THE ROLE OF WOMEN IN NATURAL RESOURCE MANAGEMENT

A case of Two Wings Agroforestry Network-Kabale

A Research Project Submitted to Larenstein University of Applied Sciences in Partial Fulfilment of the Requirements for the Degree of Master of Management of Development specializing in Social Inclusion, Gender and Rural Livelihood

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DEDICATION

This work is dedicated to my dear wife Catherine Yesigomwe, my children Primrose, Charlotte, Aaron and Arinda, for the endurance and perseverance shown during my absence. I love you so much.

ACKNOWLEDGEMENT

God bless you

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ACRONYMS

AIDS	Acquired Immune Deficiency Syndrome
AFRENA	Agroforestry Research Networks for Africa
A2N	Africa 2000 Network
FGD	Focused Group Discussion
HIV	Human Immuno Deficiency Virus
ICRAF	International Centre for Research in Agroforestry
NGO	Non Governmental Organisation
PESTEC	Political, Economic, Social, Technical, Environmental, and Cultural factors
TWAN	Two Wings Agroforestry Network
UPE	Universal Primary Education
USE	Universal Secondary Education
VOK	Voice Of Kigezi

ABSTRACT

It is increasingly becoming important to address the many problems in the realm of natural resources in Uganda. The commitment is towards sustainable use, striking a balance between economic development and conservation interventions. Agroforestry has been identified as one of the important key approaches for reducing over exploitation of natural resources while sustaining food production for rural development.

Modern Agroforestry is based on improved management and organization of traditional Agroforestry practices to give better results backed by scientific knowledge as a way of addressing problems associated with increased population pressure, land shortage and food security.

Women have an essential contribution to make in the management of natural resources because they pocess several complementary attributes that are beneficial to ecologically sustainable development. The instrumental role of women in respect to the conservation of the environment stems from their tasks and responsibilities, and direct dependence on land based resources.

This study was conducted to investigate the factors that cause low adoption of Agroforestry technologies by women of Two Wings Agroforestry Network in Kabale district. The study specifically looked at the three promoted technologies among others; home gardens, scattered trees and shrubs, and hedgerows.

Data was collected by use of semi-structured interviews and Focused Group Discussions. PESTEC and Harvard Analysis tools were used to analyse data. Findings show that adoption of Agroforestry technologies in the study area was influenced by socio-cultural factors like gender roles, division of labour and cultural norms. Socio-economic factors such as, education, marital status, land and tree tenure. Institutional factors like lack of natural resource bye laws.

Women in the study area were aware of Agroforestry and more interested in the direct/ immediate benefits of the technologies. Home gardens are highly adopted compared to scattered trees/ shrubs, and hedge rows.

There is need to further enhance dissemination through extension by all stakeholders. Relevant channels that suit women's circumstances should be used to promote technologies that are not yet fully adopted.

Key words: Agroforestry, women, adoption and natural resource management.

CHAPTER 1: INTRODUCTION AND BACKGROUND TO THE STUDY

1.1 Introduction

Sustainable use of natural resources is a global concern with an increase in climate change. Inappropriate land use activities are contributing greatly to land degradation. This mainly relates to the pattern of settlements, urbanisation, and farming practices. Among the many issues related to land use is lack of commitment by farmers to engage in sustainable farming practices that would mitigate the causes of land degradation.

The International Community has endorsed several plans of action for full integration of women in all development activities. The Beijing Conference 1995 concluded that unless the contribution of women to environment and resource management is recognised and supported, sustainable development would remain elusive (Conserve Africa, 2008).

The interest of women stems from their tasks in agriculture as well as household chores. Majority of women, particularly those living in Third World countries play a major role in managing natural resources; soil, water, forests and energy. Their tasks in agriculture and animal husbandry, makes them daily managers of the environment. In addition women participate in the commercial sectors of society. The raw materials they use in rural enterprises are vulnerable to environmental degradation and contamination. As farmers and traders, women experience environmental problems directly undermining the basis of their daily lives (Dankelman and Davidson, 1989).

Women are identified as immediate participants and beneficiaries of natural resources, but they are faced with many constraints (Warren, 1992). Therefore to support women in their efforts to sustainably use the natural resources would create an avenue to prosperity.

The government of Uganda through its Plan for Modernisation of Agriculture recognises Agroforestry as one of the options for improving farm productivity and eliminating poverty through increased household income (GOU, 2000). Women have a great responsibility in the agriculture sector. They should be focussed on if adoption of Agroforestry for sustainable natural resource and rural development is to be achieved.

Kabale District in South West Uganda is a highland area with steep slopes. For several decades Kabale Highlands were a key food producing area in Uganda. The increasing high population density is estimated to be 281 persons per km^2. There is intense land cultivation with minimum inputs. This, coupled with land fragmentation is a threat to food security. Population pressure has also led to severe land shortage and loss of tree cover. The majority of house holds do not use fertilizers nor do they practice any form of fallow. Application of compost manure is limited to plots of land near the homesteads. Other major challenges of natural resource management faced by Kabale farmers (both men and women) include; shortfall of fuel wood, shortage of poles for construction, low income, hunger and nutritional deficiencies (Kabale District Profile, 2007).

Over the last two decades, research and development organisations have made considerable efforts in promoting and disseminating Agroforestry technologies, plus other improved natural resource management practices. This was in an effort to combat soil erosion and land degradation. International Centre for Research in Agroforestry (ICRAF) and other Non Governmental Organisations (NGO's) promote contour hedges of shrubs for erosion control, and rotational wood/fallows mainly on the upper terraces for soil fertility replenishment and wood production (Siriiri et, al, 2000). The adoption levels of these technologies are less than satisfactory (Saginga et, al, 2005) as there is little integration of tree growing in the farming systems in Kabale (Miiro,1998). Except for commercial eucalyptus wood lots, very few trees are planted by farmers in Kabale District (Bamwerinde et, al 1999). Agroforestry as a land management practice is still new to the majority of farmers in Kabale (Africare, 2000).

1.2 The Context of Two Wings Agroforestry Network (TWAN)

The Two Wings Agroforestry Network is located in Kabale District in South Western part of Uganda. It is a community-based umbrella organisation of rural women and farmer groups, which registered as an indigenous Non- Governmental Organisation (NGO) in 1994. Its mission is to equip its members with necessary knowledge, appropriate skills, relevant tools and better attitudes for environmental management, soil and water conservation and poverty eradication based on self reliance and full participation. Its specific activities include:

- Agroforestry;
- Organic farming and composting;
- Construction of water saving tanks;
- Capacity building;
- Soil and water conservation;
- Nursery establishment;
- Fruit and tree growing;
- Back yard gardens;
- Dairy farming.

TWAN has an established Organisational Structure. (Refer to Appendix 1). This structure makes the network effective in coordination of its activities and grassroot delivery of services to the group members. In 1994, TWAN in collaboration with ICRAF/AFRENA started an Agroforestry project as one method of conserving the environment.
Dissemination of Agroforestry technologies was initially started by ICRAF and Africa 2000 Network. These were efforts to address the problem of land degradation and food security amongst farmers and established groups engaged in farming. TWAN was one of the target groups in research and development programmes of ICRAF. Training workshops were among the strategies of disseminating Agroforestry, women groups near Kabale town neighbourhood were often invited to attend. In these trainings strong relationships between women groups and ICRAF were established in which approaches to deal with problems of land degradation could be addressed.

1.2.1 Agricultural System within TWAN area

The bimodal rain pattern of Kabale allows two cropping seasons. Major crops grown are sorghum (for food and alcohol production), sweet potatoes, irish potatoes, beans, peas, and maize. All crops are mainly intercropped, although irish potatoes recently introduced are mainly grown as a cash crop in monoculture (Kabale District Profile 2007).
Traditionally vegetables were hardly grown. Wild growing 'greens', local types of spinach-like leaves were collected on free range. In the last decade vegetable growing has become more popular. Mainly cabbages are grown for home consumption and for sale as a cash crop. Also other vegetables such as amaranthus, carrots, onions, and tomatoes have been introduced and grown near homesteads. 'Matoke' the major staple food in the central region of Uganda was introduced to drier and warmer eastern part of Kabale, mainly recognised as a cash crop.
Availability of fruits is limited to introduced pineapples and avocados. ICRAF started dissemination of grafted avocados, trials with other fruits of moderate climates such as apples, pears, and prunes.
Milk is an important source of animal protein in the daily nutrition, especially for children. Traditionally only a small part of the population was able to own cattle of local breeds that were kept on free range grazing. With the increasing population pressure, land available for free range grazing becomes less and less available. Moreover, milk production was limited to one or two litres per cow. Exotic cows were introduced and given to selected households, mainly by Heifer International and European Union micro projects. Most exotic cows are kept on zero grazing. Zero grazing requires rather large inputs and high management capacities, with land requirements of at least 0.5 hectare for high yield pasture such as Napier grass (Van der Veen, 2001).

The largest part of the population is engaged in subsistence farming. Most of the land is decreed public land and farmers are occupying their land as customary tenants. The high population density and lack of other employment opportunities has caused fragmentation of land and small farm sizes, which vary from 0.3 to 2.5 hectares. Family land is scattered; some plots are near, others are from the homestead, making work and control a difficult task. With the traditional production system yields are too low to satisfy all basic needs and utilising external inputs is expensive and not a sustainable option to farmers. Also the traditional feeding pattern is limited in the use of vegetables and malnutrition occurs (Guinand, 1995).

Conventional agriculture does not offer opportunities to improve the production as external inputs are not available or too expensive for subsistence farmers. Sustainable organic farming is recognised as a viable and affordable option to improve nutrition and increased yields.

Agricultural land is mainly owned by men. Despite the fact that men own land and cash generating enterprises, it is women who perform most of the farm activities assisted by hired labourers for those who afford, and older children who are not in school. Children attending school help on the weekends and sometimes during evenings on school days.

Agroforestry trees enter the households through the woman who is expected to perform most of the production activities from seed bed preparation, digging holes to planting, watering and pruning. It is worthy noting that besides doing most of the farm activities, women perform most of the reproductive work such as rearing children, taking care of the sick and household chores while men are away from home doing off farm employment, formal employment, casual labour, charcoal burning, and brick making (Van der Veen, 2001).

1.3 Significance of the Study

Technologies and innovations that people use play a fundamental role in shaping the efficiency, equity and environmental sustainability of the natural resources available. Introduced technologies by themselves cannot increase productivity or improve standards of living of people unless farmers (both men and women) adopt them. This is true with Agroforestry technologies which link people with trees, to improve food security and sustainable agricultural production. Women are important actors in natural resource management and efforts are in place to take into account their involvement in protection and planting Agroforestry schemes. A number of Agroforestry technologies have been developed by research for adoption. This study will therefore enhance understanding of factors that affect women's potential in the adoption of Agroforestry technologies. The study will form a basis for researchers and development agencies in the formulation of better and accepted strategies that can improve efficiency in the diffusion and adoption of these technologies.

1.4 Research Problem

Natural resource management interventions address the needs of communities especially in situations where land degradation has impoverished livelihoods. The magnitude of soil erosion and damage caused by run off water makes communities in Kabale susceptible to low productivity. This directly impacts their livelihoods. In light of this Two Wings Agroforestry Network started on the Agroforestry Project in 1994 involving women, to adopt and disseminate appropriate technologies for improved land use and protection of the environment.

The project was chosen because it represented farming in a sustainable way, to meet increasing demands of a poor population in an area with high rate deforestation and soil degradation. Despite efforts to involve communities in natural resource base replenishment, through identified Agroforestry technologies, soil protection and improvement has remained amiss. Thus, Two Wings Agroforestry Network is concerned

that the ongoing Agroforestry Project has not significantly mitigated the causes of land degradation due to low adoption of Agroforestry technologies by women.

1.5 Objective

The main objective of the study was to make recommendations for the on going Agroforestry Project, by investigating the factors that cause low adoption of the promoted Agroforestry technologies by women.

1.6 Main Research Question

What are the causes of low adoption of the promoted Agroforestry technologies by women in the Agroforestry project?

1.6.1 Sub Questions

- What is Agroforestry?
- What are the benefits of the Agroforestry project to women?
- How do urban/rural women perceive significant advantages of using Agroforestry technologies compared to other alternatives?
- What are the cultural, socio-economic influences that affect women in deciding to take on Agroforestry?
- Do women have the necessary information and resources, to establish and manage the technology?
- How was the needs assessment of women carried out before the initiation of the project?
- What were the channels of communication of Agroforestry technologies to women?
- What type of extension/support does the organisation and other institutions provide to women?

1.7 Organisation of the Report

This report is structured as follows:

Chapter One: Provides the introduction and background of the study. It high lights the socio-economic basics of TWAN area. It explains the significance of the study. It also spells out the research problem being studied, gives the objective of the study, and finally ends with the main research question and sub-questions.

Chapter Two: Gives the conceptual/theoretical framework, definition of major concepts in the study. It also describes literature on theories under study, and shows the assessment of related studies on the research topic.

Chapter Three: Presents the research methodology. It highlights the study area, and scope of the study. It further explains methods of data collection, sampling procedure and tools of data analysis.

Chapter Four: Forms the core of this Report. It gives the findings of the study and discussion of the findings.

Chapter Five: Presents the conclusion of the study and recommendations for improvement are suggested.

CHAPTER 2: THEORETICAL FRAMEWORK

2.1 Introduction

This chapter presents concepts and theories related to adoption and Agroforestry. It also presents and reviews the contributions of other authors on Agroforestry. The literature explores how adoption of Agroforestry contributes to sustainable natural resource management.

2.2 What is Agroforestry?

Agroforestry is a collective name for land use systems and technologies where woody perennials (trees, shrubs, palms, bamboos etc) are deliberately used on the same land management units as agricultural crops and/or animals, in some form of spatial arrangement or temporal sequence. In Agroforestry systems, there are both ecological and economical interactions between different components (Lundgren and Raintree, 1982) cited in Kiptot, 2007.

Nair (1989) classified Agroforestry into major and sub systems, and according to different practices/technologies.

Table 2.1. Classification of Agroforestry

Major system	Sub-system/technology
Agrisilvicultural system	Improved fallows, biomass transfer, the taungas/shamba system, hedgerow intercropping, tree gardens, tree/shrubs on farmlands, shelter belts, soil conservation hedges
Silvopastrol systems	Cut and carry fodder banks, live fences of fodder trees and hedges, trees and shrubs on pasture land.
Agrosilvopastoral systems	Woody hedges for browse mulch, green manure and soil conservation.
Other systems	Apiculture, aqua-forestry etc.

Source: Kiptot (2007)

For purposes of this study, the researcher will use Nair's classification due to the relevance of sub-systems to the study. The study will specifically concentrate on three selected technologies namely; home gardens, scattered trees and shrubs, and hedge rows. These are among the technologies that were promoted by ICRAF in the area of study.

Agroforestry is a new name for a set of old practices (Kiptot, 2007). Although Agroforestry has existed for centuries as an array of traditional land use practices, it emerged in the late 1970's as a modern system for scientific study (Mercer and Miller, 1997). Modern Agroforestry is based on improved management and organisation of traditional Agroforestry practices to give better results backed by scientific knowledge as a way of addressing problems associated with increased population pressure, land shortage and food security.

Agricultural practices especially on rural and peri urban land holdings of majority Ugandans are not conducive for sustainable land productivity (Flakenberg and Nsita, 2000). In this respect, Agroforestry can play a major role in restoring soil fertility and preventing soil loss. The challenge in Agroforestry is to find and develop the relevant combination of woody and non woody components in relation to the land user's problems, aspirations and potential. It is also to develop spatial arrangement and management practices which minimise the competitive interactions between components and maximise the productive and service functions of the trees and shrubs (Lundgren, 1993).

Agroforestry is reviving long overdue attention as an alternative land use that is resource and environmentally friendly. Multiple outputs and flexibility of having several options for management make Agroforestry an alternative to conventional agriculture and forestry for land owners in many parts of both temperate and tropical regions.

However, with the increased awareness of environmental protection, communities where land degradation has undermined the carrying of land have embraced Agroforestry. The increase in the planting and production of trees in different forms leads to increase in crop production and also results in the improvement of the degraded lands. This addresses specific human and environmental needs. These include fertiliser tree systems for replenishing soil fertility, rotational woodlots, for solving fuel wood problems, fodder banks to supplement feed for livestock and indigenous fruit trees for improving nutrition during seasonal hunger periods and enhancing the preservation of indigenous plant genetic material (Ajay et, al, 2008).

To benefit from Agroforestry, it is necessary to make a wise selection of trees, crops and animals to fit specific soil types, landscapes, farming systems and socio-economic conditions. Expert advice is necessary. Mistakes in the choice and placement of Agroforestry technologies could result in invasive species, attraction of vermin that destroy crops, desiccation of land where trees with luxury water consumption are used, toxic effects or unhealthy competition with food crops (ICRAF, 2006).

2.3 Agroforestry technology adoption

In this section the concepts of adoption are presented and described. Some theoretical approaches/perspectives on technology adoption are also discussed. This provides an over view and the relevance of factors that affect adoption as discussed in this report.

2.3.1 Adoption Theory

For purposes of this research, the theory of adoption is important to the researcher as it will be used to assess the whole process women go through and to what extent they have adopted. This will limit the scope of my discussion to expose whether in the process women adopted or rejected and why.

Adoption is defined as the uptake of a new technology or practice when the required information and materials are made available to the farmer (Franzel et al, 2001).

The concept of Adoption is considered as a learning process (Van den Ban et al., 1996, Abadi-Ghadim and Pamell, 1999). This learning process has 2 aspects. The first aspect is the collection, integration and evaluation of new information to allow better decisions about the innovation. The other aspect is the improvement in the land holder's skill in applying the innovation to their own situation.

Early in the process of adoption, the land holder's uncertainty about the innovation is high and the quality of decision making may be low. As the process continues if it proceeds at all, uncertainty is reduced and better decisions can be made (Marra et. Al. 2003)

Adoption can also be called the innovation-decision process so is defined as the 'mental process through which an individual passes from first knowledge of an innovation to a decision to adopt or reject and to confirmation of this decision'. The process of adoption thus consists of five stages (Rogers, 1995), namely;

- Knowledge; individual exposure to existence of an innovation and some understanding of how it functions.
- Persuasion; individual formation of favourable or unfavourable attitude towards innovation.
- Decision; individual engages in activities leading to a choice to adopt or reject an innovation.
- Implementation; individual after the adoption choice puts in practice aspects of the innovation.

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- Confirmation; individual seeks reinforcement for innovation decision and discontinue if it exposed to conflicting experiences and messages.

Depending on the length of period individuals take to go through the process they are classified as innovators, early adopters, early majority and laggards. Most farmers in sub Saharan Africa are producers at subsistence level and are so risk prone that they take time to adopt technologies which they are not sure of, thus limited success in adoption (Rogers, 1995).

Generally it is difficult to identify exactly when a technology has been adopted. Researchers instead often record current use of the technology. This may be unsatisfactory for new technology where farmers may be merely experimenting or in areas where projects have had strong influence and possibly have provided incentives for farmers to use particular technologies. This is why the process of adoption is complicated, dynamic and various factors are likely to influence each other- hence they should not be treated in isolation, ignoring their mutual interdependencies and reducing the adoption decision to a zero-sum game, as is frequently done (Ajayi, O et, al, 2008)

During the adoption process, social cultural interactions between members of house holds and between specialised groups in society help in understanding local innovation and the complex social and cultural relationships and norms that affect the use and ownership of resources, how farming operations are undertaken, and how new ideas and technologies are perceived (Pannel, 1999). Chambers (1993) reported that in order to increase the scale of adoption and impact of agricultural technologies, action must be based on an understanding of the dynamics of adoption and the critical factors that determine whether farmers accept do not accept or partially accept innovation. He insists that rural development professionals should endeavour to understand small farmers' priorities or why they do what they do. Therefore it is important to note that in assessing adoption, the interaction between characteristics of the farmers, the technology and the farming systems that is required to accommodate the technology is examined (CIMMYT, 1993).

2.3.2 Adoption of Agroforestry technologies

In this section I briefly present some theoretical approaches on adoption rate as done by various studies. The aim is to assess to what extent certain factors affect adoption and give support the discussions of my findings. However, from the literature explored on adoption theories, the approach of Rogers will be used in the discussions and analysis. This will limit the scope of my discussion to the factors that affect adoption as they come up from the results of the findings.

Adoption rate is defined as the relative speed with which members of a social system adopt an innovation (Rogers, 1983). It is measured in terms of the number of individuals who adopt a new idea in a specific period.

Most farmers in Sub Saharan Africa are producers at subsistence levels and are so risk prone that they take their time to adopt technologies which they are not sure of, thus the limited success in adoption of new technologies (Bagabo, 2000). This may be partly because the adoption of any improved technology is usually affected by farmer characteristics, farm specific conditions, the technology characteristics and institutions set up in which production takes place. It is not possible for the farmer to predict the risks that lie within these vast dependent factors. However farmers are knowledgeable enough to adopt sustainable practices that bring advantage. Therefore choice to adopt technology will be based on careful assessment of technical economic and social factors (Chambers, 1993).

Some of the farmers' characteristics that may influence adoption rate of Agroforestry technologies include: age, education, gender of the household head, wealth, family size, and group membership, while the farm resources include: farm size, land tenure, farming systems characteristics and extension services. (CIMMYT, 1993).

During the adoption process, once farmers have become aware of a 'new' Agroforestry technology, they begin to seek information about the likely consequences of adoption and form an attitude towards the Agroforestry innovation in relation to no Agroforestry alternatives and current practice. During this process, Agroforestry innovations are evaluated using up to six criteria relating to innovation characteristics: relative advantage, trialability, compatibility, adaptability, observability, and complexity (Rogers 1995) Thus;

Relative Advantage; assesses the opportunity costs of the innovation and its contribution to subsistence needs. The opportunity cost includes the value of resources lost or forgone in order to develop Agroforestry and the time invested that could have been spent elsewhere. The new idea needs to provide gain in economics, prestige socially, convenience and satisfaction (Rogers 1983). Relative advantage assesses the profitability of an innovation in relation to the current practice and other alternatives such as natural forest resources (Swinkles and Franzel 1997) in Reed 2007. Non adaptive farmers always perceive a competitive nature of the tree, crop and livestock interactions. They perceive this as resulting into lowered production, lowered profitability, and increased risks, since most of such farmers produce just enough to survive. Since the economic benefits of trees take long to be realised, farmers subject Agroforestry systems to high interest rates, giving tree products lower value as compared to agricultural products and this coupled with increased labour demand required by Agroforestry technologies do make it unattractive for adoption (Masangano, 1996).

Trialability; this is the degree to which the innovation can be tried and proved by potential adopters. Farmers will be more inclined to adopt an innovation which they have tried first on a small scale on their own farm, and which performed better than an innovation they had to adopt immediately on a large scale (Van den ban and Hawkins, 1996). Innovations which can be tried on an instalment plan are more quickly adopted (Rogers 1983). Trialability can be poor in Agroforestry systems due to length of commitment required to plant trees on a trial basis. The fact that trees take long to mature makes it difficult to try out the technology before adoption, lowering the rate of scaling up. Demonstration plots can improve trialability if farmers are prepared to substitute the experience of demonstrators for their own trial. This often occurs informally when farmers substitute their own trial of an Agroforestry innovation is highly dependent on effective communication between farmers (Reed, 2007).

Compatibility; this is the degree to which the innovation is perceived as consistent with current practices, needs and social norms. For a technology to be adoptable, it must be compatible with physical environment of the target area. What matters is the degree to which an innovation is perceived as being consistent with; existing values, past experience and needs of potential adopters. For Agroforestry technologies, species must be selected with reference to climatic and edaphic factors. They must also be compatible with existing land use systems, and previously introduced innovations (for example, intercropping may not be compatible with mechanised ploughing and harvesting systems) (Swinkles and Franzel, 1997) in Reed 2007. Agroforestry technologies that build on and incrementally improve existing land use systems are likely to be more compatible than those that replace these systems. Modern Agroforestry is a new technology, which is different from the current farmer's practices. This gives it low compatibility, resulting in low rates of adoption.

Observability; this is the visibility of the technology's results as compared to others. The observability is positively correlated to rate of adoption. The easier the results of an innovation are to see, the more likely it is to be adopted. Benefits of Agroforestry take long to be realized giving it a low observability and therefore a low adoption rate. If the effect of an innovation is highly visible it will be adopted more readily (Rogers, 1995). The slow growth of trees makes their effects and rewards difficult to observe. Farmers learn much from observing and discussing their colleague's experiences, their observations often being a reason to start discussions (Van den ban and Hawkins,

1996). As such demonstration plots can improve the observability of Agroforestry systems and have been shown to have a direct impact on Agroforestry adoption rates (Evans, 1998) in Reed 2007. Soil conservation benefits and cash from tree harvesting may only become apparent after decades (Muschler and Bonnemann, 1997).

Complexity; this is the degree to which an innovation is perceived as difficult to understand and use. The simpler the idea to understand, usually the more easily adopted. Agroforestry requires skilful management since it involves the growing of two or more species of plants, lowering its potential. Innovations which are unfamiliar and /or difficult to understand and implement are less likely to be adopted than technically simple innovations (Rogers 1995, Strong and Jacobson, 2006) in Reed 2007. Innovations often fail because they are not implemented correctly. Some require complex knowledge or skills (Van den Ban and Hawkins, 1996)

2.4 Women and Natural Resource Management

Women have an essential contribution to make in the management of our natural resources. In addition to re-addressing traditionally gendered approach to resource management, they pocess several complementary attributes that are beneficial to ecologically sustainable development. Consequently women need to be engaged at all levels in all types of activities for the management of natural resources (Conserve Africa 2008). A study conducted by Women and Population Division of FAO in 1990, revealed that in developing countries women provide 70% of agricultural labour, 60-80% labour for household food production, 100% labour for processing the basic food stuffs, 80% for food storage and transport from farm to village, 90% for water and fuel wood collection for households (Umar Rani 1999).

The need for an appreciation of women's role in forestry is more urgent than ever. International plans and programmes to safeguard the world's forest are being launched. The impact of these programmes on poor women and their environment must be considered with great care, and women's input must be sought (Dankelman et, al, 1989). As with poverty and agriculture, a strong strand of thinking has been to view women as having an instrumental role with respect to the conservation of the environment; in other words, information, training and empowerment directed to rural women will result in improved management of environmental resources. The flaws in the 'women as good custodians of the environment' approach become evident when it is considered that women's access to, and ability to influence the quality of, natural resources occurs through gender relations in which men typically possess the socially accepted control over resources and a considerable amount of decision – making power concerning the use to which those resources are put. Tree planting is a good case in point. This in practice causes complex problems of contestation, negotiation, and strategising between men and women when Agroforestry and similar donor or NGO projects arrive in villages with tree planting as the goal in mind, and women as the means to achieve the goal (Frank Ellis, 2000).
In many African societies, the ownership of trees by women is culturally not permissible, but women are allowed to utilise the products of trees that are owned by men. This is a result of insecure land rights that diminish their incentive for conservation. They may also be so constrained by labour shortage, due, for example, to male out-migration that conservation activities are just not possible to carry out. Rather differently, women are often placed under social pressure by men to comply with cultural expectations concerning their provisioning role within the family. With respect to domestic needs such as firewood for cooking, it will often be the case that compliance with role imperatives supersedes resource conservation criteria in the formation of women's daily activities (Frank Ellis 2000). In order to be effective in natural resource management, women need to be empowered to gain more control of resources and of development planning. Their needs and role must also be integrated into decision making (Warren and Hambly, 1992).

CHAPTER 3: METHODOLOGY

3.1 Introduction

This chapter highlights the methods and tools for data collection, scope of study, sampling procedure as well as tools of data analysis. Qualitative techniques in collection and analysis of data were applied. The ethical considerations and limitations were also spelt out.

3.2 Data Collection

Data was collected through a case study using interviews. The research used qualitative approach and was based on empirical data, literature and documents. Primary data was collected using qualitative methods as an effective way of generalising complex issues. Qualitative methods enabled the researcher to focus on people's lived realities by emphasising their perceptions and experiences to reduce the risk of making false assumptions about life.

Semi-structured interviews with respondents and key informants were conducted. In addition Focused Group Discussions (FGD's) were also carried out. Interviewees were allowed to freely give their responses. This allowed new questions to be brought up during the interviews as a result of what the interviewees would say. The interviewees gave in their responses to pre-set semi-structured questions contained in the interview check list. All interviews were conducted in Runyankore Rukiga, a native language after which translation was made to English during data analysis. Interviews were used simultaneously with direct observation at every stage in the research.

Prior to data collection, pre test tools (interview guide) to establish their appropriateness was done.

Secondary data was collected by going through relevant documents to get more information by using journals, scientific books, PhD thesis, internet and proceedings from seminars, symposia, conferences. Wageningen University library was used for literature search.

3.3 Scope of the study

The scope of the study was limited to three promoted Agroforestry technologies that TWAN had taken up to implement in collaboration with ICRAF. The technologies under investigation were home gardens, scattered trees and shrubs, and hedge rows. These technologies are believed to contribute to house hold food security and income. Both aspects are very significant for house hold survival. The adoption of these technologies was the major concern of the organisation. Considering that women groups were involved in the project, data from these women forms the main source of primary data, with back up from other few key informants.

3.4 Study Area

The study was done in Kabale District situated in South Western part of Uganda. (Refer to Appendix 2 and 3) It lies in the Southern highlands agro-ecological zone. It has a total area of 1,827km^2 of which 1,695km^2 is arable land, 48.5km^2 is water body, 79.4km^2 is swamp or wetlands, and 41.1km^2 is marginal land.

The mean annual rainfall ranges from 800-1000mm and has a mean maximum and minimum temperature ranges of between 10^{0}c and 23^{0}c. The temperature and rainfall

regimes are influenced by altitude which ranges from 1500 to 2400 metres above sea level.
Kabale has a total population of 458,318 persons with as sex ratio of 86 males to 100 females. The district has 95,071 households giving and average household size of 5 persons. 33% of house holds are female headed. About 90% of the population live in the rural areas (Kabale District Profile, 2007)
The District has a young population with about 51% of the population being between 0-14 years, 46% between 15-64years and 3% at 65 years and above. The children (0-17 years) constitute about 57% of the population. The population density is about 281.1 persons per square km, and per capita land holding is about 0.8 acres (Kabale District Profile, 2007).

3.5 Sampling Procedure

The study was done from 4 women groups selected out of 17 groups of TWAN namely; Ihimbi Women's Group found in Kyanamira Sub County, Rwere Women's Group found in Bubare Sub County, these two groups were clustered together as groups within the town vicinity. Hamurwa Bakyara Twimukye Women's Group found in Hamurwa Sub County and Bukinda women's Group in Bukinda Sub County were clustered together as groups in a typical rural set up. (Ref. Appendix 3). The 4 women groups were selected because they were one the first groups to implement Agroforestry activities.

The reason for this sub group clustering was to compare urban and rural set up influence on the understanding and adoption potential of Agroforestry. Each women group was represented by three women chosen by the following criteria: Chairperson of the group, one illiterate woman, and one opinion leader in the group. The selection of the opinion leader was guided by the chairperson. This was based on; one who was committed to the group activities/concerns, creative and resourceful (always volunteers to take up group tasks assigned). The illiterate woman represented the majority of illiterate members of the groups and this gave an insight of how illiterate rural women embrace Agroforestry. Therefore 12 women were interviewed.

Group interviews/discussions with two women groups were conducted. Ihimbi Women's Group and Hamurwa Bakyara Twimukye Women's Group. These groups were selected because they represented both the urban and rural set ups respectively and were one of the first groups to collaborate with ICRAF. Group discussions using checklists enriched views collected from all participating women beneficiaries.
Two Executive members of TWAN were interviewed i.e. Chairperson and General Secretary. These are directly responsible for the implementation and the success of the project. This gave an overview of the role of the organisation in the implementation and success of the Agroforestry project.
The District Environment Officer of Kabale District was interviewed to get an insight of government's role in natural resource management, especially policy regarding land degradation, and implementation of the Agroforestry.
One officer (Project Assistant) of a sister organisation Africa 2000 Network, implementing a similar project was interviewed for comparison purposes of implementing strategies.

 Therefore a total of 16 individuals and 2 group interviews/discussions comprising of a total of 44 women and 2 men were conducted from 15[th]July to 10th August 2008. Each interview lasted 60-90 minutes. The interviews were conducted in homes. Before arranging an interview, each participant was given consent by outlining and spelling out his/her rights and was free to withdraw from the study.
A comparison between these clustered categories of interviewees generated information based on their understanding of the Agroforestry, its contribution/benefit to their livelihoods, and natural resource replenishment. This was the basis of the findings.

However given the limited time and small sample interviewed, the data collected did not exhaustively bring out the views that would represent a bigger population. If time allowed a bigger representative sample would have given much wider exhaustive and representative views.

Table 3.1: Categories of Interviewees.

Interviewee category	Frequency N=16
Women (respondents)	12
Executive members of TWAN (key informants)	2
District Environmental Officer (key informant)	1
Project Assistant A2N (key informant)	1

Source: Researcher's data

3.6 Data Analysis

Qualitative data was collected and analysed using the PESTEC model and Harvard Analysis Tool. The PESTEC model helps to categorise the various factors i.e. political, economic, social, technical, environmental and cultural factors that may influence women's potential in adoption. The Harvard tool analyses the division of labour and access and control of resources at house hold level. Qualitative analysis was aimed at exploration of relationship and comparisons of experiences as given by respondents.

3.7 Research Limitations

The Research period was limited to only three months (July to September 2008) and this implied a rigorous collection of data and writing of this report. As a result, a number of stakeholders were not interviewed like National Environment Management Authority staff.
However the researcher had to work vigorously under pressure within the limited time schedule and managed to get reliable data for the study.

Secondly during some interviews with some married women at their homes, men would come in to participate and would interfere with the respondents who would not feel free to give out views in the presence of men. Culturally women cannot talk freely in the presence of men (Bakiga Culture). This was solved by the researcher following up the concerned women during FGD's to finish off such un concluded issues.

Respondents expressed research/ interview fatigue. Having worked with ICRAF for along time, they had been interviewed many times. Every time they are interviewed they expected some remuneration from the researcher. Their expressions reflect that their input benefits researchers while the respondents normally don't get feedback from the research out come. The researcher had to educate women how the results of such research findings can benefit them directly or indirectly plus the generations to come.

CHAPTER 4: RESULTS AND DISCUSSION

4.1 Introduction

This chapter presents the findings from 44 respondents who participated in the interviews and FGD. The findings are also synthesized in relation to the objective of the study. Interpretation of the responses from the conducted interviews guided the researcher to come up with identified factors that cause low adoption of Agroforestry.

4.1.1 Historical trend Analysis of the Project

Since 1994, TWAN has been engaged in the Agroforestry project with the objective of sustainable land use and improvement of community livelihoods. TWAN started collaborating with development agencies which included ICRAF and A2N. ICRAF was undertaking research and development work in Agroforestry. A2N was supporting community based projects on environmental protection, capacity building and promotion of sustainable development by providing technical skills.

In 1988, ICRAF through AFRENA initiated multipurpose tree specie trials to identify various potential tree/shrubs for Agroforestry purposes. This research has brought in new tree and shrub species on farms for different purposes with practices such as zero grazing, intercropping and fodder banks becoming popular (Okorio et al, 1994)

The second phase of ICRAF (1993-1998) saw a shift in emphasis from on-station research to on-farm for testing technologies identified in the first phase. The focus was on identifying tree species that could be incorporated on agricultural land without interfering with the associated food crops. This phase initiated collaboration between ICRAF and TWAN women groups, in dissemination of Agroforestry technologies. Women were trained to get the necessary knowledge, appropriate skill, and better attitudes towards environmental management, soil and water conservation and poverty eradication.

Testing of the identified and promoted technologies was on some small holder farms of the identified women groups.

Agroforestry technologies promoted that were to be tested by women include among others;

- Scattered trees and shrubs throughout the farm land; on farm boundaries, around and within fields where crops are grown, and along the paths.
- Home garden which is a hedged or fenced area near the house where garden crops including vegetables and fruits are grown to supplement the staple food supplied by the field crops.
- Hedgerow barriers, which are rows of trees or shrubs closely planted along contours of sloping land and pruned to form hedges. They are planted to reduce erosion by run-off of water.

These specific technologies were picked on by the project to help rural farmers (both men and women), to enhance food production, both from trees and from agricultural land that is stabilised and enriched by trees, to provide income through the sale of tree products and to provide fuel, fodder and other household needs.

4.1.2 Respondent Characteristics

All participants interviewed were engaged in Agroforestry. They were members of women groups that collaborated with ICRAF when it was carrying out on farm trials. All the respondents had started off well with the Agroforestry project and still believed to be working well with Agroforestry.

Guinand, (1995), made a study of Two Wings Agroforestry groups about the living conditions based on marital status, land tenure, member's motivation for joining a group, wealth indicators, group structures and income generating activities and group facilities.

In his findings, Guinand, (1995), divided households of TWAN groups into 5 wealth categories, depending on wealth indicators identified by group members. Land being the major resource, it was ranked the most important indicator. The number of plots ranged from 1 to 35 with an average plot size of 0.3 hectare (0.75 acre). Three major groups were identified;

- 64% of TWAN group members belonged to the two lowest wealth categories, owning 1-5 plots of land (a plot has an average size of 0.3 hectare), no or only few animals (chicken, 1 or 2 goats or sheep) reared. Under the traditional agricultural production system, these farms do not produce enough to be self sufficient. This forces farmers (both men and women) to work as casual labourers.
- 24% belonged to the middle category, which owned 5-15 plots, which allows self sufficient agricultural production nevertheless fallow is not possible and cash income is still insufficient to cope with all expenditures.
- 12% belong to the two 'better off' categories which owned 15-25 plots or more and are able to produce for the market. Some have exotic dairy cattle and / or commercial woodlots. Many are government employees and employ hired labour for agricultural production.

The major part of group members were working on small farms, scattered plots of land of small size. Due to over cultivation and traditional production systems, soil fertility, decreased and yields are always low.

a) Age
The majority of Respondents are born in the area of study. They were asked their actual ages. Those who were uncertain of their age were asked to give their birth year. Therefore age category rather than actual ages were used to present the data.

Table 4.1: Respondent's age.

Age Range	Frequency N=12
25-29	1
30-39	2
40-49	3
50-59	4
60-69	2

Source: Researcher's data.

The majority of the respondents were 40 years and above. This means majority of respondents were among old farmers who are more settled with experience and taking farming as their major employment. Being women they the ones who are mostly involved in farming activities.

b) Marital Status
In this study marital status of respondents was defined according to; widows, single mothers and married.

Table 4.2: Respondent's marital status.

Marital Status	Frequency N=12
Widowed	1
Single mothers	2
Married	9

Source: Researcher's data.

The majority of the respondents were married. This means the majority of respondents, have husbands as household heads.

c) Education Level

In this study education levels of respondents were put in consideration.
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Table 4.3: Respondents levels of education.

Education Level	Frequency N=12
No education	8
Primary Level	3
Secondary level	1
Advanced level	-

Source: Researcher's data.

The majority of the respondents were illiterate.

4.2 Benefits of Agroforestry

According to the findings of the study, respondents revealed that adopting a technology depended on the benefits associated with the technology. This however depended on the specific technology as each technology has different and unique benefits.

Table 4.4: Respondents and technologies adopted.

Technology	No. of Respondents adopting a Technology N=12
Home garden	12
Scattered trees and shrubs	5
Hedge rows	3

Source: Researcher's data

According to the findings of the study, all the 12 respondents had adopted home gardens, compared to 5 out of 12 respondents who had adopted scattered trees and 3 out of 12 respondents who had adopted hedge rows. The respondents associated the high adoption of home gardens with the direct benefits which included food and increased income from the sale of the harvests from the gardens like vegetables and fruit trees.

The respondents also revealed that the preference to home gardens was because it directly contributed to daily food consumed in their homes. One respondent had this to say;

> *'I cannot invest most of my time looking after trees when my*
> *children don't have enough to eat. I would rather concentrate*
> *in an activity that directly benefits my children in getting what*
> *to eat'.*

Respondents revealed that they easily realise labour input benefits by adopting home gardens; in particular children's diet is enhanced.

The reason why women prefer home gardens could be attributed to fact that home gardens are more attached to their reproductive roles of getting immediate food and firewood, plus limited labour associated to the technology. The nearness of food source to the household compound could also be another benefit. Women are responsible for the health of the family and are therefore more interested than men in fruit trees to supplement diet. Women are generally more interested in technologies that give tangible benefit in a short time.

Respondents revealed that, compared to home gardens, the benefits of scattered trees /shrubs and hedge rows are first negotiated with men, take long to be realised and demand increased labour and hence their low adoption. This is in line with Masangano (1996), who concluded that since the economic benefits of trees take long to be realised, farmers subject Agroforestry systems to high interest rates, giving tree products lower value as compared to agricultural products and this coupled with increased labour demand required by Agroforestry technologies do make it unattractive for adoption.

According to the findings respondents preferred home gardens because home gardens are associated with conventional agricultural practices and respondents are acquainted with home garden activities as an old long practice. The respondents associate scattered trees/ shrubs, and hedge rows with knowledge intensiveness, modern practices, which indeed are being promoted by researchers amongst whom are foreigners. This perception reflects the new technologies complicated and incompatible with the old traditional practices, respondents were used to, resulting in low rates of their adoption.

Respondents who adopted scattered trees/shrubs and hedgerows when asked gave their reason for adoption as associated with additional advantages to food, diet and income. Respondents mentioned additional advantages as shade, improving soil fertility, and medicinal, land boundary demarcation, and fodder for animals. These respondents seemed more focused to long term benefits. Some of these respondents were from the groups near the town of Kabale who had additional advantage of being invited for frequent awareness trainings by ICRAF. In addition some had at least acquired some elementary education. This indicates that access to information through awareness can be a factor that improves adoption levels.

When respondents from each of the 4 women groups were asked about the benefits from each of the promoted technologies, a variety of associated benefits were revealed. Majority of respondents looked at the benefits from an economic point of view. A case example is one widow who had this to say;

> *'My husband died when we had just produced 2 children and living in a grass thatched house. Thanks to TWAN which introduce us to home gardens. I have managed to educate both of them and have built an iron roofed house out of income generated from my home garden'.*

According to the respondents, the economic benefit associated with a technology promotes its adoption.
When asked about which benefits they associated with the technologies under study, respondents enumerated various benefits with associated technologies. Results of benefits revealed are tabulated.

Table 4.5: Benefits from home gardens.

Benefit	Ihimbi Group N=3	Rwere Group N=3	Hamurwa Group N=3	Bukinda Group N=3
Increased income	+	+	+	+
Fruits	+	+	+	+
Firewood	+	+	+	+
Improve soil fertility	-	+	+	-
Improve nutrition	+	+	+	+
Shade	+	-	-	-
Medicinal	+	+	+	+

Key: + Yes – No
NB There were multiple responses
Source: Researcher's data

According to the results from the table, all respondents from the four groups concurred consistently on 5 specific benefits from home gardens as income, fruits, firewood improving nutrition and medicine. This shows the popularity of the technology.

Table 4.6: Benefits from scattered trees and shrubs.

Benefit	Ihimbi Group N=3	Rwere Group N=3	Hamurwa Group N=3	Bukinda Group N=3
Tree products (firewood, poles, timber)	+	+	+	+
Income security	+	+	+	+
Land boundary demarcation	-	-	+	+
Increased land productivity	+	+	-	+
Good neighbourliness	-	+	+	-

Key: + Yes – No
NB There were multiple responses
Source: Researcher's data

From the table, Respondents from the four groups were consistent with two specific benefits; tree products and income security. The inconsistency may be associated with the different perceptions of respondents brought about by age, education and marital status. For example one old respondent, during the FGD noted that;

> *'Land demarcation and good neighbourliness may be better than income security since social stability is a prerequisite to economic development'.*

This comment was however not taken serious by a one younger respondent who asserted that;

> *'If I can sell off tree products and get cash, and I get enough food for my children, then I can go ahead to think about good neighbourliness'.*

Another married lady had this to say;

> *'The problem of concentrating on trees is that when they mature, men can't give you freedom to enjoy the benefits. You have to negotiate with your husband first to enjoy the benefits of tree products'.*

This indicates how age variation and gender (relationship between men and women) may determine perception and context of Agroforestry which may influence adoption.

Also during FGD observations would show that old respondents were more settled to farming activities and tend to take more time thinking about the benefits of each farming enterprise from different contexts than younger respondents. From the response given by one old respondent, it is now a common popular practice to find Agroforestry trees used to demarcate land boundaries, to reduce disputes. This has social implications to rural development. More time is spent with communities working together than fighting over land boundaries, among brothers, clans and buyers. This improves social connectedness (social capital) in communities, a prerequisite of rural development.

Table 4.7: Benefits from hedge rows.

Benefit	Ihimbi Group N=3	Rwere Group N=3	Hamurwa Group N=3	Bukinda Group N=3
Control water erosion	+	+	-	+
Fodder for animals	+	-	-	+
Firewood	+	+	+	+
Soil improvement	+	-	+	-
Compost making	-	+	+	-

Key: + Yes – No
NB There were multiple responses
Source: Researcher's data

From the table above, there was consistence of respondents in one benefit of firewood, with inconsistence in other benefits. This is associated to firewood being an immediate requirement for women in cooking. Women cannot be detached from their gender reproductive roles.

From the findings of the study, benefits and edibility of the products promote adoption. Women prefer home gardens to scattered trees/shrubs and hedge rows because of the associated benefits. The implication of this is that in order for Agroforestry based-soil fertility replenishment technologies to be widely adopted by women, they must provide other tangible economic benefits such as seed, food or fodder.

4.3 Comparative advantage of Agroforestry over other alternatives

According to the results of the study, 6 out of 12 respondents revealed that given the growing of trees and petty trading, they would take up petty trading. When probed further, their response was associated with the contribution of the two alternatives to their subsistence needs.

In response to this, one respondent had this to say;

> *'The time you take to reap benefits from trees or hedge rows say after 2 years cannot be compared to the profits I can make when I set up a small shop of essential commodities in one year'.*

This indicates that the assessment of the respondents was based on the fact that there is an opportunity cost in taking up Agroforestry. The opportunity cost includes the value of resources lost or forgone in order to develop Agroforestry, and the time invested that could have been spent else where.

The findings indicate that some respondents perceived Agroforestry as resulting into lowered production, and increased risks. Majority of the respondents produce just enough to survive. The respondents revealed that since the economic benefits of trees take long to be realised, they ranked tree products lower value compared to conventional agricultural products and other investment alternatives like petty trading. For women to decide to take up the technology, they tend to think about a mechanism of cost benefit calculation. Reasoning is that; it is not worth banking in taking up a technology that makes women forego some season's growth of crops when the technology does not provide immediate tangible benefit.

During FGD, respondents revealed that they are small holder farmers who try various strategies for survival of their families. In addition to agriculture respondents try other off

farm job opportunities that may be available as alternatives. The respondents could not easily believe that planting of trees could be among the many strategies of survival. During discussions, respondents revealed that the presence of government micro credit schemes are seen as immediate sources of credit which they could invest in; say through petty trading to raise some money for sustainability of their families. From this discussion, women never perceived Agroforestry as an alternative beneficial enterprise reason being failure to provide immediate economic benefit, convenience and satisfaction hence low adoption. This concurs with Swinkles and Franzel (1997), cited in Reed (2007) who argue that relative advantage assesses the opportunity costs and profitability of an innovation in relation to the current practice plus other alternatives and therefore affects adoption.

However according to the results of the study, women around the urban centre were more inclined to the alternative job opportunities and investments than rural women. Urban women would argue that since labour shortage was on the increase, alternative survival strategies would bail them out of situations of raising income for their households compared to conventional agriculture. Rural women on the other hand still look at home gardens as the immediate source of income to support their households.
The likely reason for this is that urban women have greater exposure to various alternatives of investment and can easily access them. Rural women on the other hand have limited choices/alternatives and still find agriculture and associated practices the only available alternative to their inherent household problems.

During FGD's one respondent from the rural group had this to say;

> 'For all this time I have lived in the village, I take shrubs to be very important for the survival of my family. My children have been able to grow up because of the traditional medicine from shrubs, and I have even managed to generate some income by selling some herbal medicine to my neighbours'

The implication of this revelation is that the perception of trees/shrubs to rural women and urban women is different. Rural women may have such a perception because they live far from the main health centres, dispensaries and hospitals. Usually women use herbs/medicinal tree products as their first aid treatment since medication is easier to obtain and usually within easy reach. Such a perception may encourage adoption.

4.4 Influencing factors in Agroforestry adoption

During focused group discussions, one of the important views that came out was the relationship between men and women (gender) as a factor that influences adoption. The reason put across was that women meet obstacles in tree planting than men due to cultural norms and traditions. Women are seen as 'guests' on their husbands farm and therefore can leave land any time in case of divorce. Other views came out that women are not given chance to plan since men customary control all household resources.
  One old lady, during FGD had this to say;

> 'Men are normally tricky, when a woman plants tree seedlings, they are associated to a woman for her to do the watering, carry out the weeding and, pruning, and when they mature they are associated to the man who takes over control and all the decisions in relation to the handling of tree products. It takes a lot of effort in negotiation for women to access benefits of tree products. '.

For this reason women are not easily influenced to engage in the growing of trees because men cannot allow them to make independent decisions regarding mature plantations. The implication of this is that many women who would be interested in Agroforestry are discouraged by these societal patriarchal norms. This affects adoption. This is in line with Frank Ellis (2000) who noted that in many African societies, the ownership of trees by women is culturally not permissible, but women are allowed to utilise the products of trees owned by men. This affects adoption rates of Agroforestry.

According to respondents during FGD, the Bakiga culture does not allow women to own, and control land; some women are even restricted to access land. Respondents further revealed that when it comes to ownership and tenure rights to land and trees, they feel insecure and threatened. This finding is line with Frank Ellis, (2000) Warren and Hambly, (1992) who concluded that women often have insecure land rights that diminish their incentive for conservation. This is the most obvious deterrent to women's full participation in Natural resource management.

Respondents also revealed that although they have no control over land, there was also fear that since Agroforestry is being promoted by foreigners, after establishment of trees land would be taken away. Some respondents seemed scared, by mentioning this.
This may also be associated with inherent land politics and the surrounding land controversies that currently prevail in Uganda. This surrounds misinformation and misinterpretation of land reforms that the Government intends to implement contained in the drafted Land Bill of 2007. Such unfounded political rumours also affect the adoption of Agroforestry.
When asked what influenced them to pick on specific technologies, respondents according to study groups gave various influencing factors.

Table 4.8: Factors influencing adoption.

Factor	Ihimbi Group N=3	Rwere Group N=3	Hamurwa Group N=3	Bukinda Group N=3
House hold land size	+	+	+	+
Wealth status	-	-	+	-
House hold farm labour	+	-	-	+
Formal Education	-	+	+	-
House hold income	+	-	-	+
Relationship between men and women (Gender)	+	+	+	+
Benefits/incentives	+	+	+	+
Age	-	+	+	-

Key: + Yes – No
NB There were multiple responses
Source: Researcher's data

From the table, there was consistency in responses from all groups that benefits, gender and household land size are the main factors that influence adoption of Agroforestry. Gender affects adoption negatively where women have confessed that they find it difficult to adopt Agroforestry, as discussed above and household land size affects adoption positively, in that farmers with plenty of land find it easy to invest in Agroforestry.
Respondents revealed that the availability of land enables one to diversify livelihood strategies through extensification which may encourage putting more land to planting of trees than one with limited land who puts it to production of food crops for survival of a household. This is in line with Place, (1995), Place and Dewees, (1999) cited in Ajayi et, al, (2008) who concluded that size of the land among others is an important factor affecting adoption of Agroforestry.

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According to the Project Assistant of a sister Organisation A2N, the success of Agroforestry Project implemented by A2N is attributed to incentives among others. With A2N, if a beneficiary had an established fodder bank, it was a prerequisite to be given a zero grazing cow by the organisation. Such an incentive according to the informant encouraged beneficiaries to adopt fodder bank technology. The researcher however has a negative opinion on such incentives as they may have negative implications after the project phases out because the beneficiaries may get accustomed to the impression that associates technologies with material incentives from the promoters.

During FGD it was revealed that households which had planted some trees were discouraged by the fact that grazing animals sometimes could destroy the whole garden of young trees. It was found out that there are no strict fines imposed for damage to young trees planted by households. This brought out the issue of local established bye laws that govern natural resources, and respondents concurred that they had never heard of such laws in their area.

According the District Environment Officer, Kabale District Local Government doesn't have established natural resource management bye laws. This has a big implication, because adoption is a long process, where farmers start with uncertainty about an innovation. During the period of uncertainty, farmers may need protection by law against certain risks. Experience has also shown that during adoption, decision making is always slow depending on a technology to be adopted. In an administrative environment where there are no laws governing natural resources, it becomes tricky for farmers to adopt innovations. For example in situations where such eventualities of stray animals or fires destroy grown trees and there are no established laws to protect tree owners, it may affect adoption. Therefore there is need for strong commitment to government policies to form bye laws which enforce and spearhead management of natural resources. Lack of natural resource bye laws in Kabale District may be one of the factors affecting adoption of Agroforestry. This is in line with Haggblade et, al (2004) cited in Ajayi et, al (2008) who asserts that; adoption of Agroforestry may not take place in a policy vacuum environment. It is necessary that adoption of Agroforestry be facilitated by a conducive policy and institutional frame work at both local and institutional levels.

During FGD's when respondents were asked the criteria they used in selecting the technologies after they had trainings with ICRAF staff and extension workers, Respondents ranked different criteria as shown in the table below;

Table 4.9: Criteria used in selecting Agroforestry

Criteria	Respondents' ranking
Awareness	1
Knowledge	2
Land availability	3
Land and tree tenure	4
Labour availability	5
Availability of capital for investment	6
Availability of trees/seedlings	7
Market for trees and tree products	8

Key 1 = high 8 = low
Source: Researcher's data

Rankings show that all Respondents agreed that awareness was the most important criteria for selecting the technologies followed by other criteria as shown in the table rankings.

Awareness and knowledge ranked highest because women are prone to risks. They always want to be sure and certain before they make decisions. Once women have decided to perform an activity, they do it diligently to perfection with high expectations of

returns. Such an activity is not likely to backfire. They value their time and labour inputs due to their usual heavy work loads hence commitment to such decisions. This implies that for a decision to take on a technology, women should first be sure and certain of the consequences of adoption before they adopt or reject the innovation.

4.5 Required Information and resources to establish and manage Agroforestry

The findings reveal that 8 out 12 Respondents were illiterate. During the initial stages of dissemination before the inception of the Agroforestry project, trainings/workshops were conducted. Majority of respondents were not able to read and write notes, leave alone following the logical sequence of the proceedings. Illiterate respondents could easily forget the instructions and recommendations of the proceedings. By the end of the training session such respondents wouldn't have grasped substantial elements of the deliberations, more especially technologies which are knowledge intensive.

During one of the FGD, one illiterate respondent had this to say;

> *'During my first training, I could neither read nor write the required instructions, I forgot the required steps in compost making and spacing of the fruit trees provided. This made me fail to establish a right fruit garden plus other associated activities'.*

This is associated with lack of capacity/knowledge as majority of the respondents were illiterate. The implication of this is that Agroforestry technologies are perceived as difficult to understand and apply. Agroforestry is knowledge intensive. Women would need the technical aspects before implementation. Therefore the simpler the technology is to understand the more readily it is adopted. This is in line with Rogers (1995), and Jacobson, (2006) cited in Reed (2007) who confirmed that innovations which are unfamiliar and /or difficult to understand and implement are less likely to be adopted than technically simple innovations. Also, Van den Ban and Hawkins, (1996), concluded that innovations fail because they are not implemented correctly. Some require complex knowledge and skills.

Respondents were aware that Agroforestry was a technology which required resources for effective adoption. Asked which resources, respondents concurred with land, labour and financial capital as important resources.

From the findings of the study, all the married Respondents 9 out of 12 confessed that they can access land but had no control over land. Control is by men. The remaining 2 out of 12 were single mothers while one was a widow. Both single mothers and a widow had access and control over land, even had the right to buy land. However the single mothers and a widow revealed that they had limited land and lacked financial capital to buy more land.

9 out of 12 respondents revealed that although they accessed land, they first had to seek permission by persuading their husbands to allow them use land for other associated agricultural enterprises. Culture does not allow women to control land. Men do the planning of land and make decisions on land matters. Agricultural enterprises unacceptable to a man often cannot be blessed. Women have to take efforts to negotiate for such enterprises if they are to be blessed by their husbands. This has a negative effect because some women often fail or cannot make any effort to convince their husbands. The Kikiga Culture does not allow women to make arguments with men. Such a negotiation processes may drag adoption process. This is in line with Warren (1992), and Adesina et, al, (2000) who gave reasons for non adoption of Agroforestry as

ownership and tenure rights to land and lack of control over land. In addition Warren and Hambly (1992) concluded that unclear land and tree tenure or usufruct is among the most obvious deterrents to women's full participation in natural resource management.

It was also revealed by respondents that although some negotiate for access, land is still limited; the limited land is put to growing conventional agricultural crops. This has an implication because women who are trained in Agroforestry; may end up sitting back with the acquired knowledge and skills without putting it in practice. The implication of this is that normally it wastes the training efforts and in the long run there is nothing to show. One respondent had this to say;

> 'Although I was trained, in Agroforestry, I cannot put in practice the knowledge I acquired because the land we had which I would have used was sold off because of pressure of school fees for our children, what remained was only for vegetables and food crops and not for trees'.

From the findings, limited land came out as a major factor hindering women to fully embrace promoted technologies. This may be one of the reasons why there is low adoption. This is in line with Place, (1995), Place and Dewees, (1999) cited in Ajayi et, al, (2008) who found out that size of the available land is among important factors affecting adoption of Agroforestry.
Respondents also revealed lack of financial capital for investment, 7 out 12 respondents revealed that they were small holder farmers who engage in subsistence agriculture. Their production was only for home consumption and no surplus is left for sale to raise financial capital for investment in tree growing. This constraint they said makes them unlikely to be willing to investing in trees. According to respondents, taking up the technologies requires some additional financial capital for investment. Additional finances may be for hiring labour, buying implements like watering cans, pick axes, pangas, and hoes.
This shows that lack of financial capital is a major factor that affects adoption. This is in line with Alavalapati and Lucket, (1995) who found out that wealthier farmers adopted Agroforestry more than poor farmers in case of farm forestry but poor farmers adopted more home gardens.

Respondents during FGD revealed that they lacked labour as an important resource input. Agroforestry demands significant labour to be adopted. According to respondents the limited available labour is for simple farming systems like vegetable production and dairy cattle for the few who have. 7 out of 12 respondents revealed that they would be willing to hire labour but lacked the required capital to do that.
One respondent had this to say;

> 'To adopt Agroforestry is to adopt a lot of work. It is not only about planting and harvesting. There is a lot of work all the time, and all my children who would help me are attending school'

This is associated with women who work relentlessly to serve their children, husband and at the same time a vital source of labour for the conventional agriculture of which they are a pillar. To understand the dynamics of division of labour in the study area, an analysis was made using the Harvard Analysis tool. (Ref. Appendix 4)

According to the results of analysis of division of labour, all respondents (women) revealed that they do all house hold productive activities in addition to the reproductive activities. These activities over burden the respondents with work load. They claimed that engaging in Agroforestry activities which are labour intensive would add extra work load on their shoulders. Respondents revealed that they lacked extra labour for extra activities associated with Agroforestry. Some households in the area are affected by

HIV/AIDS, some family members are sick and cannot work, and others need to take care of the sick. This makes labour much more limited. The children who would help had all gone to school under the Governments Policy of Universal Primary Education (UPE) which started in 1997 and Universal Secondary Education (USE) which started 2006.

Respondents during FGD concurred that since government abolished graduated tax in 2001, ordinary men over relaxed and left all the burden of productive activities to women. According to respondents, ordinary men used to engage in productive activities purposely to earn and pay graduated tax, and school fees for the children.
According to respondents, ordinary men no longer had economic pressures to make them concentrate on productive activities; some have abandoned their responsibilities as house hold heads to women hence adding extra work burden to women. For example ordinary men no longer do cultivation in fields, they rarely seek for off farm jobs, and they put in rare appearances at home. The consequence of this is that some ordinary men have also turned out to be dependants on women in many aspects. As one respondent had this to say;

> *'When government introduced both UPE and USE, and at the same time abolished graduated tax, it became like a punishment to a woman. Some men over relaxed and hardly think about their families in the economic context. All the household responsibilities were left to women, and we cannot afford this entire burden. By the time government will come to realise it most families would have women constrained and stressed if the trend continues like this'.*

This revelation comes from a real desperate woman surrounded by difficult circumstances due to the heavy work load. Women in households are squeezed left right and centre and have no breathing space due to heavy work loads.
This has an impact and explains why women are reluctant to take on Agroforestry, as it will burden and constrain them more. This corresponds with Frank Ellis, (200) who found out that women are constrained by labour shortage and this diminishes their incentive for conservation activities which become impossible to carry out.

Results also show that during FGD, respondents also revealed that, they lacked time to budget for the extra activities associated with Agroforestry. According to respondents, the daily routine of women, start at 5:00am in the morning and ends at 11:00pm at night before they retire. During this time they are working to serve their children and husbands, at the same time act as a vital source of labour for conventional agriculture of which they are a pillar. Other than this, respondents revealed that any free time that falls out of this range, is used for activities that can earn them some income for economic benefits. Respondents concurred that making of handcrafts is the most appropriate activity for such a time. This was witnessed by the researcher when he was in the field collecting data. One such afternoon was the only free time for interview appointments. (Ref. Appendix 6).
The findings indicate that, time is an important resource and women value it more dearly than ordinary men in the study area. They tend to allocate free time to valuable and beneficial activities. According to respondents Agroforestry with its associated activities appears to require more time in terms of investment hence their being sceptical in saving time to the associated activities. This in the long run has an effect on the establishment of Agroforestry technologies hence adoption.
This finding is in line with studies done by Adesina et, al (2000) on adoption of alley farming that male farmers are more likely to adopt than women, because most likely women lacked extra time for labour intensive technology since they were already overloaded with work.

Results also show that 5 out of 12 respondents revealed that wealth was an important resource that is required for adoption of the technologies. When asked what they meant by wealth, they concurred that it is a state of having lots of money and property. In property they mentioned the three resources (land, labour, and financial capital). Among the 5 respondents, one had this to say;

> *'If one is wealthy, he has all the resources and cannot fail to take on Agroforestry, even if it requires additional investment, he can meet the requirements without struggling'*

Another respondent had this to say;

> '*You know farm size is used as an indicator of wealth. Large scale farmers with large farms are the ones who have the resources to do investment in trees and when you go to their farms, you find big plantations of trees'.*

This implies that the respondents perceive Agroforestry as a technology that can be afforded by the wealthy. The majority of respondents are women with minimal cash savings which are mainly used for emergency family needs. Respondents confessed they did not have enough money for school fees, hospitalisation, medicine and basic clothing. Therefore it could not come to their attention very fast to think about Agroforestry since they perceive it as an enterprise that requires additional income for investment. This in the long run affects the adoption. This is in line with CIMMYT, (1993), Alavalapati and Lucket (1995) whose findings indicate that wealthier farmers are often included in the innovators because they have more resources (land labour and capital), have more access to information and/ or credit and are able to cushion risks more than poor farmers.

4.6 Channels of communication and Agroforestry adoption

Respondents revealed that the main communication channel used was trainings/workshops. Results of the study show that majority of respondents were illiterate and therefore it implies trainees could not take notes during the proceedings. The Trainers could use English as a medium of communication although interpretations were made. After the training, some handouts with information about Agroforestry could be given to the trainees.
During FGD, it was revealed that at initiation of the project, mobilisation was done in churches where many women would be addressed generally to get the required information.
Still during this time respondents concurred that it would be done as a mobilisation strategy but not a training strategy.

Table 4.10: Sources of information during dissemination of Agroforestry.

Source of information	Respondents accessed avenue
Training/workshops	+
Public meetings/Church services	+
Farmer visits/group exchange	+
Drama groups	-
Newspapers	-
Radio	+
Friends/Relatives	+
Discussion groups.	+
Video shows	-

Key: + Yes – No

According to Respondents, group discussions and farmer visits/group exchange were mentioned as common sources of information. Women would move from one group to meet and exchange views with women of another group. Meetings would be held in a homestead where some technology is established and easily observed.

Belonging to groups was of great advantage to access Agroforestry information, because during group farmer visits, women got exposed in locations where farmers who had practised Agroforestry for some time had started to get benefits of adoption.

Respondents revealed that exposure to benefits by the adopted farmers proved to be effective in inspiring adoption process. The degree to which the result of an innovation is visible has a great impact on its adoption. The easier the results of an innovation are exposed the more easily it diffuses and more likely to be adopted. However there are some associated benefits which cannot be observed like soil fertility improvement and crop yield, which may not be convincive.

When asked about which of the technologies they had had more information about, all the 30 respondents who attended the group discussions had significant information about home gardens and had adopted home gardens, Something very interesting to note was that, 12 women out 30 women had significant information and had adopted scattered trees and shrubs where they could easily get firewood, poles for construction and timber. Only 5 women out 30 women confirmed they had significant information and had adopted hedge rows. This gave an insight to the researcher that home gardens were more adopted than scattered trees and shrubs and hedge rows in that order.

The results of the study also indicate that Drama groups, news papers, and videos were not used as communication channels in the dissemination of Agroforestry technologies in study area.

According to the Project assistant of A2N a sister organisation implementing a similar project, dissemination of information in rural communities is best achieved if drama groups are used to portray messages especially with illiterate audiences.

From these findings, it is evident that the communication channels were ineffective and fell short of the respondents capacities. Since the majority of the respondents were illiterate, they could not benefit enough from trainings and workshops as these avenues needed reading and writing skills.

Further still the addresses/communications that were made at church gatherings could not have an impact as one respondent pointed out that;

> *'When you are going to church your mind is set for spiritual issues and most of the side issues raised are sometimes taken as secondary'.*

Results from the FGD indicated that the channels used were not effective enough to impact women's awareness and perception on Agroforestry to warrant effective adoption. This is in line with Reed, (2007) who found out that if an Agroforestry technology is communicated effectively, its perceived complexity may be reduced and observability and adaptability increased, enhancing its adoptability.

Results of the study further revealed that inter group dissemination of Agroforestry has been achieved by the educated respondents of at least primary level through farmer visits and group discussions. Some were selected and trained to be trainer of trainers by the organisation to move around member groups as change agents. The findings show that this became one of the strategies that worked during dissemination to promote awareness.

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The principle of trainer of trainers is under assumption that all those who have been trained fully understand what they have been taught. Considering the complex nature of Agroforestry, it requires general understanding of the underlying principles before implementation. The implication of this is that women who adopt the technologies through this informal method do not seem to invest any time or effort in seeking to train other women due to lack of confidence or with fear of passing on wrong information. In addition, if a woman trainer does not understand the concepts during training, then it is not right to expect her to train others. This affects the quality of information passed on and may affect the principle approach of disseminating information.

According to the District Environment Officer, Kabale District Local Government under the National Environment Action Plan introduced a radio talk show to address natural resource issues. The talk show is held on a local radio station Voice of Kigezi (VOK). The programme is once a week and is presented in the evening by a panel of experts in natural resource management. However respondents during FGD's agreed to have heard about the programme but confessed that it was placed at the peak hours of women in regard to their reproductive roles.

From the findings, it is clear that Local Government has initiated efforts of addressing natural resource management, but it is not effectively benefiting women. Based on the fact that many women are poor economically, very few are able to buy radios. The few who have, the facility is dominantly used by their husbands. Secondly the programme coincides with women's peak hours. At this time women are engulfed in their home chores and cannot sit down comfortably to listen to the educative programme. Therefore such government efforts have not specifically benefited women.

In my opinion Government has put in efforts to promote natural resource management but there is need to improve on the strategy used to achieve its goals.

4.7 Needs assessment and Agroforestry adoption

From the findings of the study, each of the four groups in the case study was formed independent of the other with different and unique objectives. During FGD, Respondents revealed that they came to work together in groups to pursue strategies that would help them fight poverty. This is because women lack material resources such as land and livestock. Even the married women who have access to land, owned by their husbands, cannot access loans because they lack collateral. When ICRAF started its on station research and development work in Kabale in 1988, all the 4 women groups under study were already established. Rwere Women's Group started in 1986. Ihimbi Women's Group started in 1986, Hamurwa Bakyara Twimukye Group started in 1986. Bukinda women's Group started in 1986. All groups under study had their primary objective of fighting poverty through various income generating activities. Poverty eradication using savings and cooperative societies through micro credit borrowing was high on their agenda.

Results indicate that when ICRAF started on farm trials, their target was mainly organised groups in rural areas who would be mobilised collectively to implement the trials. The women groups under study were then picked on for implementation of on farm trials using their small holder farms. ICRAF also had intentions of using groups in the dissemination of methods of environmental conservation.

According to the Respondents, the idea of implementing these technologies was not their original pre conceived idea but an important borrowed idea. Respondents were of the view that if they were consulted before introducing the promoted technologies, they would have had an input to identify, what their immediate needs were. Respondents confirmed that along the way they found the idea of Agroforestry promotion important for their survival.

This may be one of the reasons why many respondents remained hesitant to take up the technologies and this affected the adoption. This is in line with the findings of Reed, (2007) who found out that farmer needs and objectives are a primary stimulus for the development or adoption of an Agroforestry innovation

However, according to the 4 out of 12 respondents of whom 2 had at least some primary level education and the other 2 from groups near Kabale town, revealed that when ICRAF staff and extension workers did dissemination trainings about Agroforestry, it stimulated and inspired them to take up the technologies. One respondent had this to say;

> *'Since my production yields had declined tremendously and was facing food security problems, I could not resist a remedy to improve soil productivity, which was easily accessible by following simple instructions given in addition to the seeds and some inputs supplied.'*

From the findings of the study, the researcher believes that relevant and strategic dissemination of a technology can promote its adoption.

4.8 Extension services and Agroforestry adoption.

According the executive members of TWAN, the role of extension workers in the promotion of Agroforestry were:
- Training women in, seed bed preparation, making compost, pruning trees.
- Supply of inputs from development organisations.
- Linking women groups for easy collaboration as a net work.
- Bridging women groups with development agencies like ICRAF and A2N.
- Monitoring the progress of groups in the implementation of Agroforestry activities, and select winners who would be given prizes.

Extension workers were the direct agents of the organisation in disseminating information and follow up of all activities. In case there was anything wrong within the project implementation system, extension workers were in position to detect it and make the necessary adjustments for the success of the project.

The Executive Members of TWAN, during the initial stages of the project, did the work of extension. They would supply in puts like seedlings, buckets, watering cans, spades, pick axe, forked jembe and rakes to groups as incentives. They would then organise competitions looking for the best performers in implementing the project activities and the winners would be given prizes by the organisation. This duty was later taken over by the extension worker.

However respondents mentioned that currently, extension workers were irregular in their visits to the women activities. This brought about women loosing truck of some activities and hence could not proceed. One respondent had this to say;

> *'When extension workers were still coming, it was possible and easy to work hard hoping at the end of the season one would get a prize. One would even get advice on difficult activities, but these days they no longer show up'.*

The executive members of TWAN concurred with one respondent and confirmed that the extension worker no longer does the extension work in coordinating and encouraging women in Agroforestry activities. The informants revealed that the Organisation no longer had funds to pay the extension worker.

 When asked the type of extension services they had benefited from since the inception of the Agroforestry project during the FGD, respondents had interfaced with extension workers during trainings/workshops. Training and visit by the extension workers was put

across as one method they had been accustomed to. Respondents also confessed that there was no central gazetted demonstration site.

Respondents revealed that they had no where they could run to for consultation in case one had some queries about a certain technology problem. One respondent had this to say;

> *'You know these technologies are complicated and one needs constant consultations. But we don't have a central place to run to for help when we are stuck. Even the extension worker who used to bail us out has taken quite some time without coming. Do you think it is easy to proceed with an activity you are not conversant with in such a situation?'*

From these findings, the extension services of the project are on and off. Secondary there is no central established demonstration site where group members can seek for information in case there was need. This may be one of the reasons why some women have pulled out of the activities as confirmed by one key informant (the Executive member). The implication of this is that the way the information about the technology is packaged and passed on and followed determines its adoption or rejection. This is in line with Ajayi et, al (2008) and Adesina et, al (2000) who asserts that access to information on Agroforestry, training opportunities and extension contacts are particularly important during the stages of farmer's experimentation with the technology and may affect adoption.

During FGD it was also revealed that the trainings/workshops were sometimes arranged during the peak labour periods. Women did not attend such training or very few would attend. From this finding, there was inconsistence in attending trainings since sometimes trainings would coincide with periods when women could not leave their fields. For example during the planting time of beans and sorghum in the study area, it is very difficult for a woman to leave her field for whatever reason. For Agroforestry which is complex they need consistency in successive trainings, constant breaks during trainings creates inconsistence especially when projects/technologies are being initiated or tested. This has a negative implication in the adoption

During FGD it was revealed that, extension workers sometimes become segregative and tend to approach the educated group or the wealthy house holds of the community. This is in pretext that those have better chances of access to use extension knowledge acquired. The educated can read extension documents for programmes/activities far much better than the illiterate where most respondents fell. The implication of this is that sometimes extension workers lose attention to some sections and can have an influence on adoption.

According to the District Environment Officer, the established department unit of Environment and Wetlands at the District is charged with the extension of services to the communities. The services are in relation to dissemination of environmental issues. The unit of experts moves around all over the district mobilising and educating people in communities.
Findings of the study indicate that when such mobilisations are made, it's mainly men who attend. Most women are disadvantaged by the fact that their reproductive roles cannot allow them to leave homes to attend such meetings. (Ref. Appendix 4) The dominancy of men in such meetings reflects minimum benefit of women from government initiatives to promote natural resource management.

CHAPTER 5: CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter draws conclusion and recommendations of the study. The recommendations are derived from the identified weaknesses and gaps in the project implementation.

5.2 Conclusion

From this study, a number of conclusions can be drawn;

This study has found out that the adoption of the promoted Agroforestry technologies is still low. There is selective adoption of home gardens being popular compared to selected trees and shrubs, and hedge rows which seem to be unpopular. Home gardens were highly adopted compared to other technologies due to the associated benefits.

From the study it can be concluded that if a technology seems new to women compared to conventional agricultural practices which they have known or have been used to, it is likely that they take time to adopt it or may adopt it and then reject it later depending on its simplicity or complexity. For a new technology to be adopted its associated benefits (economic gain) should be direct and immediate, in addition to its convenience and should measure to the adopter's needs and satisfaction.

This study has further shown that adoption is along term process which is variable and dynamic with women taking up and discontinuing as a result of many inter-related factors which range from; cultural factors such as patriarchy; social factors such as education, marital status, wealth; technological factors such as waiting period, knowledge intensiveness; institutional factors such as lack of environmental bye laws.

The study also found out that communication channels had a great impact on dissemination of Agroforestry. Exposure through visits and trainings/workshops were the commonly used channels. Exchange visits encouraged women from various groups to interact and share views. But this was not effective in itself to promote adoption, since it was for a few selected women. The trainings were not conducted according to the understanding capacity (levels) of majority women who were illiterate.

The study has also shown that lack of natural resource management bye laws due to poor implementation of the environmental policy at District level has affected the adoption of Agroforestry. Agroforestry innovations take long to take root; adoption has remained low because of a policy vacuum environment.

Lastly, the study found out that successful adoption and diffusion of Agroforestry goes far beyond the characteristics of the technology. It also requires cordial relationship between the promoters (researchers and development workers) and the beneficiaries (women). The necessity to work hand in hand ensures that all attempts to formulate technologies will take in consideration local knowledge and needs.

5.3 Recommendations

From the findings of the study, many gaps were identified that need to be filled if the promoted technologies are to be successfully adopted for the benefit of women.

- Awareness/Dissemination programmes about Agroforestry by government agents, development practitioners and change agents need to be strengthened. This may improve on women attitude towards Agroforestry. In addition a little more effort needs to be spent and concentrate on training all group members rather than a few representatives. The training programmes should be designed to suit women's circumstances. It may be better to work with fewer groups and train all members than work with many groups and train only a handful of women.

- Natural resource management bye laws need to be formulated in line with National Environment Policy. Decentralisation empowers communities with responsibilities of problem identification and prioritising of local concerns. Formulation of bye laws that suit circumstances of local set ups can be initiated by communities. Then the formulated bye laws can be forwarded to the District for debate and adoption.

- A demonstration unit on Agroforestry Technologies needs to be set up by the organisation to act as a reference point for women engaged in Agroforestry. This will make the technologies more visible and simplified for women to easily take them up. The organisation has enough land where such a unit can be set up.

- The channels of communication used in dissemination of information need to be improved to suit women circumstances and match their level of understanding. Drama groups need to be included on communication channels used in dissemination of information. This will improve their degree of perception on Agroforestry technologies. If available brief videos can be shown and discussions around well displayed posters can be very beneficial. The posters can be distributed to women to take home for constant reference.

- The Organisation should endeavour to start basic literacy programmes for women who cannot read or write. This should be included on the training programmes. This programme will help women to improve on their understanding and acquire skills for coping with daily life. The curriculum of such literacy programme should be relevant to local women. To be effectively relevant it should include principles of four literacies namely; word literacy, money literacy, body literacy and civil literacy.

- Further research should be conducted on direct and indirect benefits of Agroforestry to various users.

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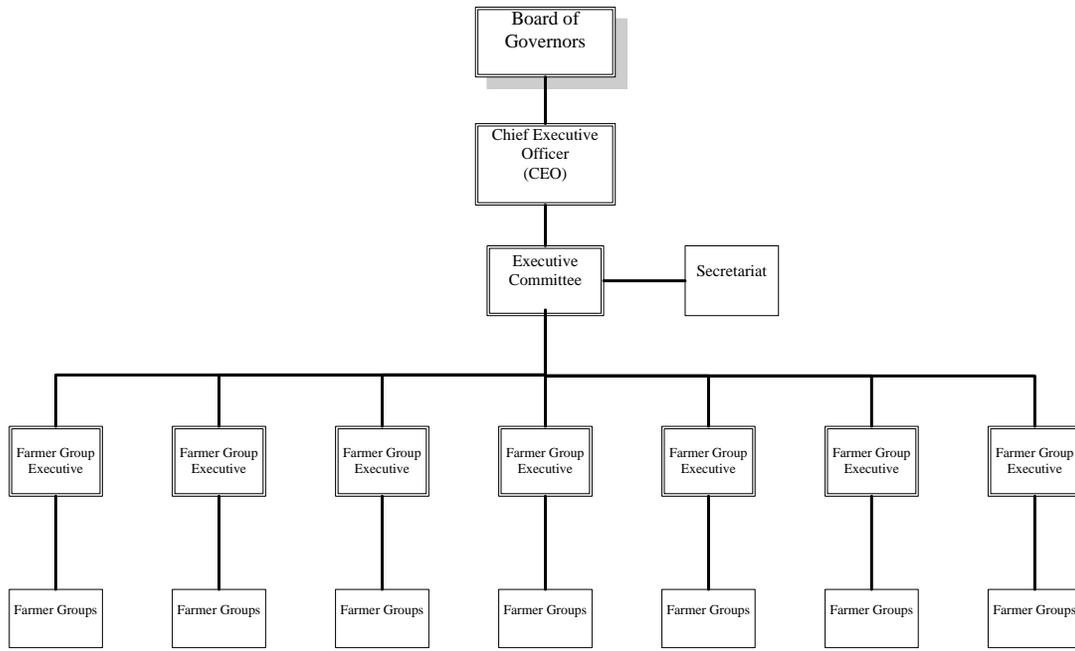
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APPENDICES

Appendix 1

Organisational Structure of Two Wings Agroforestry Network- Kabale

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                          │  Board of   │
                          │  Governors  │
                          └──────┬──────┘
                                 │
                          ┌──────┴──────┐
                          │Chief Executive│
                          │   Officer   │
                          │    (CEO)    │
                          └──────┬──────┘
                                 │
                   ┌─────────────┴────┐    ┌──────────────┐
                   │   Executive      ├────│ Secretariat  │
                   │   Committee      │    │              │
                   └─────────┬────────┘    └──────────────┘
```

Farmer Group Executive	Farmer Group Executive	Farmer Group Executive	Farmer Group Executive	Farmer Group Executive	Farmer Group Executive	Farmer Group Executive
Farmer Groups	Farmer Groups	Farmer Groups	Farmer Groups	Farmer Groups	Farmer Groups	Farmer Groups

Source: TWAN Profile (2007).

Appendix 2

Figure 1: Map of Uganda showing the location of Districts.
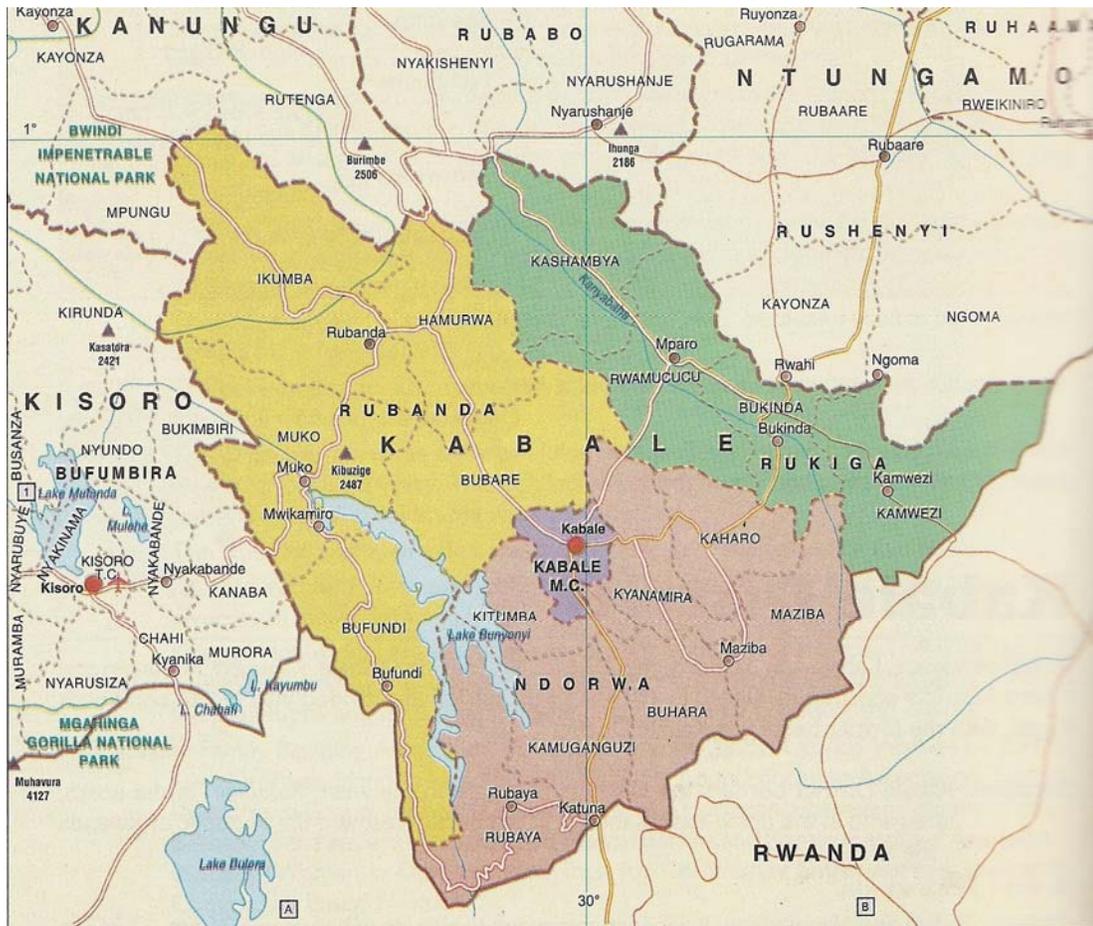*Source: Cook (2006).*

Appendix 3

Figure 2: Map of Kabale District showing Sub counties
Source: Cook (2006).

Appendix 4

Table 1: showing gender division of labour analysis of TWAN group members

HARVARD TOOL 1	ACTIVITY PROFILE			
Production activities				
	Labour contribution by household members			
	Male child	Male adult	Woman child	Woman adult
Land preparation and clearing	-	+	-	+
Planting	-	-	+	+
Weeding	-	-	+	+
Harvesting and gathering	+	-	+	+
Storing harvests	-	+	-	+
Bund construction	-	+	-	+
Compost making	-	-	-	+
Nursery tree establishment	+	-	+	+
Tree pruning	-	+	-	+
Transporting from the filed	-	-	+	+
Bird scaring	+	-	+	+
Water tank construction	+	-	+	+
Fuel saving stove construction	-	-	-	+
Reproduction activities				
Food preparation	+	-	+	+
Child care	-	-	+	+
House cleaning	+	-	+	+
Feeding zero grazing cow	+	-	-	+
Grazing livestock	+	+	-	-
Collecting firewood	+	-	+	+
Collecting water	+	-	+	+
Collecting natural medicine	-	-	-	+
Shopping from market	-	+	-	+
Community/social roles				
Church activities	+	- (+)	+	+
Community groups	-	+	-	+ (-)

Key
+ Yes
- No
Source: Researcher's data

Table 2: showing access and control of resources of TWAN group members

HARVARD TOOL 2	ACCESS AND CONTROL PROFILE			
	Access		control	
Resources	women	Male	women	male
Land	+	+	- (+)	+
Equipment	+	+	-	+
Cash	+	+	-	+
Education	-	+	-	+
Training	+	+	-	-
Fertilizer	+	+	-	+
Benefits				
Credit programmes	+	+	-	+
Outside income	-	+	-	+
Basic needs(food, clothing, shelter)	+	+	-	+
Education	+	+	-	+
Political process	-	+	-	+
Asset ownership	+	+	-	+
Rental income	+	+	-	+

Key
+ Yes
- No
Source: Researcher's data

Appendix 5

Check lists for semi- structured interviews
1. Check list Women respondents
- How old are you?
- What is your education level?
- What do you know about Agroforestry project?
- What does this project do in your area?
- Why did you get involved in the project?
- Why do you think this project is important?
- Did you ever have a meeting with TWAN about the project?
- What were the meetings about?
- What did you discuss in the meeting?
- What were your expectations from this project when you joined?
- Do you think this project has met your expectations?
- What benefits have you realised from the project?
- Do you think this project is successful? If not why?
- What do you think can be done for the success of this project?
- What problems have you faced with the project?
- Do you think you are able to cope with problems of the technology?

2. Check list for the Executive members of TWAN (Key Informants)
- Why was this Agroforestry project started by your organisation?
- Why did you choose to work with women?
- What was the criterion used by the organisation to recruit women?
- How were women of the project mobilised?
- What was your implementation strategy?
- What benefits have women got from this project?
- How is monitoring of the project done?
- What extension services do you provide as an organisation?
- What were the constraints of implementing the project?
- Do you think the project is successful? If not why?

3. Check list for the Project Assistant of Africa 2000 Network (Key Informant)
- What does your organisation do in this area?
- What are your target group/beneficiaries?
- What specific projects do you co-ordinate?
- How do you implement Agroforestry project?
- Do you think the Agroforestry project is successful? If not why?
- Why do you think your project is successful?
- What is the role of your beneficiaries towards the success of the project?
- What extension services do you provide to your beneficiaries?

4. Check list for the District Environment Officer (Key Informant)
- What is your opinion about women addressing the land degradation problems?
- What do you know about the Two Wings Agroforestry project?
- Do you think Two Wings Agroforestry project has benefited the women/ communities in Kabale district?
- What is the government policy in supporting such community projects aimed at mitigation of land degradation?
- What role has the district played in addressing land degradation problems?
- What District bye laws are in place concerning Natural resource management?
- What is the District support to women in natural resource management?
- What do you think are factors that influence adoption of Agroforestry technologies?

Appendix 6

Figure 3: Rwere Women's Group utilising one free afternoon making handcraft.
     It's rare to find a woman completely free because of the heavy work load.

   Source: Researcher