix (2010) also notes that the reforms in research and extension in the agriculture sector over time have left farmers worse off. The subdivision of administrative units coupled with rationing of staff recruitment has led to high farmer-extension staff ratio. The respondents have continued to receive conflicting messages therefore leading to low adoption of technologies for improving agricultural productivity hence suggesting lack of group synergy among small scale farmers. One study suggests that social mobilization among peasants in Asia and the absence of comparative movements in Africa are among the factors that explain why Asia launched a Green Revolution and Africa did not (Birner and Resnick, 2010).

4.4.2 Policy Incentives and Disincentives at the National Level

4.4.2.1 General Policy Analysis

This section looked at the policies in the agriculture, land and forestry sectors with the aim of analyzing the various incentives and disincentives that exist for the CAWT small scale farmer. CAWT is still a new technology in Kenya, thus not mentioned as such in the legislation, however some sections are applicable in the context of agroforestry and sustainable agricultural practices. There are many policy documents currently in Kenya. In the agricultural sector alone, there are over 130 pieces of legislation (Argwings-Kodhek, 2005) hence it was important to select representative policy document(s) in each of the target sub-sectors. The basis of selection of policy documents was on those most familiar and applicable to people at the local level, as articulated by findings based on the preliminary key informant interview sessions. Building on to this, efforts were made to analyze the most recent and relevant policy documents, as evidenced by the ASDS 2010-2020, among others. With this, some of the shortcomings were imminent, including the

realization of a more recent policy document, the Agriculture Act (Chapter 318) of 2002, which would also eliminate need for The Agriculture (Basic Land Usage) Rules. However, results from the study indicated that in fact most of the small scale farmers were most familiar with the Agriculture (Basic Land Usage) Rules, especially in Kibwezi, followed by the initial Agriculture Act (Chapter 318). As mentioned earlier on, it would also not have been possible to analyze all agriculture-related policies, specifically those significantly specific such as the Seed Policy; hence an overarching and recent policy document such as the ASDS was utilized instead. Overall, these factors formed the basis for the selection of policies representative of the agriculture, land and forestry sectors in the context of this study, as:

- i. The Agriculture Act (Chapter 318)
- ii. The Agriculture (Basic Land Usage) Rules
- iii. The Agriculture (Farm Forestry) Rules, 2009
- iv. Forest Act, 2005
- v. Sessional Paper No.3 of 2009 on Kenya National Land Policy
- vi. The Agricultural Sector Development Strategy(ASDS) 2010-2020

The forestry sector has made strides in its efforts to enhance its operations, hence the Forest Service General Order 2010/2011 and the Forest Policy 2002 were utilized to inform the policy analysis. The Vision 2030 and the New Constitution of Kenya, being among the key overarching policy documents in Kenya, also generally informed the policy analysis.

4.4.2.2 Policy Incentives and Disincentives

In general, the analysis focused on the various incentives and disincentives existing in the six policies, from a CAWT small scale farmer point of view. The study revealed that the existing incentives are non-targeted hence tend to be more beneficial to large scale respondents, as detailed in the Agriculture Act (Chapter 318). The Agriculture (Basic Land Usage) Rules exemplifies the punitive nature of the policy that focuses on offences meant for non-compliers of its regulations yet

offered no incentives to respondents that comply with its stipulations. The Agriculture (Farm Forestry) Rules offers incentives in the form of compliance certificates and valuation of damaged trees yet this does not translate to any tangible gain for the compliant farmer. On the same note, disincentives for the small scale farmer still exist within the same policy.

The Forest Act (2005) pursues a community approach with establishment of Community Forest Associations which acts as an incentive for small scale farmers. The Policy also offers incentives for people who own private forests (GoK, 2005a), which in most cases automatically disqualifies the small scale farmer. The Kenya National Land Policy takes an even more holistic approach and it is on the same note that various incentives for the small scale farmer are inherent, in the context of security on community land, acquisition of land rights by inheritance, with or without a will, to promotion of soil conservation methods. On the other hand, some of the intended incentives would play out as disincentives for the small scale farmer for example by introduction of taxes, formation of cluster settlements, minimum land size determination and privatization of delivery of services, such as valuation and surveying (GoK, 2009b). The Agricultural Sector Development Strategy marks an ambitious approach of umbrella policy approach by merging ten different sectors hence providing a more integrated policy framework with minimum duplication and increased efficiency (GoK, 2010a). It is on this basis that various incentives, as well as disincentives for the CAWT small scale farmer were drawn out.

4.4.2.2.1 Agriculture Act (Chapter 318) Background to the Policy

On 1st July 1955, the Parliament enacted the Agriculture Act (Chapter 318) with the aim of promoting and maintaining a stable agriculture, conserving soil and its fertility and stimulating development of sustainable land management. Since it was launched in the colonial times, most of the entrenched principles seem outdated. The differentiation between a large and a small scale farm is defined in the context of on-farm income as opposed to farm size.

Incentives and Disincentives in the Context of CAWT

The Act emphasizes conservation of soil and prevention of the adverse effects of soil erosion by imposing rules for preservation, utilization and development of agricultural land. There is also a rule on dispossession of owners and occupiers of agricultural land by granting powers to acquire unoccupied land as well as granting the minister power with respect to inadequately managed or supervised land. In addition, there are land development orders and land preservation orders by the Director of Agriculture (GoK, 1955). The minimum amount of time a land preservation order would take to be solved is 18-20 months given elaborate and extensive rules of the constitution of various boards, each with its own set of hierarchy from division to district to provincial to central boards (Odhiambo and Nyangito, 2002). Section 48 of the Act empowers the Minister to make rules prohibiting, regulating or controlling firing, clearing or destruction of vegetation including stubble which in the context of CA could refer to crop residues. It also makes rules as regards breaking or clearing of land for purpose of cultivation as well as grazing or watering of livestock. The Agriculture Act is one of the most authoritative land use legal documents, and this is perhaps its greatest weakness as its framework is built around commands and controls which can be a major disincentive for agricultural production and efficient land use (Odhiambo and Nyangito, 2002).

The existing incentives seem to favour large scale respondents hence acting as a disincentive to a small scale farmer. For instance, Section 5.1a of the Act has categorized particular crops as scheduled crops, namely wheat, barley, oats, beans, finger millets, sorghum, rice, sunflower and sugarcane for which their producers benefit by virtue of their prices being fixed (Section 7) and the provision of different guaranteed minimum prices (Section 11) (GoK, 1955). These crops are not all inclusive of all agricultural produce and furthermore they tend to be grown by large scale respondents, hence the incentives apply to them leaving out the small scale farmer. Section 191.1 of the Act mandates establishment of Authorities

in cases where a particular crop should be promoted or fostered. The concentration of these pieces of legislation is on the sub-sectors that were traditionally considered as major export earners and were developed during the colonial times including coffee, tea, maize and dairy. The impacts that these organizations have had on small scale farmers vary, especially with the collapse of some key Agricultural and Marketing organizations, leaving the small scale farmer vulnerable with potentially no easily accessible market for his produce, hence acting as a disincentive, unlike a large scale farmer who has a competitive advantage due to economies of scale and hence can easily access alternative market for his produce.

Section 22.2.i of the Act makes provision for incorporation and representation of large scale respondents in the District Agricultural Committees (DACs), leaving out the small scale farmer from such fora where representation is vital for challenges being experienced to be voiced. Agricultural cesses have also been established where 80 per cent is for maintaining roads and 20 per cent is to remain in the general account of the Local Authority, as highlighted in Section 192a.1. There is a further Stamp Duty Act, on Section 176.1, which charges additional tax to the respondents. The tax regime does not differentiate the capital endowment of different respondents hence may prove to be a disincentive to a small scale farmer who may have disproportionate produce as compared to a large scale farmer.

4.4.2.2.2 The Agriculture (Basic Land Usage) Rules Background to the Policy

These rules, issued in 1965, are set out to reduce soil erosion by ensuring slopy areas remain uncultivated as well as protecting riparian systems. Any person who cultivates, cuts down or destroys any vegetation or grazes livestock in any land with a slope exceeding 55 per cent (Rule 3), a slope above 20 per cent (Rule 4) or a slope between and including 12 and 35 per cent whose soil is not protected against soil erosion (Rule 5) shall be guilty of an offence. It further stipulates rules on protection of water courses (Rule 6) specifically 30 metres from the water

course (or 2 metres in the case of a smaller one). It further aims to protect against erosion by surface run-off (Rule 7) (GoK, 1965).

Incentives and Disincentives in the Context of CAWT

In the context of Conservation agriculture, the policy promotes maintenance of permanent soil cover, though in a punitive way, by punishing people who farm across the contours in slopy areas exceeding 12 per cent. It also holds liability to people who cultivate any boundary furrows, trenches or ditches on such land. Although the rules relate to CAWT, there exists no clear incentives for a small scale farmer since for the offence, one is liable to a fine not exceeding KES 5,000 or to imprisonment for a term not exceeding six months, or both. Policymakers concede that the rules have been unsuccessful in curtailing land degradation, owing partly due to lack of resources to monitor and sanction different land uses and a failure by the law to involve communities in the enforcement and management of agricultural resources (Mumma, 2004).

4.4.2.2.3 The Agriculture (Farm Forestry) Rules, 2009 Background to the Policy

Section 48 of the Agriculture Act (Chapter 318) confers some powers to the Minister for Agriculture which led to the genesis of the Agriculture (Farm Forestry) Rules of 2009. This was set up with the aim of maintaining a 10 per cent farm forest cover of every agricultural land holding (GoK, 2009a). There is a diagrammatic representation of the catch words ‘cut 1 plant 3’ emphasizing on the need to plant more trees on farms as they are ‘good for posterity’. Farm forestry is a key entry point for CAWT uptake among respondents.

Incentives and Disincentives in the Context of CAWT

Section 6.3.ii of the policy offers an incentive in the form of a ‘Compliance Certificate’ (Form CFF1) for a land owner or occupier who complies with the inspector upon notice to maintain a 10 per cent farm forestry or nursery requirement. That is the furthest the incentive goes hence may not be a key motivation as the certificate does not translate to any tangible gains from

acquisition of the certificate for the compliant farmer. Section 9.1 stipulates that the District Agricultural Committee (DAC) is also to prepare and oversee an implementation of annual seedling production plan for provision of appropriate and adequate seedlings to land owners and occupiers in the district hence can act as an incentive for small scale farmers considering practicing CA. Section 11.1 of the Act offers an incentive of valuation of damage and tree compensation guidelines to a land owner or occupier who suffers damage to his farm forest trees. This is especially helpful to a small scale farmer who may have limited capital endowment to ensure animal trespassing is eliminated.

However, where damage is due to public utility service, no compensation or commitment to the farmer is assured, as indicated in Section 10.5. Upon request, damage assessment can be carried out and the report forwarded to the requesting party, in this case the farmer. Another disincentive for the farmer is that review of farm tree compensation guidelines will be done after every five years, as stipulated in Section 10.4, which is too long a period and it may not reflect the true value of the damage incurred by the less capital endowed small scale farmer. Non-compliance of the notice attracts a Farm Forest establishment notice (Form FF1) and upon further non-compliance, a Farm Forestry Establishment and Maintenance notice (Form FF2) requiring the owner or occupier to institute necessary measures. Form FF2 is also issued to those who haven't continued to maintain a minimum of 10 per cent, which for a small scale farmer it may be due to various inhibitory reasons such as limited farm size or cost of seedlings, who upon continued noncompliance will be issued with The Farm Forestry establishment and maintenance order (Form FF3). Section 7.1.d states that the Form FF3 could also be served to someone who already has the 10 per cent tree cover, but because of interests of proper environmental protection and development of land for agricultural practices, he is instructed that more trees should be added on the farm (GoK, 2009a). This is a disincentive to small scale farmers who in most cases have limited farm size and additional land space may not be feasible. For a small scale farmer who may have maintained trees for other uses, there is an inhibitory

regulation stipulating that a person shall not harvest trees from a farm forest without notification and approval by the DAC, for which a farmer has to incur a cost in the form of time and transport charges incurred.

4.4.2.2.4 Forest Act, 2005

Background to the Policy

The Forests Act of 2005 provides for the establishment, development and sustainable management, including conservation and rational utilization of forest resources.

Incentives and Disincentives in the Context of CAWT

Section 24.1 of the Act provides an incentive for people who own private forests as well as arboreta and recreational parks to get registered with the Kenya Forest Service (KFS) hence entitled to receive technical advice on appropriate forestry practices from KFS as well as receive loans to develop the forest. The recipients are further exempted from payment of land rates and such other charges on land under which the forest is established (GoK, 2005a). Obviously, this incentive fits more for capital endowed individuals owning private forests, institutions or body corporates, not a small scale farmer, who may not even own a mini-forest, defined as a group of trees occupying less than ten hectares of land.

In the efforts of enhancing community participation, Section 46.2 of the Act introduces Community Forest Associations (CFA), whereby the members are entitled to some privileges, 'forest user rights' such as harvesting of timber or fuel wood, grass harvesting and grazing, among other benefits. As society is dynamic and community arrangements may not always be possible for every small scale farmer who may have time constraints, it does not offer any arrangements for those opting out of these community arrangements. The Act enhances personal accountability by discouraging livestock straying into forests to the extent of auctioning them after five days upon failure by the owner to reclaim them, proceeds of which are paid to the owner less the amount incurred by KFS for the cost of caring for them (GoK, 2009a), hence not being too punitive.

The Forest Act of 2005 establishes the Kenya Forestry Service (KFS), the registered professional association of forest officers. The Forest Service General Order 2010/2011, a directive of the KFS, presents some costs for the public to use forest services and products. It charges a farmer for valuation, for example for damage assessment, which is charged at 5 per cent of the gross value of the damage that has been incurred by the farmer (Kenya Forest Service, 2010). Although this is a revenue generating method and hence an incentive to the KFS, which subsequently guarantees they deal with only genuine cases, it may prove to be a disincentive to a small scale farmer. A farmer may opt for other grievance solving mechanisms, or altogether abandon farm forestry as a method of reducing possible conflicts with neighbours in cases of animal straying, especially during the dry seasons. On the other hand, there exist some incentives that could reduce deforestation especially among small scale farmers. KFS charges KES 100 for monthly fuel licence for firewood, KES 500 for forest land rent for cultivation per acre per year and KES 20 for charcoal movement permit per bag (Kenya Forest Service, 2010).

In the spirit of reducing deforestation, Section 2.2.2 of the Forest Policy 2005 promotes efficient wood energy technologies and the use of alternative forms of energy (GoK, 2005b). One of these options is biodiesel, which the KFS charges KES 4 for croton megalocarpus seed` for biodiesel per kilogram (Kenya Forest Service, 2010), which may be an incentive in respect to the available quantities. However, the disincentive lies in the cost for a licence fee for seed collection, which attracts an annual cost of KES 100,000 (Kenya Forest Service, 2010), and with this, only large scale farmers are able to invest in this system.

4.4.2.2.5 Sessional Paper No.3 of 2009 on Kenya National Land Policy Background to the Policy

The Sessional Paper Number 3 of 2009 on Kenya National Land Policy (NLP) has heralded the first single clearly defined and codified National Land Policy in

Kenya. It comprises an overall framework and a set of principles to guide reforms in land administration and management and will form the foundation upon which the administrative and legislative framework will be built. The three key categories of land recognized in the policy are public land (formerly referred to as Government Land), Community land (previously referred to as Trust Land) and private land (GoK, 2009b).

Incentives and Disincentives in the Context of CAWT

The Kenya National Land Policy (NLP) offers a wide array of incentives in the aim of ensuring land tenure security. It recognizes community land and sets out procedures in ensuring security, protection and registration of community rights to land and land based resources taking into account multiple interests of all land users, including women (GoK, 2009b). Section 66.d of the NLP incorporates mechanisms for community land management and dispute resolution as well allocating feasible options for members opting out of communal arrangements. Section 80.b of the NLP will create flexible leasehold interests out of public, community and private land and it further gives an allocation of sharing leasehold rights. Section 84.c also eliminates multiple land ownership and allocation of public land, which has exacerbated land insecurity.

In most households, most of the small scale farmers engaging in the day-to-day farming activities are women and the youth. Women's rights have been protected especially through the requirement for joint spousal registration, joint spousal consent to land disposals, inheritance of unmarried daughters, as set out in Section 223 of the NLP (GoK, 2009b). The barrier on land ownership due to one being a minor has been abandoned, providing a key incentive to youth and children, especially orphans. The rights of spouses and children are taken into account before private rights to land are taken into account, as stipulated in Section 68.b. It also ensures that private land is held and transmissible without discrimination on grounds of sex, ethnicity or geographical origin as set out in Section 68.e. Equal matrimonial rights have also been articulated in Section 225 of the NLP whereby

rights of widows, widowers, divorcees are entitled to 'co-ownership of matrimonial property'. It also requires the involvement of spouses before selling and mortgaging family land (GoK, 2009b). Further, it offers an incentive by virtue that land rights can be acquired by inheritance, with or without a will, as stipulated in Section 89. Family interests in land are also protected, whereby customary land rights are deemed to amount to ownership (GoK, 2009b).

The NLP promotes sustainable land management principles. It will establish appropriate fiscal incentives to encourage optimal utilization of private land and discourage land speculation as indicated in Section 68.f. It also recognizes traditional knowledge related to land-based resources and provides incentives for communities and individuals to invest in income-generating resource conservation programs, as stated in Section 69. The NLP stipulates provision of appropriate incentives and sanctions to ensure land owners use land productively and sustainably and there is no idle land. Through the NLP, soil conservation methods will be promoted (GoK, 2009b).

The process of land adjudication which entails individualization of tenure has been a lengthy process, proving as a predicament especially for small scale farmers who are unwilling to invest their limited capital with little or no surety of land security. The NLP ensures that land adjudication and consolidation processes are speedy, transparent and accountable and endeavours to complete on-going processes of adjudication and consolidation, as stipulated in Section 86. Additionally, succession processes have been ambiguous hence the NLP will educate Kenyans on the Law of Succession Act and disseminate information at accessible places such as markets and at the lowest administration levels as indicated in Section 91.

Participatory mechanisms for compensation for loss of land and damage by wild animals is provided as well as mechanisms for resolving conflicts arising from human wildlife conflicts. The NLP encourages and facilitates use of Alternative Disputes Mechanisms (GoK, 2009b). Section 179 stipulates a clear framework for

people in settlement schemes as well as mechanisms for resolving historical land claims. This will prove to be a key incentive for small scale farmers who lack title deeds hence are unwilling to invest in long term and sustainable agricultural activities, such as Conservation Agriculture and/or agroforestry.

On the other hand, there exist some disincentives within the existing incentives in the NLP. Small scale farmers undergo excessive taxation and the establishment of a land taxation regime to facilitate efficiency in revenue collection, as stated in Section 168, may prove to be a disincentive to these respondents. Section 106 intends to introduce provision for implementation of cluster settlements for easier provision of infrastructure and to stop uncontrolled subdivision of land, unless tackled creatively and in a participatory manner; it may prove to be a disincentive to a small scale farmer. Additionally, promotion of conformity of land subdivisions with the set minimum economically viable land sizes may meet similar resistance. The previous 'blanket approach' of setting a minimum land size was a major disincentive to small scale farmers who in most cases have small land sizes and hence they would not have been entitled to title deeds. The new approach is to determine the minimum land sizes according to different Agro-Ecological Zones (AEZs) which, may still be a disincentive to small scale farmers who do not have the set minimum land sizes. Section 120 of the NLP states that the Government will provide incentives to stimulate voluntary readjustment of land sizes as well as review and provide for laws encouraging shared proprietorship, time sharing of land and property as opposed to individual ownership only. The latter approach may be the most practical though the issue of ownership of title deed will need to be taken into consideration.

In Kenya, the two main rights of land ownership under the different tenure systems are freehold and leasehold systems. The former offers the highest amount of land rights whereas the latter offers land right for a limited time period. Through Section 93 of the NLP, the Government seeks to protect its citizens by prohibiting noncitizens from holding freehold interests in land. Non-citizens, who in most

cases are large scale farmers, play a role in contributing to agricultural productivity (hence differing from the practice in some countries where ownership of land by noncitizens is restricted), the 99 years for leasehold exceeds an average Kenyan's life expectancy. The rationale for the time period is so as to encourage long term investments in land, hence the incentive is skewed to the large scale farmer. On the contrary, it is a disincentive to a small scale farmer who may not even have land, since the NLP clearly states that not all people can own land as it is a finite resource. It is also a disincentive to a small scale farmer since renewal of all leases is minimally controlled and not subject to many conditions, simply meeting general planning requirements can guarantee renewal of a lease as stipulated in Section 80.

The NLP aims to privatize delivery of services such as valuation, surveying, physical planning and revenue collection, as stated in Section 253. Although this is to aid efficiency, it may prove to be more costly to the small scale farmers, both directly and indirectly in the sense that the surveying and valuation costs incurred may not be necessarily subsidized. The private surveyors who may have been contracted by the Ministry of Lands may not be facilitated hence in some inaccessible areas, the officers in charge may be demotivated to perform their duties in such situations.

4.4.2.2.6 Agricultural Sector Development Strategy (ASDS) 2010-2020 Background to the Policy

Kenya's economic expansion has been driven through key policy documents that provide sectoral priorities cascaded from the Economic Recovery Strategy for Wealth and Employment Creation (ERS) 2003–07. In the agricultural sector, the Strategy for Revitalizing Agriculture (SRA 2004–2014) remains the main reference document supplemented by specific Agriculture and Rural Development (ARD) sector Ministries' Strategic Plans (MoA, 2008). After the expiry of the ERS in December 2007, Kenya Vision 2030 is the country's new development blueprint covering the period 2008 to 2030, with economic, social and political

pillar strategies. The economic pillar aims at providing prosperity of all Kenyans through an economic development programme aimed at achieving an average Gross Domestic Product (GDP) growth rate of 10 per cent per annum over the next 25 years (Kenya Vision 2030, 2007). The Government perceives that the agricultural sector has been revived and is now set on the path for further development, hence the Agricultural Sector Development Strategy (ASDS) 2010-2020. It is a strategy to position the agricultural sector as the key driver for delivering the 10 per cent annual economic growth rate envisaged under the economic pillar of Vision 2030, hence it is a means of achieving the Vision 2030 for the agricultural sector. In essence, it is a successor to the SRA. The dynamism and forward looking approach of the ASDS integrates 10 key ministries in the agricultural sector.

Incentives and Disincentives in the Context of CAWT

The ASDS is tailored to benefit small scale farmers in its aim to improve agribusiness and market access. Among the key incentives is the development of appropriate credit packages for small scale producers so as to facilitate their access to key inputs. It will also implement flagship fertilizer cost-reduction investment projects. There is also the commitment to support and empower farmer organizations so that they can play their role in providing market support services. It will also aim to support mobilization of financial resources through Savings and Credit Co-operative Organizations (SACCOs) and other community-based lending organizations to accelerate agricultural development. In the effort to address the high cost of agricultural inputs, the ASDS will promote a rationalized input distribution system that will compete within the supply chain, provide information on availability and cost of inputs as well as formulate and implement farmer-friendly policies (GoK, 2010a).

Agribusiness strengthening has also been prioritized in the ASDS by prioritizing rural industrialization and forging partnerships between small scale farmers and agribusiness in the form of outgrower and contract farming schemes through

supply of inputs on credit basis or through input voucher schemes whereby a flexible system will ensure that the small scale farmers have market for their produce (GoK, 2010a).

In the context of strengthening research, extension and training, the ASDS seeks to strengthen its extension service delivery system as well as empower farmer organizations and communities to provide these services at the grassroots. It also seeks to improve and strengthen support services to encompass production and market-related information and appropriate technologies which will improve accessibility to appropriate information for the small scale farmers (GoK, 2010a). The ASDS will improve land use and crop production by ensuring sustainable land use practices and environmental conservation by developing irrigation schemes, soil and water conservation programmes, reclaiming drylands and protecting forests and riverbanks by promoting agroforestry, among other methods (GoK, 2010a).

An incentive that closely relates to CAWT is the facilitation of multiple cropping with the aim of enhancing productivity per unit of land as well as woodland rehabilitation and afforestation projects introducing high-value commercial tree species. However, high costs associated with certified seeds may prove to be a disincentive to small scale farmers, who may end up going for inferior quality seedlings and after disappointing yields, give up on the project. The Forest Service General Order (Kenya Forest Service, 2010), charges KES 15 and KES 10 for indigenous and exotic single plants respectively, in less than 15 centimetre of polythene tube per plant, and KES 75 and KES 50 for the same plants respectively for single plants in more than 15 centimetre diameter of polythene tube per plant.

The ASDS has a provision for investing in targeted Arid and SemiArid Land (ASAL) development programmes by promoting water harvesting by constructing dams, pans and tapping run-off from roads and rooftops as well as strengthening community-led natural resource management. In addition, appropriate strategies

will be developed for conserving the environment in ASALs. In order to achieve food security, initiatives will be up-scaled that involve developing appropriate technologies for the various AEZs especially in the ASALs where farm forestry, irrigation, water harvesting and drought resistant and new and emerging crops will be promoted (GoK, 2010a). These will offer key incentives to small scale farmers in these regions. Some of the flagship projects prioritized for ASAL development include facilitating sustainable exploitation of renewable sources of energy to support agricultural development (GoK, 2010a). However, alternative energy sources such as wind, solar and other renewable energy sources require high initial capital investment, which is lacking for a small scale farmer, hence this will play out as a disincentive to them. Other challenges that may result to low adoption rates of such technologies include low levels of awareness among the people, risk evasiveness attitude which may be brought about by familiarity and ease of access of other non-renewable energy sources such as kerosene lamps. Another flagship project is exploring the possibility of providing a livestock insurance scheme for producers in arid areas (GoK, 2010a) which is well-intended but may prove to be impractical as far as regular premium contributions from the small scale farmers are involved.

There is also the incentive of accelerating national irrigation policy and legal framework to accelerate sustainable development of agriculture and drainage (GoK, 2010a). Although irrigation is a key incentive to respondents, there may be inherent disincentives depending on the irrigation technology implemented. A study carried out by Centre for Agricultural and Biosciences International (CABI) and World Wildlife Fund for Nature (WWF) shows that overhead sprinklers and surface flood furrow are the most inefficient and in the case of sugarcane irrigation only 30 to 35 per cent of the water withdrawn from sugarcane irrigation farming reaches the crop and the rest is lost from irrigation (Kenya Wetland Forum, 2005). There have also been previous irrigation projects that have resulted in utter failure, notably the Hola (1953) and Bura (1978) irrigation schemes. The Bura Irrigation Scheme had the original aim of settling around 5,000 respondents in 23 villages to

grow cotton and maize on 6,700 hectares of land and an additional 4,500 hectares of irrigated forestry to provide for the fuel wood of the estimated 60, 000 settlers. It resulted in utter failure, crippled by corruption and mismanagement. The wrong choice of pumps was made whereby components and spare parts came from different continents (Kenya Wetland Forum, 2005). These irrigation schemes have led respondents in these areas to be poorer, and some even have to depend on relief food. The cost-effectiveness of the irrigation technologies employed, especially as regards need to replace pumps, will determine the success of these interventions, especially to small scale farmers.

The national water storage policy seeks to enforce a law that requires each irrigation scheme to develop facilities that store water for 90 days for agricultural production (GoK, 2010a). The start-up capital may be a limiting factor but the Government seeks to invest in development of storage facilities for small holder and national irrigation schemes.

Although the ASDS strongly promotes internal and external trade by incorporating ensuring measures are taken to improve farmer capacity to add value to their produce to make it more competitive (GoK, 2010a), this requires high capital for a small scale farmer. These standardization and quality control measures cost money- for example the newly introduced eco-labelling mechanism, aiming at African products competing at a more competitive platform with internationally recognized brands, requires a huge capital investment that only large scale respondents can afford. These incentives are not targeted towards small scale farmers; hence though they comprise over 75 per cent of Kenyan respondents, they end up losing out on this well-meaning incentive.

The ASDS also aims at strengthening research-extension links to ensure demand-driven research and effective application of research technologies on the farm (GoK, 2010a). There has been a deficit of extension officers in the recent past, due to public service hiring constraints in efforts to cut public expenditure, hence

the demand-driven approach has mostly been a disincentive to the small scale farmers rather than an incentive with the farmer opting to solve their own farming challenges and learning by ‘trial and error’.

4.5 Institutional Incentives and Disincentives

4.5.1 Institutional Frameworks Governing CAWT at the Small Scale Farmer Level

Among the respondents, it was also important to understand small scale farmers’ awareness on institutions that have a CA approach at the local level. CA was not a common practice in Kibwezi, but agroforestry practices had been widely popularized in the area. In Meru, agroforestry was widely practiced in the wetter areas of Abothoguchi and Katheri Divisions while CA was practised in the drier Buuri Division. This finding suggested that CA was not uniformly practiced in all regions and it agrees with the finding that there is spatial dimension to the adoption of soil replenishment technologies in Southern Africa and the technology does not perform equally well in all locations hence the emphasis should be to establish proper targeting to ensure that they create the desired impact among small scale farmers (Ajayi *et al.*, 2007).

Respondents in Kibwezi identified Research institutions (38.3%), Government ministries (33.3%) and NGOs (30%) as Institutions that had an agroforestry approach. The active research institutions in the area included Kenya Forestry Research Institute (KEFRI) and Kenya Agricultural Research Institute (KARI) while the widely known Government Ministry promoting agroforestry in the area was the Ministry of Agriculture (MoA). NGOs actively involved in agroforestry issues in the area were German Action Aid (GAA) that promoted preservation of water catchment areas by encouraging tree planting and constructing water storage facilities for the people. The Red Cross Society and the World Vision were also some of the other NGOs actively involved in promoting agroforestry in Kibwezi area. In Meru, NGOs (18.3%), and Government ministries (13.3%) were considered as formal institutions with a CA focus (Table 17). Meru Drylands Project and The International Small Group and Tree Planting Program (TIST)

were the most active NGOs, especially in Buuri Division. The MoA, representing a Government ministry, was actively engaged in promotion of agroforestry systems in Meru.

Table 17: Awareness on Existing Formal Organizations Promoting CA

Formal Organization	Kibwezi Awareness		Meru awareness	
	N	%	N	%
Private companies	9	15	2	3.3
Research organizations	23	38.3	3	5
Government ministries	20	33.3	8	13.3
Church organizations	9	15	1	1.7
NGOs	18	30	11	18.3
Volunteer groups	3	5	2	3.3

As regards Community Based Organizations (CBOs), farmer groups (21.7%) and church groups (6.7%) were considered more active in promoting agroforestry in Kibwezi. The farmer groups active in Kibwezi were Self Help Groups (SHGs) such as Muungano Nguvu Yetu SHG, Kanini Kaseu Mtito Andei SHG, Nzambani Fruit Growers, Makutano adaptation to climate change group, Matengelu SHG, Ufunguo Group, among others. The Latter Day Saints Church had also engaged with the local communities extensively in agroforestry-related activities. In Meru, farmer groups (18.3%) and women groups (13.3%) were perceived to have a CA focus (Table 18).

Table 18: Awareness on Existing CBOs Promoting CA

Community Based Organizations (CBOs)	Kibwezi Awareness		Meru awareness	
	N	%	N	%
Farmer groups	13	21.7	11	18.3
Women groups	3	5	8	13.3
Church groups	4	6.7	0	0

CBOs were especially active in Buuri Division. Farmer groups active were CA groups such as Munanda CA group, Riiji Kamuketha CA Group and Mukungu CA group. Muchui Women group was actively engaged in tree planting in the community.

4.5.2 Institutional Frameworks Governing CAWT at the National Level

The Agriculture Act (Chapter 318) established the Agricultural Boards as a means of implementing the policy, comprising the Central Agriculture Board, Provincial Agricultural Board, the District Agricultural Committee and the Sub District Agricultural Committee at the national, provincial, district and divisional levels, respectively. According to Odhiambo and Nyangito (2002), these boards, which have an advisory and statutory role to the Minister for agriculture, act as second tier enforcement institutions after arbitration or control by the executive have failed. However, Arwings-Kodhek (2005) argues that the National, Provincial and District Agricultural Boards are non-existent and no longer needed hence they should be replaced by an umbrella body. Kenya's post-colonial Government employed a vertical planning approach in which local communities were treated as passive recipients rather than active players in natural resource management. Hence despite efforts of the Kenyan Government to adopt bottom-up approaches, many critical decisions remain a preserve of the Central Government (Yatich *et al.*, 2007).

Both formal and informal institutions play a key role in the existing policy reforms. The key institutional players within Kenya's Natural Resource Management regime are the national government agencies, local governments, Non-Governmental Organizations (NGOs) and participating Community Based Organizations (CBOs) (Yatich *et al.*, 2007).

Most of the national government agencies have been established by an Act of Parliament. The Agriculture Act mandates establishment of Authorities in cases where a particular crop should be promoted or fostered. This has led to different established organizations to support different agricultural activities though different circumstances have resulted in the collapse of some of these organizations and the Government has had to intervene in some cases to revive them. There have been 18 Agricultural and Marketing Organizations established including the National Cereals and Produce Board, Tea Board of Kenya, The

Kenya Maize and Produce Board, the Agricultural Finance Corporation, among others.

There are various NGOs that promote approaches enhancing natural resource management. Yatich *et al.*(2007) note that the Kenyan government has created an enabling environment for the growth and development of a vibrant NGO sector. An example of these NGOs with a CA focused approach is the Kenyan Extension Network for Dissemination of Agricultural Technologies (KENDAT) which was a key member of the Kenya Conservation Tillage Initiative. Between 2004 and 2006, KENDAT ran its own CA project titled ‘‘advancing conservation agriculture through farmer knowledge, experience sharing and artisanal support’’ with support from other collaborators. An innovative approach of Village Information Resource and Exchange Centres (VIRECs) aims at organizing small scale farmers for trainings, and in the last 15 years, KENDAT has exposed small scale farmers in conservation farming practices, focusing on soil, water and farm power efficiency in journeys from subsistence to commercial farming (<http://www.kendat.org/core-departments/village-information-resource-and-exchange-centres-virecs>). Care of Creation, operating since 2003, is a Christian-based organization that aims to pursue a God-centred response to the environmental crisis and in the context of CA, it promotes ‘farming God’s way’ by equipping respondents to protect and improve the productivity of their lands through a biblical-based approach to conservation agriculture (CA). Demonstration plots called Well Watered Gardens are implemented and three main principles of biblical training, technology and management are taught (http://www.farming-gods-way.org/FGW_files/Principles.htm). Other NGOs with a CA focused approach include Conservation Agriculture for Sustainable Agriculture and Rural Development (CASARD), GTZ Sustainet and African Conservation Tillage Network (ACT).

Among the Community Based Organizations promoting natural resource management include Kijabe Environment Volunteers (KENVO), which has

membership drawn from the local residents bordering the Keirita Forest. Established in 1994, it works to conserve the biologically rich kikuyu escarpment forests and other natural resources in Lari Division for their biodiversity importance and support to the livelihoods of the local community (<http://www.kenvokenya.com>).

4.5.3 Awareness on CAWT Related Policies at the Local Level

For a small scale farmer, policies do not exactly mean the various documents but rather it refers to the activities that they had been allowed or prohibited to undertake. The policies examined were community rules passed by any local leader that affected their crop farming systems, local Government rules that talked about agriculture and awareness of any rules in land, agriculture and forestry sectors.

Awareness of local community rules that affected crop farming systems differed in the two study areas, where 63 % of Kibwezi respondents were aware of local community rules that affected their crop farming systems as compared to 12% of the Meru respondents (Table 19).

Table 19: Awareness of Local Community Rules

Awareness of local community rules	N	%
Kibwezi	38	63
Meru	7	12

Of the 63% Kibwezi respondents aware of these rules, 66% of the respondents (N=25) mentioned the rule prohibiting interference with other people’s land that had been especially caused by animal straying into neighbours’ farms. Eleven per cent of the respondents (N=4) had been evicted from Chyullu Hills water catchment, and a further 11% (N=4) cited the rule ensuring that they practiced soil and water conservation. In Meru, the rule on non-interference with other people’s land was cited by 71 % of the respondents (N=5).

In the context of Local Government agricultural rules passed in their areas, 62% of the Kibwezi respondents were aware of them compared to only 22% of the Meru respondents (Table 20). Thirty per cent of the Kibwezi respondents (N=11) were

specifically aware of the rule on non-interference with other people's farms, 19% on the regulation on terracing (N=7), and 16% were aware of the rule on soil and water conservation (N=6). Twenty three per cent of the Meru respondents (N=3) were aware of the rule on the non-interference with other people's farms, and a further 23% were aware of the potato policy regulating the packaging of potato sacks to avoid exploitation by middlemen (N=3) while 15% were aware of the meter reading rule for regulation of irrigation water from a local river (N=2).

Table 20: Awareness of Local Government Agricultural Rules

Awareness of local government rules	N	%
Kibwezi	37	62
Meru	13	22

To gauge respondents' knowledge on national government rules that relate to agriculture, the study sought to find out respondents' awareness on rules on trees on farms, soil erosion, planting crops near rivers and on land issues. Respondents in both Kibwezi and Meru (90%) were equally aware of rules that elaborated on trees on farms as well as rules about planting crops near rivers (60%). More respondents in Kibwezi (88%) were aware of rules about soil erosion as compared to Meru respondents (72%). The awareness level of rules that elaborated on land issues was more among Kibwezi respondents (50%) as compared to Meru respondents (37%) as shown in Table 21 below.

Table 21: Awareness of the Various National Policies

Policy about....	Kibwezi		Meru	
	N	%	N	%
Trees on farms	54	90	54	90
Soil erosion	53	88	43	72
Planting crops near rivers	36	60	36	60
Land issues	30	50	22	37

Rules on planting and conservation of trees as well as cutting one and planting more trees were well known in both Meru and Kibwezi. In the context of rules talking about soil erosion, terracing and use of contours were also more familiar to the local respondents. The level of awareness on rules that pertained to planting crops near rivers were the regulation on cultivation of crops 15 to 30 metres from the riverbank, similar in both areas. In Kibwezi, 31% of the respondents were more aware of river bank protection rule (N=11) while in Meru, 31% of the respondents (N=11) were aware of the rule prohibiting them from planting eucalyptus trees near rivers.

In general, respondents in Kibwezi seemed to be more aware of policies as compared to Meru respondents, where rules that emphasized soil and water conservation as well as respect for private land were most widely known.

In respect to policy documents, the Agriculture (Basic Land Usage) Rules was the most widely known by respondents in both Meru and Kibwezi. The rules stipulated regulations on protection of land with slopes between 12 and 55 metres, protection of water courses as well as protection against erosion by run-off water by incorporation of structures such as terraces and contours.

It was also interesting to understand who interpreted the Government rules to the respondents in both areas. Seventy eight per cent of the respondents in both Kibwezi and Meru mentioned that the rules were widely interpreted to them by

provincial administration officers such as village heads, chiefs, division and district officials (N=93). The media, selected by 72% of the respondents (N= 43) was the second most popular means of policy interpretation and 28% got their ruled interpreted for by the agricultural officers (N=33). The NGOs (5%, N=6) and neighbours (2%, N=2) were unpopular means of interpretation of the national Government rules. This finding agrees with a study by Ajayi and Kwesiga (2003) among farmers in Eastern Zambia, where the most important source of awareness on the bylaws is the village headmen (53%) and ‘agriculture’ (21%), a term used by the farmers to refer to all agricultural staff.

It was established that to the small scale farmers in both areas, policy was interpreted as what activities the respondents were permitted or prohibited to engage in, especially by the provincial administration, rather than what was done by the NGOs or other organizations at the local level.

4.5.4 Policy Frameworks Governing CAWT at the National Level

Kenya’s economic expansion has been driven through key policy documents that provide sectoral priorities cascaded from the Economic Recovery Strategy for Wealth and Employment Creation (ERS) 2003-2007 (MoA, 2008). Upon assuming power in 2003, the National Alliance of Rainbow Coalition (NARC) Government made reviving the economy its top priority and the ERS, launched in 2003, was the blueprint for setting the country back on the growth path. The Government developed and launched the Strategy for Revitalizing Agriculture (SRA 2004- 2014) in March 2004 as a response to the ERS (ASDS, 2010-2020). In the agricultural sector, the Strategy for Revitalizing Agriculture (SRA 2004-2014) remains the main reference document supplemented by specific Agriculture and Rural Development (ARD) sector Ministries’ Strategic Plans (MoA, 2008). The ERS was to expire in the financial year 2007/2008, hence in the early 2007 the Government started developing a new strategy to take over from the ERS. In June 2008, Kenya Vision 2030 was launched as the new long-term development blueprint for the country. The ASDS is the agricultural sector’s engine of

achieving the Vision 2030 under the economic pillar where the agricultural sector is given a key priority. The existing policy frameworks governing CAWT are captured in the various sector-specific policies. The Agricultural Sector Development Strategy (ASDS) has incorporated ten different ministries. According to Arwings-Kodhek (2005), this harmonization of sectors and policies has the potential of ensuring consistency and avoiding conflicts.

4.6 The Policy Making Process

4.6.1 Policy Making Process at the Small Scale Farmer Level

Policy needs emanating from the respondents are also key in acknowledging what their needs are. This was done at every administrative level so as to gather as much information as possible. At the village level, 11% (N=13) had a pressing agricultural issue out of which 38% of the respondents (N=5) identified the need for fertilizers and seedlings as the most pressing. At the location level, 19% of the respondents (N=23) had an agricultural issue, out of which 70% of them (N=16) identified the need for farm inputs as the most pressing. At the divisional level, out of the 22% of the respondents (N= 26) who had experienced a pressing agricultural issue, 50% of them (N=13) identified pests and diseases as the most wanting problem. This goes to show if these problems can be cost-effectively managed by CAWT, which would be a key entry strategy for the practice to be embraced by respondents.

4.6.2 Policy Making Process at the National Level

For this research study, the Kenya National Land Policy Formulation Process formed the case study of the policy making process in Kenya. The development of the Kenya National Land Policy was envisaged to take one and a half years (Ministry of Lands and Settlement, 2004), though the process took six years-from February 2004 until August 2009 when the Sessional Paper No. 3 of 2009 on the Kenya National Land Policy was developed. The slow timeline concurs with the study by Gitau *et al.* (2009) indicating that the policy making process in Kenya is a very long and tedious process. They attribute this mainly due to the wide consultation as taskforces are usually composed of many stakeholders making

consultation lengthy. At the same time, although wide consultation in policy making ensures wider stakeholders views are incorporated, lack of information symmetry amongst the various stakeholders may be counterproductive. The Kenya National Land Policy Formulation Process marked a major step in the policy making cycle. The proposed land policy process was divided into two phases, the first comprising the Draft Issues Report, also known as the 'Green paper' while the latter phase yielding the Policy Paper, also known as the 'White Paper' (Ministry of Lands and Settlement, 2004).

Phase one commenced with the review of the information available, detailed in a concept paper that was ready in March 2004. A Stakeholders' workshop and launching of the Land Policy with the aim of building consensus and acceptance of the planned process was then set out. This was closely followed by formation of functional organizational structures by formation of the steering committee, coordination unit and thematic groups. The thematic groups had six broad themes, namely rural land and urban land use, the legal framework, land tenure and social cultural equity, land information management system and institutional and financing framework for implementation. The work of the steering committee and the thematic groups was to prepare the Draft Issues Report, the 'Green Paper'. A steering committee workshop was then held with the aim of ensuring effective and cohesive leadership. Thereafter, a joint workshop of the steering committee and the aforementioned thematic groups, for the purposes of goal setting, was then held. It had the expected output of fostering team building as well as common understanding and vision as well as designing specific work plan and outputs. It was after this that the thematic groups started sourcing and compiling existing data and information on Land Policy upon which research papers were presented within set timelines (Ministry of Lands and Settlement, 2004).

From each thematic group, an Inception Report detailing the planned work programme, a Draft and a Draft Final Issues and Policy Recommendations Report detailing a background statement, a problem statement and policy proposals and

recommendations were expected. For the sake of discerning linkages within these groups, a joint workshop of all thematic groups was set out, after which a Draft Issues Report was drawn and discussed by a wider stakeholder including the Parliamentary Committee on Land Matters. Further, visits to other countries for exposure to policies and better practices were carried out, after which a workshop for reconciliation of the better practices and the Draft Issues Report was scheduled (Ministry of Lands and Settlement, 2004).

Phase two commenced in April 2007 when a Draft Kenya National Land Policy was adopted by stakeholders through a National Symposium and this led to preparation of the Final policy document. The Seventh Cabinet meeting held on 25th June 2009 approved the Draft Kenya National Land Policy and directed the minister for Lands to proceed with the preparation of the Sessional paper for presentation to Parliament (GoK, 2009b). Thus, at each step different outcomes were eminent and this is in agreement with a study that indicates that an important insight contributed by the stages model (of the policy cycle) is the understanding that different stages provide different sets of outcome, which affect other stages, even if they occur simultaneously (Parag, no date).

4.6.3 Implications of the Policy Making Process on CAWT Adoption

The existing policy making process has varying implications of the agriculture, forestry and land policy making processes for nationwide adoption of CAWT in Kenya. The first critical step is that of developing the 'Green Paper' as not all stakeholders subscribe to the benefits of conservation agriculture or view it as a pressing issue, yet for the policy to be drafted, it needs regional consensus of the awareness of the existing issue, which is not necessarily the case with CA. There are also different interpretations and understanding of the farming practice, even among the elite, which may further complicate the process. Gitau *et al.* (2009) agree that the advancing of vested interests among different stakeholders may lead to a stalemate or the process taking longer.

Politicisation as well as different economic interests of elites in agriculture has sometimes led to a lack of political will to provide long-term solutions to the food security situation in the country. The serious implications of the lack of action on the part of the State can be illustrated through the example of the National Disaster Management Policy. This policy was first drafted in 1999 but an overly cumbersome bureaucracy within the Government sector delayed its passing until 2007. Certain developments have been made in designing policies and programmes relating to the agricultural sector, but the state bureaucracy is cumbersome and draft policies take many years to be officially approved (RAPDA and FIAN International, 2010).

The speed of the policy making process also depends on the champion leaders of the expected reform. It would be assumed that since policy making is a political issue hence involving the Government would hasten the process, *Gitau et al.*, 2009 disagrees with that perspective, where they have conducted policy making processes in the dairy, coffee and cotton subsectors. Reforms in the first two subsectors have been public-led whereas in the latter, they have been private sector-led. The reform process has been faster in the cotton subsector, where it has been private sector driven, and a smaller committee of twelve people had been formed to steer the process. Analysis on the policy process also reveals that the impact of reforms is also dependent on how much the Government is involved in the particular sub-sector, with low success where the Government has strongly been involved. Despite the numerous reforms in the coffee sub-sector, it has continued to have a myriad of problems characterized by poor governance in institutions and declining production as a result of heavy Government involvement. On the other hand, the dairy sector has recorded improvement in production and the revival of farmer organizations, mostly as a result of the role played by the private sector, in the form of processors, with minimal Government involvement.

Currently, there is no policy document explicitly on CA. Within the existing policies in the agriculture, land and forestry sectors, sustainable land management practices that promote CA can be construed to imply CA practices. The broad and non-targeted approach of the existing may be so as to cater for the diverse agro-ecological zones of Kenya and the different farming needs. Further, this may have the additional benefit of allowing sufficient flexibility to accommodate the fast changing business environment without frequent recourse to Parliament (Arwings-Kodhek, 2005). Although there may be no policy specific to CA, the exceedingly slow policy-making process may be a factor to consider against designing a CA-specific policy. Argwings-Kodhek (2005) argues that the traditional pace and method of updating legislation has been extremely slow with only three pieces of legislation passing through parliament between 2001 and 2005. Further, the tragedy is that even those pieces that have gone through parliament have not been fully implemented due to flaws in the new bills, sections that are impossible to implement, and resistance from various quarters. The situation is further compounded by the large number of commodity-specific pieces of legislation in the pipeline, some of which have been in that pipeline for more than a decade. The Government has responded to this situation with a pragmatic decision to consolidate agricultural legislation under one, or a few, pieces of umbrella legislation. The Sixth Prime Minister's Roundtable Commitment Matrix (2010) notes that the agricultural sector is governed by over 45 legislations covering various sub-sectors and this may sometimes lead to duplicity and wastage of resources. It further resolves to harmonize the legal and policy instruments governing the sector in a coordinated approach to food security.

A key bottleneck could be lack of clear implementation strategies or budgetary allocations with the effect that they often remain mere paper products and have little impact on the ground. Ajayi *et al.* (2007) suggest that the extent to which local and national policy making processes accept and institutionalize soil replenishment technologies, such as through budgetary allocations and specific policy documents, plays an important role in small scale farmer adoption of these

technologies. The fragmented nature of the policy framework may have inherent weaknesses. Sometimes, the challenge has been lack of passing of policies through to the Parliament, hence they simply remain as drafts.

A way forward would be that emphasis should be placed more on solving existing constraints that the small scale farmers are experiencing, as opposed to creation of new policies. Ajayi and Kwesiga (2003) agree that emphasis should be placed primarily on how to solve the constraints identified within existing policies rather than making new policy measures and laws. Further, efforts to facilitate favourable policies in relation to soil replenishment technologies should be done in a concerted manner including close integration with related technologies, such as rain water harvesting, that are being promoted by several development organizations (Ajayi *et al.*, 2007).

4.7 National and Regional Development Initiatives

4.7.1 Existing Initiatives at the Local Level

Awareness of existing initiatives at the local level was also investigated (Table 22). Farmers in Kibwezi were mostly aware of initiatives that have had an impact at the local level such as Equity Bank (71.1%) that provided farmer loans, Njaa Marufuku (63.3%) and the Green Belt Movement (46.7%).

Table 22: Existing Initiatives at the Local Level

Initiative	Kibwezi		Meru	
	N	%	N	%
SHOMAP	0	0	17	28.3
Green Belt Movement	28	46.7	19	31.7
KAPP	5	8.3	11	18.3
Njaa Marufuku	38	63.3	9	15
NAAIAP	0	0	2	3.3
NALEP	5	8.3	14	23.3
Equity Bank	43	71.7	23	38.3
AFC	27	45	14	23.3
AGRA	0	0	1	1.7
NEPAD	1	1.7	3	5

Farmers in Meru identified more with Equity Bank (38.3%), the Green Belt Movement (31.7%) and SHOMAP (28.3%). Few farmers were aware of regional initiatives such as AGRA and NEPAD. Most of the farmers in Kibwezi were aware of initiatives such as the GAA that provided training to the farmers and Arid Lands Project that provided farm inputs.

In Meru, the Meru Drylands Initiative Project was well known for its trainings as well as the Muchui Women Group that had collaborated with TIST to help farmers plant trees. This indicated that initiatives that collaborated with communities, either individually or with existing structures could have had a greater impact on the farmers.

4.7.2 Existing Initiatives at the National Level

The recently concluded Integrated Natural Resources Management in Ukambani (INRMU) project was initiated by the Belgium Government between 2002 and 2005 to enhance community-based forest management in six divisions of Makueni district- a semi-arid area (Mathu, 2007). The objective was to build capacities of the local communities in management of existing forests in the isolated hills of

Ukambani. One of the key lessons learnt was that capacity building is a long-term process and needs to take into consideration the literacy levels of the communities, and with that, CAWT can be integrated with the valuable lessons learnt from the INRMU project.

Smallholder Horticulture Marketing Programme (SHOMAP), a pilot initiative funded by the International Fund for Agriculture Development (IFAD), covers eight of the Kenya's horticultural districts (IFAD Kenya, 2011). One of its pillar strategies that can integrate a CAWT focused approach is building linkages to marketing chains and building capacities of farmer organizations, government institutions, among others.

Mount Kenya East Pilot Project (MKEPP), a community project funded by the Government of Kenya and IFAD, aims to reduce poverty around the Mt. Kenya and Tana River Catchment Basin through sustainable Natural Resource Management practices (IFAD Kenya, 2011). CAWT, a sustainable agricultural practice, is a viable option and a key entry point.

The Green Belt Movement is a not-for-profit grassroots NGO based in Kenya that uses tree planting as an entry point to environmental conservation and hence a key entry point to utilize agroforestry as an approach to promote CAWT.

Kenya Agricultural Productivity and Agribusiness Project (KAPAP) 2010-2015 is the second phase of the World Bank funded Kenya Agricultural Productivity Programme (KAPP) with the main aim of supporting market development through an agribusiness approach, especially among the small scale farmers. Covering nineteen counties in Kenya each with a regional service unit (KAPP, 2011), KAPAP has two key components that can integrate a CAWT focused approach: agricultural extension and farmer and other stakeholders component as well as a policy and institutional support component.

Njaa Marufuku Kenya Programme was started in 2005 by the Agriculture Sector ministries with support from Food and Agriculture Organization (FAO) and the Millennium Development Goal (MDG) Centre to provide a ten-year hunger eradication action plan (MoA, no date). One of its project components that have a CAWT focused approach includes support to community-driven food security improvement projects that targets capacity building among small scale farmers. The other is support to private sector food security innovations, of which CAWT represents such a strategy in the context of environmental conservation.

Extension service provision and capacity building is the cornerstone of the National Agriculture and Livestock Extension Programme (NALEP), made possible by funding from the Government of Kenya in collaboration with the Government of Sweden through the Ministries of agriculture and livestock development. A CAWT focused approach is imminent through trainings and capacity building in the context of CA practices. This has been evidenced in the case of Eastern Province farmers who are now practicing tissue culture banana, dairy and sisal farming, among other agricultural activities (MoA, no date).

The Government, through the Ministry of Agriculture, implemented the National Accelerated Agricultural Input Access Programme (NAAIAP). Its primary objective was to improve access and affordability of the key agricultural inputs for small scale farmers (MoA, 2008). A CAWT focused approach would entail provision of CA equipment as an entry point in enhancing CA practice.

The AFC had in the past been a key source of credit, but discriminated against the low capital endowed small scale farmers. According to Okoth-Ogendo (no date), credit guidelines issued from time to time by the Ministry of Agriculture to the Agricultural Finance Corporation (AFC) and all field personnel processing small-farm loans emphasized that a farmer was entitled to a loan only if, among other criteria, he or she had a farm large enough to provide for subsistence and loan repayment. In order to receive the loan, the applicant had to offer substantial

collateral or be in a position to repay the loan from off-farm income. These guidelines, coupled with the fact that the AFC is required by legislation to function strictly on commercial lines, have raised special problems in relation to the administration of a variety of credit schemes in the small-farm sector. For example, the Agri-business loan requires a farmer to have tangible security while one of the requirements of the machinery loan is for the machinery to be insured with comprehensive insurance cover (AFC, 2011).

Some initiatives have come to the aid of the small scale farmer. Among these is Kilimo Biashara, a project launched in May 2008 by The Alliance for a Green Revolution in Africa (AGRA) and its partners IFAD and Equity Bank. It set up a Kshs. 400 million 'cash guarantee fund' that buffers the bank's risk of lending money to small scale farmers and small agricultural businesses in rural areas with little or no collateral. The loans are at an interest rate of 12 per cent, a rate well below the standard bank's lending rate of 18 per cent (AGRA, 2011). This is a prime initiative that can incorporate CA equipment purchase for the small scale farmers and with that; CA can be more affordably taken up by the small scale farmers. In addition to that, certified seeds are expensive to small scale farmers hence an intervention that would incorporate tree seeds purchase will be a kickstart in uptake of CAWT by the small scale farmers.

4.7.3 Existing Initiatives at the Regional Level

The Eastern Africa Coastal Forests Ecoregion (EACFE) Programme- Strategic Framework for Conservation -2005 to 2025 is being implemented by the World Wide Fund for nature (WWF), brings together stakeholders in Kenya, Tanzania and Mozambique (Mathu, 2007). With the main aim of operationalizing a system of enhancing conservation, management and sustainable use of forests, a CAWT focused approach is a clear entry point in achieving this objective.

The Ministerial Declaration on Africa Forest law enforcement and Governance (AFLEG) in Yaounde, Cameroon in October 2003, reaffirmed the participating African countries' resolve to work together to strengthen the institutional reforms

already started in the forestry sector. Kenya has initiated projects whose implementation addresses the intentions of the declaration such as the Integrated project for the conservation and management of the Mt. Elgon Ecosystem between Kenya and Uganda by use of participatory forest management approach (Mathu, 2007). This declaration can strengthen use of agroforestry approaches as a key strategic entry point in strengthening a CAWT focused approach.

Within the framework of the Soil Fertility Initiative (SFI), the World Agroforestry Centre (ICRAF) has been identifying and evaluating options for soil fertility replenishment in East and Southern Africa. Two years after introducing identified options in farmers' fields, 8 700 small scale farmers in western Kenya had adopted two of them: biomass transfer with the use of the wild sunflower *Tithonia* as a green manure to high- value crops such as French beans, tomatoes and kales , as well as improved fallows with *Crotalaria* sp., *Tephrosia vogelii* and *Sesbania sesban* (FAO, 2001). The CAWT Programme is spearheaded by the New Partnership for African Development (NEPAD) Comprehensive Africa Agriculture Development Programme pillar 1, in conjunction with ICRAF, African Conservation Tillage Network and other stakeholders. They aim at working with national partners in Kenya, Tanzania, Zambia, Malawi, Ghana, Mali, Niger, Mozambique, Ethiopia and Uganda in order to scale up CAWT to reach 2 million households by 2012, five million by 2015 and 10 million by 2020. In Phase I, the focus is on 4 countries namely Kenya, Tanzania, Zambia and Ghana (Mowo and Kiwia, 2009). A study by Ajayi *et al.* (2007) agrees that a number of collaborations have enabled introduction of renewable and integrated soil fertility management technologies in the region in the previous two decades. Further, these technologies are consistent with three of the four cardinal thrusts for improving Africa's agriculture as outlined in the Comprehensive Africa Agriculture Development Program (CAADP) of the New Partnership for African Development (NEPAD) to which the region subscribes. Despite efforts, the adoption and diffusion of such technologies has generally lagged behind thus reducing their impact (Ajayi *et al.*, 2007).

4.8 Small Scale Farmers' Policy Propositions

The study suggests that policy incentives exist but the benefits to small scale farmers are limited, resulting in disincentives. The study also indicates that there exist major policy implementation gaps. These findings agree with a study by Catacutan and Piñon (2009) indicating that policies governing the tree sector and vegetable industry are insufficient in stimulating small scale farmer investment in Vegetable Agroforestry Systems and that several gaps also exist in policy implementation, either due to poor communication or dissemination at the local level. Small scale farmers suggested various methods of increasing policy incentives and reducing policy gaps with the overall effect of increasing adoption of CAWT. Various policy incentives that would encourage a small scale farmer to practice CAWT were suggested.

The direct incentives that lowered a farmer's investment cost to practice CAWT that were examined were cost-sharing arrangements (36% of respondents neither agreed nor disagreed), provision of good infrastructure (43% of respondents strongly agreed) and tax relief (26% of respondents strongly agreed). This suggested that direct incentives, also considered as fiscal incentives were not the most preferred option by the respondents. This finding disagreed with a study that suggests that fiscal policies such as subsidies and institutional support for certain soil fertility management options may have considerable indirect influence in shaping farmers' decisions on soil fertility replenishment strategies (Ajayi *et al.*, 2007). Birner and Resnick (2010) argue that initial subsidies in credit, fertilizer and irrigation have been crucial for small scale farmers to adopt new technologies but that they have become unproductive in the recent years.

Indirect variable economic incentives that had the potential of increasing returns on a farm were also rated, and for this study, the ones considered were control of input and output prices (31% of respondents strongly agreed), introduction of special taxes (23% neither agreed nor disagreed while another 23% strongly agreed) and managing of foreign exchange rates (30% of respondents strongly

agreed). This category may not have elucidated strong options as the local people may not be aware of any direct impacts felt at the local level. This is actually the converse, as one study shows that the indirect tax on agriculture from macroeconomic policies, such as overvalued exchange rates, was three times the direct tax on agriculture, such as export taxes (Birner and Resnick, 2010). Indirect enabling incentives that would contribute to a farmer's decision making to practice CAWT were also rated. For the purposes of this study, the factors considered were extension services (45% strongly agreed), land ownership security (67% strongly agreed) and market development for farm produce (67% strongly agreed).

Overall, respondents overall strongly agreed on all the indirect enabling incentives as being the most important that could offer the best motivation (Table 23). This finding agrees with a study carried out by Catacutan and Piñon (2009) where the farmers ranked the top three policy concerns in promoting Vegetable Agroforestry Systems as indirect enabling incentives, namely, technology promotion, improvement of marketing system and improvement of local extension. Ajayi *et al.* (2007) suggest that market development incentives may include helping farmers get access to niche markets where the produce from farms under sustainable practices, such as CAWT, can fetch higher prices, enhance profit and incite farmers' interests in adopting them. Birner and Resnick (2010) argue that experience has shown that policies that support small farms by correcting for the market failures inherent in small scale farmer agriculture, especially in the early phases of agricultural development, are a particularly promising strategy to achieve pro-poor growth, yet it is politically difficult to implement such policies.

Table 23: Rating of Different Policy Motivations

Rating		Strongly disagree		Disagree		Neither disagree nor agree		Agree		Strongly agree	
Incentive	Type	N	%	N	%	N	%	N	%	N	%
Direct	Cost-sharing arrangements	11	9	15	13	43	36	15	13	36	30
	Provision of good infrastructure	4	3	16	13	26	22	23	19	51	43
	Tax relief	15	13	22	18	27	23	25	21	31	26
Indirect economic	Control of input& output prices	17	14	15	13	28	23	23	19	37	31
	Special taxes	21	18	23	19	27	23	22	18	27	23
	Managing foreign exchange	14	12	19	16	22	18	29	24	36	30
Indirect enabling	Extension services	5	4	8	7	15	13	38	32	54	45
	Land ownership security	5	4	6	5	11	9	18	15	80	67
	Market development	6	5	3	3	11	9	20	17	80	67

Institutional factors that could help motivate a CAWT small scale farmer were also sought. The need for capacity building in form of trainings for both male and female farmers in the study areas, 77% in Kibwezi and 64% in Meru (Table 24). This finding agrees with a study by Ajayi *et al.*, (2007), which further suggests that programs to scale up soil improvement technologies will be more successful when farmer training and other dissemination activities at the farm level are complemented by active engagement of policy makers and shapers to facilitate policy incentives and regulations that are conducive to encourage small scale farmers to adopt such technologies.

Table 24: Recommended CA Motivations at the Local Level

CA motivation	Kibwezi				Meru			
	Male		Female		Male		Female	
	N	%	N	%	N	%	N	%
Trainings on CA practice	34	57	12	20	25	42	13	22
Provision of inputs	1	2	1	2	9	15	6	10
Extension services	1	2	3	5	1	2	1	2
Others	6	10	2	3	2	3	3	5

The study showed that a myriad of both policy and institutional factors would be required to motivate small scale farmers to adopt CAWT. This finding agrees with a finding that suggests that since adoption is a dynamic process, several factors, presumed to be independent are, in fact, likely to influence one another in efforts to enhance adoption of such technologies (Ajayi *et al.*, 2007). The authors further suggest that adoption of such technologies is a long-term process, with acquisition of information, testing and eventual adoption phases. It is during the testing phase that factors relating to availability of information and training, and incentives that are associated with the dissemination of the technology, play important roles (Ajayi *et al.*, 2007).

4.9 Summary of Results on Policy incentives and Disincentives

Table 25: Overview of six key national policy incentives and disincentives

Policy	General policy background	Incentive	Disincentive
1. Agriculture Act (Cap 318)	Emphasizes conservation of soil and prevention of the adverse effects of soil erosion by imposing rules for preservation, utilization and development of agricultural land.	<ul style="list-style-type: none"> • Categorization of particular crops as ‘scheduled crops’ for which their producers benefit by virtue of: (i) their prices being fixed (ii) provision of different guaranteed minimum prices (iii) fixing prices at which any scheduled crop may be marketed by any agent • The Act mandates establishment of Authorities for promotion of particular crops. 	<ul style="list-style-type: none"> • ‘Scheduled crops’ are not all inclusive of all agricultural produce. Further, these crops tend to be grown by large scale farmers, hence incentives apply to the former leaving out the small scale farmer. • The concentration of legislation on established Authorities is on subsectors that were traditionally considered as major export earners and developed during colonial times, such as coffee, tea, maize and dairy. With the collapse of some key agricultural and marketing organizations, small scale farmers are left vulnerable with potentially no easily accessible market for their produce, hence acting as a disincentive.
2. Agriculture (Basic Land Usage) Rules	Rules are set out to reduce soil erosion by ensuring sloping areas remain uncultivated as well as protecting riparian systems	<ul style="list-style-type: none"> • In the context of CA, the Policy promotes maintenance of permanent soil cover. 	<ul style="list-style-type: none"> • Promotion of permanent soil cover is done in a punitive way, by punishing people who farm across the contours in areas exceeding 12% slope
3. Agriculture (Farm Forestry) Rules	This Policy was set up with the primary aim of maintaining a 10% farm forest cover of every agricultural land holding, a key entry point	<ul style="list-style-type: none"> • The Policy offers an incentive in the form of a ‘Compliance Certificate’ (Form CFFI) for a land owner or occupier who maintains 10% farm forestry or nursery requirement, though this doesn’t translate to any tangible 	<ul style="list-style-type: none"> • A limitation of valuation occurs when damage to farm forest is due to public utility service. In this case, no compensation or commitment to the farmer is assured.

Policy	General policy background	Incentive	Disincentive
<p>4. Forest Act</p>	<p>to CAWT adoption among small scale farmers.</p> <p>It provides for the establishment, development and sustainable management, including conservation and rational utilization of forest resources.</p>	<p>gains for the compliant farmer.</p> <ul style="list-style-type: none"> • There is valuation of damage and tree compensation guidelines to a land owner or occupier who suffers damage to his farm forest trees. This is especially helpful to a small scale farmer who may have limited capital endowment to ensure that animal trespassing is mitigated. • It provides an incentive for people who own private forests as well as arboreta and recreational parks to get registered with the Kenya Forest Service (KFS) hence entitled to receive technical advice on appropriate forestry practices from KFS as well as receive loans to develop the forest. The recipients are further exempted from payment of land rates and such other charges on land under which the forest is established. • To enhance community participation, the Policy introduces Community Forest Associations (CFAs) whereby the members are entitled to 'forest user rights' such as harvesting of timber or fuel woods, grass harvesting and grazing, among other benefits. • It enhances personal accountability by 	<ul style="list-style-type: none"> • Review of farm tree compensation guidelines will be done after every five years, which is too long a period and it may not reflect the true value of the damage incurred by the less resource-endowed small scale farmer. • For a small scale farmer who may have maintained trees for other uses, there is an inhibitory regulation stipulating that a person shall not harvest trees from a farm forest without notification and approval by the DAC, for which a farmer has to incur a cost in the form of time and transport charges. • The incentive on private forest owners fits more for capital endowed individuals owning private forests, institutions or body corporate, not a small-scale farmer. • Though CFAs are a good incentive, society is dynamic and community arrangements may not always be possible for every small scale farmer who may have time constraints. The Policy does not offer any arrangements for those opting out of these community arrangements.

Policy	General policy background	Incentive	Disincentive
5. Kenya National Land Policy	Comprises an overall framework and a set of principles to guide reforms in land administration and management.	<p>discouraging livestock straying into forests to the extent of auctioning them after five days upon failure by the owner to reclaim them, proceeds of which are paid to the owner less the amount incurred by KFS for the cost of caring for them.</p> <ul style="list-style-type: none"> • It offers incentives such as security on community land, acquisition of land rights by inheritance, with or without a will, and promotion of soil conservation methods 	<ul style="list-style-type: none"> • The introduction of taxes, privatization of delivery of services, such as valuation and survey, are cost implications faced by small scale farmers which act as disincentives.
6. The Agricultural Sector Development Strategy	An ambitious policy approach formed by merging 10 different sectors to provide a more integrated policy framework with minimum duplication and increased efficiency	<ul style="list-style-type: none"> • It is tailored to benefit small scale farmers in its aim to improve agribusiness and market access. • An incentive closely relating to CAWT is the facilitation of multiple cropping with the aim of enhancing productivity per unit of land as well as woodland rehabilitation and afforestation projects introducing high-value commercial tree species. 	<ul style="list-style-type: none"> • The Forest Service General Order charges KES 15 and KES 10 for indigenous and exotic single plants, respectively. The high costs associated with certified seeds prove to be a disincentive to small scale farmers, who may end up going for inferior quality seedlings and after disappointing yields, give up on CAWT. • One of the flagship projects entails exploring the possibility of providing a livestock insurance scheme for producers in arid areas, which is well-intended but may prove to be impractical as far as regular premium contributions from the small scale farmers are involved.

CHAPTER 5: CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

The adoption of sustainable agricultural practices, despite demonstrating high biophysical performance, is constrained by policy and institutional factors. Eight key conclusions were derived from this study:

1. From the study, CA was widely practiced in the drier Buuri area while agroforestry was widely practiced in Kibwezi and the wetter Abothuguchi division in Meru district. Further, the farmers in the wetter Abothuguchi and Katheri divisions did not see the need for CA. With respect to institutional frameworks governing CAWT at the small scale level, farmers in Kibwezi were more aware of institutions promoting agroforestry practices, specifically Research organizations, Government ministries and NGOs while in Meru, NGOs and Government ministries were considered to incorporate a CA approach. At the local level, farmer groups, church groups and women groups were deemed most active in Kibwezi and Meru areas.
2. Even if there are more incentives than disincentives in the existing policies, the benefits to small scale farmers remain limited. Results show that small scale farmers did not benefit from the various policies in place but rather the main reason for compliance with the various policies may have been as a result of the inherent benefits associated with adopting the recommended policies. In some instances, farmers considered some policies neither encouraging nor discouraging, casting doubt on the efficiency of implementation of the various policies at the local level. In cases where the rules were punitive yet farmers considered them as ‘encouraging’, it may have implied that there exist ‘escape routes’ hence low enforcement at the grassroots level.

From the six key policies analyzed, the major conclusions derived were as below:

3. A major consequence of the Agriculture Act is its non-target nature, where, for instance, it¹ categorizes particular crops as scheduled crops yet these crops are not all inclusive of all agricultural produce and furthermore they tend to be grown by large scale farmers, hence the incentives apply to them leaving out the small scale farmer. The concentration of the pieces of legislation mandating existence of agricultural Authorities is on the sub-sectors that were traditionally considered as major export earners and were developed during the colonial times including coffee, tea, maize and dairy. The impacts that these organizations have had on small scale farmers vary, especially with collapse of some key Agricultural and Marketing organizations, leaving the small scale farmer vulnerable with potentially no easily accessible market for his produce.
4. The Agriculture (Basic Land Usage) Rules promotes maintenance of permanent soil cover, though in a punitive way. Although the regulations relate to CAWT, there exist no clear incentives for a small scale farmer.
5. The Agriculture (Farm Forestry) Rules of 2009, aiming to maintain a 10 per cent farm forest cover of every agricultural land holding (GoK, 2009a), marks a key entry point to CAWT adoption among small scale farmers. The Policy offers an incentive in the form of a 'Compliance Certificate' (Form CFF1) for a land owner or occupier who maintains a 10 per cent farm forestry or nursery requirement. This is the furthest the incentive goes hence may not be a key motivation as the certificate does not translate to any tangible gains from acquisition of the certificate for the compliant farmer. Section 11.1 of the Act offers an incentive of valuation of damage and tree compensation guidelines to a land owner or occupier who suffers damage to his farm forest trees. However, where damage is due to public utility service, no compensation or commitment to the farmer is assured. Another disincentive for the farmer is that review of farm tree

¹ Section 5.1a

compensation guidelines will be done after every five years, as stipulated in Section 10.4, which is too long a period and it may not reflect the true value of the damage incurred by the less resource- endowed small scale farmer. For a small scale farmer who may have maintained trees for other uses, there is an inhibitory regulation stipulating that a person shall not harvest trees from a farm forest without notification and approval by the DAC, for which a farmer has to incur a cost in the form of time and transport charges.

6. The Forest Act (2005) provides an incentive for people who own private forests as well as arboreta and recreational parks to get registered with the Kenya Forest Service (KFS). Obviously, this incentive fits more for capital endowed individuals owning private forests, institutions or body corporates, not a small scale farmer. To enhance community participation, Section 46.2 of the Act introduces Community Forest Associations (CFA), whereby the members are entitled to 'forest user rights' such as harvesting of timber or fuel wood, grass harvesting and grazing, among other benefits. As society is dynamic and community arrangements may not always be possible for every small scale farmer who may have time constraints, it does not offer any arrangements for those opting out of these community arrangements. The Act enhances personal accountability by discouraging livestock straying into forests to the extent of auctioning them after five days upon failure by the owner to reclaim them, proceeds of which are paid to the owner less the amount incurred by KFS for the cost of caring for them (GoK, 2009a).
7. The Sessional Paper Number 3 of 2009 on Kenya National Land Policy (NLP) takes an even more holistic approach, providing incentives such as security on community land, acquisition of land rights by inheritance, with or without a will, to promotion of soil conservation methods (GoK, 2009b). However, some incentives have turned out to be a disincentive to small scale farmers. In line with the NLP, the introduction of taxes, formation of

cluster settlements, minimum land size determination and privatization of delivery of services, such as valuation and survey are issues faced by small scale farmers, because of their inability to pay taxes, especially during the initial years, and to incur the costs of valuation and survey, in view that the incurred costs may not be necessarily subsidized. The private surveyors who may have been contracted by the Ministry of Lands may not be facilitated; hence in some inaccessible areas, the officers in charge may be demotivated to perform their duties.

8. The Agricultural Sector Development Strategy (ASDS) is tailored to benefit small scale farmers in its aim to improve agribusiness and market access. An incentive that closely relates to CAWT is the facilitation of multiple cropping with the aim of enhancing productivity per unit of land as well as woodland rehabilitation and afforestation projects introducing high-value commercial tree species. However, high costs associated with certified seeds prove to be a disincentive to small scale farmers, who may end up going for inferior quality seedlings and after disappointing yields, give up on the project.

5.2 Recommendations

The key recommendations from this study are that:

- Up-scaling of CAWT is most successful when particular agro-ecological zones are targeted. In Kibwezi, since agroforestry is already in practice, a CA focus can thus be introduced, whereas in Buuri division of Meru District, an agroforestry focus is a strategic entry point of upscaling CA, hence achieving a CAWT focused approach in both regions. Further, there is a need for incorporating existing Government frameworks in the efforts of up-scaling CAWT adoption. In terms of institutional support, farmers most active in conservation agriculture and agroforestry in Buuri and Kibwezi areas, respectively, were organized in CBOs. This suggests that CA can best be promoted by collaborations with the existing CBO structures active at the community level.

- There is a need to create small-scale farmer targeted incentives. As of now, the farmers seem not to derive any external incentives and neither do they seem to derive any benefits from the existing policies, creating limitations on adoption of CAWT.
- The Agriculture Act needs to be more sensitive to the needs of small scale farmers by creating mechanisms to enhance production of all agricultural produce. This can be by, for example, creation of Authorities dealing with representative crops in all sub-sectors, not just those traditionally considered as major export earners.
- The Agriculture (Basic Land Usage) Rules have suffered poor implementation due to lack of adequate resources. One of the ways to help in curtailing land degradation can be by incentivizing communities in enforcement and management of agricultural resources and providing incentives to compliant small scale farmers.
- The incentive provided by the Agriculture (Farm Forestry) Rules of 2009, in the form of a 'Compliance Certificate' (Form CFF1), needs to translate to tangible gains from acquisition of the certificate for the compliant farmer. This can be by, for example, possibility of incurring subsidized cost of tree seedlings upon presentation of Form CFF1.
- The Forest Act (2005) needs to provide an incentive for small scale farmers, such as registration with the Kenya Forest Service to obtain technical advice and other benefits, in a similar way to people who own private forests as well as arboreta and recreational parks benefit.
- The Sessional Paper Number 3 of 2009 on Kenya National Land Policy (NLP) needs to consider small scale farmer cash constraints by offering subsidized costs to small scale farmers with the introduction of taxes and privatization of delivery of services in the NLP.
- The Agricultural Sector Development Strategy (ASDS) needs to be further tailored to benefit small scale farmers in its aim to facilitate multiple

cropping. This can be, for example, offering subsidized costs for small scale farmers to obtain high-value commercial tree species.

5.3 Areas of Further Research

Other CAWT related policies such as those entailing seed acquisition, environmental management, wildlife policies, among other related policy documents need to be further analyzed with a CAWT-based approach. This study has also not exhausted all the impacts that Government policies have had on conservation agriculture. Researchers exploring policy analysis in the context of sustainable agricultural practices should also consider how related policy incentives and disincentives affect men and women differently. Another potential area for future research is the relationship between conservation agriculture and its potential to mitigate against and adapt to climate change. Further, studies on existing CA technologies utilized by the farmers would form a concrete basis for understanding the complexities and advocating for improved CA technologies in policy forums.

REFERENCES

- Agricultural Finance Corporation. (2011). *Machinery Loan*. [online]. AFC. Available from: http://www.agrifinance.org/index.php?option=com_content&view=article&id=92&Itemid=114 [Date accessed: 12.09.2011].
- Ajayi, O.C, Akinnifesi, F.K., Sileshi, G. and Chakeredza, S. (2007). Adoption of renewable soil fertility replenishment technologies in the southern African region: Lessons learnt and the way forward. *Natural Resources Forum*. 31:306-317.
- Ajayi, O.C and Kwesiga, F. (2003). Implications of local policies and institutions on the adoption of improved fallows in Eastern Zambia. *Agroforestry Systems*. 59:327-336.
- Alliance for a Green Revolution in Africa. (2011). *Kilimo Biashara Lives, Bringing Hope to Kenya's Smallholder Farmers* [online]. AGRA. Available from: <http://www.agra-alliance.org/content/story/detail/969> [Date accessed: 12.09.2011].
- Argwings-Kodhek, G. (2005). *Background Document on Umbrella Legislation for Kenyan Agriculture*. Tegemeo Institute of Agricultural Policy and Development Working Paper.
- Birner, R. and Resnick, D. (2010). The Political Economy for Smallholder Agriculture. *World Development*. 38:1442-1452.
- Bullen, P. (no date). *Writing Policy and Organizational Manuals* [online]. Paul Bullen Management Alternatives. Available from: <http://www.mapl.com.au/policy/tp1.htm> [Date accessed: 09.05.2011].
- Care of Creation. (no date). *Farming God's Way Principles*. [online]. Care of Creation. Available from: http://www.farming-gods-way.org/FGW_files/Principles.htm [Date accessed: 13.09.2011].
- Carsan, S. and Holding, C. (2006). *Growing Farm Timber: Practices, Markets and Policies: The Meru Timber Marketing Pilot Programme Case Studies and Reviews*. ICRAF.
- Catacutan, D and Piñon, C. (2009). The Policy Environment Of Vegetable-Agroforestry In The Philippines: Are There Incentives For Smallholders? *International Journal for Ecology and Development*. 14:47-62.

- CiteHR.com.(no date). *Difference Between Act and Policy* [online]. CITEHR.COM. Available from: <http://www.citehr.com/336069-difference-between-act-policy.html> [Date accessed: 11.05.2011].
- Cobo, J.G., Dercon, G. and Cadisch, G. (2010). Nutrient Balances In African Land Use Systems Across Different Spatial Scales: A Review Of Approaches, Challenges and Progress. *Agriculture, Ecosystems and Environment*. 136:1-15.
- De Jager, A., Onduru, D., Van Wijk, M.S., Vlaming, J., and Gachini, G.N. (2001). Assessing Sustainability Of Low-External-Input Farm Management Systems With The Nutrient Monitoring Approach: A Case Study In Kenya. *Agricultural Systems*. 69:99-118.
- Dumanski, J., Peiretti, R., Benites, J., McGarry, D. and Pieri, C. (2006). The Paradigm of Conservation Agriculture. In, *Proceedings of the World Association of Soil and Water Conservation*, 2006.
- Enters, T., Durst, P., Brown, C., Carle, J. and McKenzie, P. (2004). *What does it take? The role of incentives in forest plantation development in the Asia-Pacific Region- Executive Summary*. FAO.
- Food and Agriculture Organization. (no date). *Definition of Policy* [online]. FAO. Available from: <http://www.fao.org/Wairdocs/ILRI/x5499E/x5499e03.htm#TopOfPage> [Date accessed: 11.05.2011].
- Food and Agriculture Organization. (2010). *Farming for The Future In Southern Africa: An Introduction To Conservation Agriculture*. FAO Regional Emergency Office for Southern Africa (REOSA) Technical Brief.
- Food and Agriculture Organization. (2009). *Scaling- Up Conservation Agriculture In Africa: Strategy and Approaches*. FAO Sub-regional Office for Eastern Africa.
- Food and Agriculture Organization. (2001). *Conservation Agriculture : Case studies In Latin America and Africa*. FAO (FAO Soils Bulletin;78).
- Food and Agriculture Organization. (2000). *Manual On Integrated Soil Management and Conservation Practices*. FAO. (FAO Land and Water Bulletin; 8).
- Gibbon, H., Mbithi, D., Mugo, E.N. and Phiri, M. (2005). Forest and Woodland Management in East and Central Africa: Emerging Models for Improvement in Livelihoods and Natural Resource Management in Kenya and Zambia. In, *Proceedings of the 17th Commonwealth Forestry Conference*, 2005.

- Gitau, R., Kimenju, S., Kibaara, B., Nyoro, J., Bruntrup, M. and Zimmermann, R. (2009). *Agricultural Policy-making in Sub-Saharan Africa: Kenya's Past Policies*. Tegemeo Institute of Agricultural Policy and Development.
- Gladwin, C., Buhr, K., Goldman, A., Hiebsch, C., Hilderbrand, P. and Kidder, G. (1997). Gender and Soil Fertility in Africa. In, *Replenishing Soil Fertility In Africa: Soil Science Society of America(SSSA) Special Publication No.51: Proceedings Of The 88th Annual Meetings Of The Agronomy and The SSSA*, 1996, Indiana. Ed. By Buresh, R., Sanchez, P. and Calhoun, F. SSSA and American Society of Agronomy: 219- 236.
- GoK. (2010a). *Agricultural Sector Development Strategy 2010-2020*. Government Printer, Nairobi.
- GoK. (2010b). *The Proposed Constitution of Kenya*. Government Printer, Nairobi.
- GoK. (2009a). *The Agriculture (Farm Forestry Rules)*. Government Printer, Nairobi.
- GoK. (2009b). *Sessional Paper No. 3 of 2009 on National Land Policy*. Government Printer, Nairobi.
- GoK. (2007). *Kenya Vision 2030*. Government Printer, Nairobi.
- GoK. (2005a). *The Forests Act*. Government Printer, Nairobi.
- GoK. (2005b). *Forest Policy*. Government Printer, Nairobi.
- GoK. (1965). *The Agriculture(Basic Land Usage) Rules*. Government Printer, Nairobi.
- GoK. (1955b). *Agriculture Act Chapter 318*. Government Printer, Nairobi.
- GTZ Sustainet. (2006). *Sustainable Agriculture: A pathway Out Of Poverty For East Africa's Rural Poor- Examples From Kenya and Tanzania*. GTZ
- Haileslassie ,A., Priess, J., Veldkamp, E., Teketay, D. and Lesschen, J.P. (2005). Assessment Of Soil Nutrient Depletion and Its Spatial Variability On Smallholders' Mixed Farming Systems In Ethiopia Using Partial Versus Full Nutrient Balances. *Agriculture, Ecosystems and Environment*.108:1-16.
- International Fund for Agricultural Development. (2011). *Smallholder Horticulture Marketing Programme* [online]. IFAD Kenya. Available from: <http://www.ifadkenya.org/spip/spip.php?article69> [Date accessed: 11.09.2011].
- International Fund for Agricultural Development. (2011). Mount Kenya East Pilot

- Project [online]. IFAD Kenya. Available from: <http://www.ifadkenya.org/spip/spip.php?article6> [Date accessed: 11.09.2011].
- Jaetzold, R., Schimdt, H., Hornetz B. and Shisanya, C.A. (2007). *Farm Management Handbook Of Kenya. Natural Conditions and Farm Management Information*. 2nd ed. Vol.11/C. Eastern Province. MOA/GTZ.
- Jayne, T.S., Govereh, J., Mwanaumo, A. and Nyoro, J.K. (2002). False Promise or False Premise? The Experience of Food and Input Market Reform in Eastern and Southern Africa. *World Development*. 30:1967-1985.
- Kaumbutho, P. and Kienzle, J. Eds. (2007). *Conservation Agriculture As Practiced In Kenya: Two Case Studies*. ACT, CIRAD and FAO.
- Kenya Agricultural Productivity Programme. (2011). *Kenya Agricultural Productivity and Agribusiness Project* [online]. KAPP. Available from: http://www.kapp.go.ke/?option=com_content&view=section&layout=blog&id=34&Itemid=25 [Date accessed: 13.09.2011].
- Kenya Forest Service. (2010). *The Forest Service General Order 2010/2011*. Kenya Forest Service.
- Kenya National Bureau of Statistics. (2009). *Kenya Population and Housing Census: Population Distribution By Administrative Units*. Vol. 1A. KNBS.
- Kenya Network for Dissemination of Agricultural Technologies. (2011). *Village Information Resource and Exchange Centres (VIRECs)* [online]. KENDAT. Available from: <http://www.kendat.org/core-departments/village-information-resource-and-exchange-centres-virecs> [Date accessed: 12.09.2011].
- Kenya Wetland Forum. (2005). *The Proposed Sugarcane Project in the Tana Delta, Tana River District – Coast Province, Kenya. A Technical Paper* [online]. KWF. Available from: http://www.eawildlife.org/programme_areas/tech_paper.pdf. [Date accessed: 03.08.2011].
- Kijabe Environment Volunteers. (2008). *Welcome on the KENVO group website* [online]. KENVO. Available from: <http://www.kenvokenya.com/> [Date accessed: 15.09.2011].
- Koning, N. and Smaling, E. (2005). Environmental Crisis Or ‘Lie Of The Land’? The Debate On Soil Degradation In Africa. *Land Use Policy*. 22:3-11.

- MaCorr Analytical Services. (no date). Determine Sample Size and Find Confidence Interval [online]. MaCorr Analytical Services. Available from: <http://www.macorr.com> [Date accessed:03.12.2009].
- Mathu, W. (2007). *Forest Law Enforcement and Governance in Kenya*. Kenya Forest Service.
- Meijerink, G., Muchena, F., Njue, E., Noel, S., Onduru, D. and Porras, I. (2007). *Political, Institutional and Financial Framework for Green Water Credits in Kenya*. World Soil Information, Wageningen.
- Ministry of Agriculture. (2008). *The Ministry at a Glance*. MoA.
- Ministry of Agriculture.(no date). *Njaa Marufuku Kenya* [online]. MoA. Available from:http://www.kilimo.go.ke/index.php?option=com_content&view=section&layout=blog&id=151&Itemid=148 [Date accessed: 12.09.2011].
- Ministry of Agriculture. (no date). *Farmers benefit from a Government Program NALEP initiatives* [online]. MoA. Available from: http://www.kilimo.go.ke/index.php?option=com_content&view=article&id=384:farmers-benefits-from-a-government-programme-nalep-initiatives&catid=22:news-flash&Itemid=46 [Date accessed: 11.09.2011].
- Ministry of Agriculture. (no date). *Director- Extensions, Mrs. Mary Kamau tours NAAIAP programmes and officiates at Bungoma South Agro-dealer Graduation Ceremony* [online]. MoA. Available from: http://www.kilimo.go.ke/index.php?option=com_content&view=article&id=350:director-extension-mrs-mary-kamau-tours-naaiap-programmes-and-officiates-at-bungoma-south-agro-dealer-graduation-ceremony-&catid=149:news&Itemid=46 [Date accessed: 11.09.2011].
- Ministry of Lands and Settlement. (2004). *National Land Policy Formulation Process Concept Note*. Ministry of Lands and Settlement.
- Mowo, J. and Kiwia, A. (2009). *Brief Report On The Conservation Agriculture With Trees Side Event: Proceedings Of The 2nd World Agroforestry Congress, 2009, Nairobi*.
- Mumma, A. (2004). *Policy, Regulatory and Organizational Framework Concerning Dam (and Water Infrastructure) Decision Making in Kenya* [Unpublished Discussion Paper Prepared for the Dams and Development Secretariat of the UNEP].
- Mwangi, W., Verkuijl, H., Bisanda, S. (1996). Gender Differentials in Adoption of Improved Maize Production Technologies in Mbeya Region of the Southern Highlands of Tanzania. CIMMYT.

- Odhiambo, W. and Nyangito, H. (2002). *Land Laws and Land Use in Kenya: Implications for Agricultural Development*. Kenya Institute for Public Policy Research and Analysis (KIPPRA).
- Okoth-Ogendo, H.W.O. (no date). *The Perils of Land Tenure Reform: The Case of Kenya*. University of Nairobi.
- Parag, Y. (no date). *A System Perspective for Policy Analysis and Understanding: The Policy Process Networks*. Oxford University Centre for the Environment.
- Place, F., Barrett, C., Freeman, H., Ramisch, J. and Vanlauwe B. (2003). Prospects For Integrated Soil Fertility Management Using Organic and Inorganic Inputs: Evidence From Smallholder African Agricultural Systems. *Food Policy*. 28:365-378.
- Quinones, M., Borlaug, N. and Dowswell, C. (1997). A Fertilizer-Based Green Revolution for Africa. In, *Replenishing Soil Fertility In Africa: Soil Science Society of America(SSSA) Special Publication No.51: Proceedings Of The 88th Annual Meetings Of The Agronomy and The SSSA*, 1996, Indiana. Ed. By Buresh, R., Sanchez, P. and Calhoun, F. SSSA and American Society of Agronomy: 81-96.
- RAPDA and FIAN International. (2010). *Kenya's Hunger Crisis- The Result of Right to Food Violations: Report of a Joint International Mission*. RAPDA and FIAN International.
- Reij, C.P and Smaling, E. (2008). Analyzing Successes in Agriculture and Land Management in Sub-Saharan Africa: Is Macro-level Gloom Obscuring Positive Micro-level Change? *Land Use Policy*. 25:410-420.
- Rockström, J., Kaumbutho, P., Mwalley, J., Nzabi, A., Temesgen, M., Mawenya, L., Barron, J., Mutua, J and Damgaards-Larsen, S. (2009). Conservation Farming Strategies In East and Southern Africa: Yields and Rain Water Productivity From On-Farm Action Research. *Soil and Tillage Research*. 103:23-32.
- Sanchez, P. and Leakey, R. (1996). Land Use Transformation In Africa: Three Determinants For Balancing Food Security With Natural Resources Utilization. *European Journal of Agronomy*.7: 15-23.
- Sanchez, P., Shepherd, K., Soule, M., Place, F., Buresh, R. and Izac, A. (1997). Soil Fertility Replenishment In Africa: An Investment In Natural Resoure Capital. In, *Replenishing Soil Fertility In Africa: Soil Science Society of America(SSSA) Special Publication No.51: Proceedings Of The 88th Annual Meetings Of The Agronomy and The SSSA*, 1996, Indiana. Ed. By Buresh,

- R., Sanchez, P. and Calhoun, F. SSSA and American Society of Agronomy: 1-46.
- Sheldrick, W. and Lingard, J. (2004). The Use Of Nutrient Audits To Determine Nutrient Balances In Africa. *Food Policy*. 29:61-98.
- Shetto, R. and Owenya, M., Eds. (2007). *Conservation Agriculture As Practised In Tanzania: Three Case Studies*. FAO.
- Sixth Prime Minister's RoundTable. (2010). In, *Commitment Matrix: Proceedings of the 6th Prime Minister's RoundTable*, 2010. Nairobi.
- Smaling, E. and Fresco, L.O. (1993). A Decision-Support Model For Monitoring Nutrient Balances Under Agricultural Land Use (NUTMON). *Geoderma*. 60:235-256.
- Smaling, E., Nandwa, S. and Janssen, B. (1997). Soil Fertility In Africa Is At Stake. In, *Replenishing Soil Fertility In Africa: Soil Science Society of America(SSSA) Special Publication No.51: Proceedings Of The 88th Annual Meetings Of The Agronomy and The SSSA*, 1996, Indiana. Ed. By Buresh, R., Sanchez, P. and Calhoun, F. SSSA and American Society of Agronomy: 47-62.
- Van den Bosch, H., De Jager, A. and Vlaming J. (1998). Monitoring Nutrient Flows and Economic Performance In African Farming Systems (NUTMON) II. Tool Development. *Agriculture, Ecosystems and Environment*. 71:49-62.
- Wangungu, C.W., Maina, M., Gathu, R.K., Mbaka, J., Kori, N. (2010). Passion Fruit Production In Kenya: Opportunities and Constraints. In, *Contributions of Agricultural Sciences Towards Achieving The Millenium Development Goals: Proceedings Of The 3rd International E-Conference On Agricultural Biosciences*, 2010. Ed. By Mwangi, M. FaCT Publishing: 59-67.
- Wonnacott, T.H. and Wonnacott, R.J. (1977). *Introductory Statistics*. 3rd ed. John Wiley & Sons.
- Yatich, T., Awiti, A., Nyukuri, E., Mutua, J. Kyalo, A. , Tanui, J. and Catacutan, D. (2007). *Policy and Institutional Context for NRM in Kenya: Challenges and Opportunities for LandCare*. ICRAF Working Paper No. 43. ICRAF.
- Zenger, T., Lazzarini, S. and Poppo, L. (2001). *Informal and Formal Organizations in New Institutional Economics*. University of Washington.

APPENDICES

Appendix I: Study Framework

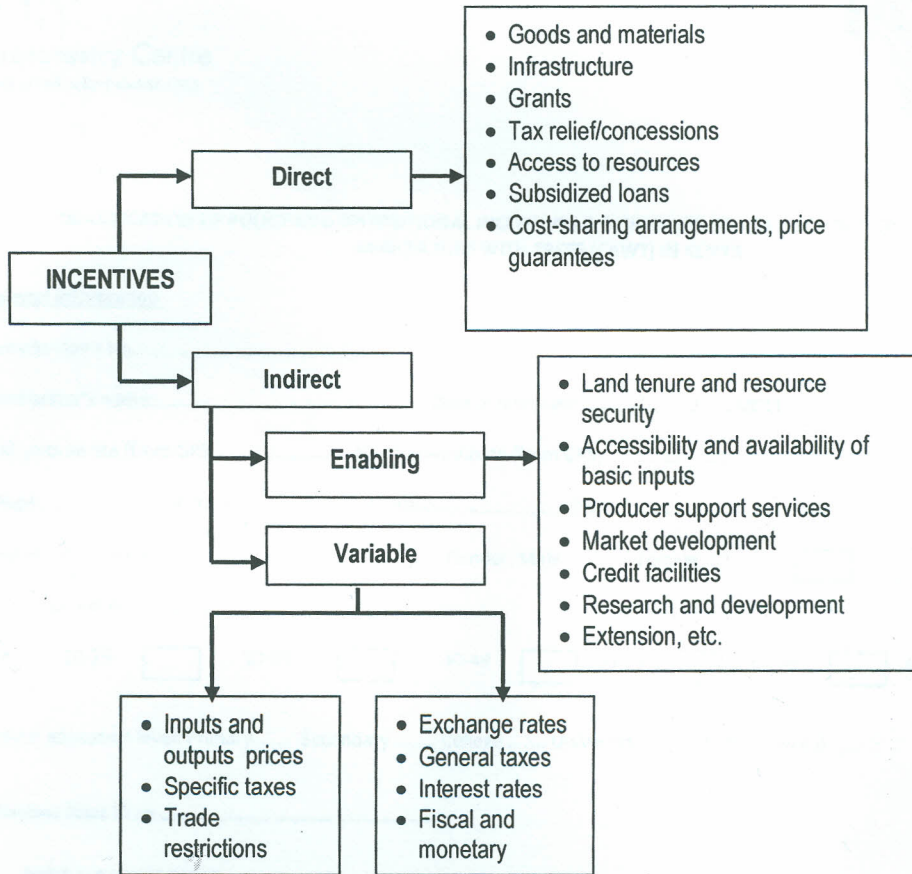


Figure 4: Types and examples of incentives (and disincentives)

(Source: Enters et al., 2004; Catacutan and Piñon, 2009)

Appendix II: Small Scale Farmer Interview Schedule



IDENTIFICATION OF POLICY AND INSTITUTIONAL INCENTIVES & DISINCENTIVES FOR ADOPTION OF CONSERVATION AGRICULTURE WITH TREES (CAWT) IN KENYA

General Information

Questionnaire No.:

Enumerator's name:..... Date of interview:...../...../...../2011

East co-ordinate (from GPS)..... North co-ordinate (from GPS).....

Village:..... Location:..... Division..... District.....

Respondent's name:..... Gender: Male Female

Contact phone no.:.....

Age: 20-29 30-39 40-49 50-59 60-69 Above 70

Highest education level: Primary..... Secondary College University Other(Specify).....

Interview Start Time.....

PART 1: BACKGROUND

1. (a) What have been your three most important crops in the last one year?(crops that provided the highest income to your household)

.....,,

(b)How do you prepare your farm? (Tick all that apply)

		<u>For how long have you done this (years)?</u>
1) Digging (jembe, panga)	<input style="width: 50px; height: 20px;" type="checkbox"/>
2) Animal drawn plough	<input style="width: 50px; height: 20px;" type="checkbox"/>
3) Tractor	<input style="width: 50px; height: 20px;" type="checkbox"/>
4) Burning	<input style="width: 50px; height: 20px;" type="checkbox"/>

5) Use of chemicals

6) Any other (specify)

2. (a) Do you know of the following practices?

	Yes	No
1) Minimum or no soil turning	<input type="checkbox"/>	<input type="checkbox"/>
2) Use of cover crops eg beans, sweet potatoes	<input type="checkbox"/>	<input type="checkbox"/>
3) Crop rotation	<input type="checkbox"/>	<input type="checkbox"/>

3. (a) Have you ever practiced any of the following:

	Yes	No
1) Minimum or no soil turning	<input type="checkbox"/>	<input type="checkbox"/>
2) Use of cover crops eg beans, sweet potatoes	<input type="checkbox"/>	<input type="checkbox"/>
3) Crop rotation	<input type="checkbox"/>	<input type="checkbox"/>

(b) Have you heard of Conservation Agriculture (CA)?

Yes No

(c) If 'Yes' above, what does CA mean to you?

1)	Use of organic inputs (eg cow,goat&chicken manure, vegetable remains)	<input type="checkbox"/>
2)	Minimum or no soil turning	<input type="checkbox"/>
3)	Trees on farms	<input type="checkbox"/>
4)	Any other(specify)	<input type="checkbox"/>
5)	Don't know	<input type="checkbox"/>

NB: CLEARLY explain CA (using the 3 principles in Question.2a) before proceeding to next question.

4. (a) Do you practice CA (using its 3 principles)?

Why?

Yes

No

(b) Do you think there is need for CA to be practiced by small scale farmers?

Yes

For what reason(s)?

Increased yields

Improved soil fertility

Improved water retention

Reduced labour cost

Any other (specify)

.....

No A costly farming practice
 Risky(increased crop yields not guaranteed)
 Any other (specify)

Don't know

(c) In your opinion, what is the **most important** way that small scale farmers in this area (Meru/Kibwezi) can be motivated to practice CA?

		In what way?
Trainings on CA practice	<input type="checkbox"/>
Provision of inputs	<input type="checkbox"/>
Extension services	<input type="checkbox"/>
Provision of indirect motivations (eg land security,market for produce)	<input type="checkbox"/>
Any other (specify)	<input type="checkbox"/>

(d) Do you think including trees in farms can promote CA among the small scale farmers?

For what reason(s)?

Yes

No

Don't know

PART 2: EXISTENCE OF POLICY AND INSTITUTIONAL ENCOURAGEMENTS & DISCOURAGEMENTS

6. (a) (FIRST GIVE A STORY eg Ghana story) Then ask...Do you know of any community rules passed by the village headman/chief/any other local leader that affects your crop farming systems? (for example, livestock allowed to graze in neighbours' farms at certain times of the year etc)

Give an example

Yes

No

(b) Who interprets Government rules for you?

Chief

Agricultural officers

Provincial administration

Neighbours

Local leaders (specify)

Media (Radio, TV)

Any other (specify)

(c) Do you know of any Local Governmet laws in this area (Meru/Kibwezi) passed by the chief/village head that talk about agriculture?

Give an example

Yes

No

7. Have you heard of any National Government rules that talk about agriculture?

		Which are they?
On trees on farms	<input type="checkbox"/>
On soil erosion	<input type="checkbox"/>
On planting crops near rivers	<input type="checkbox"/>
On land issues	<input type="checkbox"/>
Any other (specify)	<input type="checkbox"/>
Don't know	<input type="checkbox"/>	

8. (a) How would the following Government rules influence you (in any way) to practice CA?

Rule on.....	Specific rules	Yes	No	How?
Trees on farms	The need for a permit to cut trees	<input type="checkbox"/>	<input type="checkbox"/>
	10% tree cover	<input type="checkbox"/>	<input type="checkbox"/>
	Restriction on cutting and transporting specific trees	<input type="checkbox"/>	<input type="checkbox"/>
	Any other rule on trees on farms (specify)	<input type="checkbox"/>	<input type="checkbox"/>
Land ownership	No restriction of minimum land sizes	<input type="checkbox"/>	<input type="checkbox"/>
	Any other rule on land ownership (specify)	<input type="checkbox"/>	<input type="checkbox"/>
Crop farming rules	Promotion of irrigation agriculture	<input type="checkbox"/>	<input type="checkbox"/>
	Extension officer-farmer trainings	<input type="checkbox"/>	<input type="checkbox"/>
	Any other rule on crop farming (specify)	<input type="checkbox"/>	<input type="checkbox"/>
Any other agricultural rule?	<input type="checkbox"/>	<input type="checkbox"/>

9. On a scale of 1 to 5 (1 as the lowest and 5 as the highest), rate how these Government rules can best encourage you to:

(a) lower your investment cost to practice CA (eg lower your input costs)

Encouragement	Scale
Cost-sharing arrangements	
Provision of good infrastructure (eg roads, factories)	
Tax relief	

(b) increase returns on your farms (eg increase your profit margins)

Encouragement	Scale
Input and output prices controlled	
Other people taxed so that CA farmers can benefit (special taxes)	
Managing foreign exchange rates	

(c) decide to practice CA

Encouragement	Scale
Extension services	
Land Ownership security	
Market development for farm produce	

PART 3: MAJOR POLICY AND INSTITUTIONAL CONTEXT OF CAWT

10. Do you know of any initiatives promoting agricultural development in this area (Meru/Kibwezi)?

Initiative		How do they promote agriculture?
SHOMAP	
Green Belt Movement	
KAPP		
Njaa Marufuku		
NAAIAP		
NALEP		
Equity Bank Farmer Loans		
Agricultural Finance Fund		
AGRA		
NEPAD		
Any Other (specify)		

11. In your opinion, how do you think Government support can help motivate small scale farmers to practice CA?

		In what way?
Provision of inputs	<input type="checkbox"/>
Provision of basic needs eg food	<input type="checkbox"/>
Tax reliefs	<input type="checkbox"/>
Any other (specify)	<input type="checkbox"/>

12. (a) Do you know of any established organizations that help promote CA among small scale farmers?

Private companies	<input type="checkbox"/>	Who are they?	How do they promote CA?
-------------------	--------------------------	--	--

Research organizations	<input type="checkbox"/>
Government ministries	<input type="checkbox"/>
Church organizations	<input type="checkbox"/>
NGOs	<input type="checkbox"/>
Volunteer groups	<input type="checkbox"/>
Any other (specify)	<input type="checkbox"/>
.....	
Don't know	<input type="checkbox"/>		

(b) Do you know of any grassroots groups in this area (Meru/Kibwezi) that help promote CA among the small scale farmers?

		Who are they?	How do they promote CA?
Farmer groups	<input type="checkbox"/>
Community Based Organizations (CBOs)	<input type="checkbox"/>
Women Groups	<input type="checkbox"/>
Church groups	<input type="checkbox"/>
Any other (specify)	<input type="checkbox"/>
.....	
Don't know	<input type="checkbox"/>		

PART 4: POLICY MAKING PROCESS

13. (a) If there is any agricultural issue, which decision making body do you address so that the issue reaches the people at the national level?

Agricultural issue at the....		Which decision making body?
Village level	<input type="checkbox"/>
Location level	<input type="checkbox"/>
Division level	<input type="checkbox"/>
District level	<input type="checkbox"/>

(b) Have any of the agricultural issues been addressed at the national level?

Agricultural issue at the....		Which agricultural issue?
Village level	<input type="checkbox"/>
Location level	<input type="checkbox"/>
Division level	<input type="checkbox"/>
District level	<input type="checkbox"/>

14 (a) Has anyone ever asked your opinion during writing of any Government Agricultural rule?

		When?
Yes	<input type="checkbox"/>
No	<input type="checkbox"/>

(b) Do you think it is important to involve farmers in developing Government rules related to agriculture?

		Why?
Yes	<input type="checkbox"/>
No	<input type="checkbox"/>

(d) If 'Yes' above, what is the best way that farmers can be involved so as to encourage CA in the existing:

		How can farmers be involved?	
Government rules		Farmer meetings eg in barazas to express their needs	<input type="checkbox"/>
		Successful CA farmers be highlighted in media	<input type="checkbox"/>
		Any other (specify).....	<input type="checkbox"/>
Established organizations		Farmer training workshops	<input type="checkbox"/>
		More time allocation for CA projects	<input type="checkbox"/>
		Any other (specify).....	<input type="checkbox"/>
Grassroots groups		Frequent follow-up of CA activities	<input type="checkbox"/>
		Increased farmer support groups	<input type="checkbox"/>
		Any other(specify).....	<input type="checkbox"/>

15 (a)What is your (total) land size? (in acres).....

(b) What kind of ownership is your land under (tick all that apply)

- Inherited
- Bought
- Borrowed
- Hired (leased)
- A gift
- Communal land

(c) Do you have a title deed?

No

Yes : Under your name family name

(d)Would you be willing to practice CA in your land?

		Why?
Yes	<input type="checkbox"/>
No	<input type="checkbox"/>

16. (a) Should we continue subdividing land to smaller pieces?

		Why?
Yes	<input type="checkbox"/>
No	<input type="checkbox"/>

(b) Can combining land with your relatives/family work?

		How?
Yes	<input type="checkbox"/>
No	<input type="checkbox"/>

Conclusion:

Thank you very much for your time.

Interview End Time.....

Appendix III: Key Informant Checklist



World Agroforestry Centre
TRANSFORMING LIVES AND LANDSCAPES



IDENTIFICATION OF POLICY AND INSTITUTIONAL INCENTIVES & DISINCENTIVES ON ADOPTION OF CONSERVATION AGRICULTURE WITH TREES (CAWT) IN KENYA

General Information

Checklist No.: /
K.I. / P.M

Date of interview:...../...../...../2011
Day / Date /Month / Year

Respondent's name:.....

Gender: Male.....Female.....

Contact phone no:.....

Contact email addr:.....

Division..... District.....Province/County:.....

Age Bracket..... Highest Level of Education.....

Profession:.....

Organization:.....

Interview Start Time.....

PART 1: BACKGROUND

1. (a) Does Conservation Agriculture (CA) mean:

1.	Use of organic inputs	.....
2.	Reduced ploughing	.....
3.	Use of trees in farms	.....
4.	Other (please specify)	
5.	Don't know	.....

- (b) Do you know of Conservation Agriculture (CA) practices?

Yes	(please provide examples)
No.....	.....

- (c) If 'Yes' above, do you know of anyone practicing CA?

Yes	(What CA practice)
No.....	.....

2. (a) Do you think CA is widely practiced among small scale farmers in Kenya?

	For what reason(s)?
Yes.....	
No.....	
Don't know.....	.....

- (b) If 'No' above, Please suggest some practical ways that small scale farmers in Kenya can be motivated to practice conservation agriculture

3. Do you think including trees in farms can promote CA among the small scale farmers?

	For what reason(s)?
Yes.....	
No.....	
Don't know.....	

PART 2: MAJOR POLICY AND INSTITUTIONAL CONTEXT OF CAWT

4. In your opinion, how do you think Government Support can help motivate small scale farmers practicing CA?

Examples of Government support	In what way?
Provision of inputs	
Provision of basic needs eg food	
Tax reliefs	
Others	

5. (a) Do you know of any established organizations that help promote CA among small scale farmers? (such as regional and national research institutes, Government bodies, private organizations etc)

Who are they?	How do they promote CA?

- (b) Do you know of any grassroots groups at the local level (village/location/division/district) that help promote CA among the small scale farmers? (such as Farmer Groups, Community Based Organizations, Women Groups etc)

Who are they?	How do they promote CA?

6. (a) Are there any national policies in Kenya that talk about CA systems?

Yes	(please specify)
No.....	
Don't know.....	

- (b) Do you know of any Local Government by-laws that promote CA systems at the local level?

Yes	(please specify)
No.....	

- (c) Do you know of any community rules among farmers that affect their crop farming systems? (For example, livestock allowed to graze in neighbours' farms at certain times of the year, etc)

Yes	(please specify)
No.....	

PART 3: EXISTENCE OF POLICY AND INSTITUTIONAL INCENTIVES & DISINCENTIVES

7. (a) Do existing formal organizations and grassroots groups discourage small scale farmers to practice CA?

	Yes	No	Don't know
Formal organization
Grassroots groups

- (b) If 'Yes' above, in what way?

Name of formal organization	In what way?
Name of grassroots group	In what way?

8. (a) Are there any methods that have been used to encourage small scale farmers to engage in CA in the following institutions?

	Yes	No	Don't know
Formal organization
Grassroots groups

(b) If 'Yes' above,

Name of formal organization	What method?
.....
Name of grassroots group	What method?
.....

9. (a) Do you know of any national policies that target agricultural systems in Kenya?

Yes.....	.....
No.....	.....

(b) If 'yes' above, do you know of any national policies that talk about CA?

10. (a) Do you know of a specific policy that encourages small scale farmers to practice CA?

Yes.....	.....
No.....	.....
Don't know.....	.....

(b) If 'yes', in what way?

What policy?	In what way?
.....

11. (a) Do you know of a specific policy that discourages small scale farmers to practice CA?

Yes.....	.....
No.....	.....
Don't know.....	.....

(b) If 'yes', in what way?

What policy?	In what way?
.....

12. (a) In your opinion, how best can national policies motivate small scale farmers to practice CA?

	In what way?
Direct motivations	.....
Indirect motivations	.....
Other ways	.....

(b) On a scale of 1-5 (For reference, give out this sheet of paper)

1=strongly disagree

3= neither agree nor

5= strongly agree

disagree

2= disagree

4= agree

Please fill the following:

(i) From the following, rate which factors will likely directly lower the investment cost of small scale farmers practicing CA with trees							
	Provision of goods& materials	Provision of good Infrastructure	Availability of grants	Tax relief	Access to resources	Subsidized loans	Cost-sharing arrangements
Scale

(b) From the above, which is the **most important** motivation likely to encourage small scale farmers to practice CA with trees?

Which motivation?	Why?
----------------------------	---------------

(ii) From the following economic factors, rate how these increase returns on farm investments for small scale farmers practicing CA with trees

	Control and support of Inputs & output prices	Imposing specific taxes	Balancing/imposing trade restrictions	Managing Exchange rates	Imposing General taxes	Lowering Interest rates
Scale						

(b) From the above, which is the **most important** motivation likely to encourage small scale farmers to practice CA with trees?

Which motivation?	Why?
----------------------------	---------------

(iii) From the following, rate which factors will likely influence farmers' decision making towards CA with trees

	land tenure & resource security	Accessibility & availability of basic inputs	Producer support services	Market development	Credit facilities	Research & Development	Extension Services
Scale							

(b) From the above, which is the **most important** motivation likely to encourage small scale farmers to practice CA with trees?

Which motivation?	Why?
----------------------------	---------------

PART 4: POLICY MAKING PROCESS

13. (a) Do you know of a decision making body at any of these levels? (Tick all that apply)

village	division	district	province	national	Don't know
(specify)	(specify)	(specify)	(specify)	(specify)	

(b) In your opinion, what kind of approach does the national policy making process adopt?

What approach?	Why is that?
Top-down approach	.....
Bottom-up approach	.....
Don't know	

(c) Have you ever been informed or consulted at any point during the writing of these policies?

Informed	Yes.....	No.....
Consulted	Yes.....	No.....

14. (a) Do you think it is important to involve farmers in developing agricultural policies?

Yes.....	No.....
----------	---------

(b) If 'yes' above, how can farmers be involved so as to encourage CA in the existing:

	How they can they be involved?
National policies	
Formal organizations	
Grassroots groups	

15. In your opinion, what is the **most important** intervention needed in the **existing** policies and institutions to encourage small scale farmers to practice CA?

	What is the most important intervention?
National Policies	
Established organisations	
Grassroots groups	

PART 5: MAJOR LOCAL, NATIONAL & REGIONAL AGRICULTURAL DEVELOPMENT INITIATIVES

16. (a) Do you know of any initiatives promoting agricultural development in Kenya or other African countries?

	Provide examples
Kenya	
Other African countries	

(b) In your opinion, how can any of the initiatives be used to encourage a small scale farmer to practice CA?

	Provide examples
Kenya	
Other African countries	

Interview End Time.....

Appendix IV: List of Key Informants Interviewed

Policy Role	Person Interviewed	Organization	Job Title	Location
NGOs	Mercy Gichuhi	CASARD	Senior Technical Assistant	Nairobi
	Craig Sorley	Care of Creation	Director	Kijabe
	Sadiq Juma	Red Cross	Relief Coordinator	Kibwezi
	Peter Kuria	Sustainet	Program Officer	Nairobi
	Pascal Kaumbutho	KENDAT	C.E.O	Nairobi
	David Ojwang'	USAID Kenya Horticultural Competitiveness Project	Field Manager-Eastern Region	Kibwezi
Research Organizations	Stella Makokha	KARI-NARL	Socioeconomist	Nairobi
	Samuel Wakori	KEFRI	Dissemination Officer	Muguga
	David Muchiri	KEFRI	Zonal Officer in charge	Kibwezi
CBOs	David Kuria	KENVO	Director	Lari
Farmers' Organizations	Judith Libaisi	KENFAP	Deputy Head, Membership Services	Nairobi
	Doris Wanjiku Nguni	KENFAP	Program Coordinator	Meru
Farmers	Stanley Muriuki	None	Farmer	Laikipia
	Samuel Nzongolu	None	Farmer	Kibwezi
Policy	Bernard Aruya	Ministry of Agriculture	Assistant DAO	Lari

Policy Role	Person Interviewed	Organization	Job Title	Location
Implementers				
	Paul Ndung'u	Ministry of Lands	Land Surveyor	Nairobi
	John Macharia	Ministry of Agriculture	District Agricultural Engineer	Thika East
	William Nyasimi	Ministry of Agriculture	DAO	Mbooni East
	Janet Oyuke	Ministry of Agriculture	Principal Agricultural Officer	Nairobi
	Mary Muteti	Ministry of Agriculture	DAO	Kibwezi
	Joel Mutiso	Arid Lands Resource Management Project II	District Foods for Assets Coordinator	Kibwezi
Policy Makers	Emilio Mugo	Kenya Forest Service	Senior Deputy Director	Nairobi
	Khadaka Liyai	Ministry of Lands	Assistant Director	Nairobi
	Stephen Laititi	ASCU	Deputy Coordinator (Policy & planning)	Nairobi
Decision Makers	Vinehas Kaaria	Ministry of Agriculture	Provincial Advisory Board	Eastern Province
Policy Enforcers	Francis Kung'u	Kenya Forest Service	Forest Officer	Kibwezi