

**THE ROLE OF WOMEN IN THE CONSERVATION
OF INDIGENOUS LEAFY VEGETABLES IN SUNEKA
DIVISION, KISII DISTRICT**

EAST AFRICANA COLLECTION

BY

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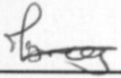
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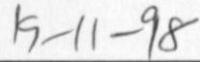
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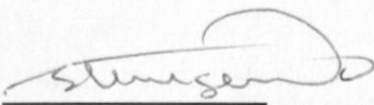


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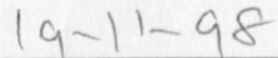


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This thesis has been submitted with my approval as a University Supervisor.



DR. STEVE NANGENDO



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<i>Corchorus Olitorius</i>	Jute	Omkore	
<i>Crotolaria Brevidens</i>	Mingo		
<i>Gynandropsis Gynandra</i>	Spider herb	Chinsaga	
<i>Solanum Nigrum</i>	Black nightshade	Rinagu	
<i>Vigna Unguiculata</i>	Cowpea	Egesano	

INDIGENOUS LEAFY VEGETABLES

BOTANICAL NAMES	ENGLISH/COMMON NAME	VERNACULAR (KISII)
<i>Amaranthus</i>	African Spinach	Emboga
<i>Basella Alba</i>	Vine Spinach	Enderema
<i>Corchorus Olitorius</i>	Jute	Omotere
<i>Crotolaria Brevidens</i>	Mitoo	--
<i>Gynandropsis Gynandra</i>	Spider herb	Chinsaga
<i>Solanum Nigrum</i>	Blacknightshade	Rinagu
<i>Vigna Unguiculata</i>	Cowpea	Egesare

ABBREVIATIONS

ACKNOWLEDGEMENTS

- CGIAR - Consultative group International Agricultural Research
- DAP - Di Ammonium Phosphate
- FGD - Focus Group Discussion
- GOK - Government of Kenya
- IPGRI - International Plant Genetic Resource Institute
- IUCN - World Conservation Union (formerly International Union for the Conservation of Nature and Natural Resources)
- KDDP - Kisii District Development Plan
- NGBK - National Genebank of Bank
- KENGO - Kenya Energy Non-Government Organization.

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ABSTRACT

This study examines the role played by women in the conservation of indigenous leafy vegetables in bushy domain in Kano State. The study focuses mainly on the socio-cultural factors which influence women's conservation of indigenous leafy vegetables; the extent to which the production of exotic vegetables affect women's conservation of indigenous leafy vegetables and lastly the extent to which lack of nutrition education affects women's conservation of indigenous leafy vegetables. A total of 130 respondents were sampled and interviewed.

The methods used in obtaining data for this study are documentary sources, interviews, focus group discussion and key informants. Modernization and socialization theories guided the study. The data was analysed using both qualitative and quantitative approaches and the information has been presented using percentages, frequencies and tables. The hypotheses that were formulated are: socio-cultural factors influence women's conservation of indigenous leafy vegetables, production of exotic vegetables affect women's conservation of indigenous leafy vegetables and lastly lack of nutrition education partly affect women's conservation of indigenous leafy vegetables.

The findings reveal that women play an important role in the conservation of indigenous leafy vegetables and that the socio-cultural factors influence their conservation of these vegetables. Other findings are that the production of exotic vegetables has an adverse effect on women's conservation of indigenous vegetables and lastly lack of nutrition education discourages women's conservation of indigenous leafy vegetables.

Given these findings, the study recommends that development planners include women's agricultural activities, especially conservation of indigenous leafy vegetables, in the agricultural policies. There is also a need to intensify nutrition education in relation to indigenous leafy vegetables so as to increase their production and utilization.

CHAPTER ONE

INTRODUCTION

1.0 Introduction

In Kenya, indigenous leafy vegetables have been used by people since time immemorial. A considerable variety of vegetable species such as African spinach, cowpea, blacknightshade, spider herb and vine spinach are indigenous to Africa (Attere, 1990). They are referred to as indigenous because they have not been introduced from outside the region (Maundu, 1993). Indigenous leafy vegetables have a number of functions in any given community. Chweya (1993) asserts that vegetables, especially leafy vegetables, play an important role in Africa's agricultural and nutritional systems. These vegetables supply much if not most of the population's required vitamins (A, B and C), minerals, fibres, carbohydrates and proteins compared to exotic vegetables.

Apart from their nutritional significance, indigenous vegetables contribute significantly to income generation for women who sell the surplus (FAO, 1988; Okigbo, 1990). Indigenous leafy vegetables are also used as medicine. For example, the African spinach is believed to treat malaria and the leaves of spider herb are prepared and eaten for the treatment of scurvy and stomach upsets (Busolo and Wasike, 1994). Among the Abagusii, some indigenous vegetables were regarded as having medicinal value. For example, spider herb was recommended for women when pregnant and after giving birth and also for boys immediately after circumcision. Other vegetables were eaten during a prolonged dry season or during famine. This is because such vegetables were drought tolerant and were the only type that could survive. They included vine spinach, Riisa and Egekondo the latter two only known in

their local names (Buruchara and Okiomeri, 1986). The Abagusii also observe certain taboos whose rationale may be based on ideas about health or social reasons. The food taboos affect certain categories of people. These taboos include use of indigenous leafy vegetables. Blacknighshade, for example, could not be eaten by a pregnant woman or one who has recently given birth. The Abagusii believe that if a pregnant woman eats this type of vegetable, she will not produce enough milk for the infant and the result will be an unhealthy infant (Buruchara and Okiomeri, 1986).

community (Raymond, 1991). Among the Abagusii, provision of food was undertaken by both men and women. Men cleared the fields while the actual cultivation of Indigenous leafy vegetables are also preserved for future use. Food preservation was an important aspect of home management. The Abagusii utilized the sun to preserve most of their food stuffs. Among these food stuff were indigenous vegetables. These used to be dried in the sun and kept in a pot. They could then be soaked in water and cooked on the fire when needed. However, this indigenous method of vegetable preservation has now disappeared. Instead vegetables are boiled in water, and then kept in coking pots, sufurias, for use for one or two meals, after which fresh vegetables are again collected. (Buruchara and Okiomeri, 1986)

boys and the men. Since men concentrated on livestock husbandry, their work was mainly non-Many indigenous leafy vegetables tolerate difficult conditions such as poor soils erratic rainfall, drought, pests and diseases, producing a harvest on lands too marginal to support major staples thus contribute to food supply and security (Kabuye, 1993; Maingi, 1993; Olendi, 1993.).

hoeing, sowing, weeding and harvesting. Also they were the ones who performed the routine It has been alleged that in much of the developing World, the conservation and use of plant genetic resources begins and ends with women (Raymond, 1991). As farmers, they are responsible for growing and collecting food for their families. They grow indigenous leafy

vegetables in home gardens and in marginal areas as most of the farms are used for more important cash crops. The processing and storage of food is also their responsibility. They know the value of the plants they grow or collect in the wild and they are aware of the different uses to which they can be put. Their special knowledge of the uses of plants for nutrition, health and income has important implications for the conservation of genetic resources because the decision to conserve a plant variety depends, to a large extent, on its usefulness to the individual farmer and community (Raymond, 1991). Among the Abagusii, provision of food was undertaken by both men and women. Men cleared the fields while the actual cultivation of crops was the responsibility of both men and women. Harvesting was mainly done by women though men could also assist. The collection of certain relishes, particularly vegetables, was almost entirely the responsibility of women, although men could collect animal relishes especially those that involve hunting (Buruchara and Okiomeri, 1986). Male adults occasionally rustled cattle from neighbouring tribes for their age-mates needed them for bridewealth. They were also involved in hunting and trapping of wild animals and defending their community in case of war. Uninitiated boys, *abaisia*, looked after sheep and goats and ran errands for older boys and the men. Since men concentrated on livestock husbandry, their work was mainly non-agricultural and their involvement in crop production was minimal.

On the other hand, it was women who did almost all the routine agricultural activities such as hoeing, sowing, weeding and harvesting. Also they were the ones who performed the routine household duties such as collecting firewood, fetching water, cooking for the family, taking care of the children, maintaining the houses, grinding finger-millet and sorghum and giving advice on various issues.

Levine and Levine (1979) argue that the development of a cash economy has undermined some

Gusii values and transformed others into a more convertible currency. Young men go to work

Mature but unmarried girls, abaiseke, helped their mothers with duties around the home and in the cities to earn money that can replace agricultural income and purchase consumer goods also with agricultural work. Uninitiated young girls, chinyaroka looked after their small brothers and sisters and also helped their mothers in and around the house in activities such as house cleaning and fetching of firewood and water. The growing of food crops was an activity largely left for women and initiated girls since it was regarded as less prestigious than cattle herding (Choti, 1996).

and sold, meat and (in many families) milk must be purchased.

There were times when women were confronted with more agricultural and even non-agricultural tasks than they could shoulder as individuals. Gusii women therefore formed communal or cooperative working groups. The groups aimed at easing the workload during labour peak periods such as weeding and harvesting seasons. Egesangio was one such communal group in which women of a neighbourhood voluntarily co-operated and worked for each other in turns. There were no remunerations when the group worked in the morning, it was referred to as egesangio and the evening session ekebosano. The other cooperative group was risaga in which a co-operative group did either routine or non-routine work for one of the members who in exchange offered local beer or food. The concept of communal work was widespread in Gusii Society. Work was understood as a social activity. It was performed and encouraged in promoting social relationships and kinship solidarity. Buruchara (1986) notes that though the traditional division of labour is no longer observed, the division of labour involving home activities remains basically unchanged.

Levine and Levine (1979) argue that the development of a cash economy has undermined some Gusii values and transformed others into a more convertible currency. Young men go to work in the cities to earn money that can replace agricultural income and purchase consumer goods desired. The cultivation of cash crop now makes possible for women to earn money at home from their agricultural labour particularly if the labour migrant husband fails to send part of his wages regularly. It is also possible to sell food crops - maize, finger-millet and vegetables at the local market places when cash is needed. Now, in contrast with the past, land can be leased and sold; meat and (in many families) milk must be purchased.

A number have migrated to work in tea estates and factories, whereas some have professional jobs as teachers or in the public

Like population growth and a cash economy, schooling has changed the lives of Gusii women in many ways. First, it changed their economic perspective on child rearing. They are now rearing children to be successful in school and get good jobs, an investment in their own economic structures. These changes in land pressure, economic adaptation and education translate into both burdens and possibilities in the experience of contemporary Gusii women. Their husbands away, their land resources small, their neighbourhood support groups reduced, they struggle to feed their children and send them to school, working long hours every day on agricultural and domestic tasks - with less reliable help than before from young daughters who now go to school instead of spending the whole day in infant care.

Nyamwaya and Bogonko (1986) add that with increased emphasis on education, most children go to school and are only able to help the parents after school or during the holidays. This creates labour constraints in many homes. Children who are going to school use whatever farm income is earned for their education without themselves contributing much towards the

family labour demands. The education received by the children in school tends to make them have a negative attitude towards farm work and hence make their labour contribution very minimal.

In a number of cases children leave home after school for professional jobs in urban areas outside the farm. In other cases where farm incomes earned from agricultural production are not able to meet the costs of children's education and other financial obligations, family heads, seek outside employment or other sources of extra income. A number have migrated to work in tea estates and factories, whereas some have professional jobs as teachers or in the public and private sectors. Some run their own business such as shops or public transport. When the men are away, it is the women who shoulder most of the responsibilities and have to make day-to-day decisions on both agricultural and home production activities.

Levine and Levine (1979) add that participation in a cash economy and school give Gusii women choices they never had before: to console themselves with a drink to join one of several Christian churches and to start a small business among others. Levine argues that though they have these possibilities in this new found freedom, the anxieties and burden often seem to outweigh them.

According to Okigbo, (1992 : 17, cited in Jacobs, 1988), conservation is the wise utilization of natural resources that involve the following three cardinal components of the World Conservation Union (IUCN 1980) strategy namely:

- (i) maintaining essential ecological processes and life support systems,

- (ii) preserving genetic diversity , and
- (iii) ensuring the sustainable utilization of species and ecosystem.

Thus, conservation involves elements of protection, preservation, usable and sustainable management of plant genetic resources that satisfy with increasing efficiency, current and future needs of humanity and other organisms.

Despite the significance of indigenous leafy vegetables in the nutritional, cultural and economic value, the African continent is witnessing a serious (disappearance) loss of these useful plants (M'mukindia, 1992). Rapid changes in land use, modernization of agricultural practices and deforestation, among others, have led to a rapid disappearance of traditional crops which used to grow wildly (Seme, *et al*, 1992). For example, Abagusii grew a wide variety of indigenous vegetables, although some of them grew wild. The most important ones are:

- (1) spider herb (**Chinsaga**)
- (2) Blacknightshade (**Rinagu**)
- (3) East African Spinach (**Ototo**)
- (4) Vine spinach (**enderema**)
- (5) Pumpkin leaves (**Risosa**)
- (6) Cowpea leaves (**Egesare**)
- (7) Bean leaves (**Rikuneni**). Others only known by their local names include:
- (8) Ekeroti
- (9) Enkurura
- (10) Ekenyabosaga
- (11) Rinyamoa
- (12) Omokonga
- (13) Riboroche
- (14) Ekenyabosio
- (15) Ogoto kwe embeba
- (16) Egekondo

Source: **Buruchara (1986)**

Presently, some of the indigenous vegetables are still grown by Abagusii people. These include spider herb, blacknightshade, African spinach, cowpeas, pumpkin leaves and vine spinach. However, there has been a general reduction of the quantity and types of indigenous vegetables grown mainly due to introduction and promotion of exotic vegetable crops. The latter include cabbage, kales, onions, tomatoes and carrots. The increasing popularity of the exotic vegetables is partly due to the increasing attention, encouragement and provision of technical information by the agricultural officers. This has been coupled with a total neglect of indigenous vegetables particularly with respect to their agronomic improvement. Some of the indigenous leafy vegetables which used to be eaten but have disappeared include *egetano*, *retandora ngobo*, *risaaroche*, *ekenyamochichi*, *omomu ombori*, *enkurura* and *rikongiro* among others. The reasons given is that there is availability of exotic vegetables and no long dry periods as olden days and population increase leading to clearing of natural vegetation where they used to grow wild.

from the Department of Culture in the Ministry of Culture and Social Services, the Division of Indigenous Health, Nutrition and Environment was started in

Thus, due to the increasing disappearance of indigenous leafy vegetables in their natural habitat, there is a deliberate move by both Government and Non-governmental organizations to encourage its production and consumption.

cope with food shortages for example, by

encouragement of agroforestry practice and planting of traditionally known drought

The National Genebank of Kenya (NGBK) was established in 1988 by the Kenya government as the National institution for the co-ordination and implementation of all activities concerned with crop plant and forage genetic resources. These activities include: collection, seed processing and conservation, multiplication, regeneration, characterisation, preliminary evaluation and documentation. Thus, Genebank conserves seeds, pollen, parts of plants under

modified temperature and humidity (tissue culture); and/or plant the indigenous vegetables in the Genebank garden. Among the priority species for action are leafy vegetables threatened by genetic erosion. The Kenya Energy Non-Governmental Organization (KENGO) started in 1987 and is currently working towards the conservation of indigenous vegetables threatened by extinction.

The International plant Genetic Resource Institute (IPGRI) was established in 1994. Its basic function is to promote and co-ordinate international network of genetic resource centres to foster the collecting, conserving, documentation, evaluation and use of indigenous leafy vegetables and, thereby, contribute to raising the standard of living and welfare of the people throughout the world.

According to the information from the Department of Culture in the Ministry of Culture and Social Services, the Division of Indigenous Health, Nutrition and Environment was started in 1995 and deals with the three aspects. On the part of traditional foods, research will be on going on:

- (i) Use of indigenous food plants to cope with food shortages for example, by encouragement of agroforestry practice and planting of traditionally known drought resistant food crops.
- (ii) Looking into policy governing local and international food festivals.
- (iii) Regulation that deal with promotion of traditional foods through Jua Kali kiosks
- (iv) Promotion and encouragement of the use of traditional foods through exhibitions, seminars and workshops among others.

- (v) Research and documentation of indigenous knowledge in processing, serving and preservation of different species of traditional foods utilized by different Kenyan communities.
- (vi) Documenting information on communities feeding habits and dietary deficiencies with a view to addressing the constraints in a cultural setting.

Although there has been efforts to conserve indigenous leafy vegetables by the above mentioned Government and Non-Governmental Organizations, there is still a decline in knowledge, production and use of some species (Maundu, 1994). Some like the Division of indigenous Health in the Department of culture have started recently. It was for this reason that this research on the role of women in conservation of indigenous leafy vegetables in Suneka Division was undertaken as a way of highlighting the existing knowledge, production and use of these plants.

1.1 Problem Statement

This study explored the role of women in the conservation of indigenous leafy vegetables in Suneka Division, Kisii District. Agriculture is the main economic activity undertaken in Suneka Division. High and well distributed rainfall, supported by good soils, enables the growing of both cash crops like coffee, tea, sugarcane and exotic vegetables such as kales and cabbages. The need for increased production of these crops puts much pressure on the available land leading to clearing of natural vegetation. This in turn, leads to destruction of certain plant

species specifically indigenous leafy vegetables such as spider herb, blacknightshade and African spinach which grow wild and are usually used as food (Okigbo, 1992; Seme et.al 1992). Moreover, women who are said to be the ones involved in their conservation are involved in arduous activities of production of cash crops and other reproductive roles.

As mentioned in the introduction, indigenous leafy vegetables have a high nutritive value compared to exotic vegetables. This is in terms of proteins, minerals, vitamins, fibre and carbohydrates (Imungi, 1989). Despite this nutritional significance, their destruction from their natural habitat has continued through clearing of natural vegetation and their production is also low. This has adverse effects on the health status of the community. For example, anaemia is among the top killer diseases in Kisii District (Kisii District Development Plan, 1994) which is brought about by iron deficiency in the body. One of the major causes of this is the low intake of foods rich in iron.

According to Busolo and Wasike (1994) when regularly consumed, indigenous leafy vegetables can supply the body with adequate iron (7 - 10 mg/100g). For example, indigenous spider herb has (10.8 mg /100g) iron; **mitoo** has (7.7 mg/100g) iron compared to exotic white cabbage (1.3 mg/100g) iron and French beans (3.4 mg/100g) iron. This implies that if indigenous leafy vegetables are readily available, then people would be in a position to have access to them not only as a cheap source of iron but also a source of other nutritive components. This would in turn improve their health and help in contributing to the development of a healthy nation. This study assessed the role of women in the conservation of

1.1.2 Objectives of the study

General Objective

The main objective of this study is to examine the role of women in the conservation of indigenous leafy vegetables.

Specific Objectives

To investigate the socio-cultural factors which influence women's conservation of indigenous indigenous leafy vegetables as a way of seeking appropriate strategies to promote their production and use. The research asked and answered the following questions:

- (i) What role do women play in the conservation of indigenous leafy vegetables?
- (ii) What are the socio-cultural factors that influence women's conservation of indigenous leafy vegetables?
- (iii) To what extent does production of exotic vegetables and other cash crops affect women's conservation of indigenous leafy vegetables?.
- (iv) Does lack of nutrition education affect women's conservation of indigenous leafy vegetables?

product, especially in relation to indigenous leafy vegetables considering their nutritional, economic and cultural importance. The understanding of interactions between variables such as cash cropping, exotic vegetables and gender disparity in division of labour is useful for policy makers in designing strategies for curbing low production of food. This study will therefore, provide reference material for rural development project(s) designers who are geared to the promotion of food production and curbing economic dependence on relief food. Also through this study, implementors of health programmes will find the anthropological input a useful data source for their work on improvement of health.

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General Objective

The main objective of this study is to examine the role of women in the conservation of indigenous leafy vegetables.

Specific Objectives

- (i) To investigate the socio-cultural factors which influence women's conservation of indigenous vegetables.
- (ii) To assess how production of exotic vegetables and other cash crops affect women's conservation of indigenous leafy vegetables.
- (iii) To find whether lack of nutrition education affects women's conservation of indigenous leafy vegetables.

1.3 Justification of the study

There is need for detailed knowledge of the effects of commercial agriculture on food production particularly in relation to indigenous leafy vegetables considering their nutritional, economic and cultural importance. The understanding of interactions between variables such as cash cropping, exotic vegetables and gender disparity in division of labour is useful for policy makers in designing strategies for curbing low production of food. This study will, therefore, provide reference material for rural development project(s) designers who are geared to the promotion of food production and curbing economic dependence on relief food. Also, through this study, implementors of health programmes will find the anthropological input a useful data source for their work on improvement of health.

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LITERATURE REVIEW AND THEORETICAL FRAMEWORK

Few studies have been done on women's role in the conservation of indigenous leafy vegetables. Much of the literature focuses on nutritional value of these vegetables (Chweya, 1993; Imungi, 1989; Kimani and Chweya, 1989; Mathooko and Imungi 1994) among others. This justifies this study's focus on women's role in conservation of these vegetables which has not been highlighted. In addition, the scientific findings of the high nutritional content of indigenous leafy vegetables would not be useful if production is low and the users are not taught nutrition education on their importance as consumption depends on both the availability of vegetables and knowledge of their usefulness.

Thus, by focusing on women's role in conservation of indigenous vegetables, the findings of the study will be of importance in contributing to effective strategies for increased production of these vegetables. This is because knowledge held by individuals (women) and communities on plant and crop management is an invaluable tool in the search for new ways of conserving and using indigenous leafy vegetables. Furthermore, the study will also contribute knowledge to scholarship by adding to existing literature and reference materials for future scholars.

1.4 Scope and Limitations of the study

This study focusses mainly on the role of women in the conservation of indigenous leafy vegetables. The factors that influence women's conservation of indigenous vegetables are many and cannot be handled exhaustively in a single study. These include education, age, and economic contribution (income generation). However, for this study, socio-cultural factors and their influence on conservation of indigenous leafy vegetables were studied.

CHAPTER TWO

LITERATURE REVIEW AND THEORETICAL FRAMEWORK

2.0 Introduction

Current literature on indigenous leafy vegetables puts much emphasis on their nutritional value neglecting other variables (Chweya; 1992; Kimani and Chweya, 1989; Mathooko and Imungi, 1994) among others. This study makes a departure from this trend by focusing attention on the role of women in the conservation of indigenous leafy vegetables. The following topics were reviewed in order to highlight the current status of available literature:

- Gender disparity in division of labour and food production
- Socio-cultural factors and conservation of indigenous leafy vegetables
- Effects of commercialization of agriculture on women's food production and,
- Nutrition education in relation to conservation of indigenous leafy vegetables.

2.1 Gender Disparity in Division of Labour and Food Production

The participation of women as producers of the right and proper quality of food for families in Africa is said to be vast (Raymond, 1991). Women are involved in the production, distribution, processing, preservation and consumption of food. As producers, traders and processors, they provide much of the agriculture labour (Bunzel, 1978; Hansen and Dello, 1970). They make strategic consumption decisions in the family, prepare and handle food and distribution systems (FAO, 1989, Kanyua, 1993). Women do the major tasks of breaking

planting, weeding, harvesting and carrying the harvest home with little or no
Ayiecho, 1990; Boserup, 1970; Levine, 1966; Pala 1983). Sometimes they may
either by hired labour or the junior family members.

crop production is differentiated on the basis of gender (Suda, 1991). Women
ater contribution in subsistence agriculture. They are more heavily and regularly
planting, weeding, harvesting, sorting, processing and marketing food crops
Men are usually responsible for clearing the land and ploughing. Suda adds that,
70 per cent of the total labour force in food production is provided by women as
dy in Siaya District. She argues that food preparation is regarded as 'Women's
ch is a cultural definition of gender roles with the belief that a woman's place
at home. Thus, women's role in food production and preparation is culturally
over the food crops. The cash crops belong to the husband who makes
regarding the production and the sale of these crops.

(1990) observes that home-based food production is an ancient activity, primarily
t by women, having an impact on the nutritional status of entire families and
ies. According to Olatunde and Ademola (1985), women's role in agriculture
tant influence on economic development. In some farming areas such as West
n, Igboland in Nigeria and Liberia, women are by custom, the cultivators of food
wn for home consumption. Among the Yoruba people of Western Nigeria, farm
one by men while women generally help in preparing crops like beans, cassava,
maize and vegetables. They also help a great deal to harvest and transport during

the harvest period. In the eastern part of Western Nigeria, namely, Eiti area, one of the major tasks performed by women is the processing of food for family consumption. This is particularly so in the processing of cassava into gari and marketing whatever surplus there is. The division of labour means that to a large extent a woman takes care of the home, does the cooking, tends the livestock and cares for the children.

Ayiecho (1991), asserts that though men help on the farm, the women are more involved in agricultural activities on the farm. They are the main producers and processors of the food and horticultural crops. Men get involved where a lot of physical energy is required like land clearing and ploughing. Ayiecho adds that the ownership of various crops is based on sex lines within Siaya District. The women own food crops which are mainly for the family subsistence. Since they are charged with the duties of feeding the family they feel more responsible over the food crops. The cash crops belong to the husband who makes decisions regarding the production and the sale of these crops.

According to Buruchara (1986), Abagusii society had well-defined roles in the agricultural and home production systems based on sex and age. Male adults were the natural heads of the families. They generally managed the home and performed non-routine tasks such as clearing bushes for cultivation, fencing around the land, building huts, granaries and cattle bomas. On the other hand, it was women who did almost all the routine agricultural activities such as hoeing, sowing, weeding and harvesting. Also they were the ones who did the cooking for the family. Choti (1996) notes that the growing of food crops among the

Gusii community was an activity largely left for women and initiated girls since it was regarded as less prestigious than cattle herding. They involved themselves in processes of grain drying, threshing, sorting, winnowing, storing, grinding and cooking for the family.

household items, such as sugar, paraffin, soap and matches among others

Hay and Sticher (1984) assert that the 'men's work' in agricultural and pastoral societies (land clearing, house building, herding and military tasks) was usually performed entirely by the dependent males of the household - the son, younger brothers, nephews, clients, and slaves of the family head. Women's work included food production, storage and preparation and other wide range of domestic chores for the family. Hay and Sticher add that this traditional sexual division of labour in the family has been reproduced in ideology and in practice for centuries. One of its most important legacies is the contemporary expectation that African women must feed their families, either by growing the food themselves or by earning the money necessary to buy it. Since most African women have enormous difficulties developing a sufficiently large cash income to purchase their daily food, the great majority are forced to spend the bulk of their labour time in subsistence food production.

women's role in planting, weeding, harvesting, preparation, method used in storage of seeds and pests control and preservation of indigenous leafy vegetables for

Choti (1996) notes that Gusii women had vegetable gardens within their homesteads. These gardens locally known as ebiticha were not regarded as productively important enough to warrant communal or family labour. Only women with the assistance of their daughters attended to them, and mostly in the evenings after major work in the agricultural field. However, men who spent most of their evenings drinking traditional beer could also

use their "free" time in making and repairing agricultural tools. Pala (1983) notes that women depend a lot on land for their livelihood. They grow agricultural crops and vegetables which are largely used for home consumption and sometimes sold to buy household items, such as sugar, paraffin, soap and matches among others.

Preparation of some indigenous leafy vegetables requires boiling until all water evaporates and then fresh or sour milk is added (Busolo, 1994). Drying out in the sun was used traditionally to preserve most of the foodstuffs. The dried vegetables were kept in a pot and they could then be soaked in water and cooked in fire when needed (Buruchara and Okiemer, 1986). Granaries which were built close to the homestead were usually used in storing food.

From the above literature, there is a general overview on women's role in food production but detailed information particularly on the processes of conservation of indigenous leafy vegetables is not given. This study was undertaken to fill this gap in knowledge. Issues explored include: women's role in planting, weeding, harvesting, preparation, method used in storage of seeds and pests control and preservation of indigenous leafy vegetables for future use.

2.1.1 Socio-cultural factors and conservation of indigenous leafy vegetables

According to Tylor (1958:1), 'Culture is that complex whole' which includes knowledge, belief, art, morals, custom and any other capabilities and habits acquired by a human being

as a member of society. It is the sum total of peoples' way of life which is learned by individuals and transmitted from generation to generation through the process of socialization. The environment plays an important role in the culture of a society where each society has its own unique culture which has developed throughout its history and transmitted to its members. In relation to indigenous leafy vegetables, cultural beliefs about food can be important in understanding their conservation.

The following indigenous leafy vegetables are culturally significant. Busolo and Wasike (1994) assert that leaves of spider herb (*Gynandropsis Gynandra*) are bound, soaked in water and concoction drunk or the leaves are prepared and eaten for the treatment of nutritional anaemia scurvy, constipation and helps mothers to recuperate from labour pains faster. The leaves of blacknightshade (*Solanum nigrum*) are boiled, fresh milk added and the mixture drunk to relieve sudden stomach-ache. It is used as a meal to boost health of expectant mothers. It restores strength and prevents erupting of skin diseases. Roots are chewed by expectant mothers to reduce labour pains. It stops young children from getting marasmus and kwashiorkor. This is especially if enriched with milk, peanuts or simsim paste (Busolo 1994). Among the Abagusii, blacknightshade is a type of indigenous vegetable which cannot be eaten by a pregnant mother or one who has recently given birth. The Abagusii believe that if a pregnant mother eats this type of vegetable, she will not produce enough milk for the infant and the result will be unhealthy baby (Buruchara and Okiomeri, 1986).

According to K'okul (1991), among the Samia, spider herb (**Akeyo**) was believed to cure beriberi and edematous foot. It also helps facilitate birth, and is good for the treatment of conjunctivitis and other parasitic infections, especially threadworm. K'okul adds that a woman assured him that once she took spider herb, stomach ache and constipation vanished. Vine spinach (*Spinacia oleracea*) is used in treating abdominal ulcers while African Spinach is used in treating malaria (Busolo, 1994).

Among the Abagusii, the spider herb is recommended for pregnant and lactating mothers and those who have been circumcised. It is also believed that the spider herb increases breast milk production for lactating mothers (Buruchara and Okiomeri, 1986). This view has scientifically been proved to be true. Chweya (1989) asserts that indigenous spider herb are rich in iron and calcium, which is why pregnant and lactating mothers are encouraged to take them. According to Oduro (1948), Quoted in Kimani and Chweya (1989), the spider herb sap is squeezed and applied to the ears in case of epileptic fits to ease the pain. It can also be used to treat severe infestation of threadworm and the seed can be used as an insecticide.

Among the Digo and Duruma, indigenous vegetable Mtusunga wa Utsungu a bitter plant which grows wild in the bush and was used to cure headaches and stomachaches. The juice extracted from boiled vegetable was given to patients. However, because of its bitterness, it should not be given to pregnant women as this could result in abortion (Kimokoti, 1986). The leafy vegetable and juices of cowpeas (*Vigna unguiculata*) are used as a treatment of abdominal pains, toothache and toothache. Young leaves may be bound for topical application on infected skin.

to relieve ringworms. It is used to control aphid by sprinkling ashes on plants (Busolo and Wasike, 1994).

Indigenous leafy vegetables were and are also used as relishes. For example, the traditional diet of the Luyia and Iteso consists of the main staple and other supplements of food found within the environment. In case of the Luyia groups, what is regarded as 'food' (staple) consists of flour of cassava and sorghum which is prepared into a thick cake, obusuma (ugali). Relishes (edia) which were vegetables were boiled in water with salt and may then be mixed with either cow's blood or ground Simsim (Olenja, 1986). The traditional vegetables of the Meru people include cowpeas (nthoroko), pumpkin leaves and terere (amaranth). Leaves were the main edible part either cooked with ncabi and bananas and pounded to make a dish called kithanda or used to make soup (Buruchara, 1986). Among the Kikuyu, the traditional dishes include irio, githeri, muthura and giteoro. Pumpkin leaf is used as one of the ingredients in preparing Irio while cowpeas and pumpkin leaves are used in making muthura.

Riley and Brokensha (1988) note that among the Mbeere, Terere (amaranth) in their first stage of growth are used as relish to add to the staple diet of cooked cereals and beans. This is general use, but dead stalks when fully dry are sometimes collected to use as kindling and resuscitate a dying hearth. Buruchara and Okiemer (1986) observe that among the Abagusii, some indigenous leafy vegetables were eaten during a prolonged dry season or during famine. This is because such vegetables were drought tolerant and were the only type that could survive. They include vine spinach (enderema), among others.

included such elements as promotion of valuable cash crop production previously not

As can be seen from the above literature, indigenous leafy vegetables have well known cultural and medicinal value. However, little is written on their ceremonial and religious uses. This study came in to fill this gap in knowledge. Culture, thus, plays an important role in society and can be a baseline for scientific knowledge. Traditionally, before popular science knowledge discovered the iron content in indigenous leafy vegetables, it was known by people in different cultures. Thus, it is the researcher's feeling that more information on cultural beliefs about food will be useful in enhancing scientific inquiry and perhaps lead to an integrated approach in search of knowledge and use of indigenous leafy vegetables. This study also had to investigate the taboos among the Abagusii for it is alleged that some indigenous leafy vegetables are not to be eaten by certain categories of people even though they have a high nutritive value. As a whole, the study focused on whether cultural beliefs negatively or positively influence women's conservation of indigenous vegetables.

2.1.2 Effect of commercialization of Agriculture on women's food Production

The Swynnerton Plan of 1954 espoused both tenurial and agrarian reforms in Kenya. First of all, systems of customary African land tenure were to be 'reformed' from a presumed communal to an individual freehold basis, for both use and disposal rights. According to Native land tenure rules of 1956, the reform was to proceed in three stages: adjudication, or recording of individual or group rights over particular plots of land in a given locality; consolidation, or aggregation of sub-economic, dispersed or highly fragmented parcels to an individual and issuance of a title deed, which could then be used as security against loans and other forms of credits. The agrarian reform component of the swynnerton plan

included such elements as promotion of valuable cash crop production previously not permitted to be grown by Africans, provision of credit, marketing, extension and education services (Fleuret, 1985).
Nasimiyu (1985) asserts that the changes that took place as the result of the Swynnerton plan had a significant impact on the situation of women vis-a-vis men. In the first place, women's economic rights were undermined by land consolidation. Women were disposed of their usufructory land rights. The introduction of individual rights to land which went mainly to men on the assumption that it was men who were heads of families removed the security previous enjoyed by women. Lack of control over land and all that goes with it became major cause of women's economic dependence. Nasimiyu adds that the introduction of cash crops led to increase in the area under cultivation. This meant that more weeding had to be done by women. This extra work was done in addition to individual women's small scale farm labours and domestic chores.
Wandera (1991), in his study in South Maramba, Butere, found out that commercial production of sugarcane as a cash crop has adversely affected food security in the studied households. Both commercial and subsistence farmers are understandably constrained to only small holdings. However, the commercial farmers with relatively bigger proportions of the cultivated land put less of their land under food production but more under sugarcane production. Moreover, the small food plot is not under intensive cultivation and, consequently produces a low yield.

without compensating labour-saving innovations. Ayiecho (1990) asserts that as the farm

Badiru (1994), in his study in North Bunyala, Kakamega, found out that the decline in output of food was brought about by the farmers' engagement in cash crop production. Badiru gives an example of decline in production of maize due to a greater concentration of crop husbandry on resources such as production. This view is also shared by Owinyi (1977) and Mwandhili (1985) who agree that sugarcane production in Mumias Division, Kakamega, has greatly replaced maize and cassava, contributing to food deficit.

horticultural crops. The man often markets or arranges for the marketing of cash crops

Kusimba (1992), in his study in Mumias Division, Kakamega found out that sugarcane growers tended to allocate more land to sugarcane than food crop production. Though land-holdings were generally small, more land, however was devoted to sugarcane production and though diverse crops were grown, they were produced in small quantities. Bunzel (1978) notes that with the introduction of cash economy, changes in land tenure resulted which limited arable land available for cultivation of subsistence crops like sorghum, potatoes and vegetables. Hankanson and Levine (1992), asserts that women's access to subsistence agriculture has been reduced through emphasis on cash crop production and the increased male control over resources.

of domestic buildings. It should, however, be emphasised that these responsibilities have

Hay and Stitcher (1984), had earlier agreed with the above views by asserting that new technology has the adverse effect of increasing women's workload without consistently increasing benefits to them. Where cash cropping and subsistence crops depend on women's labour, subsistence production must drop if women are to spend more time on cash crops

without compensating labour-saving innovations. Ayiecho (1990) asserts that as the farm worker, the supervisor and the manager, the woman is seriously overworked. While she has to attend to the farming activities she has to set up the family survival systems (water, food, children up-bringing and health care). The lack of adequate farm labour is a major setback.

Ayiecho continues to say that it is the responsibility of the woman to market any surplus of horticultural crops. The man often markets or arranges for the marketing of cash crops. During his survey in Siaya District, Ayiecho found that some women indicated that they assisted in transporting cotton and sunflower to the marketing centres. Apart from women's contribution in production of food crops, other reproductive roles, they also participate in the production of cash crops.

Were (1991) notes that women's role in society has undergone drastic transformation. For example, women have gradually filled the gap left by menfolk as household heads. They have assumed roles previously reserved for men such as clearing the land before cultivation, ploughing, livestock management, home-fencing, cash crop farming, petty trade and repairs of domestic buildings. It should, however, be emphasised that these responsibilities have been thrust upon women in addition to their traditional roles.

Njiro (1990) in her study in Embu district, found out that levels of subsistence production (Maize beans and potatoes) had declined. This decline was attributed to reduced hectarage

allocated to food crops in this area as more land is being channelled to growing cash crops the main one being tea. Njiro says that the respondents were saying: *we simply have no time for cultivation of food crops. It is easier to work on tea and buy food from shops with money from tea (Njiro 1990:239)*. Even potatoes and vegetables which do well in the area are not grown in sufficient amounts. Respondents, preferred to mortgage their bonus money in grain shops.

about 0.8 hectares. The main crop grown is onions which covers about 80% of irrigation land per year. Other crops include brinjals, melony chillies.

The above literature confirm that the production of cash crops affects food production and increases women's workload for they are the ones who provide much of the labour. This study specifically sought information on how cash crop production has affected production of indigenous leafy vegetables in terms of labour devoted to cash crop production and marketing by women including the acreage devoted to the growing of indigenous leafy vegetables.

contract farmers to grow particular vegetables. These companies collect the produce on particular days from the farmers and export them. Crops grown for export

2.1.2.1 Exotic Vegetables Versus Indigenous Leafy Vegetables

In Meru, presently, most of the traditional crops are still grown but in varied quantities. Root crops such as cassava, yams and sweet potatoes are considered less important. Changes in the food habits among the Ameru and competition from exotic food and cash crops are partly responsible for the reduced production of some of the traditional crops. Sunflower is grown over a wide area in the same zone as tobacco. The East African Industries and other agents and individuals promote production of the crop by contracting

of vegetable crops to be cultivated. These include the size and outlay of the plots, market,

farmers. They supply them with inputs on credit and deduct the costs from the payments due them (Buruchara, 1986b).

In Loitokitock a variety of horticultural crops are grown mainly along river courses and under irrigation in Ngong. In Loitokitok, farmers mainly use furrow irrigation on their plots which are on average about 0.8 hectares. The main crop grown is onions which covers about 80% of irrigation land per year. Other crops include brinjals, melony chillies, tomatoes, Kerela (bitter gourd, *moniorдика charantia*), cabbages, Kale French beans for seed, broad beans, pigeon beans and turai, among others.

Marketing of the horticultural produce is handled by the societies but some farmers market their own produce either individually or in small groups. Some vegetable exporting companies contract farmers to grow particular vegetables. These companies collect the produce on particular days from the farmers and export them. Crops grown for export include Kerela, turai and French bean seeds. In Ngong, the main horticultural crops grown consist of tomatoes, cabbages, onions, spinach, cauliflower and melons. Vegetables from Ngong are sold in Nairobi. (Buruchara and Wandera, 1986). Thus, it can be seen that encouragement in the increased production of exotic vegetables by farmers is due to ready market, formation of societies and provision of inputs for deductions later on.

In Kisii, some of the indigenous leafy vegetables are still grown. These include spider herb.

Ngethe (1995) asserts that women take into consideration a number of factors in the choice of vegetable crops to be cultivated. These include the size and outlay of the plots, market,

price, variety of usage, staple food, taste, storage and perishability rate among others. In his study, Ngethe found out that women choose to grow crops that meet daily or family food requirements where surplus could be sold. The following are some of the vegetables grown by women and the reason for their production: Kales was preferred to all other crops because it matures quickly and can be harvested regularly, say once a fortnight, thus providing a reliable and regular income. There is high demand for Kale and it sells fast, besides most buyers come to buy on site. There is no transportation cost. As food, Kale has an appealing taste and is highly nutritious. Kale is not a labour intensive vegetable and has the advantage of being intercropped with potatoes and other crops.

Cabbages mature at more or less the same time. Thus, one can organize buyers in advance before they are ready. Spinach is cultivated on a small portion to mix with Kale for family's food. Carrots are said to produce high yields from a very small portion of the land. There is hardly any weeding to be done because carrots smother weeds and provide a cover for the soil. There is a great demand for carrots even among the neighbouring farmers who may not have cultivated them. In his study, Ng'ethe also found that only one indigenous leafy vegetable (pumpkin leaves) was grown out of the seventeen horticultural crops. This shows that production of exotic vegetables has taken over the growing of indigenous vegetables.

In Kisii, some of the indigenous leafy vegetables are still grown. These include spider herb, blacknightshade, African spinach, cowpeas and pumpkin leaves. However, there has been a general reduction of the quality and types of indigenous leafy vegetables grown mainly due

2.1.3 to the introduction and promotion of exotic vegetable types. The latter include Kales, Onion, tomatoes, cabbages and carrots (Buruchara, 1986a). The increasing popularity of the exotic vegetables is partly due to the increasing attention, encouragement and provision of technical information by the agricultural officers. This has been coupled with a total neglect of indigenous leafy vegetables particularly in respect to their agronomic improvement (Chweya, 1992).

Buruchara (1986a) also notes that today more crops are grown including a number of exotic types which never existed in Gusiiland in the early times. Westernization and modernization of the agricultural sector have resulted in changes of emphasis on the types of crops grown. Buruchara adds that agriculture in Kisii at the moment is modern. Ayiecho (1990)'s study in Siaya district, showed that a variety of vegetables were grown for subsistence and local markets. This included Kale, cabbages, onions and tomatoes among others. This view was also noted in Kakamega district (Ayiecho, 1991)

From the literature above, it can be seen that production of exotic vegetables is very high. This study sought information on the ways in which cultivation of exotic vegetables has undermined conservation of indigenous leafy vegetables by Abagusii women. It also sought to find out whether visit of agricultural extension officers and exporting companies motivates the growth of exotic vegetables as argued in the above literature.

2.1.3 Nutrition Education in Relation to Indigenous Leafy Vegetables

As indicated earlier, indigenous leafy vegetables contain different nutrients that play very important roles in the human body. They contain high amounts of vitamins (A, Bs and C), minerals, protein, fibre and carbohydrates. According to Busolo and wasike (1994), these nutrients play the following roles: Fibre is a term used to describe the strengthening and supporting part of plants. Dietary fibre is the portion of plant materials resistant to human digestive enzymes. Although fibre is not digestible by the body, it remains a crucial element in our everyday diet and health. Low fibre have been associated with disease such as diabetes, non-infectious diseases of the colon, such as constipation and cancer. Thus, fibre has the advantage of holding water so that stools are soft bulky and readily eliminated. This high fibre prevents and relieves constipation. Large fibre content of the indigenous leafy vegetables varies from 1.04% to 2.8% compared to fibre content in drum head cabbage (1.2%) but less than that in the cereal (3%) (Busolo and Wasike, 1994).

Indigenous leafy vegetables are a source of good quality proteins. Proteins are necessary for tissue building and repair in the body. They also supply raw materials for the production of digestive enzymes, hormones, vitamins and haemoglobin among others. Protein content of indigenous leafy vegetables range from 3.14 to 5.68%. Protein deficiency causes kwashiorkor. It is possible that the small quantities of protein derived from indigenous leafy vegetables in diets could go a long way in alleviating this problem. For example, indigenous spider herb (*Gynandropsis gynandra*) contains 5.8% protein; Mitoo (*Crotolaria Brevidens*) contains 4.5% protein; cowpeas (*vigna unguiculata*) 4.7%; Blacknightshade (*Solanum*

Nigrum) 4.6%; African spinach (*Amaranthus*) 3.8% protein; jute or mlende (*Corchorus Olitorius*) 4.8% protein compared to spinach 2.6% protein; French beans 2.7% protein and drumhead cabbage 2.9% protein. Approximately 25% of the protein indigenous leafy vegetables is lysine. Thus, indigenous leafy vegetable protein can complement the lysine deficiency in cereals and improve their protein quality for growth and body repair (Busolo and Wasike, 1994).

Vitamins are important in the protection of the body against infection and disease. The vitamins are divided into: (i) water soluble vitamins (vitamin B complex and vitamin C); (ii) fat soluble vitamins which are vitamins A, D, E and K. The vitamin A content of indigenous leafy vegetables vary from 5.5 mg/100g for cowpeas (*vigna unguiculata*); 8.67mg/100g for spider herb (*Gynerosia gynandra*); 10.7mg/100mg for jute (*corchorus olitorus*); 7.0 mg/100g for black nightshade (*Solanum nigrum*); and 9.90mg/100g for Mitoo (*crotalaria brevidens*) compared to white cabbage 0.7mg/100g vitamin (Busolo and Wasike, 1994).

Lack of sufficient vitamin A in diets leads to a deficiency disease which in its very mild form manifests itself as blindness. This could be followed by drying up of the cornea of the eye and in the advanced form by total destruction of the eye, leading to blindness. Lack of vitamin C (Ascorbic acid) in diets leads to nutritional deficiency disease called scurvy. The disease is characterised by lack of integrity of body tissues, leading to easy haemorrhage bleeding gums (Busolo and Wasike, 1994).

Minerals are necessary for several body functions. Calcium, iron and phosphorus are among the minerals which the human needs. Calcium is a catalyst needed for skeletal development, teeth and bone formation, clotting of blood and it works in combination with Vitamin D. The best source of calcium is milk and green vegetables. About 4% of the body is made up of minerals (Busolo and Wasike, 1994).

The indigenous cowpeas (*vigna unguiculata*) contains 255.0 mg/100 g calcium; blacknightshade (*solanum nigrum*) 215.0 mg/100g calcium, Mitoo (*crotonaria brevidens*) contains 270 mg/100g calcium compared to French beans (50.0mg/100g calcium and cabbage (120.0mg/100g) calcium. The calcium in spinach (327.5mg/100g) is comparable to that of indigenous leafy vegetables. Phosphorus is essential for growth and helps in protein assimilation into the body. The indigenous leafy vegetables contain adequate amounts of these minerals to meet the body requirements consumed. The indigenous cowpeas (*vigna unguiculata*) contains 62.0 mg/100g phosphorus; African Spinach (*Amaranth*) contain 93.0 mg/100g phosphorus, spider herb (*gynandropsis gynandra*) 70.0 mg/100 g phosphorus compared to white cabbage which contains 49.0 mg/100 g phosphorus (Busolo and Wasike, 1994).

Iron is essential for formation of haemoglobin. Indigenous leafy dried grain such as millet, black beans, liver and blood are rich in iron. Iron deficiency is the most common cause of anaemia. The body needs 7-10mg/100g iron. When regularly consumed, indigenous leafy vegetables can supply the body with adequate iron. The indigenous spider herb

(*Gynandropsis gynandra*) contains 10.8mg/100g iron; Mitoo (*Crotolaria Brevidens*) 7.7mg/100g iron compared to exotic white cabbage (1.3mg/100g) iron and French beans (3.4mg/100g) iron (Busolo and Wasike, 1994).

Carbohydrates are a source of energy for the body. Fats are nutrients that provide energy in a more concentrated form than carbohydrates. Indigenous leafy vegetables contain less than 1% fat content (Busolo and Wasike, 1994). Busolo (1994) observes that one of the factors contributing to decline in use of indigenous leafy vegetables has been the changes in lifestyles and scanty information articulated on their significance.

From the above literature, it can be noted that indigenous leafy vegetables if readily available and consumed can supply the body with adequate nutrients and help in preventing and curing diseases such as anaemia, kwashiorkor and scurvy. This can contribute to a healthy nation. However, very little is there to show that education on their nutritional significance is known by people. This study therefore, sought to investigate the extent to which nutrition education influences or affects conservation of indigenous leafy vegetables.

Theoretical Framework

For this study, modernization and socialization theories are used.

Modernization Theory

Modernization is defined as:

"total transformation of tradition or pre-modern society into types of technology and associated social organization that characterize the advanced, economically stable Nations of Western World (Moore, 1963:91 - 92). Levy (1969) defines modernization as the use of inanimate sources of power and the use of tools to multiply the effect of efforts (Levy, 1969:11).

Inanimate sources of power is any sources of power that are not produced from human or animal energy. A tool is any physical device that is ordinarily separable from the body of individual who applies it and that is used to accomplish what he/she could not accomplish at all or could not accomplish so well without it. Levy argues that the greater multiplication of effort as the effect of application of tools, the greater is the degree of modernization.

Levy (1969: 38-60) lists the following features as characterizing any relatively modernised

Division of units - where in relatively modernized contexts, it is possible to do highly specialized and limited things on a very large scale. As the level of specialization increases, each individual member of the society plays parts in terms of increasing number of roles.

- **Self-sufficiency units** - whereby as the level of specialization increases, the level of self-sufficiency decreases. In the long run, once the process of modernization is started, the levels of modernization and specialization increases. The increase of specialization in general always increases the problem of adjustment of the members of relatively non-specialized units insofar as the levels of self-sufficiency of these units are concerned, and therefore continually declines without the level of specialization of such units necessarily increasing.

- **An increasing universalistic ethic** whereby a relationship or ethic is considered more or less particularistic to that extent that it emphasizes "who a person is rather than what he/she can do or does" (Levy, 1969: 52). The members of the societies considered to be modern democracies pride themselves on their emphasis on highly universalistic ethic.

- **Combination of Centralization and Decentralization.**

Levy notes that on the family system, it is frequently noted that activities in terms of the family have been radically reduced in relatively modernized contexts. The reduction of education in terms of the family is one of the most spectacular examples. In relatively modernized societies, the family as an educational unit has had its wings cut radically. Less and less training takes place in terms of such units. The decrease in family - based education reaches into younger and younger age categories with further increases of modernization. With increasing modernization, more education takes place in non-family contexts.

also change in terms of goods produced. The major sources of control on the relatively non-modernized societies. He says that there is always a move among the members of relatively non-modernized societies for taking up some structures of modernization with or without duress - from outsiders. The problems of modernization of late comers have almost uniformly been discussed in the context of imperialism. Levy argues that the morals of imperialists are essentially irrelevant to the problems faced by members of relatively non-modernized societies in contact with modernization. If there is contact, some set of members of that society will always attempt to take up some of those structures even if those structures are not forced upon them. Attempts to prevent them by force short of extermination, have never been successful. They take up some structures even if not forced up on them because of the following reasons:

- (i) There is no society whose members are in general unaware of material factors.
- (ii) There is no society whose members fail to distinguish between being relatively better off and relatively worse off materially.
- (iii) There is no society whose members in general do not prefer to be better off materially and that the relatively modernized societies are always superior to the relatively non-modernized societies (Levy, 1969: 125-129).

After contacts between the relatively modernized and non-modernized societies have been made, in addition to gradual erosion of some existing structures, many structures with long pedigree of stability begin to change with great rapidity. The results of behaviour of people

also change in terms of goods produced. The major sources of control on the relatively non modernized societies are always eroded.

There always appears to be something in transfer from modernized societies for somebody and frequently there appears to be something in it for everybody. Once the process of modernization has began, previous conceptions of sovereignty, independence, maintenance of tradition, and the like are doomed. Levy concludes by saying that in the modern world, the problem par excellence for the members of every relatively non modernized society is modernization itself.

This theory has been criticized for establishing the stages of growth which all countries have to pass through. This establishment of stages of development does not hold any logic as ultimately it has reduced the study of historical process of development to what Larraine (1989:99) has preferred to call "the construction of abstract models of universal applicability, "without recognizing the existence of some historical differences between the developed and developing countries".

Although modernization theory has its own criticisms, it is, however, useful in explaining peoples' attitudes towards conservation of indigenous leafy vegetables with introduction of exotic vegetables and commercialization of agriculture in Suneka Division.

As seen earlier, Levy (1969), asserts that as the level of specialization increases, the level of self sufficiency decreases. This is true when considering specialization of cash crops in relation to conservation of indigenous leaf vegetables whereby women's labour is diverted to production of cash crops and thus less time for production of indigenous leafy vegetables. This view of specialization by Levy is shared by Haviland (1983), who adds that instead of raising crops and livestock for their own use, people turn more and more to production of cash crops, with greater reliance on a cash economy and markets for the sale of farm products. Thus, the self-sufficiency in production of indigenous leafy vegetables declines with specialization on cash crops where much of the labour and time is devoted to.

Levy argues that once the process of modernization has began, previous conceptions of independence and maintenance of tradition are doomed. This is shared by Rostow (1960) who asserts that in the pre-conditions for take off stage, people have to change their traditional attitudes by accepting those from the modernized societies. This is true of the attitudes formed towards indigenous leafy vegetables. The eating habits is affected where indigenous leafy vegetables and other indigenous foods are seen as low status foods despite their nutritive value. In addition to this, the family as an educational unit has had its role cut radically as argued by Levy. Instead, more education takes place in non-family contexts with increasing modernization. This poses a problem to conservation of indigenous leafy vegetables by women as the younger generations form negative attitude to indigenous leafy vegetables as being bitter and instead prefer exotic vegetable which they only fry and are considered not to be bitter. Also, as Levy argues, is that relatively modernized societies are

superior to non-modernized societies. Thus, that negative attitude towards indigenous leafy vegetables is formed that they are for low class people. All these problems are due to modernization.

2.2.1 Socialization Model

Socialization is the way culture is transmitted and the individual is fitted into an organized way of life (Broom and Selzick 1955:84; Olatunde and Ademola 1985:57) and it is a life long process. Through the process of socialization, the child learns to take attitudes toward himself or herself and to other subjects. How a child learns to behave in earlier life has implications for what the child may be like in future, that is, his or her behavioural patterns in the years to come. Personality traits and overall patterns of personality are greatly dependent upon the cultural matrix in which the child develops.

Socialization humanises the biological organism and transforms it into a self having a sense of identity, capable of disciplined and ordered behaviour, and endowed with ideals values and aspirations. Broom and Selzick (1955), assert that socialization inevitably produces a degree of conformity. People brought up under similar circumstances tend to resemble each other in habits, values and personality. Suda (1991) observes that ideas about what patterns of behaviour and activities are appropriate or inappropriate for women and men are largely social and cultural in origin and are acquired through the socialization process. From the time children are born, they are socialized into different roles on the basis of their sex.

Women are socialized to be affectionate, submissive, conformists, supportive nurturant and docile. Men on the other hand, are expected to be achieving, competitive, aggressive and adventurous (Robertson, 1981 quoted in Suda, 1991). The above stereotypical traits about women are considered compatible with women's expressive role and images as wives, mothers and home makers. The theory is relevant to the topic under study as women are socialized as they grow up that it is their role to cultivate, store, preserve and cook indigenous leafy vegetables and other foods. Through socialisation, we also learn the values, beliefs, norms, behaviours and symbols of our society. Socialization can also be used to explain Abagusii cultural beliefs about food and particularly indigenous leafy vegetables which influences their conservation. This is because individuals are taught the importance of vegetables to be eaten by certain categories of people and those that are discouraged at certain occasions.

2.3 Hypotheses

From the literature review, the following hypotheses were tested and validated or rejected on the basis of the research findings.

- (i) Socio-cultural factors are likely to influence women's conservation of indigenous leafy vegetables.
- (ii) Production of exotic vegetables and other cash crops have negative influence women's conservation of indigenous leafy vegetables.
- (iii) Lack of nutrition education is likely to have a negative influence on women's conservation of indigenous leafy vegetables.

2.4 Definition of terms

Many of the terms used in this study have varied meanings. This section aims to clear any confusion that may arise.

Socio-cultural factors:- In this study, socio-cultural factors refer to the social and cultural practices and attitudes that influence the health and well-being of a community.

practices and attitudes

and inherited traditions

taboos particularly

Exotic vegetables:-

These are the vegetables that are not native to the local community from other countries.

community from

sale and consumption.

French beans and

Cash crops:-

These are crops that are grown for sale and profit.

tea, sugarcane and

Nutrition education:-

In this study, it refers to the process of providing information and education to the community about the importance of a healthy diet and the role of various nutrients in the body.

value of indigenous

vitamins and minerals

diseases such as

scurvy.

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the female adults who are 18 years and above.

producers and have knowledge of use of the leafy vegetables.

that consist of edible leaves of plants such as amaranth, cowpeas, blacknightshade and spider herb.

referred to as indigenous as they have not been introduced to the region or community from outside.

organism utilizes food. In nutrition,

from disappearance of indigenous leafy

destruction of natural vegetation where

aid by cultivating, preserving, storing

led by women in the cultivation,

storage and consumption of indigenous

bles.

of genetic variation present in a population or

involves the different types of indigenous leafy

CHAPTER THREE

RESEARCH METHODOLOGY

Genetic erosion:-

Loss of genetic diversity over time. In this study, it is the disappearance of different types of indigenous leafy vegetables which used to be consumed.

3.2 Introduction

This chapter focuses on giving details concerning the study area, sampling procedure,

methods of data collection and data analysis. Suneka division of Kisii district was

Germplasm:-

In this study, germplasm is used to describe different indigenous leafy vegetables with similar genetic characteristics that may be conserved and used.

assess the role women are playing in the conservation of indigenous leafy vegetables.

An assessment of their low production was also undertaken.

Nutrition:-

The process by which an organism utilizes food. In nutrition, food or anything normally ingested by the organism is utilized by the process of digestion for the purposes of maintenance of life, growth, normal functioning of organs and production of energy.

3.1 Research Site Description

Suneka Division (Map 1) is one of the eleven (11) divisions in Kisii District of Nyanza

Province and lies on the western part of the district. The other divisions include

Mesocho, Nyamarambe, Marani, Masiba, Kerumbu, Nyamache, Sarata, Ogemo,

Kenya and Nyachei. The division covers an area of 123.4 KM² and is divided into

five locations and fourteen sub-locations.

3.1.1 Population Size

The 1989 census reported that Suneka Division had a population of 62,967 persons

where the number of females was 34,118 and that of males was 29,849, with a density

of about 534 persons per km² (KIDDP, 1994). The overall population of Suneka

Division is dominated by females. For example, the number of females in

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

This chapter focuses on giving details concerning the study area, sampling procedure, methods of data collection and data analysis. Suneka division of Kisii district was chosen as the area of study. The district has many vegetables and it has been possible to assess the role women are playing in the conservation of indigenous leafy vegetables. An assessment of their low production was also undertaken.

3.1 Research Site Description

Suneka Division (Map 1) is one of the eleven (11) divisions in Kisii District of Nyanza Province and lies on the western part of the district. The other divisions include Mosoch, Nyamarambe, Marani, Masaba, Kerumbu, Nyamache, Sameta, Ogembo, Kenyena and Nyachekei. The division covers an area of 123.4 KM² and is divided into five locations and fourteen sub-locations.

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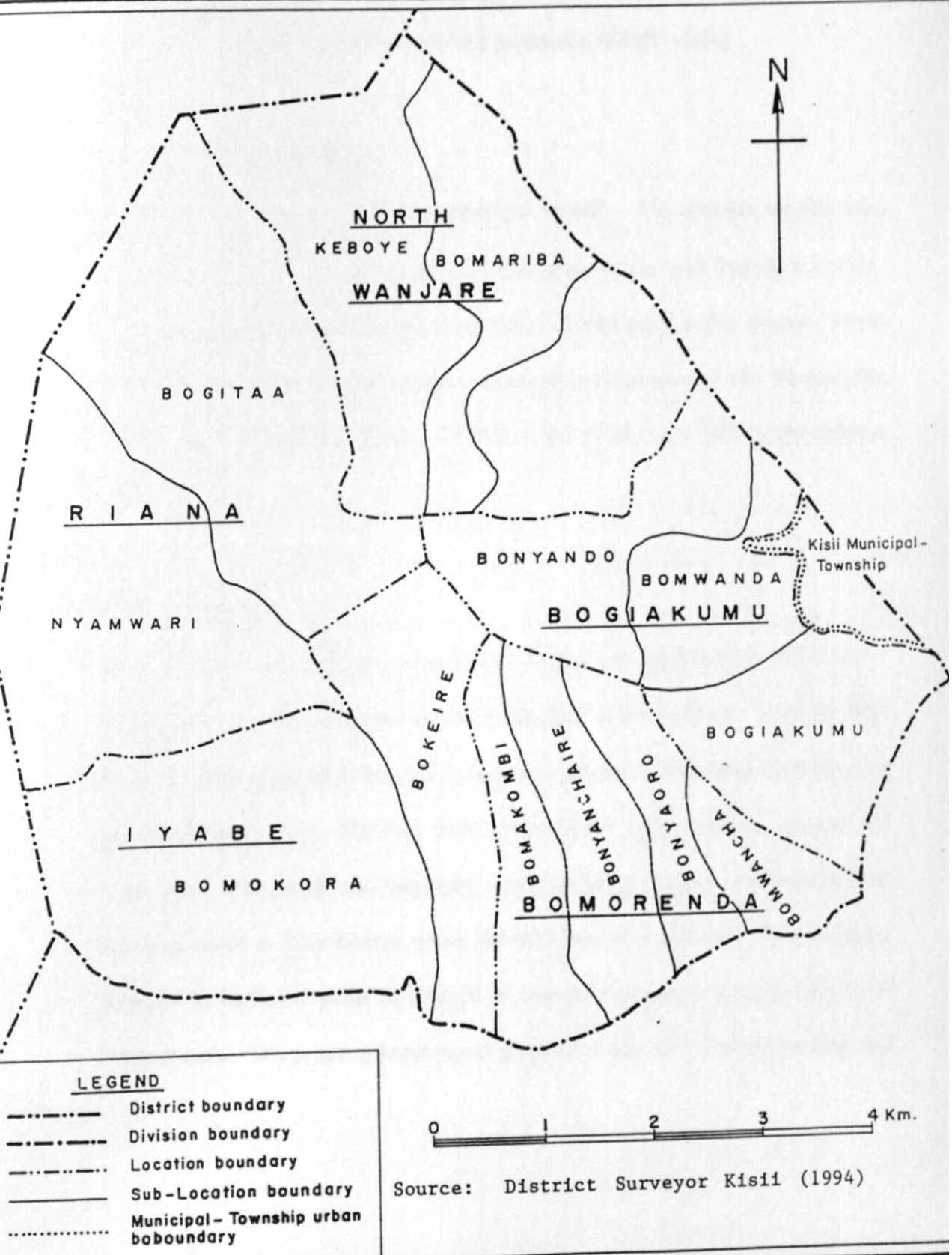
Division is dominated by females. For example, the number of females in

LEGEND

- District boundary
- Division boundary
- Location boundary
- Sub-Location boundary
- Municipal - Township urban subboundary

Source: District Surveyor 1989

Map 3.1: Suneka Division: Administrative Boundaries.



The 1979 census was 23,698 which increased to 34,118 in the 1989 census, compared to 11,786 males in 1979 census and 29,849 in the 1989 census. It is also majority of the females (87%) who reside in the rural areas and provide 80% of the labour for food production and more than 50% for cash crop production (KDDP, 1994).

Climate and Physical Features

Suneka Division lies on a highland equatorial climate. The division receives rain throughout the year. The mean annual maximum temperatures range from 22°C to 26°C. Its average annual rainfall received is usually over 1,500mm and is highly reliable. There are several permanent rivers and streams which drain the area into Lake Victoria, the main ones being Riana and Lyabe. Nsaria is one of the main hills in the division (KDDP, 1994).

Economic Activities

Suneka Division has 78.4 km² cropped land of the total land area of 123.4 km². Agriculture is the main economic activity undertaken in the Division. High and well distributed rainfall supported by good soils enable growing of cash crops like sugarcane, bananas, tea and coffee. The food crops grown include maize, cassava, potatoes and finger millet. The people also keep dairy cattle, poultry and sheep. Horticulture is an upcoming sector in Kisii District where Suneka Division is included. This is mainly attributed to increased yields as a result of improved extension services and use of certified seeds. The prices of horticultural goods have also been very encouraging and

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farmers are now going into the business with more seriousness. More land has been allocated for horticultural production (KDDP, 1994).

3.1.5 Status of Women

Horticultural crops grown are onions, pineapples, beans cabbages, Kales, tomatoes, Sunflower, French beans, soya beans, green grams, spinach, sweet potatoes and citrus fruits. These crops are sold at Suneka Market which is situated on the Kisii-Migori main road and other markets outside Kisii District. Some of the Kales and cabbages are sold to secondary schools and hospitals. The indigenous leafy vegetables grown include spider herb, blacknightshede, vine spinach, cowpeas and pumpkin leaves. There is also mining of granite in Suneka Division at Bogiakumu which is used in the building industry. The granite is mined and taken to Athi River for processing into tiles. The full exploitation of this mineral is inhibited by its small market. The granite is only mined when the mining company gets orders. Bricks and tiles are also made from clays in the valley. The exploitation of the mineral is inhibited by lack of organized co-operatives (KDDP, 1994).

3.1.4 Nutrition and Health

The major killer diseases in Kisii District where Suneka Division is included are: Malaria, Anaemia, respiratory infections, tuberculosis, diarrhoea, meningitis, measles and pneumonia. The proportion of stunted children growth is reported to be very high in the district due to low intake of nutritious foods. The low nutritional levels in the

3.2.0 district is partly attributed to lack of taking balanced diets due to ignorance among the mothers (KDDP, 1994).

3.1.5 Status of Women

3.2.1 A large proportion of women in Kisii District are illiterate. This has been caused by high dropout of girls from schools. Girls enrolment rate in Secondary School in the district is only 45% compared to that of boys (KDDP, 1994). Due to cultural beliefs, women do not own land. However, these beliefs are changing and some women have begun to acquire commercial plots in the urban centres. The number of households headed by single mothers in the district are insignificant.

3.1.6 Socio-Cultural Factors

3.2.2 There are a number of beliefs among Abagusii concerning food and especially indigenous leafy vegetables. For example, the spider herb is believed to add milk to the body for pregnant and lactating mothers (Buruchara and Okiomeri, 1986). It is also preferred for boys who have undergone circumcision rites. They are given to take during seclusion period. Lactating mothers are prohibited from taking blacknightshade for the belief that milk would disappear. Thus, in one way or the other, belief systems influence the conservation of indigenous leafy vegetables.

3.2.0 Population Universe

The Government of Kenya population census (1989) reports that there are 12,148 households in Suneka Division. The above figure of 12,148 was used as the population from which the sample for the study was obtained.

3.2.1 Population Sample

The units of analysis consisted of all the households in the division. This was because the household is the decision making unit as far as food and cash crop production is concerned. However, because of time and financial constraints, it was not possible to study all the households in the division. Therefore, a sample population of 150 households was selected and studied.

3.3.0 Data Collection Techniques

3.2.2 Sampling Procedure

In this study, purposive sampling and simple random sampling were used. The latter method was advantageous as it gives each member a non zero chance of being selected

3.3.1 Documentary Technique

(Babbie, 1989). Due to time and financial resources it was not possible to study the whole of Kisii district. Thus, the researcher choose Suneka Division as her area of study. The research site comprised of 5 locations with a total of 14 Sub locations. With the assistance of chiefs and sub-chiefs, all the villages in each sub-location were listed and one village was chosen using simple random sampling. This was done by assigning numbers to villages for each sub-location which were written on separate pieces of paper.

The separate pieces of paper for all villages in each sub-locations were then folded and tossed on a table one sub-location after the other. Then a folded piece of paper was picked and the village it represented and that sub-location was recorded down. After

the tossing exercise was complete for all the sub-locations, a list of 14 villages, each representing a sub-location was drawn. The next stage was the compiling of a sampling frame of women in each village. This was done with the assistance of the village headman of the sampled areas. The simple random sampling as applied above in the choosing of villages was used in getting the women who were contacted for interviews using standard questionnaire. A total of ten households were chosen from each village in each sub-location.

3.3.0 Data Collection Techniques

The methods used in data collection are: documentary technique, interviews, participant observation, key informants and focus Group Discussions (FGD).

3.3.1 Documentary Technique

Secondary sources were extensively used to supplement the primary data. These included both published and unpublished theses, books, dissertations, journals, and seminar papers. They were helpful in the general background of the problem which was investigated. They provided further orientation to the problem, and at the same time helped in eliminating the possibility of unnecessary duplication (Goode, 1952). The researcher was also able to identify some of the existing gaps related to women's

role in the conservation of indigenous leafy vegetables and some basic data on the relevant theoretical framework.

3.3.2 Interviews

The study adopted the survey research design within which the basic tool for data collection was structured interview. The questions were translated into the local Ekegusii language. Administering the questionnaire was easy for the researcher because she comes from the Gusii community. The personal interviews also enabled the researcher to get information from the illiterate women unlike self administering of the questionnaire. The questionnaire contained both closed-ended and open-ended questions. The closed ended questions are useful as they lead to standardized data which can be compared from one person to another and thus can yield a high level of reliability. The answers are also much easier to code and analyze, and can be coded directly from the questionnaire (Bailey, 1978).

Given the fact that relevant information may be omitted because closed - ended questions have fixed response sets, open-ended questions were used where probing was necessary and eliciting of more information not provided by closed ended questions - (Babbie, 1989).

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3.3.4 Key Informants

3.3.3. Participant Observation

According to Bailey (1978) and Moser (1971), the observation method is the primary technique for collecting data. According to Foster *et al* (1979), participant observation can yield an understanding of social change that is simply not possible in any other way.

It can yield reliable results on sensitive topics when the researcher already speaks the same language of the people and has some background knowledge and experience; what Spradley (1980:50) calls "explicit awareness" of the little details in life. The main disadvantage of the method is that it takes much time to be useful for a programmed

study such as this one. Fortunately, for this study, a part from the few days spent in the field and participation in the respondents daily activities, this was possible on the account that the researcher is from the community studied and previous experiences and participation in community activities necessitated its application as a method of data collection as noted by Njiro, 1990.

There was also need to establish rapport so as to be accepted by the informants by identifying with them. In this study, it was not a problem because the researcher speaks the same language as the respondents which facilitated easy communication. The researcher being a woman also participated in various activities without suspicion. Observation was also made on the types of indigenous and exotic vegetables grown including what was consumed in the household most of the times.

3.3.4 Key Informants

In-depth interviews were carried out with older women of the community who are well versed with the traditions and can recall the past. This was easily done as the researcher in her questionnaire had a question on naming a person more knowledgeable on cultural beliefs in the community. They were of much help especially on cultural beliefs connected to indigenous leafy vegetables which were not remembered by the interviewees. Other key informants interviewed included agricultural extension officers and women group leaders.

3.3.5 Focused group discussions

Focus groups were guided group discussions aimed at exploring the issue of conservation of indigenous leafy vegetables by women. The meetings usually started with a word of prayer and then introduction of the researcher from one of the group members.

For the purpose of this study, three FGDs were held. The first FGDs to be organized was in Bogitaa Sub-location with MOGONCHI women Group. There were eight discussants. The discussion took place under a tree at one of the members' home where they usually hold their meetings. The researcher was introduced to the group by a social worker trainee who was on field attachment. She helped the researcher to take notes as the discussion went on.

The second FGD was conducted in Bomwanda sub-location. The day it was supposed to take place failed as there was a lot of rain and the discussants didn't turn up. The Chief who had organized the meeting for the researcher advised her to come the following week on Monday when he usually conducts his Barazas. It was a successful one as many people turned up among whom were women. The chief introduced the researcher to the congregation and requested the women to give her any assistance she needed. This was done almost at the end of the Chief's Baraza. The researcher had discussion with fifteen discussants. As the group was big for the discussion, it was divided into two. Thus one group comprised of seven discussants and another eight. Each group discussed with the researcher separately.

The third FGD was held at the grounds of Suneka Divisional headquarters. This was done with the assistance of Suneka Agricultural Extension Officer. There were six discussants. In all the three FGDS, the researcher made some short notes with the assistance of a helper. The assistant's notes were later compared and complemented by the researcher's. The FGD method was vital to the study as it enabled comparison to be done from the discussion with discussants and the responses from the interviews. The focus group discussion also helped to break the monotony of moving from one household to another and also facilitates data within relatively short time as noted by (Njiro, 1990).

3.4 Methods of Data Analysis

The data for this study were analysed through qualitative and quantitative approaches. The qualitative approach was used in discussing data gathered or collected through the focused group discussion and key informants. Descriptive statistics were made use of for quantitative approach whereby percentages and frequencies of various responses were calculated and the information presented in the form of tables.

3.5 Problems encountered in the field

Although the research was successfully carried out, the researcher encountered some few problems. The researcher sometimes failed to get the respondents at their respective homes on the day of interview. This was mostly on the market days which were Sundays and Wednesdays for Suneka Market while for Taraja Mbili in Kisii town was on Mondays and Thursdays. This kind of problem was overcome by informing the children or neighbours to inform the female adult of the home that the researcher was to be around on a chosen day which was not a market day. Through such appointment, the researcher met the informant at home and interviewed her.

Another problem was that of being asked to give some money by some respondents before information was passed over. However, the researcher overcame the problem by explaining that she was a student and that the information given to her was for the benefit of the future generation as it may prevent the dying of the Abagusii tradition.

They then agreed and commented that it is good to save the traditions from dying and then freely gave the information.

INDIGENOUS LEAFY VEGETABLES

Another problem encountered was when the researcher found more than two women in a home she had gone for interview. It was hard interviewing the intended respondent as the others would comment and in the process confuse the informant who eventually keeps quiet. In such a case, the researcher requested the rest of the women to have a few minutes with the intended informant by moving aside and discussing with her.

Another problem was that of getting the exact age of the respondent. This was the case with the old female adults who were not sure of their age. This was solved by asking the respondent the age of her first born and the age she was when she got married. From here, it was easy to calculate the respondents' age. At times, help was

got from the respondents' sons if they were around.

		%
15 - 24		-
24 - 34	27	18.0
35 - 44	46	30.7
44 - 54	40	26.6
55 - 60	26	17.3
65 and above	11	7.3
Total	150	100

CHAPTER FOUR

WOMEN'S ROLE IN THE CONSERVATION OF INDIGENOUS LEAFY VEGETABLES

4.0 Introduction

This chapter focuses on the role played by women in the conservation of indigenous leafy vegetables. The following variables were examined: clearing, breaking the soil, seed selection, planting, weeding, harvesting, preparation, preservation and pests control. The socio-cultural factors which influence women's conservation of indigenous leafy vegetables are discussed.

4.1 Demographic Characteristics

There were 150 respondents in the sample who comprised of only females. Their ages are presented in table 4.1 below.

Table 4.1: Age of Respondents

AGE	FREQUENCY	%
15 - 24	-	-
24 - 34	27	18.0
35 - 44	46	30.7
44 - 54	40	26.6
55 - 60	26	17.3
65 and above	11	7.3
Total	150	100

Of the sampled respondents, 30.7% of the respondents were aged between 35 and 44 years. There were 26.6% aged between 44 and 54 years. The respondents aged between 25 and 34 years were 18%. There were 7.3% of the respondents aged between 55 and 64 years while 7.3% of the respondents were above 65 years. It can be noted from Table 5.1 that majority of the respondents were aged between 35 and 44 years while those above 65 years had the lowest number. All the respondent's were aged 25 years and above. This is probably because majority of those under 25 years are in schools and colleges while those who have finished school are in towns looking for employment. The respondents above 65 years had the lowest number.

On the side of education, 33.3% of the respondents had none; 57.3% are primary school leavers 2.7% secondary school leavers and 6.7% were college leavers. It is noted that the number of secondary leavers is the lowest. This could probably be because majority of school drop outs are at primary level. Also, it could be that the secondary leavers are working far from home.

From the study, 90.7% of the respondents were engaged in agriculture; 6.7% in formal employment and 2.7% in self employment. The higher percentage of female adults were engaged in agriculture probably because some are school dropouts or didn't go to school at all.

Concerning whether there were crops tended along gender lines, 67.3% said yes while 32.7% said no. For those who said yes, they noted that men are usually in charge of cash crops while women are in charge of vegetables and food crops. The reason given for this was that they grew up and found the trend like that and even after their marriage. This was said to be as a

result of the culture where women traditionally were involved in vegetable and food crop production and preparation of food for the family while men were heads of household controlling the resources. The 32.7% of the respondents said they are the heads of the household and are in charge of all crops as their husbands had passed away. 2.7% said their husbands were away from home for work and thus were charged with that responsibility while 10% said they share the responsibility of looking after the crops.

- | | |
|------------------------------|----------|
| 1. Spider herb | Chinsaga |
| 2. Blacknightshade | Rinagu |
| 4. Pumpkin Leaves | Risosa |
| 5. Spinach | Enderema |
| 6. African Spinach (Mchicha) | Emhoga |
| 7. Jute (Mkenda) | Omotere |

Data on marital status showed that 79.3% were married, 20% widowed and one respondent (0.7%) single.

4.2 Role of Women in the Conservation of Indigenous Leafy Vegetables

Among the Abaqali, the spider herb and the blacknightshade rank among the top of the most liked vegetables in the community and as such they play an important role. This will be seen when looking at the socio-cultural beliefs connected to indigenous leafy vegetables. It is also noted by all respondents that female adults are more knowledgeable about indigenous leafy vegetables. The reasons given for being more knowledgeable were culture which was supported by 85.3% of the respondents and culture in combination with schooling supported by 14.7% of the respondents. In arguing for culture, the respondents said that women's work traditionally included vegetable and food crop production and preparation among other reproductive roles. This was as a result of traditional division of labour whereby men's work included fencing, grazing the cattle and building houses among other works. Thus the respondents said that this traditional division of labour has continued until today and that is why women are the major conservers of indigenous leafy vegetables. Schooling of younger generation has also left female adults with a lot of work including conservation of indigenous leafy vegetables. Traditionally they could be helped by female children who by introduction of

formal education are most of the times in school, colleges and working or looking for jobs in big towns.

In discussing the role played by women in the conservation of indigenous leafy vegetables, it is important to know which types of these vegetables are produced by the Abagusii women.

These are:-

- | | | |
|----|------------------------------------|----------|
| 1. | Spider herb | Chinsaga |
| 2. | Blacknightshade | Rinagu |
| 3. | Cowpeas | Egesare |
| 4. | Pumpkin Leaves | Risosa |
| 5. | Vine Spinach | Enderema |
| 6. | African Spinach (<u>Mchicha</u>) | Emboga |
| 7. | Jute (<u>Mlende</u>) | Omotere |

Among the Abagusii, the spider herb and the blacknightshade rank among the top of the most liked vegetables in the community and as such they play an important role. This will be seen when looking at the socio-cultural beliefs connected to indigenous leafy vegetables. It is also important to make clear that Jute (mlende) is not indigenous to the Gusii community though it has been used for a long time but has been introduced from outside the group by intermarriage and sharing of market by surrounding ethnic groups.

The role played by women from production to consumption of indigenous leafy vegetables is presented and discussed as follows:

2.1 Clearing and Breaking of the Soil for Production of Indigenous Leafy Vegetable

The respondents were asked the person who does planting of indigenous leafy vegetables.

Table 4.2 illustrates their responses.

Table 4.2 Clearing of Land for Production of Indigenous Leafy Vegetables

Clearing	Frequency	%
Male adult	17	11.3
Female adult	116	77.3
Male children	16	10.7
Female children	1	0.7
Total	150	100

Of the sampled respondents 77.3% of the clearing is done by female adults, 11.3% by male adult, 10.7% by male children and 0.7% by female children. Table 4.3 shows that the breaking of the soil is done by 80.7% of the female adult, 8.7% by male adult, 9.3% by male children and 1.3% by female children.

Table 4.3 Breaking of the soil for production of Indigenous leafy vegetables.

Breaking the Soil	Frequency	%
Male adult	13	8.7
Female adult	121	80.7
Male Children	14	9.3
Female Children	2	1.3
Total	150	100

From Table 4.2 and 4.3 it is evident that female adults are mostly involved in clearing and breaking of the soil. This could probably be because the production of these indigenous leafy vegetables is done on a very small scale (small portion of land is devoted to their growing) which is usually done as kitchen gardening. Also, since the vegetables are grown around the

homestead which is usually kept clean or slashed frequently it makes it easier to use an hoe in both clearing and breaking the soil without use of slasher. This also can explain why a larger percent of women are the ones who do much of the clearing and breaking of the soil. The children who could have done it are most of the times at school.

4.2.2 Planting of Indigenous Leafy Vegetables

With deforestation and modernization of agricultural practices as seen earlier by Seme *et.al.* (1992), there is disappearance of traditional crops which used to grow wild indigenous leafy vegetables being included. This means that they have to be planted. The following presentation shows the planting of various indigenous leafy vegetables. It was found out that 99.3% of the planting of indigenous leafy vegetables was done by female adults with 0.7% done by female children as shown in Table 4.4 below.

Table 4.4 Planting of Indigenous Leafy Vegetables

PLANTING	FREQUENCY	%
Male adult	0	-
Female adult	149	99.3
Male children	0	-
Female children	1	0.7
Total	150	100

Spider herb

It is called **Chinsaga** in Gusii community. In asking why it is given that name, it was explained by the respondents and even elderly key informants that they grew up and found that is called

that name. This was the same with the other indigenous leafy vegetables studied. Chinsaga is broadcasted although at times ordinary planting is carried out. This was supported by 55.3% of the respondents. This kind of vegetable does well on loamy soil (very fertile) as indicated by 100% of the respondents. Its cultivation requires moderate rainfall. All the respondents (100%) said that this type of vegetable is not drought resistant. It was found out that if spider herb is planted when the rain is too much, it can either not germinate or can germinate but become brownish and its survival in the field becomes very short-lived.

When inquiring on the type of fertilizer used in production of indigenous leafy vegetables, 80% use inorganic fertilizer, 9.3% use organic and 10.7% use both organic and inorganic fertilizer. The respondents explained that if both organic and inorganic fertilizers are used in the planting of spider herb, the output will be very high in the first harvesting but will deteriorate in the next planting season if organic fertilizer is not used again. The respondents said that organic fertilizer destroys the soil and gave an example of Di Ammonium phosphate (DAP) which they said does not do well with spider herb as the roots are shallow and do not go deep into the soil. When DAP is used, the spider herb can germinate but become reddish and dry up. It was also added that when cooked they become bitter and their food value (nutritional value) decreases. They do not taste like the ones which are planted using inorganic fertilizer.

Spider herb can also be intercropped with other crops. This is especially with mlende and African Spinach. Traditionally, the vegetable used to grow wild but due to soil infertility, it has to be planted.

Blacknightshade

It is called **Rinagu** in Gusii community. The vegetable does well on loamy soil as indicated by 100% of the respondents. The seeds are put in a nursery bed then transplanted after a month if rainfall is reliable. When planting it, the rainfall should be moderate and not too much. This type of vegetable can be grown in rows and not broadcasted. This was supported by 2% of the respondents and 27.3% who talked of both blacknightshade and cowpeas as grown in rows. It is rarely intercropped with other crops as it grows closely though with modern methods of production, intercropping can be done. The vegetable is not drought resistant as said by the respondents with the exception of exotic type known as **Ekerasta**.

Cowpeas

It is known as **Egesare** in Gusii community. It was noted that the vegetable can do well in loam soil, sandy soil and any type of soil. The respondents who supported loam soil were 25.3%, any type of soil were 66.7% and sandy soil were 8%. The vegetable does well with minimum amount of rainfall.

It does well without the use of fertilizer. It is grown in rows as indicated by 70.7% of the respondents. The vegetable is also drought resistant as indicated by 24.7% of the respondents.

Pumpkin leaf

It is called **Risosa** in Gusii community. It does well on loamy soil as supported by 100% of the respondents. The seeds can be broadcasted and after germination be transplanted. It doesn't

need intercropping as it spreads. The vegetable is drought resistant as supported by 64% of the respondents.

Vine spinach

It is known as **Enderema** in Gusii community. It does well on loamy soil as indicated by 98.7% of the respondents or on any type of soil as indicated by 1.3%. The stalk of the vine spinach is what is planted. It has no seeds. A stick is used to hold it and also makes the vegetable to spread on it. It can also be planted next to a fence so that it spreads on it. It is intercropped with other crops as it is only a stalk which is planted. If there is nothing to support it like a stick and if left to spread on the ground, the leaves become thin and can be short lived in the field. The vegetable is drought resistant as indicated by 64% of the respondents.

Jute (mlende)

It is known as **Omotere** in Gusii community. It does well on loam soil as said by 15.3% of the respondents and any type of soil as indicated by 16.7%. The other respondents (68%) said they didn't know the type of soil suitable for its cultivation. This can be due to the fact that it is not original with the Abagusii community. Thus, there can be those consuming it by buying from the market but not cultivating it. The vegetable is planted by broadcasting and can be intercropped with other crops like spider herb. It is also drought resistant.

From the above discussion concerning planting of indigenous leafy vegetables, it is seen that all the vegetables with the exception of cowpeas need fertile soils.

4.2.3 Weeding of indigenous leafy Vegetables

The vegetables need some weeding done after planting so as to stay long in the field and also for continued harvesting to be done. It was found out that 99.3% of the respondents who did weeding were female adults and 0.7% was female children as shown in Table 4.5.

Table 4.5 Weeding of Indigenous Leafy Vegetables

Weeding	Frequency	%
Male Adult	0	-
Female Adult	149	99.3
Male Children	0	-
Female Children	1	0.7
Total	150	100

Spider herb

Weeding for spider herb is done after two weeks from planting period. This is called okoiyana (thinning) so that the remaining ones can get space to become fat (chiagarare) and have wide leaves (amasabore). When thinning is done, the thinned spider herb called omonyenye is eaten while unedible weeds are thrown away. The 99.3% of the female adults who are mostly involved in weeding of indigenous leafy vegetables said it is due to schooling of female children who usually help their mothers in such kind of work as defined and perpetuated by traditions.

Blacknightshade

Weeding is done using a small jembe together with one's hands. The weeds are removed by the hand and then the jembe is used to put soil to the plant so that the roots are not exposed to the sun.

Cowpeas

Weeding is done using a jembe. It does not have a lot of work as compared to spider herb and blacknightshade. This is because it grows on any type of soil as supported by 66.7% of the respondents while the other two grow and do well on fertile soils. This makes other weeds to also grow very fast. Thus, if digging is done well before planting and more especially if it is a sandy place, weeding for cowpeas does not become much of a problem

SEED SELECTION	FREQUENCY	%
Male adult	-	-
Female adult	150	100
Male Children	-	-
Female Children	-	-
Total	150	100

In this section of seed selection, it is important to know the variation within different types of vegetables as it affects seed selection. The vegetables which the respondents said had variation within themselves included African spinach, blacknightshade, cowpeas and pumpkin leaf.

Pumpkin Leaf and Vine Spinach

The weeding for pumpkin leaf and vine spinach is also done easily. Weeding for vine spinach is done using a jembe just putting soil around the plant. Weeding for pumpkin leaf is done using hands for removing the weeds. Weeding for mlende (jute) is also by use of hands.

4.2.4 Seed Selection

When planting indigenous leafy vegetables, it is not any type of seeds which is planted. Seed selection is done. It was found that 100% female adults are the ones involved in seed selection as shown in Table 4.6.

Table 4.6 Seed Selection for Indigenous Leafy Vegetables

SEED SELECTION	FREQUENCY	%
Male adult	-	-
Female adult	150	100
Male Children	-	-
Female Children	-	-
Total	150	100

In this section of seed selection, it is important to know the variation within different types of vegetables as it affects seed selection. The vegetables which the respondents said had variation within themselves included African spinach, blacknightshade, cowpeas and pumpkin leaf.

The different types for African Spinach include:

- (i) **Ototo**
- (ii) **Emboga Yekegusii**
- (iii) **Omoteogo**
- (iv) **Riboroche**

The above types are differentiated by their leaves, height and thorns. The ototo type is one with wide leaves. The Emboga Yekegusii has thin leaves and it is given that name because it is indigenous with the Gusii community. The others have been introduced to the community. Omoteogo or Risoaso is one which has thorns while Riboroche is one which grows four inches feet. The respondents said that Riboroche was introduced from the Kalenjin community but the one with white leaves is indigenous with Abagusii. From the study, it was found that 46% of the respondents knew of two different types of African spinach which are Ototo and Emboga Yekegusii. There were 51.3% of the respondents who knew of four different types of African spinach named above. The other respondents knew only one type of African spinach. The Ototo was only known by one respondent (0.7%), two respondents (1.3%) knew of Emboga Yekegusii and one respondent knew (0.7%) knew of only Riboroche. It can be seen from the above that majority of the respondents know of more than one type of African Spinach.

The different types for Blacknightshade include:

- (i) **Oara**
- (ii) **Ekerasta**
- (iii) **Rinagu Riegesongo**
- (iv) **Rinagu Riekegusii**

The Oara type is one which is very bitter and can be differentiated by the colour of the leaves as they are very dark with white flowers. The Ekerasta type is one which is drought resistant. It is also very dark all over the body including the petioles but is differentiated from Oara as its seeds are dark and very big while those of Oara are dark but very small. The Rinagu Riekegusii is one which is indigenous to Gusii Community while Rinagu Riegesongo is the high breed with orange seeds. From the study, it was revealed that 46% of the respondents knew of two types of blacknightshade (Rinagu Riekegusii and Rinagu Riegesongo). There were 22.7% who knew of the above mentioned four type of blacknightshade. There were 22.7% of the respondents who only knew of Oara; 1.3% of knew of only Ekerasta; 6% knew of only Rinagu Riekegusii while 1.3% of the respondents knew only Rinagu Riegesongo. It can be noted from the above that majority of the respondents know more than one type of blacknightshade.

The different types for cowpeas include:

- (i) Black cowpeas (Endandanse)
- (ii) Egesare giekegusii (indigenous Gusii Cowpeas)

The black cowpeas also known as Endandanse has wide dark leaves and is said to have originated from Luoland. The Egesare giekegusii is one which is indigenous to Gusii community and has thin leaves which are not dark. From the study, it was noted that 11.3% of the respondents knew of only the black cowpeas. The Egesare giekegusii was represented by 32.7% of the respondents. The number of respondents who knew both types of cowpeas was 52.7% while 3.3% of the respondents said they did not know the variation within the cowpeas species.

The different types within pumpkin leaf include:

- (i) pumpkin leaf eaten with a fruit
- (ii) pumpkin leaf not eaten (one which produces gourds)

The number of respondents who knew both types of pumpkin leaves was 51.3%. The pumpkin leaf eaten was represented by 32.7% of the respondents. The pumpkin leaf not eaten but produces gourds was represented by 10% while 6% of the respondents said they did not know of any variation within pumpkin leaf. The respondents said that the pumpkin leaf which is eaten can further be differentiated by their different colours of the fruit and leaves including ones with dark and whitish leaves but did not know the names given to them.

The presentation of variation within different indigenous leafy vegetables was highlighted as mentioned earlier for it affects seed selection. Thus, when selecting seeds, bitterness of the vegetable when mature is taken into consideration. Majority of the people, therefore, opt for seeds whose vegetables may not be bitter when cooked for utilization. Another factor taken into consideration on seed selection is soil types and adequacy of rainfall during time of planting. For example, if the soils are infertile and rainfall unreliable one may go in for cowpeas which does well on any type of soil with minimum amount of rainfall. The other factor taken into consideration is the type of vegetable most liked by the family members.

4.2.5 Harvesting of Indigenous Leafy Vegetables

After planting indigenous leafy vegetables, they take a certain period to mature before they are harvested. The harvesting is done by hand. Table 4.7 shows the person does the harvesting.

Table 4.7 Harvesting of Indigenous Leafy Vegetables

Harvesting	Frequency	%
Male adult	-	-
Female adult	112	74.6
Male children	-	-
Female Children	10	6.6
Female adult and Female Children	28	18.6
Total	150	100

From Table 4.7, it is seen that 74.6% of the harvesting of indigenous leafy vegetables is done by female adults. The female children who do harvesting represented 6.6% and 18.6% is done by both female adult and female children.

Spider herb

From the study, it was revealed that maturity period for spider herb ranges from two weeks to four weeks whereby 7.3% of the respondents talked of two weeks; 38.7% said of three weeks and 54% talked of four weeks. As noted by the respondents, with moderate rainfall and fertile soils, spider herb takes two weeks for the first harvesting to be done which is called thinning (**Okoiyana**). If the soil is not fertile and the rainfall unreliable, it can take three to four weeks to mature. After one month is over, the vegetables would have had wide leaves (**amasabore**). During the first harvesting or thinning both the mid ribs and the petiole are harvested. When the leaves have become wide enough, only mid rib is harvested.

As seen from above, majority of the female adults are involved in the harvesting of spider herb. This is due to schooling of young boys and girls. The respondents said that even with the presence of female and male children around, female adults like harvesting spider herb themselves for fear of over harvesting **Kong'ura** by the youngsters. If overharvested it becomes old quickly. The spider herb can be harvested twice a week if weeding is done frequently and when they are in a fertile place and also if not overharvested during the first harvest. If left for a long time without harvesting, they become old quickly and start having white flowers on the top. The vegetable produce seeds within three months. From the study, it can be seen that the spider herb is short-lived in the field whether in a fertile or non fertile place.

When in a fertile place, the pumpkin leaf can produce the fruits but the leaves can continue to

Blacknightshade

The maturity period of blacknightshade for harvesting ranges between three to four weeks. This was revealed in the study whereby 86.7% of the respondents supported four weeks and 13.3% were for three weeks. The three weeks talked of is after transplanting from the nursery has been done. The first harvesting done after three or four weeks is called **Okonatera** in which case the upper part is harvested so that it creates space for it to spread. The petioles and midrib are harvested. Harvesting can be done twice a week depending on fertility of the soil, frequent weeding and if not overharvested during the first harvest. When properly managed, can finish five months before becoming old.

Cowpeas

The maturity period of cowpeas for harvesting ranges between three to four weeks. This was shown in the study whereby 79.3% were for three weeks. Harvesting can be done thrice a

week. The respondents said that if harvesting is done frequently, it makes the cowpeas to be in good condition (**goseboka**). The leaves are the ones which are harvested. It takes three to four months before becomes old.

Pumpkin Leaf

The maturity period of pumpkin leaf for harvesting ranges from one and half to three months. The study showed that 78% of the respondents were for two months, 16.7% for one and half months, 4% for three months and 1.3% for two and half months. The petioles and midribs are harvested. It can stay for six months and disappear when the pumpkin fruit have appeared. When in a fertile place, the pumpkin leaf can produce the fruits but the leaves can continue to be harvested.

Vine Spinach

The maturity period of vine spinach for harvesting ranges from one and half months to three months. There were 76% of the respondents who talked of two months, 21.3% said one and half months, 2% talked of two and half months while one respondent (0.7) talked of three months. It is always there unless uprooted or cut down. Even after a long dry season, it sprouts again if not destroyed. From the above presentation, it can be seen that indigenous leafy vegetables are short-lived in the field.

2.6 Preparation of Indigenous Leafy Vegetables

When the indigenous leafy vegetables have been harvested, they are prepared or cooked for consumption. The respondents were asked the person who prepare the indigenous leafy vegetables and their responses are given in table 4.8 below.

Table 4.8 Preparation of Indigenous Leafy Vegetables

Preparation	Frequency	%
Male adult	-	-
Female Adult	116	77.3
Male Children	-	-
Female Children	4	2.7
Female Children and Female Adult	30	20
Total	150	100

From the table, 77.3% of female adults were involved in the preparation of indigenous leafy vegetables. The female children who helped in preparation were 2.7% while both female adult and female children were 20%. The preparation of different indigenous leafy vegetables is given below:

Spider herb

The cooking of spider herb involves boiling water first. This is because if cold water is used, the vegetables would become hard and bitter when eaten. They would taste badly

(Chigochinchima) when water is boiled first, the vegetables when cooked becomes tasty. The water is also let to boil first so as to make the over matured spider herb to cook fast.

75% of the respondents said that the spider herb goes bad after one day from harvesting.

When cooking has started, the fire is supposed to be in a simmering state as that is when they cook well and become tasty. If the fire is too much, it is said that they would not taste well. The leaves of bananas are used to cover the vegetables after the water has boiled and the vegetables has been put. This is done to prevent vapour coming out of the pot as this would make the vegetables not to be tasty **(Chigokuba)** and may become bitter. If the spider herb is hard or one which has matured and is almost becoming old, when cooked alone, becomes bitter. Thus, African spinach, pumpkin fruit, vine spinach, jute (mlende), sweet potato and sugar can be mixed with it so as to neutralize the bitterness.

After water is poured out after a few minutes of cooking so as to lessen the bitterness. The pouring of water can be done twice.

There is also the adding of blood of a cow to the vegetables to make them tasty. This practice used to be observed traditionally. However, it is fast disappearing due to modernization. It is rarely observed by a few individuals especially of the older generation. The respondents also said that when the spider herb has been put in the pot after water has boiled, one has to wait till the vegetables have cooked well before turning **(goonchora)** them. If turned before cooking well, they would become bitter. At the start of the cooking, enough water is put. If some water is added in the process of cooking, the vegetables would taste half-cooked **(Chigochinchima)**. It was also said by the respondents that, if spider herb is fried with cooking oil when fully cooked, they would taste bitter and loose taste.

Depending on one's liking, it can be cut before being cooked or can be cooked without cutting.

Some milk can be added to make it tasty. The respondents said that cowpeas can take between

It was also noted that the spiderherb after harvesting is supposed to be cooked on the same day. If it stays for a day and is known as Mosisi, when cooked, it doesn't taste well. Thus 58.7% of the respondents said that the spider herb goes bad after one day from harvesting. There were 39.3% who talked of two days while 2% of the respondents talked of three days. If kept in a cool place and no water is spread on them, spider herb can finish two to three days. It is, however, argued that for their taste not to be lost, they are to be cooked the same day they are harvested.

Blacknightshade

It can be cooked using cold water as they are not hard as spider herb when mature. They are soft and take short time to cook. If it is the bitter type like Oara, water is poured out after a few minutes of cooking so as to lessen the bitterness. The pouring of water can be done twice or thrice depending on one's choice. Alternatively, the African spinach can be mixed with them to neutralize the bitterness. It can also be mixed with jute and vine spinach. Milk can also be added to make them tasty. The respondents said if kept in a cool place and water is not spread on it, black nightshade can stay up to five days without going bad. They also noted that if it stays one day after harvesting before being cooked, that is when it becomes tasty. Thus, 62.7% of the respondents said it can finish three days without going bad, 31.3% talked of four days, 5.2% talked of two days and one respondent (0.7%) talked of five days.

Cowpeas

It can be cooked using cold water. It is mostly mixed with mlende though can be eaten alone. Depending on one's liking, it can be cut before being cooked or can be cooked without cutting. Some milk can be added to make it tasty. The respondents said that cowpeas can take between

two to five days before going bad if kept in a cool place and water is not spread on it. There were 87.3% of the respondents who said three days; 10% talked of two days and 2.7% talked of five days.

Pumpkin Leaf

It can be cooked without boiling water first. It can be mixed with jute, vine spinach and African Spinach to make them tasty. The respondents said that when it has been planted and the sheep eats it or if it is being stepped on by people, pumpkin leaf becomes bitter when cooked. Thus, if such kind of vegetable is cooked, water is poured out twice or thrice in the process of cooking. This to reduce bitterness. The respondents also said that it gets spoiled quickly after harvesting if not cooked on the same day. This was indicated by 72.7% of the respondents who said that the vegetable get spoiled after one day while 27.3% said that the vegetable can take two days before it gets spoiled if not cooked.

Vine Spinach

It can be cooked without boiling water first. It can be mixed with pumpkin leaf, African spinach, spider herb, jute and blackningtshade. The respondents said the vegetable can stay even upto five days if kept in a cool place. There were 80% of the respondents who talked of three days; 3.3% were for two days; 4.7% were for four days and 2% were for five days. The indigenous leafy vegetables are used as relishes (ebiriero) after preparation.

2.7 Preservation

The preservation of indigenous leafy vegetables can either be after cooking or when they are fresh from the garden after harvesting. Thus, after cooking the vegetables and eating some, the remaining is left in the cooking pot. If the place is too hot, there is no covering of the pot with a lid as too much heat would make them rot quickly and not to be used the following day. For the vegetables to stay longer even for a week before going bad, they are supposed to be kept in a cool place, warmed every morning and some milk can be added. One is also not supposed to remove or touch the vegetables with a hand. Instead, a cooking stick or spoon is supposed to be used for if a hand is used, the vegetables would go stale by the following day.

Preservation of vegetables can also be done after harvesting. The method used is by boiling them first for about five to ten minutes, dry in the sun then keep them for use in future. When boiling them, they are not supposed to cook fully. This method is meant for spider herb, blacknightshade and cowpeas. The other method is by drying in the sun without boiling first and this is the case with mlende. The vegetable like pumpkin leaf is never preserved using either of the two methods mentioned above. The respondents said that the vegetable is very soft and if dried in the sun, preserving it would be a problem as it would become like ash.

Traditionally, indigenous leafy vegetables used to be preserved for use during drought period. This was because there was only one season for digging during which the rains were much and the vegetables were a lot. The above two methods were the ones used for preservation. It was indicated by 63.3% of the respondents that indigenous leafy vegetables had to be boiled, dried

in the sun and the kept. There were 6% who said both methods of drying in the sun directly after harvesting and boiling them first while 30.7% said they did not know how preservation was done traditionally.

When the respondents were asked whether the traditional method of preservation has changed, 69.3% said yes while 30.7% did not know as they did not in the first case know how preservation used to be done. When the researcher asked why the preservation method has changed, there were various answers given. Of the sampled respondents, 31.3% argued for availability of exotic vegetables, 17.3% said that indigenous vegetables are few, 8.7% said there is no long dry period as in olden days, 11.3% argued for both factors of no long dry periods as in olden days and indigenous vegetables being few, one respondent (0.7%) talked of the preservation method being seen as unhygienic while 30.7 said they did not know.

It can be noted from the above answers that a large percentage argued for availability of exotic vegetables. Thus, if even drought comes, the exotic vegetables would be utilised. The respondents added that were it not for the availability of exotic vegetables, they would be preserving indigenous leafy vegetables as they would know there is no substitute. The 17.3% of the respondents who noted that indigenous vegetables are few, said that their production is low and is worsened by pests making the vegetables have holes in them. The infertility of the soil also makes the vegetables not to have wide leaves. When combined with pests' attack, it becomes a problem on how to preserve them because traditionally, the vegetables were a lot with wide leaves so that even if boiled and dried, they remained normal (as when fresh from the garden with wide leaves).

4.2.8 Storage of seeds

Since there is infertility of the soil and the indigenous leafy vegetables are no longer growing wild as they used to there is need to keep some seeds after each harvest for next planting season. The respondents gave various methods of seed storage as presented in Table 4.9 below.

Table 4.9 Methods of Seed Storage

Methods	Frequency	%
Polythene Paper	62	41.3
Tin	22	14.7
Pot	9	6.0
Bottle	3	2.0
Gourd	12	8.0
Polythene paper and tin	42	28.0
Total	150	100

The respondents gave some problems which they face in the production of indigenous leafy. It is noted that 41.3% of the respondents use polythene paper, 14.7% use tins, 6% use pot, 2% use bottle, 8% use gourd and 28% use both polythene paper and tin. It can be noted that majority of the respondents use tin and polythene paper. This is because they are the readily available. The tin can be used after cooking oil is over and the polythene paper can be bought. The gourd and the pot were normally used traditionally and are not a lot nowadays.

seeds have been put in their various containers, they are mixed with ash (**ribu**) to protect them from weevil eating (**Okobongwa**). The seeds are supposed to be kept in a warm place, not a cool place to avoid germination.

Control

There are some pests which attack indigenous leafy vegetables. The common ones include those which are given different names in Gusii community. These are **Obororo**, **Ekemonyo**

boke. The blacknightshade when attacked by **Ekemonyo** becomes coiled (boring) and sometimes dries up. This is the same with cowpeas. When cooked, they become bitter (**eringani**) and sometimes dries up. This is the same with cowpeas. When cooked, they

When **Obororo** attacks spider herb, it becomes reddish and may dry up. The respondents said ash and remains of locally brewed beer (**Emeseke**) are broadcasted on the vegetables for the pests to disappear.

Problems faced in the production of Indigenous Leafy Vegetables

Respondents gave some problems which they face in the production of indigenous leafy vegetables. From the study, 27.3% of the respondents talked of pests, 3.3% talked of chicken disturbance, 10.7% talked of seeds problem, 8.7% talked of no time for weeding, 41.3% talked of pests and chicken disturbance and 8.7% talked of birds' disturbance. It can be noted from the responses that the majority have problem of pests and chicken disturbance. Though the use of ash as mentioned earlier by the respondents in killing the pests, they do pose a problem as they do not disappear completely. The chicken also eat (**Gotoru**) the vegetables and take away the soil with their feet from the vegetables which have been broadcasted and those which are being harvested.

Table 4.10 Cultural Factors Connected to Indigenous Leafy Vegetables

Cultural Beliefs	Frequency	%
Used during drought period	9	6.0
help group, where youths are fully prepared to put their school agricultural knowledge into practice but have no seeds.	15	10.0%
Adds blood to the body	13	8.7%
Prevents diseases	5	3.3%
Adds blood to the body and prevents disease	24	16.0%
Used during drought and in ceremonies	12	8.0
conservation of indigenous leafy vegetables. This is in line with what Hansen and Dello (1970) noted. They argue that women are involved in the production, distribution, processing, preservation and consumption of food.	150	100

It is noted from the above table that 18.7% of the respondents said that they were used during drought period, in ceremonies, prevention of diseases and adding blood to the body. They were also used as relishes as indicated by 13.3% of the respondents.

The respondents were asked the cultural factors connected to indigenous leafy vegetables and their responses are presented in Table 4.10 below.

Some information given above is elaborated further in the presentation that follows which would show whether these cultural factors influence the contemporary conservation of these vegetables by Abagusii women.

4.4.1 Ceremonies in which Indigenous Leafy Vegetables were used traditionally

One of the cultural beliefs connected to indigenous leafy vegetables as shown in

Table 4.10 is that they were used in ceremonies. The respondents were asked

Table 4.10 Cultural Factors Connected to Indigenous Leafy Vegetables

Although 10.7% of the respondents had seed problem, it was also mentioned by Mogonchi women Group at Bogitaa sub-location, Seboka women group at Igonga and BIGOGO self help group, where youths are fully prepared to put their school agricultural knowledge into practice but have no seeds.

Cultural Beliefs	Frequency	%
Used during drought period	9	6.0
Helps in seed production	24	16.0
Practice but have no seeds.	15	10.0%
Adds blood to the body	13	8.7%
Prevents diseases	5	3.3%
Adds blood to the body and prevents disease	24	16.0%
Used during drought and in ceremonies	12	8.0
Added to the body and prevents diseases	12	8.0
Total	150	100

It is noted from the above table that 13.7% of the respondents said that they were used during drought period, in ceremonies, prevention of diseases and adding blood to the body. They were also used as relishes as indicated by 13.3 % of the respondents.

4.4.1 Socio-cultural factors which influence women's conservation of indigenous leafy vegetables

The respondents were asked the cultural factors connected to indigenous leafy vegetables and their responses are presented in Table 4.10 below..

Some information given above is elaborated further in the presentation that follows which would show whether these cultural factors influence the contemporary conservation of these vegetables by Abagusi women.

4.4.1 Ceremonies in which Indigenous Leafy Vegetables were used traditionally

One of the cultural beliefs connected to indigenous leafy vegetables as shown in

Table 4.10 is that they were used in ceremonies. The respondents were asked

Table 4.10 Cultural Factors Connected to Indigenous Leafy Vegetables

Cultural Beliefs	Frequency	%
Used during drought period	9	6.0
Tasty (gives satisfaction)	24	16.0%
Used in Ceremonies	15	10.0%
Adds blood to the body	13	8.7%
Prevents diseases	5	3.3.%
Adds blood to the body and prevents disease	24	16.0%
Used during drought and in ceremonies	12	8.0
Relish	20	13.3
Used during drought period, in ceremonies adds blood to the body and prevents diseases	28	18.7
Total	150	100

It is noted from the above table that 18.7% of the respondents said that they were used during drought period, in ceremonies, prevention of diseases and adding blood to the body. They were also used as relishes as indicated by 13.3 % of the respondents.

Some information given above is elaborated further in the presentation that follows which would show whether these cultural factors influence the contemporary conservation of these vegetables by Abagusii women.

1.4.1 Ceremonies in which Indigenous Leafy Vegetables were used traditionally

One of the cultural beliefs connected to indigenous leafy vegetables as shown in Table 4.10 is that they were used in ceremonies. The respondents were asked

the ceremonies in which the vegetables were used. Thirty six (24%) of the respondents said circumcision, 13% said during child birth, 20% said in marriage, one respondent (0.7%) talked of sacrifice, 21.3% said during both circumcision and child birth while 20.6% said the vegetables were used in circumcision, child birth and marriage.

Table 4.11 Ceremonies in which indigenous leafy vegetables were used traditionally

Ceremonies	Frequency	%
Circumcision	36	24.0
Child birth	20	13.0
Marriage	30	20.0
Sacrifice	1	0.7
Circumcision and child birth	32	21.3
Circumcision child birth and marriage	31	20.6
Total	150	100

Among the Abagusii, circumcision is highly regarded as a gateway to marriage. During this ceremony, spider herb was cooked and mixed with cow's blood before being served to the newly circumcised boys and girls including the visitors. This view is in line with what Buruchara and Okiomeri (1986) wrote about Abagusii and the use of spider herb during circumcision. However, they only mentioned that spider herb was used and given to

circumcised boys without explaining why. Thus, from the study, it is true that the spider herb was especially given to circumcised boys than girls.

It was explained by the respondents, it is because the spider herb is believed to add blood to the body and give strength. When in seclusion, the boys were to eat only the spider herb. This was because it was believed the spider herb made them sexually active after the seclusion period or maturity. The Abagusii believed that if a boy who had been circumcised was given any other vegetable like blacknightshade and others, would be sexually inactive. This was because other vegetables apart from spider herb were believed to make the body cold - (not making blood or have sexual emotions).

According to Busolo (1994), the spider herb is believed to increase breast-milk for lactating mothers. This view has been scientifically supported by Chweya (1989) who asserts that leafy vegetables are rich in iron and that is why pregnant and lactating mothers are encouraged to eat them. This is in line with what the researcher's findings from the study revealed. Thus, among the Abagusii, spider herb was believed to increase milk production for mothers who had given birth and thus was recommended for their diet. This shows that culture can be the baseline for scientific knowledge. It was believed that the spider herb also prevented malaria (Rigeki or Rikwarimo). The leaves of spider herb were cooked and mixed with blood before being served to the mother.

Other vegetables like blacknightshade were not given to a mother who had given birth in fear of malaria, diarrhoea and reduction of milk. The disease which the Abagusii believed the

spider herb to cure was anaemia. Literally, they say that the loosing of a lot of blood during child birth is regained by eating spider herb. During child birth, the spider herb was also served to the midwives and those present when the baby was born. When the baby was also given a name, it was the spider herb which was served to the visitors. The same vegetable was served to the visitors from the woman's home who had come to greet the newly born baby.

The respondents were asked if indigenous leafy vegetables are used in ceremonies today. They

As indicated by 20% of the respondents, spider herb was also used in sealing the marriage.

During the olden days, when a girl had been married and dowry paid, Ugali was cooked from

the girl's home and brought to the home she had been married to. The Ugali was put in a plate

called Ekee and was accompanied with cooked spider herb mixed with blood and covered with

leaves of Omonyaboga which were put in a plate made from trees called ebitabo. This was

taken as a sign of the marriage having been sealed. This is still practised today among the

Abagusii though the taking of spider herb has been replaced by the taking of meat. One of the

key informants from Bomwancha sub-location added the following in connection to marriage:

"When a girl had been married, the first night she spent with her husband and was found to be a virgin, she had to be sent back to her home the following day. Her mother-in-law gave her fried flour for making locally brewed beer to take to her home. This was carried by a small child she was given to escort her. When she arrived at her home, her mother prepared locally brewed beer and when it was ready, she went back with it together with Ugali and spider herb mixed with blood. This was done traditionally as part of the Abagusii culture. It was also done as a sign of blessing for her to get pregnant.

From the focused group discussion, it was noted that indigenous leafy vegetables were used during dowry negotiation. This was especially with the spider herb and blacknightshade. The

spider herb was also used during sacrifice as noted from the focused group discussion. Thus,

when there were sacrifices for appeasement of ancestral spirits, spider herb was cooked.

However, this was not the main relish. It was normally a goat, sheep or hen which was sacrificed but the spider herb was cooked and eaten by those not eating meat or served together with meat.

4.2 Ceremonies in which indigenous leafy vegetables are used today

The respondents were asked if indigenous leafy vegetables are used in ceremonies today. They gave various responses which are illustrated in table 4.12 below.

Table 4:12 Ceremonies in which Indigenous Leafy Vegetables are used today

Ceremonies	Frequency	%
Circumcision	51	34.0
Child Birth	13	8.6
Special Occasions	42	28.0
Dowry negotiation	12	8.0
Circumcision and child birth	32	21.3
Total	150	100

The indigenous leafy vegetables are used in circumcision ceremony as supported by 34% of the respondents. There were 8.6% of the respondents who said the vegetables are used during child birth, 28% said the vegetables are used in special occasions, 8% said the vegetables are used both during circumcision and child birth.

As noted from Table 4.12, the majority of the respondents said that indigenous leafy vegetables are used in circumcision ceremonies. This is true considering the fact that circumcision is still practiced by the Gusii community. The spider herb and blacknightshade are cooked during the ceremony in addition to slaughtering a sheep or a cow or buying meat from the butchery. The circumcised ones are also given spider herb though these days they can be given other vegetables.

	Frequency	%
Relish	86	57.3
Prevents diseases	6	4.0
Adds blood to the body	10	6.7
(Tasty) Gives satisfaction	14	9.3
To exchange with exotic vegetables	16	10.7
For special occasions	8	5.3
	150	100

Women who have given birth are also encouraged to eat spider herb as it increases milk production. Even those working in big towns are sent the vegetables by public means like through Akamba Bus Services, Gusii Deluxe among other means of transport. The vegetables are used in special occasions as noted by 28% of the respondents. The special occasions include weddings (reception time) and seminars whereby spider herb and blacknightshade are the ones mostly cooked as the respondents said. What was noted by the researcher was that there was religious factor associated with use of indigenous leafy vegetables on these special occasions.

This is because the respondents were from the Seventh Day Adventist denomination. When inquiring why the vegetables are used, it was said that they are not supposed to eat meat. The vegetables are also used during dowry negotiations as shown by 8% of the respondents. The vegetables that are cooked include spider herb and blacknightshade which are served together with meat or eaten by those not taking meat. Thus, the indigenous leafy vegetables are today used in various ceremonies as in olden days as described above.

Reasons why indigenous leafy vegetables are eaten.

The respondents were asked why indigenous leafy vegetables are utilized today. Their responses are given in Table 4.14 below.

Table 4.13 Reasons for Eating Indigenous Leafy Vegetables

Reasons	Frequency	%
Relish	86	57.3
Prevents diseases	6	4.0
Adds blood to the body	1.0	6.7
(Tasty) Gives satisfaction	14	9.3
To exchange with exotic vegetables	16	10.7
Religion	8	5.3
Presents diseases and adds blood to the body	10	6.7
Total	150	100

From the above table, 57.3% of the respondents said that indigenous leafy vegetables are used as relish. Thus, Ugali has to be served with vegetables or other relishes like meat and milk. Indigenous leafy vegetables are also eaten to exchange with exotic vegetables as supported by 10.7% of the respondents. They were 9.3% who said that these vegetables are eaten because of religious factors. This is the case where meat is forbidden and examples are drawn from the bible in support of vegetarian diet. Six respondents (4%) said the vegetables prevent diseases;

6.7% said they add blood to the body; 6.7% talked of the vegetables adding blood to the body and preventing disease while 9.3% said the vegetables give satisfaction when eaten.

From the above responses, it can be noted that majority of the respondents said that indigenous leafy vegetables are eaten because they are relishes. This shows that personality traits and overall patterns of personality as noted by Odetula and Ademola (1985) are greatly dependent upon the cultural matrix in which the child develops. Thus, it can be said majority of the respondents talked of relishes as they grew up and found that Ugali is eaten with vegetables.

CHAPTER FIVE

Table 5.1 Reasons for Decline in Knowledge, Production and Use of Indigenous Leafy Vegetables

EFFECT OF MODERNIZATION OF AGRICULTURE AND NUTRITION

EDUCATION ON VEGETABLES	CONSERVATION	OF	INDIGENOUS	LEAFY
	120	80.0	30	20.0
	100	66.6	50	33.3
	96	64.0	54	36.0
	90	60.0	60	40.0

5.0 Introduction

This chapter examines the effect of modernization of agriculture on conservation of indigenous leafy vegetables. In this case, the focus is on production of exotic vegetables and other cash crops and how they affect conservation of indigenous leafy vegetables. Also included is knowledge of the nutritive value of indigenous leafy vegetables and its influence on their conservation.

5.1 Reasons for decline in knowledge, production and use of indigenous leafy vegetable

The respondents were asked the reasons for decline in knowledge, production and use of indigenous leafy vegetables. They gave various responses which are presented in table 5.1 below.

comparing to olden days which used to provide compost manure for production of indigenous leafy vegetables. Although the soils have become infertile, the respondents said that if it was only indigenous leafy vegetables available and no competition from exotic vegetables, people were to look for means of preparing compost manure for use.

Table 5.1 Reason for Decline in Knowledge, Production and Use of Indigenous Leafy Vegetables.

REASONS	YES	%	NO	%
Introduction of exotic vegetables	120	80.0	30	20.0
Soil infertility	100	66.6	50	33.3
Schooling	96	64.0	54	36.0
Dying of old people	90	60.0	60	40.0
Population increase	80	53.3	70	46.6

N=150

From the above table, 80% of the respondents said the decline in production and use of leafy vegetable is due to the introduction of exotic vegetables, 66.6% said it is because of soil infertility, 64% talked of schooling, 60% talked of dying of old people while 53.3% of the respondents said it is due to population increase. The respondents in support of exotic vegetables as the reason for decline in production and use of indigenous leafy vegetables said that with unavailability of exotic vegetables, people would have concentrated on production and use of indigenous leafy vegetables as was traditionally. Those in favour of soil infertility said that there are very few cows nowadays compared to olden days which used to provide compost manure for production of indigenous leafy vegetables. Although the soils have become infertile, the respondents said that if it was only indigenous leafy vegetables available and no competition from exotic vegetables, people were to look for means of preparing compost manure for use.

contemporary situation with the olden days. They say that in the olden days, The respondents who argued for schooling said that the young learned generation have adopted the western methods of doing things. Even when it comes to production and use of indigenous leafy vegetables, they prefer exotic vegetables so as to look westernized. The respondents added that the educated youngsters say that indigenous leafy vegetables are for the villagers and especially the grandparents. They also complain that the indigenous vegetables are bitter. Even after completing schooling, the educated youngsters go to towns to look for jobs and thus have not time to stay at home with their parents and grandparents. The respondents also said that the youngsters meet with their parents during holidays which is very short. In the process, it is found that there is knowledge gap between the younger generation and older generation in relation to indigenous leafy vegetables.

The 60% of the respondents in support of dying of old people as a cause of decline in knowledge, production and consumption of indigenous leafy vegetables argued that the older people with knowledge concerning indigenous leafy vegetables have died and the remaining few are also dying.

There were also other respondents (60%) who were for the increase of population as a factor for the decline in production of indigenous leafy vegetables. They argue that due to population increase, there is building of houses even in fertile places where the indigenous leafy vegetables would have been cultivated. They compared the

contemporary situation with the olden days. They say that in the olden days, population was low and this allowed for shifting cultivation to be done thus leaving the land fallow for sometime. Thus, population increase poses a danger to production of indigenous leafy vegetables as also these increased population leads to clearance of the fertile land for food production.

From the above presentation, it can be said that all the mentioned factors are important and complement each other in decreasing the production and use of indigenous leafy vegetables. However, the respondents put more emphasis on introduction of exotic vegetables as having an upper hand in contributing to low production and use of indigenous leafy vegetables. This is because the energy and portion of land people devoted to the production of exotic vegetables would be used in the production of indigenous leafy vegetables. Even in the consumption side, when there is no substitute, people would utilize what is there.

Table 5.2 Reasons for Preference of Production of Exotic Vegetables

Reasons	Yes	%	No	%
Eating	150	100	-	-
Selling	110	73.3	40	26.6
Easy weeding and picking	90	60.0	60	40.0
Long	100	66.7	50	33.3
Influenced by	110	73.3	35	23.3
Availability of pesticides	85	56.6%	65	43.3

N=150

5.2 Exotic Vegetables Grown In Suneka Division

As one of the objectives was to examine the extent to which exotic vegetables affect conservation of indigenous leafy vegetables, the respondents were asked to name the exotic vegetables which they grow. These include:-

- 1.Kales
- 2.French Beans
- 3.Cabbages
- 4.Green grams
- 5.Tomatoes
- 6.Irish potatoes
- 7.Carrots
- 8.peas
- 9.spinach
- 10.Sunflower
- 11.Soya Beans
- 12.Beans

5.3 Preference of production of Exotic vegetables to Indigenous leafy vegetables

The respondents were asked why they prefer production of exotic to indigenous leafy vegetables. They gave various responses which are presented in Table 5.2 below.

Table 5.2 Reasons for Preference of Production of Exotic Vegetables

Reasons	Yes	%	No	%
Eating	150	100	-	-
Selling	110	73.3	40	26.6
Easy weeding and picking	80	53.3	70	46.6
Long-lived in the field	100	66.6	50	33.3
Influenced to grow	95	63.3	55	36.6
Availability of pesticides	85	56.6%	65	43.3

N=150

All respondents said that they produce exotic vegetables for consumption. There were 73.3% of the respondents who said that they produce exotic vegetables for sale. The vegetables were sold in the market while others were taken to schools and hospitals, among other institutions. Some respondents said the money they get from the sale of these vegetables is being used in payment of school fees for their children and purchase of some household goods. For those who do not get tenders at schools and hospitals, they take their vegetables to both local and other markets where the middlemen purchase from them.

The exotic vegetables are also preferred because they are long-lived in the field as indicated by 66.6% of the respondents. They said that even after a long drought, the vegetables can again reproduce leaves for consumption. The respondents gave an example of Kales which produced leaves again when the rains were back in mid March, 1997 after the dry season as from 1996 December. They said this cannot be compared to indigenous leafy vegetables which after three to five months become old. During the dry season, irrigation can be done for exotic vegetables which is not the case with indigenous leafy vegetables. The respondents said that the roots for indigenous vegetables are shallow and when irrigation is done, they dry.

There were 63.3% of the respondents who said that production of exotic vegetables is done due to influence and encouragement by some firms. As for Suneka Division, there is influence especially on the production of French beans. The respondents revealed that they are provided with seeds, fertilizers and there are people who do spraying. They said that this motivates them

and agreed to grow them also because there is a ready market. There are some buying centres where they take the French beans. It was observed by the researcher that it is an upcoming activity undertaken in many homes. There was a lorry which passed round the buying centres collecting the produce. The respondents said that there is a contract made between them and the firm in the area. The firm gives them seeds free and expect thirty kilograms from each farmer. The remaining is what becomes the profit of the farmer. The respondents said the French beans are taken to Webuye by the contractors where the factory is based. The findings support what Buruchara and Wandera (1986) observed in Kajiado that a variety of horticultural crops including French beans, Kerela and Turai are produced and some vegetable exporting companies contract the farmers to grow them.

The respondents were asked the type of vegetables raised by their family members. If The other reason why production of exotic vegetables is preferred to indigenous leafy vegetables is because of easy weeding and picking as supported by 53.3% of the respondents. The respondents said that one can contract even men to weed the exotic vegetables because usually a jembe is used compared to indigenous leafy vegetables. The indigenous spider herb and mlende were given as an example where one uses hands and also kneeling in order to weed. The respondents added that it is hard to get a man do it even for money taking into consideration the culture in which they have been brought up. They may not even know how to do it and may end up uprooting everything. The respondents added that with increased responsibility of women in taking up work traditionally done by men like watering the flock, it is seen easier to grow exotic vegetables which do not require much labour. This is because weeding of indigenous leafy vegetables takes time.

Lastly, 56.6% of the respondents argued for the availability of pesticides. They said that when pests attack the exotic vegetables, they purchase pesticides from the shops which they spray and the pests disappear. This is not the same case with indigenous leafy vegetables which don't have specific pesticides. The respondents said that they use ash which does not kill the pests completely or works partially. This problem of pests for indigenous leafy vegetables is major according to the respondents as they asked the researcher to take their pleas to the relevant or concerned party to supply them with pesticides for indigenous leafy vegetables.

5.4 Consumption of Indigenous and Exotic Vegetables

The respondents were asked the type of vegetables liked by their family members. It was found out that 73.3% of the respondents said exotic vegetables while 26.6% were for indigenous leafy vegetables. For each case, the respondents were asked the reasons for preferring the consumption of the vegetables chosen.

The majority of the respondents were for exotic vegetables. The respondents gave various reasons for the preference of consumption of exotic vegetables. Of the sampled respondents, 26.6% said it is because the exotic vegetables cook faster and never bores even if eaten always as compared to indigenous leafy vegetables. In supporting the fastness of cooking of exotic vegetable, the respondents said that it is only a matter of frying the vegetables with cooking oil. This is especially cases with kales, cabbage and spinach.

The respondents gave some examples where the frying of exotic vegetables are of great help. First, it helps children during lunch hours who are given between thirty minutes and one hour break for lunch. It is sometimes found that the homes for some children are far from school. When they reach home, they find that lunch has not been prepared as the parents and especially the mothers are in the garden or have left for the market (buying centres). The children find it easy to cook and fry the vegetables before running back to school. When visitors come abruptly, it is the exotic vegetables which are fried as they are faster. Even at night if it is late before cooking and young children are there, exotic vegetables are fried so that the children can eat before sleeping. This is not comparable with indigenous leafy vegetables which take time to cook before being fried. In addition to this, firewood itself is a problem as there are no forests due to increased population. The harvesting of exotic vegetables is also easy. It can be done even at night using a torch while this is not the case with indigenous leafy vegetables which take time and need carefulness.

There were 24% of the respondents who said that the exotic vegetables are preferred because indigenous leafy vegetables are bitter. In explaining this, the respondents said that it is usually the youngsters who complain of the bitterness of indigenous vegetables. They say that exotic vegetables do not have any bitterness in them. The families end up cooking exotic vegetables as it is the one liked by the youngsters. There were 20.7% of the respondents who said that exotic vegetables cook faster,

2.7% talked of exotic vegetables not boring even if eaten always. There were only four respondents (2.7%) who said the exotic vegetables never bore because the majority as shown above (26%) gave as an answer together with fastness in cooking. The remaining respondents (26.6%) did not give an answer as they were for indigenous leafy vegetables.

The 26.6% of the respondents gave their reasons as to why they prefer indigenous leafy vegetables to exotic vegetables. Sixteen respondents (10.6%) said it is because they give satisfaction when eaten with ugali. Seventeen (11.3%) respondents said it is because the vegetables both add blood to the body and prevent diseases. Those who were for adding blood to body were 2%. These percentages were small because majority of the respondents gave both adding blood to body and preventing diseases combined. The remaining 73.3% were for exotic vegetables. Thus, it can be seen from above that exotic vegetables are more utilized than to indigenous leafy vegetables. Though from the explanations given by the respondents, it was learnt that pressure and age plays an important role in the consumption of indigenous leafy vegetables. This is because even the 73.3% who said that they mostly utilize exotic vegetables in their diet do so due to pressure from their youngsters and not that they do not like utilizing indigenous leafy vegetables.

The 26.6% who utilize indigenous leafy vegetables are mostly the ageing who say that exotic vegetables like kales are too hard for them to chew. Also, the exotic vegetables

are taken to be the ones causing diseases as they are not fully cooked but rather fried with cooking oil. Thus, the old prefer the indigenous leafy vegetables that are left to cook on fire for enough time and no frying with cooking oil. If milk is added, that is enough. In connection to this point of frying, one respondent (over 65 years) commented the following:

There were no diseases in the olden days as compared to the contemporary situation. The use of cooking fat and frying of exotic vegetables without cooking them first is the cause of many diseases and deaths nowadays.

Thus, as Busolo (1994) noted, it is true that the decline in the use of indigenous leafy vegetables has been due to change in lifestyles. One of the changes of lifestyles is from traditional to modern ways (due to western influence) of living where the attitude towards indigenous leafy vegetables has changed with the introduction and use of exotic vegetables. Otherwise, it can be argued that had it been that there were no substitutes for indigenous leafy vegetables, the latter could still be the one being used as was traditionally.

5.5 Influence of Agriculture extension officers on production of exotic vegetables.

According to Buruchara (1986a), the increasing popularity of the exotic vegetables is partly due to the increasing attention, encouragement and provision of technical

information by the agricultural officers. During the study the respondents were asked whether agricultural extension officers visit them. From the study, it was revealed that only 22% of the respondents were visited by the extension officers while 78% said they had not been visited by the officers. The 22% agreed that they are given advice on the cultivation of both exotic and indigenous leafy vegetables. The information got from the agricultural extension officer in Suneka Division was that there are fourteen assistant agricultural officers in the whole division each covering a sub-location. Thus, the larger number of respondents not reached can probably be because the area is too large to be covered by one person visiting every home. Thus, the findings do not support Buruchara's (1986) views that there is increased production of exotic vegetables due to provision of technical information by agricultural officers. This is because majority of the respondents are not reached by agricultural extension officers.

by hired labour was 8%, 1.3% male adults, 83.3% female adults while 7.3% was done

Cash crops grown in Suneka Division

The cash crops grown in Suneka division are: tea, coffee, sugarcane and bananas. The respondents were asked whoever in the family does certain tasks involved in the production of cash crops. On the clearing side, 96.7% was said to be done by male adult, 2% by male children and 1.3% by hired labour. Thus, the male adults do much of the clearing in preparation for planting. During the breaking of soil, 28.7% is done by male adults, 4% by female adults, 1.3% by male children, 57.3% by both male adults and female adults while 8.7% said the breaking of the soil is done by hired

Concerning breaking the soil and planting, both male and female adults play a greater

labour. In this case, much of the work is shared by female adults and male adults as the majority of the respondents said.

This is because cash crop-like tea can stay at the buying centre for two to three days

It was found out that 63.3% of the weeding is done by women, 13.3% by hired labour, 22.7% by both male and female adults while one respondent (0.7%) said it is done by male adults. The percentage for male adult was low as the work is done by both male and female adults. From the study, 28.7% of the male adults did the planting, 2% of talked of female adults, 68% talked of both male and female adults while 1.3% talked of hired labour. The percentage for female adults is low as majority of the respondents combined both female and male adults as doing the planting.

In the case of bananas and sugarcane, it depends on the supply and demand. If the

The transportation of the cash crops to the market as revealed from the study as done by hired labour was 8%, 1.3% male adults, 83.3% female adults while 7.3% was done by both female and male adult. It can be noted that a majority of the women are involved in the transportation of cash crops to the market. It can also be noted from the study that male and female children are rarely involved in the above activities because most of the times they are at school and can give assistance during the holidays which are also very short.

production of indigenous leafy vegetables. This is because

production of indigenous leafy vegetables is usually done in the evening after the day

From the process of production to transportation to the market, it is noted that female adults play a greater role apart from clearing which is done mostly by male adults.

Concerning breaking the soil and planting, both male and female adults play a greater

role while majority of the female adults are involved in the weeding and marketing of cash crops. The greatest problem arise when it comes to marketing of cash crops. This is because cash crop like tea can stay at the buying centre for two to three days especially during the rainy season when the roads are impassable. This forces the one who take it (and for this study a greater percentage is female adults) to stay there till late in the evening. Some people (usually males) can be hired to look after the tea in the buying centre and in some cases the male adults themselves go to sleep there. Even when there are no rains, the vehicle collecting the tea may delay and this forces people to stay at the buying centre till it comes.

more weeding had to be done by women. This is also in line with the researcher's

In the case of bananas and sugarcane, it depends on the supply and demand. If the demand is high, then the selling take less time and if the supply is high and no buyers, more time is taken in the market.

From the focused group discussion, it was learnt that cash crop production take a lot of female adults' time. The discussants said that after harvesting the cash crops, they are taken to the market for sale and that is done in the afternoons. When one returns home, it is late in the evening. They commented that this takes one's time which could have been spent in the production of indigenous leafy vegetables. This is because production of indigenous leafy vegetables is usually done in the evening after the days work (Choti, 1996). At times, when one returns home earlier, one finds that she is very tired to engage in production of indigenous leafy vegetables. This is besides the reproductive roles. Thus, with cash cropping, women's time is limited in the

6% to 8 acres and 1.3% used 9 acres and above. Thus, it can be noted that the majority of the respondents use the least proportion of the total land in production of indigenous cash cropping from production to transportation to the market.

5.7 Knowledge on nutritive value of Indigenous Leafy Vegetables

Ayiecho (1990) and Were (1991) noted that apart from women's traditional roles, they also participate in cash cropping and other roles traditionally reserved for men. This is in line with the findings of the study whereby women are overworked doing their reproductive roles and also involved in the whole process of cash cropping from production to transportation to the market. Nasimuyu (1985) also adds that the introduction of cash crops led to increase in the area under cultivation and this meant more weeding had to be done by women. This is also in line with the researcher's findings as majority of the female adults were involved in weeding. This was also observed during the study whereby some did the weeding in the evenings thus no time

Table 5.3 Diseases Prevented and Cured by Indigenous Leafy Vegetables

Diseases	Frequency	%
Anaemia	104	69.3
Kwashiorkor	7	4.6

to attend to production of indigenous leafy vegetables. From Badiru (1994)'s study and Kusimba (1992), more land allocation to cash cropping led to decline of food production. From the study, it was found that very small proportion of land was devoted to growing of indigenous leafy vegetables while the rest was under cash crops. It was found out that 4.7% of the respondents used between 0.2 to 0.3 acres of the total land in growing indigenous leafy vegetables, 30% used between 0.096 acres to 0.03 acres, 14% used between 0.016 to 0.02 acres while 51.3% used between 0.0004 to 0.012 to grow indigenous leafy vegetables. In cash crop production, it was found out that 54% of the respondents use between 1 to 2 acres of land in their production, 42.7% between 2½ to four acres, 2% used between

6½ to 8 acres and 1.3% used 9 acres and above. Thus, it can be noted that the majority of the respondents use the least proportion of the total land in production of indigenous leafy vegetables.

Knowledge on nutritive value of Indigenous Leafy Vegetables

During the study, the respondents were asked whether they knew of any nutritional value of indigenous leafy vegetables. It was found that all the respondents were knowledgeable on the vegetables' nutritive value. They were then asked the sources of knowledge concerning the vegetables nutritive value. Of the sampled respondents, 52.7% said they knew the nutritive value of indigenous leafy vegetables through their mothers, 28.7% through their grandmothers, 10.7% through hospitals and 8% through books. Thus, the majority of the respondents know the nutritive value of the vegetables through their mothers. The respondents were asked diseases which these indigenous leafy vegetables prevent and cure. The answers given are presented in Table 5.3 below.

Table 5.3 Diseases Prevented and Cured by Indigenous Leafy Vegetables

Diseases	Frequency	%
Anaemia	104	69.3
Kwashiorkor	7	4.6
Blindness	6	4.0
False teeth	44	29.3
Stomachache	13	8.7
Measles	2	1.3
Scurvy	8	5.3

N = 150

From Table 5.3 above, it is revealed that 69.3% of the respondents said that indigenous leafy vegetables prevent and cure anaemia. There were 8.7% of the respondents who said that the vegetables prevent and cure stomachache, 1.3% talked of measles, 4.6% talked of Kwashiorkor, 1.3% talked of measles and 5.3% said the vegetables prevent and cures scurvy. From the findings, it is noted that majority of the respondents said that the vegetables cure anaemia. This is probably because it was traditionally and it is today believed by the Abagusii that indigenous spider herb adds blood to the body and thus prevents loss of blood during child birth.

Although majority of the respondents said that indigenous vegetables prevent and cure anaemia, when asked the vegetables which prevent the diseases, a majority of the respondents said it is indigenous spider herb. The spider herb was mentioned by majority of the respondents. This is due to due to Abagusii cultural belief that all the other vegetables could make a mother who had given birth to diarrhoea and have some stomachache. Also, spider herb was mentioned by majority of the respondents, because the source of their nutritive knowledge concerning indigenous vegetables was through their mothers (52.7%) and grandmothers (28.7%). However, according to Busolo and Wasike (1994), the other indigenous leafy vegetables, contain some iron in

them. For example, blacknightshade contains 4.0mg/100g iron, Mitoo contains 4.0 mg/100g of iron and jute (mlende) contains 8.0mg/100g iron.

Thus, it can be said that as far as culture plays an important role as a source of knowledge. There is need to teach people about the nutritive value of other indigenous vegetables which have scientifically been proved to contain some iron in them. Communities should be taught that indigenous vegetables and especially spider herb are not only for the mothers who have given birth, but also for every body. By saying this the researcher does not mean that all the respondents said that spider herb is eaten only when one has given birth. But in most cases more is consumed during that period by mothers. Thus, for enough blood in the body, there is need for people to be encouraged to eat more indigenous vegetables. One can argue that indigenous leafy vegetables are not the only ones which contain iron. There are some other substitutes like the liver but majority may not afford purchasing it everyday considering the economic situation. Thus, if indigenous vegetables are readily available (by being produced more) and utilized more often, they can supply the body with the required iron.

Forty four (29.3 %) of the respondents said that indigenous leafy vegetables are used in the prevention of false teeth. This is especially the vine spinach. It is believed among the Abagusii that the false teeth (**ebisara**) or plastic teeth can be very dangerous to the life of young children as from three months to around two years. If traditional

medicine vine spinach included is not used to prevent them from developing or growing the child would die. The child starts vomiting and diarrhoea immediately after suckling or eating. Thus, leaves of vine spinach are used after warming them on the three cooking stones on the fire and rubbed on two of the upper ends of the teeth (where the molars are located), two of the lower ends of the teeth (where the molars are also located) and at the midst of the teeth both upper and lower parts. If earlier precautions are taken as soon as the baby is born, the false teeth can be prevented from growing or developing. But if they have developed, a specialist has to remove them. They are usually whitish.

From Table 5.3, it is noted that 8.7% said that indigenous leafy vegetables prevent and cure stomachache. The information given is also due to the cultural belief that the spider herb used to prevent stomachache after giving birth. However, during the study there were a mixture of responses given to the researcher. There were those respondents who said that by eating spider herb, stomach ache stopped. Another group said the spider herb did not prevent stomachache. This latter group said having stomachache is natural and gave as example of the contemporary situation whereby some mothers do have stomachache after birth and are given some beer to stop it. From the findings, it can be noted that some respondents gave stomachache as a disease prevented and cured by indigenous leafy vegetables most probably because they do not know that they also cure some diseases like kwashiorkor and scurvy.

One can argue from here that some people may not bother to produce and consume indigenous leafy vegetables regularly as they do not know their importance as far as disease curing and prevention is concerned though they may know that they are generally good for one's health. Thus, one may have a child suffering from kwashiorkor but because he/she does not know that indigenous vegetables can partly contribute to solving the problem, the child would continue having the problem. This would be aggravated if one does not have money to purchase other foods rich in protein. Thus, there is need for people to be taught the kind of diseases prevented and cured by indigenous leafy vegetables. From Table 5.4, it is also observed that 4.6% of the respondents said that indigenous leafy vegetables prevent and cure kwashiorkor. This could probably be from books by those respondents who said their source of indigenous vegetables' nutritive value is through reading. It can also be the influence from hospitals for those taking children for clinic or those whose children have suffered from Kwashiorkor and are advised to give them indigenous vegetables. According to Government of Kenya (GOK, 1994), it is noted that Kisii District has one of the high prevalence rates (33.2%) of child malnutrition. This is attributed to low intake of nutritious foods. The low nutrition levels is partly attributed to lack of taking balanced diets due to ignorance among mothers (KDDP, 1994).

There were six respondents (4%) who said that indigenous leafy vegetables prevent and cure blindness. Spider herb, pumpkin leaves, African Spinach and vine spinach were taken for the treatment of scurvy. From the focused group discussion, it was

also learnt that vine spinach is good for healing of sores (**Egetonda getari gosira**).

Pumpkin leaf and vine spinach was given to the child who had stopped breast feeding

so that the bones would become strong. Vine spinach was eaten and helped prevent

joint aching. Blacknightshade was given to coughing persons as it was soft and was

preferred because it did not make the stomach ramble and does not make one have

worms. According to Busolo (1994) indigenous leafy vegetables are used to prevent

and cure some diseases. This is in line with what the researcher found out from her

study as described above.

From the findings, it can be noted that the respondents have some knowledge

concerning the nutritive value of indigenous leafy vegetables. But there is also

confusion of cultural beliefs like prevention of stomach ache and false teeth as being

cured by the vegetables but with very little scientific prove as in case of anaemia.

According to medical anthropology, false teeth could be classified as illness and not

disease. In connection to this there was no complete agreement of all respondents on

the vegetables preventing stomachache. There are also some diseases like rickets

which were not mentioned by any of the respondents. Thus, to some extent the

findings of the study are in line with what Busolo and Wasike (1994) said. That there

is decline in use of indigenous vegetables due to scanty information articulated on their

significance.

CHAPTER SIX

CONCLUSION AND RECOMMENDATIONS

1.1 Conclusions.

The role of women in the conservation of indigenous leafy vegetables in Suneka Division in Kisii District, was the subject of this study. The study set out to explore the socio-cultural factors that influence women's conservation of indigenous leafy vegetables. The study also looked at the extent to which production of exotic vegetables and lack of nutrition education affect women's efforts in the conservation of indigenous leafy vegetables.

The results of the findings are as stated below:

1. Women play an important role in the conservation of indigenous leafy vegetables. This is from breaking the soil, seed selection, planting, harvesting, preparation, pests control and preservation. In pests control, there is use of ash and remains of local brew which partially solves the problem. Concerning preservation method, it was noted that the traditional method of boiling the vegetables half-cooked, dry in the sun and then keep for future use is rarely practised. The reasons given being: availability of exotic vegetables, indigenous vegetables are few and the dry periods are not prolonged as in the olden days. Women rarely get help from men in the conservation of these indigenous leafy vegetables. These findings imply that women are the main conservers of indigenous leafy vegetables. Thus, for increased production and consumption of indigenous leafy vegetables, women should be targeted by the development policies.

While trying to conserve these indigenous leafy vegetables, women are faced with some problems. These include: chicken's disturbance, pests, lack of seeds and time. For pests, ash and local brew are used but does not solve the problem fully. Lack of seeds poses another problem as there are even some women groups and youth groups interested in the production of indigenous leafy vegetables but no seeds. Chicken also take away the soil from the vegetables when planted and at the same time eat them while time for weeding is difficult to get due to a lot of work. There is therefore need to provide agricultural extension on pest management for indigenous leafy vegetables.

The findings also revealed that socio-cultural factors influence women's conservation of indigenous leafy vegetables. The factors include: belief that the vegetables add blood to body, prevent diseases, are used in ceremonies and as relishes. These findings imply that socialization plays an important role in passing knowledge from one generation to another.

This study also found out that production of exotic vegetables and other cash crops affect conservation of indigenous leafy vegetables. The reasons given for preference of production of exotic to indigenous leafy vegetables include: exotic vegetables are long-lived in the field compared to indigenous ones, exotic

vegetables are easy to harvest and weed compared to indigenous ones, there is availability of pesticides for exotic vegetables compared to indigenous leafy vegetables, exotic vegetables even in surplus have market in places like hospitals and schools and finally there is influence and encouragement to grow them from private firms with provision of seeds free, fertilizers, spraying is done by employed people and a ready market.

Other cash crops like tea, coffee, bananas and sugarcane were found to affect conservation of indigenous leafy vegetables. These crops take the largest proportion of land compared to food crops. The indigenous leafy vegetables are planted on a very small portion of land. Concerning labour, it was found out that male adults play a greater role in clearing while women play a greater role in weeding and marketing. It is on breaking the soil and planting where both female adults and male adults share the responsibility. Thus, for weeding, some women do it even in the evenings. On marketing, it depends on the availability of customers in case of bananas and sugarcane and for tea, the time the vehicle comes to collect it from the buying centre also the season period whether rainy or dry.

The findings imply that much of women's time and labour is spent on cash cropping which leaves them tired and very little time to attend to indigenous leafy vegetables. This is worsened by schooling of youngsters who could have given some assistance and also other reproductive roles done by them.

4. Another findings of this study is that lack of nutrition education partly affects women's conservation of indigenous leafy vegetables. It was revealed from the study that majority of the respondents indicated that indigenous leafy vegetables prevent and cure anaemia. However, when asked the kind of vegetables, majority of the respondents said it is the indigenous spider herb. But from the scientific findings, other indigenous leafy vegetables like blacknightshade, mitoo, jute (mlende) and pumpkin leaf contain some iron and if consumed regularly can prevent and cure anaemia.

6.2 Recommendations

Some respondents also confused illness like false teeth as diseases. Concerning stomachache, the respondents were not consistent of its prevention and cure by indigenous leafy vegetables. Some were for it and others against it. Those against it said that it is natural for one to have stomachache after birth and consumption of indigenous vegetables does not solve the problem. They said the problem is there even today but one can be given beer as it is said that it helps. Some diseases like rickets were not mentioned by any of the respondents. The spider herb was the only type of indigenous leafy vegetable known to prevent and cure anaemia by majority of the respondents. Some diseases prevented by indigenous vegetables were also known by the respondents. These findings imply that lack of increased nutrition education can affect conservation of leafy vegetables.

encouraged to produce the indigenous leafy vegetables. This calls for cooperation

However, this cannot make one to conclude that there is completely lack of nutrition as some respondents though few said the indigenous vegetables prevent

and cure blindness, scurvy and kwashiorkor and a majority talked of anaemia. But it can be concluded that had it been that people were fully aware of the nutritional value of indigenous leafy vegetables in terms of preventing and curing all diseases, their production and consumption would be very high.

Other factors like soil infertility, schooling and increased population affect conservation of indigenous leafy vegetables.

6.2 Recommendations

It is hoped the following recommendations which arise from the study's findings will go along way in helping to increase production and utilization of indigenous leafy vegetables.

1. The study has clearly shown that women play an important role in the conservation of indigenous leafy vegetables. Thus, development planners need to take into account women's role in the conservation of indigenous leafy vegetables in order to design appropriate policies which would make them motivated in increasing production. There is need to provide farmers with seeds. In this way, individual farmers, women groups and youth groups having seeds problem will be encouraged to produce the indigenous leafy vegetables. This calls for cooperation among government and non-governmental organizations concerned with conservation of indigenous leafy vegetables to supply farmers with seeds. The

genebank in this case has a greater role to play in the multiplication of seeds. This will also be possible if it gets enough financial support from the government and non-governmental organizations in support of conservation of indigenous leafy vegetables. The seeds will then be supplied to the farmers.

Farmers should be taught how to prepare compost manure so as to use in the planting of indigenous leafy vegetables. This is in case of soil infertility and when taking into consideration that inorganic fertilizers destroys the soil and the taste of the vegetables when cooked as indicated by the respondents. It is also easier to be prepare compost manure compared to inorganic fertilizer which is expensive to purchase.

Another way of increasing production of indigenous leafy vegetables is by providing farmers with wiremesh for the problem of chickens' disturbance as indicated in the study. This can be done by governmental and non-governmental organizations in support of conservation of indigenous leafy vegetables. In this case, it need not be free but in form of a loan. Thus, after getting the wiremesh, the farmers are supposed to be given conditions on the growth of indigenous leafy vegetables for repayment of the loan. This will encourage the farmers to grow more of these vegetables.

There is also need to provide energy saving stoves in solving the problem of firewood for easy cooking of indigenous leafy vegetables. People are also

supposed to be encouraged to cook more vegetables which can last the family for some days.

It also emerged from the study that women are the ones involved in the conservation of indigenous leafy vegetables because of the traditional division of labour and the activity also considered as less prestigious by men. Thus, commercialization of these vegetables will play an important role in their increased conservation. In this case, there is need for formation of societies for the marketing of these vegetables. Thus, if farmers know that there is somewhere to take their vegetables even during the surplus period, they will be encouraged to produce more. This will in turn improve their source of income. In connection to this, preservation as used to be done traditionally is supposed to be revived. The vegetables will then be packed and sold in supermarkets. For more consumption, this would need advertisements to be done through radios and television to make people aware of the availability of such vegetables in the supermarkets.

2. In the study, it emerged that socio-cultural factors influence women's conservation of indigenous leafy vegetables. The factors include used as relishes, adding blood to the body and having some medicinal value. Thus, more information on cultural beliefs about food especially indigenous leafy vegetables will be useful in enhancing scientific enquiry for intergrated approach in search of knowledge and use of these vegetables. Therefore, there is need for combination of scientific and cultural knowledge. However, some taboos proven scientifically as wrong should be

discouraged. These taboos are the ones which discourage the utilization of some nutritive indigenous leafy vegetables by some categories of people.

3. The study also revealed that production of exotic vegetables and other cash crops affect conservation of indigenous leafy vegetables. Formation of groups to ease work like weeding of indigenous leafy vegetables needs to be encouraged. Farmers should also be advised to hire labour from the proceeds they get from cash crops. This will help women to have time to rest and devote some to production of indigenous leafy vegetables. Also, those implementing agricultural policies should emphasize the need to leave some portion of land for food production, indigenous leafy vegetables included. They should not concentrate on cash crop production only as indigenous vegetables can be profitable cash crops.
4. It also emerged from the study that lack of nutrition education partly affect women's conservation of indigenous leafy vegetables. Thus, nutrition education needs to be intensified through women groups, churches, barazas, hospitals, agricultural extension officers, nutritionists and community health workers. People are supposed to be taught that all indigenous leafy vegetables prevent and cure diseases. The diseases prevented also need to be told to people. Making people fully aware of the nutritive value of indigenous leafy vegetables can be the first step in changing their negative attitudes towards them and for preference of exotic vegetables. Parents are supposed to make children get used to indigenous vegetables from their early childhood. And they would only do this if they know

their nutritive value. Indigenous vegetables also need to be made part of the diet in schools, hospitals and other institutions. For schools, this will be one way of encouraging consumption during vacations, at school and after completion of school. There is need to use both electronic and print media so as to reach more people and help in creating awareness of the nutritive value of indigenous leafy vegetables. This will help increase consumption.

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APPENDIX ONE

UNIVERSITY OF NAIROBI

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APPENDIX ONE

UNIVERSITY OF NAIROBI

HOUSEHOLD QUESTIONNAIRE

Serial number _____

Name of interviewer: _____

PARTICULARS OF AREA

Name of Location _____

Name of sub location _____

Name of village _____

SOCIO-DEMOGRAPHIC DATA

Name of respondent _____

Sex _____

Age (ask and estimate) (01) 15-24 ☐ (02) 25-34 ☐ (03) 35-44 ☐ (04) 44-54 ☐
(05) 55-64 ☐ (06) >65 ☐

Marital status (01) Single ☐ (02) Married ☐ (03) Separated ☐

Head of household (01) Self ☐ (02) Other (Specify) ☐

Relationship to household head _____

Household size (how many people are members) _____

Ethnic group (01) Kisii ☐ (02) Other (specify) _____

Residence (01) number of years lived in present site (02) Previous residence if any.

0. Type of education received (01) Formal training (02) Informal education (03) both vocational and informal training.

1. Level of formal education (01) None ☐ (02) Primary ☐ (03) Secondary ☐
(04) College ☐ (05) University ☐ (06) Other (specify) _____

2. Religious affiliation (01) Christian (specify denomination) _____
(02) Moslem ☐ (03) Other (specify) _____

13. Occupation (01) Main _____ (02) Other (specify) _____
(03) Of spouse if married _____

GENERAL AGRICULTURAL INFORMATION

Household Economic Background

Production

- What do you do for a living? Please rank your economic activities in order of importance. Indicate also the approximate contribution of each activity to total income.

Economic activity	Approximate income per year
1.	
2.	
3.	

- What is the size of your land in acres? _____

- What agricultural activities are carried out within this farm's boundaries?

- _____
- _____
- _____
- _____

- If crop cultivation is the main agricultural activity list in order of importance the main types of crops grown and for how long you have grown the crop.

Food crops	Cash crops	Length of growth time
1.		
2.		
3.		

- How many acres are under:- (a) food crops? _____ (b) cash crops _____ grazing lands _____

Are there crops grown on this farm tended by females or by male members of your household?
If so which ones. Give reasons why.

Socio-cultural factors affecting the conservation of indigenous leafy vegetables

Do you know of any cultural beliefs connected to indigenous leafy vegetables?

(a) Yes ☐ (b) No ☐

If yes, list these cultural beliefs

Were indigenous leafy vegetables used in any cultural ceremonies?

(a) Yes ☐ (b) No ☐

If yes, which ceremonies?

Name of vegetable

Ceremony

How were these vegetables used in the ceremony?

Name of vegetable

Ceremony

Are indigenous leafy vegetables used in ceremonies today? Yes ☐ No ☐

If yes, which ceremonies?

Name of vegetable

Ceremony

Are there taboos concerning indigenous leafy vegetables? Yes ☐ NO ☐

If yes, which ones?

Name of vegetable

Ceremony

Are there indigenous leafy vegetables not grown because of taboos? Yes ☐ No. ☐

If yes, name them a. _____ b. _____ c. _____

Are there indigenous leafy vegetables which have continued to be grown because of their positive cultural belief? Yes ☐ No ☐

If yes, which ones?

Name of Vegetable

Ceremony

Why are indigenous leafy vegetables being eaten.

Do you know of any medicinal value of indigenous leafy vegetables? Yes ☐ No. ☐

If yes, which ones

Name of Vegetable

Medicinal value

How did you come to know the cultural value of indigenous leafy vegetables?

Household Division of Labour in the Conservation of Indigenous Leafy Vegetables

Who is this household has the knowledge of indigenous leafy vegetables?

(a) Ma ☐ (b) Fa ☐ (c) Fc ☐ (d) Mc ☐

In you opinion, why is this person more knowledge about indigenous leafy vegetables?

Who in this community has more cultural knowledge on indigenous leafy vegetables?

Do you grow indigenous leafy vegetables in your farm? Yes ☐ No ☐

If yes, name them _____

What is the proportion of land devoted to the growing of indigenous leafy vegetables? _____

Who does the following tasks?

Tasks performed

Sex

Clearing (a) Ma (b) Fa (c) Mc (d) Fc (e) Os

Breaking the soil (a) Ma (b) Fa (c) Mc (d) Fc (e) Os

Planting (a) Ma (b) Fa (c) Mc (d) Fc (e) Os

Weeding (a) Ma (b) Fa (c) Mc (d) Fc (e) Os

Seed selection (a) Ma (b) Fa (c) Mc (d) Fc (e) Os

Harvesting (a) Ma (b) Fa (c) Mc (d) Fc (e) Os

Preparation (a) Ma (b) Fa (c) Mc (d) Fc (e) Os

Key

Ma - male adult

Fa - female adult

Mc - male children

Fc - female children

Os - other (specify)

Which soil type are favourable for growth of indigenous leafy vegetables.

Vegetables

Soil type

Do you apply any fertiliser when planting indigenous leafy vegetables Yes ☐ No ☐

5. If yes, which ones

(a) Organic _____ (b) Inorganic _____

(c) Both _____

7. Are there indigenous leafy vegetables which you plant by broadcasting? Yes ☐ No ☐

8. If yes, which ones?

9. Are there indigenous leafy vegetables which you plant in rows? Yes ☐ No ☐

10. If yes, which ones?

11. Are there indigenous leafy vegetables which grow separately without intercropping? Yes ☐
No ☐

22. If yes, which ones?

23. Are there some indigenous leafy vegetables which are grown with other crops (intercropped)?

24. If yes, which ones?

25. How long does it take for indigenous leafy vegetables to mature before they are harvested?

Vegetable

Maturity period

26. After harvesting the indigenous leafy vegetables, how long does it take before going bad?

Vegetable

Time before going bad

27. Do you store some seeds for the next planting season? Yes ☐ No ☐

28. If yes, which method do you use?

How do you prepare or cook indigenous leafy vegetables?

Do you think there is a decline in knowledge and use of indigenous leafy vegetables? Yes ☐ No ☐

Indigenous leafy vegetable

Method of cooking

How do you preserve indigenous leafy vegetables?

Indigenous leafy vegetable

Method of preservation

Has the method of preservation changed today compared to olden days? Yes ☐ No ☐

If yes, How?

Types of vegetables (exotic and indigenous), which ones do you like in your diet?

Do you know of any indigenous leafy vegetables which grow wild? Yes ☐ No ☐

If yes, which ones?

Do you know of any leafy vegetables which grow wild? Yes ☐ No ☐

If yes which ones?

Are there types (variation) within one species Yes ☐ No ☐

If yes, which ones?

Indigenous leafy vegetable

Types within species

Which problems do you face in the production of indigenous leafy vegetables?

Task performed

Sex

11. Clearing

(a) Ma (b) Fa (c) Mc (d) Fc (e) Os

12. Breaking the soil

(a) Ma (b) Fa (c) Mc (d) Fc (e) Os

13. Planting

(a) Ma (b) Fa (c) Mc (d) Fc (e) Os

14. Weeding

(a) Ma (b) Fa (c) Mc (d) Fc (e) Os

Effects of Modernisation of Agriculture on Indigenously Leafy Vegetables

Do you think there is a decline in knowledge and use of indigenous leafy vegetables? Yes ☐
No. ☐

How long does it take to market the crops?

If yes, why?

Nutritional Knowledge about Indigenous Leafy Vegetables

Which exotic vegetables do you grow?

Do you know any nutritional value of indigenous leafy vegetables? Yes ☐ No. ☐

Why do you prefer exotic vegetables to indigenous leafy vegetables?

What are the sources of information concerning the nutritional value?

Of the two types of vegetables (exotic and indigenous), which ones do you like in your diet?

Exotic _____

Indigenous _____

Why?

Do extension officers visit you? Yes ☐ NO. ☐

Does lack of knowledge about the nutritive value of indigenous leafy vegetables discourage

If yes, do they advice you on the cultivation of exotic vegetables? Yes ☐ No. ☐

Do they advice you on the cultivation of indigenous leafy vegetables? Yes ☐ No. ☐

leafy vegetables?

Which cash crops do you grow?

For question 11-16 fill in whoever does the following tasks in cash crop production

Task performed	Sex
11. Clearing	(a) Ma (b) Fa (c) Mc (d) Fc (e) Os
12. Breaking the soil	(a) Ma (b) Fa (c) Mc (d) Fc (e) Os
13. Planing	(a) Ma (b) Fa (c) Mc (d) Fc (e) Os
14. Weeding	(a) Ma (b) Fa (c) Mc (d) Fc (e) Os

5. Manuring (a) Ma (b) Fa (c) Mc (d) Fc (e) Os
6. Preparation (a) Ma (b) Fa (c) Mc (d) Fc (e) Os
2. Preparation (a) Ma (b) Fa (c) Mc (d) Fc (e) Os

7. How long does it take to market the crops?

Nutritional Knowledge about Indigenous Leafy Vegetables

Do you know any nutritional value of indigenous leafy vegetables? Yes ☐ No. ☐

What are the sources of information concerning the nutritional value?

Which diseases do indigenous leafy vegetables prevent and cure?

Vegetable

Disease it prevents

Does lack of knowledge about the nutritive value of indigenous leafy vegetables discourage you from product. Yes ☐ No. ☐

In your view, what can be done to increase the production and consumption of indigenous leafy vegetables?

APPENDIX TWO

UNIVERSITY OF NAIROBI

Focus Group Discussion Interview Guide

Indigenous leafy vegetables grown in Suneka Division

Their production and climatic condition

Their preservation traditionally and in the contemporary situation

Methods of pests control

Who is more knowledgeable on Indigenous leafy vegetables and why?

Cultural beliefs connected to Indigenous Leafy vegetables

Ceremonies in which Indigenous Leafy vegetables were used traditionally/contemporary situation.

Medicinal value of Indigenous leafy vegetables

Taboos connected to indigenous leafy vegetables

Why preference of production of exotic vegetables to indigenous leafy vegetables?

Type of vegetables mostly utilized and why

Cash crop production and its effect on women's conservation of indigenous leafy vegetables -
in terms of time (labour) and area under cultivation

Diseases prevented and cured by indigenous leafy vegetables.