

**MARKET CHAIN ANALYSIS OF AFRICAN INDIGENOUS
VEGETABLES (AIVs) IN TANZANIA: A CASE STUDY OF AFRICAN
EGGPLANT (*Solanum aethiopicum*) IN KAHAMA DISTRICT**

BY

ZEDEKIAH SOLOMON OSANO

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ABSTRACT

This study was conducted to assess the market chain analysis of African Indigenous Vegetables (AIVs) in Tanzania with emphasis of African eggplant (*Solanum aethiopicum*) among smallholder farmers. Specifically the study had four objectives namely (a) to identify African indigenous vegetables with high value marketing potential grown in the study area (b) to identify supply chain actors (c) to determine role played by different actors along the market chain (d) to determine the profitability of African eggplant by small holder farmers. Primary data were collected and gathered using structured questionnaires, observation and discussion. Responses from the interview were coded and analysed with the aid of the excel and Statistical Package for Social Science (SPSS) computer programme. Data analysis entailed a descriptive statistics. Gross Margin technique was employed to determine profitability among the market actors. Through ranking, African eggplant were identified the most in contributing more in provisional of dual functions of vegetables both physical and mental health and poverty alleviation due to it is long harvesting period hence long supply duration in market supply. The study identified that main actors in this sub sector are producers, traders, transporters and consumers. It was also revealed that, while GM/Kg (Tshs37.35) from producer seemed to be low compared with that of wholesalers GM/Kg (Tshs 42.78), the GM/Kg (Tshs 114.62) for retailers is higher hence receiving more benefits than other actors along the chain. Therefore it may be concluded that by identifying different actors and roles played along the market chain will assist the institutions in formulation of policy intervention that may stimulate smallholders' farmers' profitability in AIV marketing. Hence it was recommended that, establishing institutions such as NGOs or Cooperatives will promote farmers to work together in order to have a strong voice and unity as they need to negotiate for favorable prices for their produce.

DECLARATION

I, **ZEDEKIAH SOLOMON OSANO**, do hereby declare to neither the Senate of Sokoine University of Agriculture that this dissertation is my own original work and has neither been nor being concurrently submitted for a higher degree award in any other institution.

Zedekiah Solomon Osano
(M.A. Candidate)

Date

The declaration is confirmed

Dr. Mbwambo J. S.
(Supervisor)

Date

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DEDICATION

This dissertation is dedicated to my mother Salome Awino who paved the way for my academic career through objectives upbringing, and my wife and children for their patience, understanding and lovely prayers during the course of study. To them I say God bless you all.

TABLE OF CONTENTS

[LIST OF TABLES](#)

LIST OF FIGURES

LIST OF APPENDICES

LIST OF ABBREVIATIONS

AIVs	-	African Indigenous Vegetables
AVRDC-RCA	-	Asian Vegetable Research and Development Centre Regional Centre for Africa
BCR	-	Benefit Cost Ratio
BTC	-	Belgium Technical Cooperation
DSI	-	Development Studies Institutes
FAO	-	Food and Agricultural Organisation
GCC	-	Global Commodity Chain
GM	-	Gross Margin
IITA	-	International Institute of Tropical Agriculture
IPGRI	-	International Plants Genetic Resource Institute
IRR	-	Internal Rate of Return
KDC	-	Kahama District Council
MM	-	Market Margin
NGOs	-	Non Governmental Organisation
NSGRP	-	National Strategy for Growth and Reduction of Poverty
NUS	-	Neglected and Underutilized Species
ROI	-	Return on Investment
SADC	-	Southern Africa Development Community
SNAL	-	Sokoine National Agriculture Library
SPSS	-	Statistical Package for Social Sciences
SSA	-	Sub Saharan Africa
TDV	-	Tanzania Development Vision
URT	-	United Republic of Tanzania
VCA	-	Value Chain Analysis

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background Information

Market phenomena and marketing systems are growing in importance as key factors influencing the success or failure of efforts to improve food production, consumption and poverty reduction in developing countries (Morris *et al.*, 2005). Selling agricultural products is the main source of cash income for most rural household's farmers in Tanzania. Farmers are no longer not only interested in high yield or even in high prices per se, but in more remunerative marketing outlets (Scott, 1995). Studies by Dolan and Humphrey (2000) found that the aggregate value of traditional crops like coffee, sisal, cotton in the world trade market has been declining since 1980s this in turns promote for investment in high value crops like fruit and vegetables in developing countries.

According to Debello (2007) improving and promoting vegetables market will stabilize income at macro and micro level. However, vegetable farming has a rapid expansion over the last few years since the country started its transition into a market economy. This has been accompanied by a remarkable change in agriculture from subsistence vegetable cultivation towards commercial production for urban sale and export (Nyange, 1993).

According to IITA (1999) African Indigenous Vegetables (AIVs) are increasingly consumed by Tanzanian due to their ability to fit into year round production systems. Furthermore, during the times of relish scarcity especially in dry season; a preserved African indigenous vegetable are crucial in household food security and provides needed nutrition during famines; hence referred to as supplementary food and hence its marketing need be understood. A large number of African Indigenous Vegetables have long been

known and reported to have health protecting properties and uses (Smith and Eyzaguirre, 2007; Shiundu and Oniang'o, 2007 and Will 2008). One of the important AIVs is African eggplant. According to Chadha and Oluoch (2003) cultivation of African eggplant is expanding in Tanzania because of its economic and nutritional value. However, (Eskola, 2005) reported that, in order to improve the marketing arrangements for agricultural products in Tanzania, one needs to understand the channels that are currently used for trade. In fact, the majority of small-scale agricultural producers are consuming their production to large extent within the household. The remaining surplus production can be sold either to the local markets or to district market depending on the products and producer's access to the market information.

In order to stimulate the process of commercialized sustained indigenous vegetables in the country, the Tanzania government and non-governmental organization such as Asian Vegetable Research and Development Center-Regional Center for Africa (AVRDC-RCA) among the initiatives are supporting production of African egg plant (*Solanum aethiopicum*) in order to promote it as an alternatives cash crop. These initiatives are in line with the Tanzania Development Vision (TDV) to 2025 specifically by addressing high quality livelihood based on sustainable growth and be free from abject poverty by ensuring food self-sufficiency and food security, the cluster I and II of National Strategy for Growth and Reduction of Poverty (NSGRP), that focusing on the Growth and reduction of poverty and Improvement of Quality of Life and Social Well-Being respectively (URT, 2009). Recently, Kahama smallholder farmers are among the producers and consumers of varieties of AIVs but it is not clearly known weather these farmers of AIVs benefit from this underutilized group vegetables. Moreover, exist marketing information system and how is it flowing is not clearly known.

1.2 Problems Statement and Justification

Studies on AIVs in Tanzania dated back from 1984 when the government started to work closer with the AVRDC-RCA program such that in 2002, the Asian Vegetables Research and Development Centre –Regional Centre for Africa (AVRDC-RCA) started promoting neglected indigenous vegetables in Tanzania (AVRDC-RCA, 2005). Under this programme, production of African eggplant has been aiming at improving productivity, household income and reducing poverty. It was reported by (Onyango, 2007; Shiundu and Oniang'o, 2007) that AIVs are endowed with higher levels of nutrients than exotic counterparts. Recent research on AIVs including economics of vegetables marketing in Arumeru by Nyange (1993), AVRDC's experience with marketing of indigenous vegetables by Chadha (2003), Edmond *et al.* (2008) concentrated on dried fruit and vegetables for urban and export markets sub sector and value chain analysis. Additionally, Weinberger and Msuya (2004) focused on the significance and prospect of indigenous vegetables; Putter *et al.* (2007) studied the overview of vegetable sector in Tanzania while Nyange *et al.* (2000) on the fresh fruit marketing in Tanzania prospects for international marketing, and Kalugila (2007) conducted a social economic assessment of agricultural commercialization of African indigenous vegetables. It is evident from these studies that there is paucity of information on AIVs marketing chain. Hence, this study therefore, is an attempt to assess the market chain for AIVs in Kahama district specifically focusing on African eggplant growers.

This study among other things, will also document the marketing information flow among different actors in this sub-sector. The findings from this study will be used as a base to policy makers to design strategies to improve the AIVs sub sector.

1.3 Objectives

1.3.1 General objective

The general objective of this study was to assess the current market chain of African Indigenous Vegetables (AIVs) in Tanzania using African eggplant (*Solanum aethiopicum*) as a case study.

1.3.2 Specific Objectives

- (i) To identify African indigenous vegetables with high value marketing potential grown in the study area.
- (ii) To identify supply chain actors
- (iii) To determine role played by different actors along the market chain.
- (iv) To determine the profitability of African eggplant by small holder farmers.

1.3.3 Research questions

- (i) What specific AIVs are grown by farmers in Kahama district?
- (ii) What are the existing supply chains actors of African eggplant in Kahama district?
- (iii) What are the roles played by different actors along the market chain of African eggplant?
- (iv) Who are the actors' category benefits in the market chain of African eggplant production in Kahama district?

1.4 Conceptual Frame Work

The conceptual framework of this study has adopted the value chain system theory by Raikes *et al.* (2000) since; Global Commodity Chain (GCC) approaches explain the

distribution of wealth within a chain as an outcome of competition within different actors. Furthermore, the approach focuses on the power relationship in the coordination of globally dispersed, but linked production systems. Generally, GCC are characterized by leading party or parties that are determining the overall character of the chain. Moreover, in GCC the focus is on the whole range of activities from production to consumption and the linkage binding them.

In this study, conceptual framework (Fig. 1) illustrates that the household characteristics have greater power relation to both growers of the AIVs as well to the consumers along the market chain since these two variables have direct links to traders and finally affect dependent variables of the study. Sex of the respondent can determine type of crops to grow. Men usually tend to grows cash crops and other highly paying vegetables both exotics and African indigenous vegetable compared to women. Likewise women are more prone to sales of vegetables compared to men since women can travel long distance during the sales as compared to men. The other important household characteristic is the education level, which had a positive and significant influence on the number of species and sub-species grown.

Growers

- AIVs
 - African eggplant
 - Other AIVs
- Other crops

Consumers

- Household consumers
- Hotels
- Restaurant
- Institutional

Household characteristics

- Age
- Sex
- Education
- Occupation
- Farm size
- Household size
- Income

Institutional Frame work

- Research
- NGOs
- Extensio agents
- Inputs providers

Figure : Conceptual framework for the study

This factor, by contributing to the producers' human capital, most likely enhances the ability to grasp faster new production techniques and to seek any new information on AIV varieties, and generally to better coordinate farm activities even when more species and sub-species are grown. Moreover, production of vegetables involves the use of inputs like pesticides which are toxic and that can affect the health of consumers if not properly applied as it is recommended hence level of education is important. Farm size has influence on the market performance since it is un-economic and difficult to manage small scattered plots as compared to medium farm in terms of resource availability and distribution. Furthermore, house hold size has greatest impacts not only in terms of labour availability (since it assists in reducing of the labour costs in the production) but also it determines the volume of vegetable to be purchased by the buyers. Similarly, incomes of both growers and traders not only can determine investment level towards the available markets (e.g. hotels, restaurants and institutions etc) but also choices of the buyers. In addition, Institutional frame work in this case research, NGOs, extension services, inputs providers to a certain extent can influence indirectly growers to engaged towards the choices of a certain varieties to be grown due to it qualities like resistant to pests and disease, high yields hence increased profitability among African eggplant growers. Enhanced participation of chain actors in the markets depends on the institutional inspiration that influencing exchange along the market chain. Good market environment therefore is an important factor that influences participation among the market chain actors.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 An Overview

In this chapter, the study reviews some literature on African indigenous vegetables market chain. The chapter is however divided into five sections. Section one review on the definitions of key concepts while, section two provides an overviews of the African indigenous vegetables in Tanzania, section three deals with the overall market dynamics of vegetables. Otherwise section four present the theoretical background on the market chain analysis and finally section five provides the review of the studies of market chain analysis.

2.2 Definition of the Key Concepts

2.2.1 Markets

The term market has got a variety of meanings. In some cases the market may mean the place where buying and selling takes place, an arena in which a good is sold, a group of people carrying on buying or selling, or the commodity traded, such as the corn market, or time market (Weldeslassie, 2007). Study by Kohl and Uhl (1985) put their definition of market in reference to giving answers to questions of what to produce, how much to produce, how to produce, and how to distribute. Additionally Saccomandi (1998) defined market as the exchange, circulation and distribution of commodities between people and places. By agricultural market, Saccomandi (1998) furthermore refers markets to the economic place in which agricultural producers sell the products obtained in their firms with the degree of form, space, and time related function required by the buyers.

In this study markets definition has adopted the definition by Weldeslassie (2007) since the commodities can be traded in various places by different chain actors along the markets as in the farm field, garden, local market as well as in the central market provided buying and selling can take place.

2.2.2 Marketing

Marketing in its simplest form is defined as the process of satisfying human needs by bringing products to people in the proper form, time and place (Branson and Norvel, 1983). Marketing has an essential productive value, in that it adds time, form, place and possession utilities to products and commodities. Through the technical functions of storage, processing and transportation, and through exchange, marketing increases consumer satisfaction from any given quantity of output (Mendoza, 1995). Meanwhile, Kotler and Armstrong (2006) also defined marketing as the task of creating, promoting, and delivering goods and services to consumers and businesses. In this study, marketing definition adopted Gill (2006) who states that marketing is a societal process which discerns consumers' wants, focusing on a product or services offered.

2.2.3 Market chain

According to Fafchamps and Hill (2005) marketing chain is used to describe the numerous links that connect all actors and transactions involved in the movement of agricultural products from the farm to the consumer. It is the paths that good follow from their source of original production to ultimate destination for final use. Similarly, Will (2008) describes market chain as the sequence of activities from producing raw material and transforming the same into products that can be purchased by final consumers. As such, the market

chain methodology is a conceptual means for characterizing the different stages that a given product experiences from initial product conception, to the provision of inputs, to primary production, to intermediary trade, to processing, to retail marketing and to final consumption, including the identification of the value added at each node of the market chain. According to FAO (2005a) common functions conducted in a marketing chain have three things in common; they use up scarce resources, they can be performed better through specialization, and they can be shifted among channel members. A market chain therefore, consists of all value-generating activities, sequential or otherwise, required to produce, deliver and dispose of a commodity (Will, 2008). More specifically, it describes the full range of activities which are required to bring a product or service from conception, through the different phases of production (involving a combination of physical transformations and the input of various producer services), to delivery to the final consumer and final disposal after use (Kaplinksy and Morris, 2000). In these regards market chain operates over different types of consumers. These consumers' categories include rich, poor, young old, ethnic referred as segments. Each segment has a specific demand requirements based on price and quality parameters of which marketing plan aims to meet the need of these segments with a specific products.

The efficiency of the market chain is a result of how well the actors in the chain are organized and how well the chain is supported by a range of business development services (Will, 2008). African eggplant market chain can be identified as comprising of producers, primary and secondary collectors, transporters, wholesalers, retailers, supermarkets, and the food service sector. Therefore, AIVs flows from farmers to consumers in chain structure are facilitated by traders. Inefficient segments along the market chain affect farmers, traders, consumers and the national food system (Dooren, 2005). Thus, a study of market chain is vital in order to identify the segment which is

inefficient. This would allow interventions geared towards improving the benefits of African eggplant marketing. Also, it is useful to identify the participants, the chain structure, opportunities, constraints and challenges of African eggplant and AIVs marketing in general.

2.2.4 Market chain analysis

There are no standardized definitions of market chain analysis. However different scholars and agencies have defined market chain analysis in different ways. FAO (2005b) conventionally refers the channel from a farmer down to a final user, through which the commodity passes and which embodies these transactions and activities as a marketing and processing chain, a supply chain, or a value chain. Goletti (2006) reported that value chain analysis ideally requires dealing with all participants along the value chain. The major goals of market chain analysis is to obtain a more detailed understanding of the actors activities, costs and opportunities related to the flows of the particular products and associated services starting with farmers and ending with buyers or consumers. The other issues need to be addressed involved identification of critical constraints opportunity and the entry points for agro enterprises intervention.

2.2.5 Marketing systems

Is defined as the sequential set of kinds or types of business firms through which a product passes during the marketing process. It is the interrelationship of firms (Branson and Norvell, 1983). It is usually seen as a system because it comprises several, usually stable, interrelated structures that, along with production, distribution, and consumption, underpin the economic process (Mendoza, 1995).

2.2.6 Market margin

According to Kotler and Armstrong (2006) marketing margin or price spread is a commonly used measure of the performance of a marketing system. It can be a useful descriptive statistics if used to show how the consumers' expenditure is divided among market participants at different levels of the marketing systems. Tomek and Robinson (1990) defined marketing margin as the difference between the price the consumer pays and the price that is obtained by producers, or as the price of a collection of marketing services, which is the outcome of the demand for and supply of such services.

2.2.7 African Indigenous Vegetables

According to Jaenicke and Hoeschle (2006) African indigenous vegetables are those species with under exploited potential for contributing to food security, health (nutritional/ medicinal), income generation, and environmental services. Other scholars defined the African indigenous vegetables as a crops species or varieties both *indigenous* and *traditional* vegetables that have been part of the food systems in Sub-Saharan Africa (SSA) for generations (Smith and Eyzaguirre, 2007). In this study the AIVs definition was adopted from Smith and Eyzaguirre (2007), since Indigenous vegetables are those vegetable crops that have their natural habitat on sub-Saharan Africa while the traditional leafy vegetables were introduced over a century ago and due to long use, have become part of the food culture in the sub-continent (Smith and Eyzaguirre, 2007). Crops bred scientifically are excluded from this definition. In contrast, exotic crops are crops that have been imported to a certain region (Engle and Altoveros, 2000).

An additional common feature is that most of these crops are still selected, adapted and multiplied by farmers in marginal environments of developing economies. Thus AIVs or

underutilized crops have the potential to contribute not merely to agricultural biodiversity but most importantly to the livelihood of the poor. Marketing development of underutilized plant species (AIVs) is one way to increase social welfare by generating income for the local producers and chain actors and by promoting the sustained use and conservation of agricultural biodiversity (Will, 2008). AIVs considered in this case study is African eggplant (*Solanum aethiopicum*).

2.2.8 AIVs production in Tanzania

African Indigenous Vegetables are used in diverse forms and many of them can be considered multi-purpose crops, e.g. most of them are used for their preventive and curative medicinal properties besides serving as daily food. In Tanzania information on AIV is limited and dispersed Mnzava (1993) cited by Maro (2007). Early studies by (Fleuret, 1979 and Gerson 1989) are exploratory in nature. Recently study by FAO (2005b) classified AIV as cultivated, semi-cultivated and gathered from the field. Additionally, it should be noted that there are different varieties of AIVs commonly found in all districts of Tanzania. The composition of species however varies to great extent in the different agro-ecological zones as well as the five different phyto-geographical regions of the country. Furthermore, the importance and number of AIVs species used are quite distinct between the zones. Some important AIVs domesticated and undomesticated crops grown in Tanzania are listed in the (Table 1).

Table : List of Common AIV in Tanzania

Domesticated		Undomesticated	
Common Name	Botanical Name	Common Name	Botanical Name
African cabbage	<i>Brassica carinata</i>	Black jack	<i>Biden pilosa</i>
African eggplant	<i>Solanum aethiopicum</i>	Jews mallow	<i>Corchorus olitorius</i>
Amaranthus	<i>Amaranthus spp</i>	Water cress	<i>Ronipa rosturtium</i>

Bottle gourd	<i>Langenaria sineraria</i>	Crotalaria	<i>Clotalaria spp</i>
Cassava leaves	<i>Manihot esculentum</i>	Rosella	<i>Hibiscus subdariffa</i>
Cowpeas leaves	<i>Vigna sinensis</i>	Trapoelum	<i>Nasturtium officinale</i>
Ethiopian Mustard	<i>Brassica carinata</i>		
Night shade	<i>Solanum nigrum</i>		
Okra	<i>Abelmoschus spp.</i>		
Pumpkin (leaves)	<i>Cucurbita spp.</i>		
Sweet potato leave	<i>Ipomea batata</i>		

Source: Ngwediagi and Marandu (2002).

In Tanzania, it was reported by Edmond *et al.* (2008) that the most important areas in the country for horticultural production are in the Southern regions, being Morogoro, Iringa, Mbeya and Ruvuma and in the Northern corridor, consisting of Arusha, Kilimanjaro, and Tanga regions. Owing to the fairly good reliability of rainfall and high altitude, the regions mentioned above produce mainly temperate vegetable types. Moreover, among the two zones Edmond *et al.* (2008) emphasizes that, the Northern Corridor zones are comprises the main mixed vegetable production area AIVs inclusive.

2.3 Overall market dynamics of vegetables

Fruits and vegetables comprise a large and dynamic sub-sector within the world agriculture (Briones, 2009). In Philippine, It accounts for 31% of agricultural output (by value); in the past three decades it has been growing at a rate of 2.8% per year, compared to just 1.8% for agriculture as a whole. Nevertheless, agricultural development strategy continues to emphasize traditional crops as (Briones, 2009) points out a significant role for fruits and vegetables in agricultural diversification and rural development. On the other sides Ali (2006) narrated that in Asia vegetable production grew at an annual average rate of 3.4% in the 1980s and early 1990s, from 144 million t in 1980 to 218 million t in 1993.

In this context fruits and vegetables represent a significant set of “high-value” activities, some of which are produced within organized Supply chains (Briones, 2009).

As the economy develops, fruits and vegetable should become increasingly important, both as a share in agricultural output and in the food basket. Diversification could be pro-poor as it may raise incomes of smallholders and workers. This diversification has significant impact to a dynamics of fruits and vegetables production systems and food supply chains, largely due to the current global retail chains on improved quality standards (Dyer *et al.*, 2006). The instituted changes include centralized procurement systems, the use of specialized-dedicated wholesalers and preferred supplier systems, and the demanding requirements of private contracts (Dyer *et al.*, 2006). However, global retail chains do not invest uniformly in all countries and some, especially poor countries; have been left behind in the retail revolution (Dolan and Humphrey, 2000).

Some of the indicators for this dynamics of changes were addressed by Ali (2006) on the food demand side, whereby emphasis is now shifting from basic nutrients (calories and protein) to balanced diets (calories, protein, and micronutrients). In addition Louw *et al.* (2009), asserts that fresh fruits and vegetables markets are restructuring, characterized by an increased consolidation and concentration of the industry which lead to substantial increase of large retailers in the agribusiness supply chain in the Southern African Development Community (SADC) region. The implications of these changes are that formal markets are replacing informal markets farmers’ produce markets for fruits and vegetable (Briones, 2009).

The restructuring process is likely to exclude farmers from food markets in two ways; firstly through displacement of traditional markets by formal food chains that will leave

smallholder farmers with no alternative markets. Secondly, the restructuring process will exclude farmers through the introduction of private standards which make it difficult for smallholder farmers to attain compliance. In light of these threats the restructuring process favours large agribusiness to smallholder agriculture.

According to Putter *et al.* (2007) another dynamic of fresh fruit and vegetable sub-sector in Tanzania are spot markets whereby it is estimate that 80% of the produced vegetables in Tanzania is sold by the farmers at farm gate to commissioners. Moreover, the traditional supply chains in the fresh fruit and vegetable sector are long, involving an array of many subsequent stages and actors, un-coordinated flow of produce and generating very small margins per actors. In this market environment farmers are in a disadvantaged position, lacking assets (social capital, financial capital, human capital) to improve their positioning.

Furthermore, seasonality in production affects vegetable production not only from year to year, but also from season to season as explained in the previous section. Like the rest of agricultural activities in Tanzania AIVs farming relies mostly on rain-fed agriculture. Consequently, this leads to fluctuating supply of AIVs on the markets. The outcome of this is pronounced in the rural areas where production takes place. Moreover, other factors include increased information and technological change, and improved grades and standards.

In Tanzania the urbanisation rate is approximately 20% with an expected urbanisation of 50% in the year 2010. The population in 2006 is estimated at about 37 187 939 people Putter *et al.* (2007). The urban people can not grow their own vegetables and are depending on supply from the rural areas. In addition, in the urban areas there are also a

middle class and a rich class of people developing. These people show a growing demand for less traditional vegetables, which makes the market grow.

Moreover, growing tourism creates a growing demand for high value and high quality vegetables. Study by Ashimogo and Greenhalgh (2007), asserts that fruits and vegetable market are influenced by factors like change in market demand, technology, barriers to entry, input supply, profitability of different niches, risks and policy environment. Furthermore in Tanzania, fresh fruit and vegetables the major forces are heavy reliance on the Dar es Salaam urban market which consumes over 50 percent of urban consumption, thereby determining traded volumes, prices, and quality standards, irrigation technology, and market access by farmers close to major consumption areas (Ashimogo and Greenhalgh, 2007).

Another barrier of market chain are overproduction as a results of rain fed farming that causes problems during the sales of the produce such that a lot of produce rots away due to perishable nature of the crops (Edmond *et al.*, 2008). Fig. 2 and 3 provides some anecdotic evidence for tomatoes and cabbage.

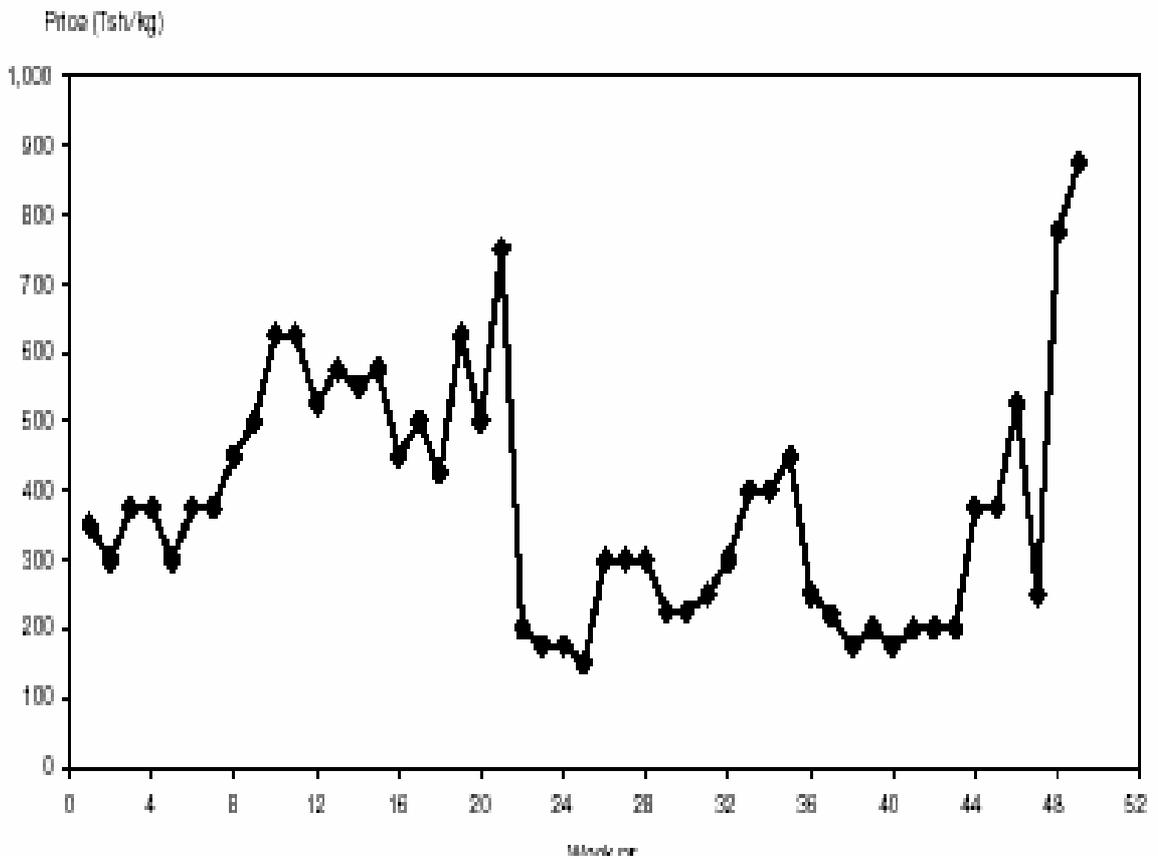


Figure : Tomato prices per kg delivered in crates of 40 kg at Kilombero market, 2005

Source: Vegetable project Arusha (2005)

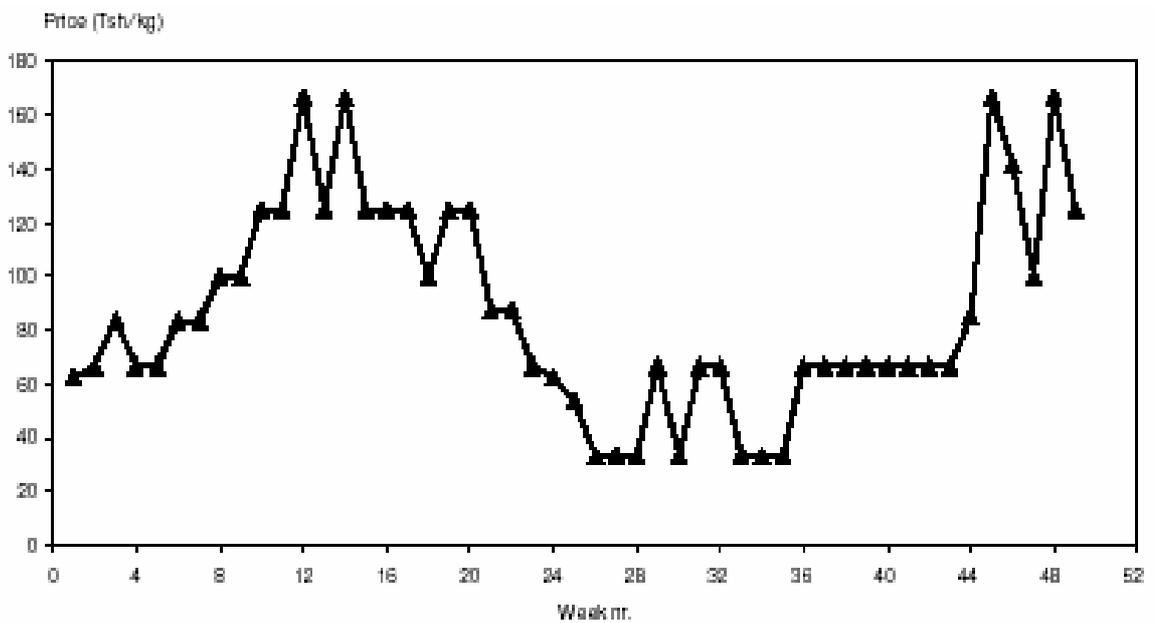


Figure : Prices of cabbage per kg delivered in bags of 120 kg at Kilombero market, 2005

Source: Vegetable project Arusha (2005)

2.4 African Indigenous Vegetables and markets: Opportunities and Challenges

Market integration of producers of fruits and vegetable is usually higher than that of staple crops producers (Weinberger and Lumpkin, 2007). The same hold for AIV crops. About half of the AIV produced reached in the market; the rest being used for home consumption. Country wide commercialization of AIV is higher in Arumeru and Muheza followed by Singida and lowest in Kongwa (Katinka and Msuya, 2004).

2.4.1 African indigenous and marketing opportunities

Traditional vegetables are a regular part of the diet in most part of the community unlike exotic vegetable. They are usually obtained from different sources as compared to exotic vegetables. While the majority of all exotic vegetables consumed were purchased in the market (65.4%), the majority of traditional vegetables consumed was produced in their own fields, or collected from the fields as volunteer crops (Keding *et al.*, 2007). AIV are used in diverse forms and many of them can be considered multi-purpose crops. Leaves of all traditional vegetables are utilized except for African eggplant. Aside from human consumption, some traditional vegetables are also fed to animals (e.g. stems of African nightshade) or eaten by free-ranging animals in the wild (e.g. the mlenda) types.

Additionally, most traditional vegetables in Tanzania are not only consumed but are used for their preventive and curative medicinal properties as well (Keding *et al.*, 2007). Several diseases have been reported to be cured by this sub sector hence prove need for the existence of this neglected biodiversity.

2.4.2 African indigenous vegetables marketing challenges

As an essential source for food, feed, natural medicine, and many other purposes, African indigenous vegetables synonyms as the Neglected and Underutilized Species (NUS) are an indispensable element of the livelihood of people worldwide which is still largely untapped for various reasons. Firstly, low competitiveness of actors along the entire market chain, from input suppliers and producers up to traders, processors and retailers. Secondly, limited knowledge of private and public service providers concerning appropriate technology packages to promote AIVs. Thirdly, inappropriate rural development policies and programmes focusing on a limited number of commodities or cash crops; and lastly widespread mistrust between market chain actors/ operators, as well as between private and public stakeholders. However, these leads to global food security increasingly depend on narrowing ranges of animal and plant species.

It has been reported by Will (2008) that today, only about 30 plant species out of the global agricultural biodiversity are used to meet 95% of the world's food energy needs. In the end, food supply is provided on average by a mere 100 species, leaving the wealth of plant genetic resources lying idle (Shiundu and Oniang'o, 2007), resources that could contribute to increasing food security and improving nutrition, generating income and reducing poverty, as well as furthering the sustainable use of natural resources.

In addition, the ever-increasing importance of an extremely small number of commodities alongside ever-decreasing African Indigenous Vegetables worldwide was driven by the concept of major crops that were perceived to be superior to those of AIVs, the so called minor species, in terms of product properties that includes quality, physical appearance,

taste, nutritional value, perishability or storability, processability Vegetables are highly perishable, they start to lose their quality right after harvest and continued through out the process until it is consumed. This poses major challenges in distribution and marketing. For this purpose elaborated and extensive marketing channels, facilities and equipments are vital. This behavior of vegetables exposed the commodity not to be held for long periods and fresh produce from one area is often sent to distant markets without a firm buyer or price.

The other feature was production traits, which affect yielding capacities, cultivation, harvesting, transport, storage and processing technologies. However, marketing properties also have influenced by consumer preferences and trends, distribution technologies, trade concentration. Furthermore, environmental properties adaptability to different and/or changing environmental conditions (e.g. climate change) affect vegetables since they have seasonal production which directly influencing their marketing. Normally they have limited period of harvest and more or less a year round demand. Infact, in some cases the cultural and religious set up of the society also matter demand to be seasonal. This seasonality also worsened by lack of facilities to store which in turn affects market price.

Another challenge is Research and development (R&D) capacities, potential uses, production and processing technologies and potential for innovation may affect the prospering of the product. Inadequate skills affect both production and marketing of indigenous vegetables when farmers lack requires skills. However, poor roads, which are in accessible during the rain seasons hinders timely transportation of AIVs to the market. Moreover, alternative product forms and markets can hinder the availability of vegetables since different varieties and qualities could be grown for the fresh and processed markets, there could also be often alternative markets. These include form markets (fresh, frozen,

dried, and canned), time markets (winter, summer) and place markets (different towns, foreign market).

Another challenges of AIVs marketing involves product bulkiness, increases costs since it is expensive to transport, storage, handling and processing properties in fresh form every time. This, therefore, exposed farmers to loose large amount of product in the farm unsold.

These listed characteristics of the product require a special complex system of supportive inputs. It demands a regular marketing preparation process like washing, cooling, proper management from the time of harvest until the produce is put on display. It is frequently believed that vegetable not only remain attractive to the consumer but also have a shelf life of few days after having purchased by the consumer (Nonnecke, 1989). Moreover Low level of AIVs productivity and inadequate network is partly due to inadequate investment in business and insufficient seed production and supply. Inadequate market linkages and market extension support to foster multiplicity of technology transfer systems. Furthermore, inadequate network as most of the resource poor farmers are not adequately covered, technical Capacity within the Extension System, and capacity building of farmers

2.5 Theoretical Background on Market Chain Analysis

There has been a systematic school of thought to describe and analyze the market chain by different authors along the way from production and distribution processes. Generally, a chain is defined as a sequence of organizations that are involved in consecutive production activities (Bathelt and Gluckler, 2002). The three main market chain analysis theories in

this study are the French Filiere approach, The Porter's approach and Global Commodity Chain Analysis.

2.5.1 The French Filière approach (Static Model)

The model describes the linear flow of physical input and services in the production of a final product, and it is concerned with quantitative technical relationships (Raikes *et al.*, 2000). The quantitative analysis of inputs and outputs, prices and value added along a commodity chain can be considered. However, the analysis tends to be static over a short period of time and the commodity chains are rarely studied in their whole length.

In 1960s the model was applied in agriculture, later it was applied in industries. It is called a "Static Model" due to non changing actors and national boundaries. It is less functional to analyze the global world economy (Stamm, 2004). Furthermore, Static Model does not indicate the growing or shrink of commodities, nor rise or fall of actors. Generally, it has applied to domestic value chain, thus stopping at national boundaries (Kaplinsky, 2000). Filière studies dealt initially with local production system and consumption, while area such as international and processing are overlooked until 1980 (Raikes *et al.*, 2000). Studies on trades were seen as a largely superfluous since these area were controlled by the states institutions which under took all transport and all marketing of commodities at a price set by the central administration.

2.5.2 The Porter's approach

In the mid 1980s, PORTER developed the so called modern value chain analysis (VCA) as an element for identifying the value at each step of production. Porter identified primary and support activities that form the chain as shown in the Fig.4

Figure : Porter's Generic value chain

¹ The primary activities

² The support activities

The goal of these activities is to offer the customers a level of value that exceeds the cost of the activities, thereby enhancing the profit margin. The enterprise margin depends on the performance of the activities. Further, the competitive advantages can be created by reconfiguring the chain in order to achieve lower costs or performing a better differentiation than competitors do (Kaplinsky, 2001). For the enterprises to achieve a competitive advantage through differentiation, Porter recognized the main factors which are; policies and decision, timing, interrelationships, integrations, scale, linkage among activities, location, learning, and institutional factors. Porter concluded that the optimizations of the enterprises are the functional for the whole production process of commodities.

2.5.3 The Global Commodity Chain (GCC)

The GCC approaches explain the distribution of wealth within a chain as an outcome of the relative intensity of competition within different modes (Raikes *et al.*, 2000). The GCC synonymously known as the Global Value Chain (GVC).

The approach was introduced in the mid 1990s (Gereffi, 2001). It was focused on the power relationship in the coordination of globally dispersed, but linked production systems. Generally, GCC are characterized by leading party or parties that are determining the overall character of the chain. Moreover, the GCC differentiated the producer-driven and buyer-driven (Gereffi, 2001). The examples of producer-driven are industries which are capital and technology intensive such as aircrafts and computers; meanwhile examples of buyer-driven are those industries which are labour intensive such as food production. For the latter the specifications are supplied by large retailers that order the commodity.

According to Gereffi (2001), the four core dimensions of GCC are input-output structure of the chain, the territory it covers; its governance structure (power), and the institutional framework that identifies how local, national and international conditions and policies shape the globalization process at each stage in the chain. The main hypothesis of GCC is linking up with the most significant lead-firm in an industry. The lead-firm is distinguished from subordinate companies in terms of access to major resources. The GCC analysis attempts to develop a unified theoretical framework which can identify appropriate production and marketing strategies. Furthermore, the key points for upgrading firms within particular types of the commodity chain so as to change the existing power relations within the chain can be identified.

This study has adopted the Global Commodity Chain analysis based on the following observations. Firstly, the GCC has revealed the potential for unveiling some of the key characteristics of the contemporary market liberation and the dynamics of changes that have emerged in the age of globalization. It can also capture the changing roles of developing countries in the precise context of structure and governance of global commodities chains.

Secondly, the GCC traditions provides a much more coherent approaches as compared to French and Porters approaches (Gereffi, 1999) in moving on the direction of fine turning theoretical concepts. Thirdly, the GCC approaches seems to hold more potential for the study of commodity chain restructuring because it generally concerned with the full range of the global chains, while the Filière traditionally mostly focuses on the local or national level of the chain. Also the GCC approaches dealt with the power issues more specifically, and stress the control of key agents within the chains while the Filière analysis have generally attached more importance to the technical side of the materials flows than to the roles of social actors.

2.6 Review of the Studies of Market Chain Analysis

Worldwide production of fruit and vegetable crops has grown faster than that of cereal crops, albeit from a much lower base. Between 1960 and 2000, the area under horticultural crops worldwide has more than doubled. There are several reasons for the global increase in production and trade of fruit and vegetable crops. Horticultural production is profitable. Farmers involved in horticultural production usually earn much higher farm incomes as compared to cereal producers and per capita farm income has been reported up to five times higher (Weinbeger and Lumpkin, 2005).

In Asia study by Ali (2006) addressed on the dynamics of vegetables were it was identified that income and population growth and fast urbanization have created additional demand for regular supply of quality vegetables, while the need to diversify cereal production systems for sustainability has generated additional scope for vegetable cultivation. Another study in Vietnam by Jaenicke *et al.* (2007) focused on Scoping study on enhancing the safe production, promotion and utilization of indigenous vegetables by women in Vietnam. The finding of this research recommend the establishment of a pilot project to assemble information on post harvest, processing and market chains, and to develop mechanisms for the dissemination of this information to village processors, small traders, entrepreneurs and others.

In Africa as elsewhere, agricultural development is taking place in the context of rapid urbanization and market integration. The livelihoods of small farmers are influenced more and more by the demands of urban consumers, market intermediaries, and food industries. In modernizing agricultural markets, small farmers are often at a significant disadvantage relative to larger commercial farmers, who benefit from economies of scale and better access to information, services, technology, and capital (Lumpkin *et al.*, 2005).

Study by Mumbi (2006) focused on viable market opportunities and threats for urban and peri-urban farmers for African leafy vegetables (ALV). They obtained poor product image and lack of consumer awareness that results into low consumption of ALV while at production level, low demand, poor seed systems and weak AIV value chains which further identified as major constraints to AIVs commercialization. However, Shiundu and Oniang'o (2007) based on the Marketing of African Leafy Vegetables: Challenges and Opportunities in the Kenyan Context and found among other thing the issues of issues of

quality control, reliability and pricing still remain critical to the future success of AIVs farming.

A similar study was conducted by Smith and Eyzaguirre (2007). Their study wanted to identify the roles of AIVs in the World Health Organization's through global fruit and vegetables initiative. They concluded that, the experience in Kenya and neighbouring countries shows that a combination of cultural pride, interest in healthy foods, and a growing taste for diversity is creating a favourable opportunity to protect and revitalize AIVs as a nutritious resource derived from Africa's biological and cultural diversity.

In Tanzania study by Chadha (2003) on the AVRDC's experience with marketing of indigenous vegetables: A Case Study on Commercialization of African eggplant. Survey results shows that 4 promising lines of African eggplant namely Manyire green, DB3, AB2 and Tengeru White have been identified and are being multiplied and commercialized. Moreover, among the 4 varieties many farmers focused to grow Tengeru White varieties because of it is high demand and high yield. Additionally, Weinberger and Msuya (2004) while studying Indigenous Vegetables in Tanzania the Significance and Prospects found that, the production of AIVs is particularly important for small-scale farmers because the production involves little monetary cost and relies strongly on family labor. Also AIVs is easily adapting to biotic constraints, in particular droughts. Furthermore, recent study by Edmond *et al.* (2008) concentrated on the baby vegetables for EU market sub sector quick scan Tanzania. The finding show fluctuation of around 3000 ton per year, export volumes trended down over the period "between" 2003-2006, especially for key destination markets UK and the Netherlands. From these little reviews, it is true that limited research have been carried out to examine the market chain analysis in this sub sector. Therefore there is need to expose more on the market chain analysis of African indigenous vegetables: case study of African eggplant among the smallholders far.

CHAPTER THREE

3.0 RESEARCH METHODOLOGY

3.1 Overview

This chapter shows the methodology that was used in the study. It is divided into nine sections. Section one provides the description of the study area which encompasses the location, administrative units and climate. In addition section two focusing on drainage and section three explains the topography. Furthermore, section four deals with land use and vegetation while section five describing the economic activities. Otherwise, sections six addresses the research design which includes sampling strategies, sample size and selected village for study, data collection and instrumentation and section seven addressing on methods of data analysis while section eight focuses on analysis of marketing chain and finally section nine discusses on methodological problems and their solutions.

3.2 Description of the Study Area

3.2.1 Location

The study was conducted in Kahama district in Shinyanga region. The district is situated on the Northwest of Tanzania (South of Lake Victoria). Roughly the district lies between latitudes 3°15 and 4°30 south of Equator and longitudes 31°00 and 33°00 East of Greenwich (KDC, 2008).

According to URT (2005), Kahama district has a total area of about 8,477 Km² (or 847 695 ha) with population of 596 456 people as per 2002 population and housing census. Due to the growth rate of 3.3% by 2008 the district was having a total population

of about 767 164 of which 391 254 are female and 375 910 are male (projection of the population Census 2002) (KDC, 2008). The district is bordered by Shinyanga and Nzega districts in the East, to the North by Geita district, to the West by Bukombe district and the South by Tabora district western part of shinyanga region (Fig. 5).

3.2.2 Administrative units

Kahama District is administratively divided into 5 divisions, which in turn are subdivided into 34 wards and a total of 221 villages. Politically the Council has two electorates namely Kahama and Msalala, each represented by one elected Member of Parliament (KDC, 2008).

The district has 34 Wards each represented by one elected Councilor and twelve appointed Councilors representing special seats for women. This makes a total of 2 members of parliament and a total of 46 Councilors (KDC, 2008). There are also politically elected leaders, 221 at the villages and 1083 at sub village levels (KDC, 2008). Fig. 5 showing area of administration comprising of 34 wards and selected village for study.

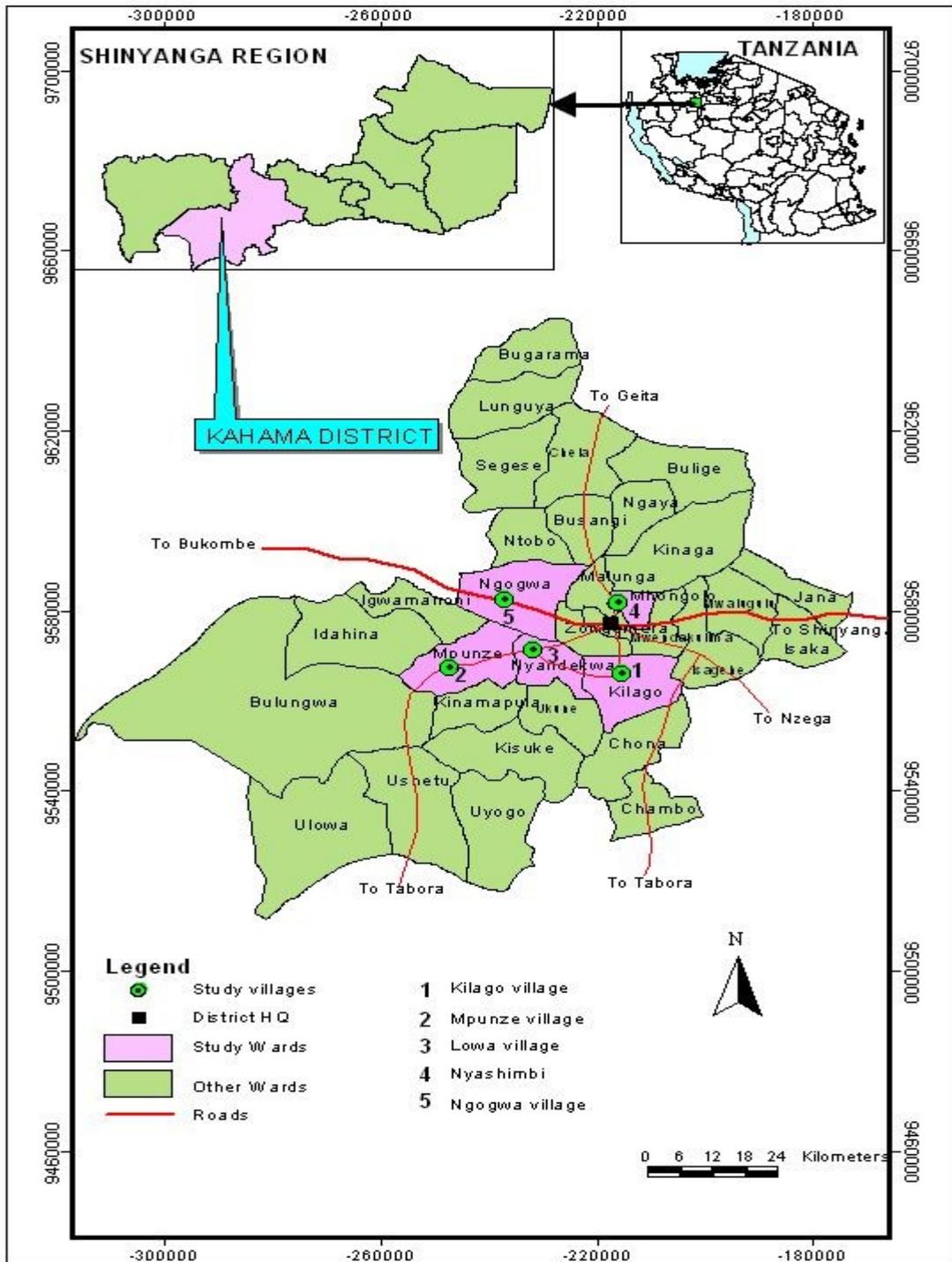


Figure : Map of Kahama district showing the study area

The largest division is Mweli (264 580 ha) comprising 31.2% of the total area of Kahama district, followed by Msalala with 236 032 ha (27.9% of the total district area). Kahama is the smallest division (30 053 ha) occupying only 3.5% of the total district area. Bulungwa in Mweli is the biggest ward (159 588 ha) occupying 18.1% of the total district area, followed by Ulowa ward 55 683 ha (6.6% of Mweli division). The smallest ward is Nyihogo ward (Kahama division) occupying 2,682 ha; only 0.3% of the total district area.

3.2.3 Climate

3.2.3.1 Rainfall

Rainfall is generally erratic, there is no clear pattern, and the district is characterized by highly unreliable conventional rainstorms causing considerable differences in rainfall both in terms of space and time. Nevertheless, rainfall variability on a year-to-year basis is not exceptionally high, averaging between 750 and 1030 mm per year (KDC, 2008). Rains fall mainly during a period of approximately five (5) months, lasting from late October to early May; this rainy period is characterized by two-week to one-month dry spells, being most in January and February (KDC, 2008).

3.2.3.2 Temperature

Temperatures are relatively constant throughout the year; with mean daily temperatures ranging from 20° to 26° C, August and September are the warmest months. Due to relatively small difference in elevation, the district temperatures are essentially the same throughout the district (KDC, 2008).

3.2.3.3 Relative Humidity

Relative humidity is on average of 79% with little variation during the year; during the rainy season values are between 80% and 85% and are slightly lower during the dry season. On a monthly basis wind speed seems to be little variation – averaging to 0.9m/sec, during the rainy season wind speeds are slightly lower than during the dry season. Strong winds frequently occur associated with rainstorms, particularly at the on set of the rains (KDC, 2008).

3.4 Drainage

Kahama district is landlocked and has no perennial streams, all streams have very low gradients and over 80% of their annual flows can be expected to occur in the period of December to May. The numerous seasonal streams collect water from five catchments areas known as Mtoni, Kigozi, Isanga, Manonga and Kadongkeni. Mtoni and Kigozi catchments drain the southern and western part of the district into lake Tanganyika, whereas, Isanga and Kadongkeni catchments drain the eastern and northern parts respectively into lake Victoria (Smith Sound).

3.5 Topography

The district is located on the inter-rift plateau at altitudes ranging from 1050 to 1500 m. above sea level. The land surface can best be described as an almost flat to undulating plains. Residual hills of low relief are common, the highest hills are not much higher than the about 300m above their surrounding plains. These undulating to flat plains are characterized by frequent occurrences of bottomlands, which the lowest levels in the landscape and locally known as mbugas. These are in fact very shallow and wide, flats to almost flat, seasonally flooded valleys (KDC, 2008).

3.6 Land Use and Vegetation

In Kahama district, land is mainly used for crop cultivation and livestock. Major crops grown include; paddy, cotton, tobacco, maize, grain legumes, sorghum, cassava and sweet potatoes. Fruit trees commonly found include particularly mangoes and further around homesteads, lemons, lime grapefruit, oranges, bananas, guava and papaya, with a few places cashew (KDC, 2008).

3.7 Economic Activities

The District Economy largely depends on Agriculture and Livestock. Approximately 483 320 ha is arable land and is presently being utilized, either for crop production or livestock grazing. There are five major crops named as main income earning crops, these are; cotton, paddy, tobacco, maize and chickpea. These crops contribute more than 40% of the District Economy. Basically Agriculture and Livestock employs more than 80% of the district population (KDC, 2008).

The district has forest reserves occupying an area of 211 000 ha (107 000ha Mkwani, 15 000 ha Ushetu, 52 000ha Usumbwa and 37 000 ha Ukamba), which are sources of high quality timber (KDC, 2008). There are also two official mines in operation, Kahama Gold Mines (Underground mining), and Buzwagi mines (Open ground mining), small scale gold mining are found at Mwabomba and Bumbiti. Small-scale diamond mines are found at Nyang'hwale where large mining companies were operating in the past.

3.7.1 Agricultural activities

The majority of Kahama residents depend on subsistence agriculture and livestock rearing as main source of income, it is estimated that more than 85% are engaging in this business. Approximately, 80% of the total arable land (482 320 ha or 57% of district area) is presently being utilized either for crop production or as grazing land. Farm sizes vary from 0.4 to 20 ha per farm household, averaging to 2.4 – 6.0 ha (KDC, 2008).

Five main agro ecological zones in the district have been distinguished. Firstly, the cotton farming system zones (42% of total district area). Secondly, the rice farming system zones (17%). Thirdly, the tobacco based farming system zone (14%). Fourth, the maize farming system (8%) and finally, maize-chick pea farming system (< 2%). Main food crops are maize, cassava, sweet potatoes, sorghum, groundnut, millet and beans. Cotton, tobacco and rice constitute the main cash crops, although all have suffered from unreliable rainfall, prolonged drought and unfavorable market outlets. In some years the district enjoys boom productivities especially during the favorable market and rainfall condition (KDC, 2008).

3.7.2 Small, medium to large enterprises

Small, medium to large enterprises or industries in the district are mainly agro-based, there are four cotton ginning industries in the district, and all of them are within the vicinity of Kahama town, also the district has two oil mill industries. Small-scale industrial enterprises deal mainly with carpentry (43 groups), construction, rice processing (86 milling machines), cereal processing (156 machines) and metal works. The service sector over the last three years; these include hotels and restaurants, petrol station, transportation companies, retail shops, private dispensaries, tailors and hairdressers (KDC, 2008).

3.7.3 Lumbering Industries

The district still has vast forest reserves, which are sources of high quality timber. There are five forest reserves within the district occupying an area of 49 000 ha (or 5.8% of the total district area). The district moreover hosts the Ushetu/Ubagwe game controlled area (90 000 ha or 10.6% of the total district area, which is in fact a buffer zone around the Kigosi game reserve, with hunting as the mainstream business. It is estimated that more than 70% of the population depend on trees as their source of fuel/energy (KDC, 2008)

3.8 Research Design

A cross-sectional research design was used in the study. It has the advantage of researcher to save time and collect data and information at single points in time. This design according to (Babbie, 1990; Bailey, 1998) is useful for descriptive purposes as well as for determination of relationship between and among variables at a particular point in time. The study was undertaken for about four months from October to February.

3.8.1 Research phases

The study was involve two phases in data collection. Reconnaissance survey was done during the first phase of the study. Reconnaissance survey enabled the researcher to obtain information on the ethnicity, population size and economic activities of the study area. The second phase focus on the household survey; where by structured questionnaire with both closed and open ended questions were used to obtain information from the respondents

3.8.2 Sampling strategies and sample size for interview

The household survey was conducted in five villages in Kahama district namely Kilago, Mpunze, Lowa, Nyashimbi and Ngogwa using purposive and multi-stage sampling procedure due to their potentiality in growing African eggplant. Studies on AIVs marketing has been conducted in the country, just to mention few district of Arumeru, Lushoto, Kondoa, Mororogo, Mpwapwa and Moshi but no such study has been conducted in Kahama district. Figure 5 present study area. The overall sample size was selected by simple random sampling method and it was comprises of 120 farmers growing African Indigenous Vegetables (AIVs), 39 African eggplant traders (wholesalers and retailers) and 10 consumers. The intension was to interview 30 farming household per village and 150 household for five study villages were considered manageable given time and financial resource. However, due to limited number of growers of African eggplant and inconvenience caused by poor accessibility in some areas, not all sampled household were ultimately reached for interview. No troubles were made to replace the missed household heads as the sizes of reached samples were still statistically plausible.

The structure of the respondents by location is shown in Table 2. It was hypothesized that household head are more informed on matters related to the household compared to other members, thus their dominance in the survey (90%) reflected the credibility of the data collected.

Table : Respondent and locations involved in the study

Location	Farmers (N=120)	Wholesales (N= 3)	Retailers (N=36)	Consumers (N=10)
Kilago	26	-	-	-
Mpunze	22	-	-	-
Nyashimbi	33	-	-	-
Lowa	22	-	-	-
Ngogwa	27	-	-	-

Central market	-	2	10	5
Wakulima market	-	1	26	5
Total	120	3	36	10

For the case of traders, Central market and Soko la wakulima were the big market place of African eggplant, thus the number of respondents were high than the rest in order to give good representation of African eggplant traders

3.8.3 Data Collection and instrumentation

3.8.3.1 Primary data collection

Collection of primary data using a questionnaire survey was preceded by key informants' interview between October -December 2009. The questionnaire and the checklist used in the household survey explore necessary information in this research. Information gathered through key informants' interviews gave insight on the community wide aspect of production, Market chain analysis and public responses to AIVs crops at large.

Primary data were gathered through observation; discussion and use of structured questionnaire with both open ended and closed ended questions. Three types of questionnaire were administered, one for farmers, traders and consumers respectively. Questionnaire was pre-tested on 10 respondents in one village so that the validity and reliability of the questionnaire items were checked and necessary modifications were made to suit stated objectives and prevailing local circumstances. The structure of the questionnaire for African eggplants actors in the chain are shown in (Appendix 1-3).

3.8.3.2 Secondary data collection

Secondary data were also used to supplement primary data. Secondary data source included both published and unpublished relevant documents from department of agriculture in Kahama district, Sokoine National Agriculture Library (SNAL), and internet.

3.9 Data Analysis

3.9.1 Analytical tools

Descriptive statistics were used in this study, based on the objectives stated. The responses from interviews were coded, summarized and entered in a computer. The data were analyzed using Statistical Package for Social Sciences (SPSS) computer package. The descriptive analyses involved computation of statistical means, standard deviations, percentage, graphs, pie chart, and frequency distribution. However, gross margin analyses were used in the study to evaluate the profit margins accrued by different actors in the African eggplant marketing chain.

3.9.3 Gross margin analysis (GM)

There are various measures of profitability of the enterprises which are Gross Margin (GM), Return on Investment (ROI), Benefit-Cost Ratio (B/C), Internal Rate of Return (IRR) and Marketing Margin (MM) (Turuka, 2000). However, Kotler and Armstrong (2006) revealed that to date there is no adequate measurement of profitability available in the marketing sector. A survey done by Kotler and Armstrong (2006) for marketing executives and professionals revealed that 68% of marketing executives have difficulties in measuring profitability on investment and 73% of them reported that there is no adequate profitability measurement tool available.

Therefore, to calculate profit we employ Gross Margin at different levels of AIVs marketing chain. GM analysis is concerned with identifying returns (profit) obtained by market participants at each stage of AIVs marketing. GM is a gross return minus the total variable expenses, which can be expressed in nominal value, ratios or as a percentage of return (Debertin, 1993). The size of GM under a competitive market condition is the outcome of supply and demand for marketing functions, and should therefore be equal to the minimum cost of service provided plus normal profit (Scarborough and Kydd, 1992). The normal profit is the least payment a trader or the owner of the enterprise would be willing to accept for performing the entrepreneurial functions. Therefore, receiving normal profit is important in order to keep the trader or owner from withdrawing the capital and managerial effort and putting it into other alternative business (Kotler and Armstrong, 2006).

To define the concept of gross margin, we have to distinguish first between fixed and variables costs. Variable cost are those cost that increase with or decreases as output change whereas fixed cost do not change as out put changed (Kohl and Uhl, 1995). In crop production, the common examples of variables costs include fertilizers, pesticides and seeds. The most important fixed costs in agricultural production are farm machinery and implements, owned land, family labour, and farm building. Gross margin analysis was used in this study to evaluate the profits margins accrued by different actors in the African eggplant marketing enterprises along the market chain. It was also assumed that own labour of farmers is unpaid, since it is tedious to estimate it as a cost incurred in African eggplant marketing enterprises. It was assumed that fixed costs are small enough to affect the sustainability of the enterprises. The expression which was used to calculate the GM across different actors in African eggplant marketing is therefore estimated by adding the

total sales and subtracting all the cost incurred at each level of the market chain as shown below;

$$\text{Gross margin (Gmi)} = \text{Total revenue } (\sum \text{Tri}) - \text{Total variable cost } (\sum \text{TVCi})$$

Where;

$$\text{Gmi} = \text{Gross margin (Tshs/kg)}$$

$$\sum \text{Tri} = \text{Total revenue (TShs/kg)}$$

$$\sum \text{TVCi} = \text{Total variable cost (Tshs/kg) spent on one acre due to ith marketing function.}$$

Its main advantage is that it does not involve tedious calculation and is within comprehension of any farmer.

Thus, GM was used to test the research question whether smallholder farmers and other actors benefit from African eggplant along the supply chain by comparing GM/kg obtained by different functional segments (enterprises) of African eggplant along the supply chain.

3.10 Analysis of Marketing Chain

The study started by identifying key actors in the AIVs markets chain, using structured questionnaires and key informants interviews. AIVs marketing chain involved understanding of the sector map for key vegetables and identified supply channels and end markets. The actors and their interrelationships were mapped. It also involved identification of opportunities, constraints and critical services provided by each actor. As explained in the preceding sections, costs associated with operations along AIVs

marketing chain were presented through a simplified Gross Margin. However, opportunities were also identified through interview and from secondary data.

3.11 Methodological Problems and their Solution

Several problems were encountered to limiting data collection. Among other problems, some farmers had problems of memory recall due to poor record keeping. Study by Mbwambo (2007) on Agrobiodiversity and Food Security among Smallholders farmers in Uluguru mountains reported similar problem whereby in some cases the researchers had to rely on their estimates. Problems related to price data collection is a possibility that prices reported do not apply in all markets at the same time, partly, because of differences in markets operating days and hours. Also the fact that there were generally no regulations as to when prices were to be collected. Another problem is that some of the farmers either showed an obvious interview fatigue due to past research studies which exposed the farmers to be paid money in order to respond for the interview. However, some farmers do not appear for the interview for the reason not known by the researchers. Other problems /limitations include the following:

- Limited number of AIVs growers in the area
- A case study approach as used in this study limits observation to only few/one location. Hence the conclusion reached may not hold for other similar AIVS marketing activities and their efficiencies in other study areas
- Using cross section data limits observation over time. This makes it difficult for the study to account for changes due to time difference

Due to these limitation the following solutions can be addressed to resolves the problems

- a) More education should be given to farmers on the importance of research to national on both social and economic development
- b) Addressing the issues of record keeping in various enterprises is vital tools in monitoring and evaluations of all business undertaking
- c) More education on the importance of AIVs both in physical and mental health in order to increase production and consumption of these biodiversity
- d) More research on a case study approaches and cross section data needs to be undertaken in order to improve results and conclusion due limiting observations over time

CHAPTER FOUR

4.0 RESULTS AND DISCUSSION

4.1 Overview

This chapter presents the results of analysis and discussion. The chapter is divided into six sections; section one highlight the relevant demographic and socio-economic variables of the respondents while section two presents the identified African indigenous vegetables with high value marketing potential grown in the study. Section three presents the supply chain actors and roles played along the market chain of African eggplant. Furthermore,

section four presents the empirical results from gross margin analysis for different actors. The chapter also presents constraints facing African eggplant producers in section five. Finally marketing opportunities for African eggplant are discussed in section six.

4.2 Demographic and Socio-economic Characteristic of the Respondents

Demographic and Socio-economic characteristics of farmers respondents shows the composition of essential attribute to farmers and trader's behaviour towards decision to participate to the market, which in turn influence the households' economic behaviour. The characteristics that were examined in the study includes the composition of household by age, sex, education level, occupation, farm size, marital status, family size, experience in African eggplant growing as well as access to credit all of which are quit similar in the study area. These have important social and economic implications towards factors influencing production and market chain of African indigenous vegetables (AIVs). For example, household characteristics of respondent usually influence the volume of agricultural outputs, decision and allocation as it has been discussed in the following sections.

4.2.1 Age

The majority of the respondents (41.7%) were between the ages¹ of 21 to 40 years; the next age group (37.5%) comprises individual between the ages of 41 to 60 years, and few (11.6%) were above the age of 60 years old. Likewise for the case of traders' situation is almost the same since most of the respondents (69.2%) are within the age range of 21 to

¹ In this study the mean age of the farmers was about 46 years with a standard deviation of 12 while the minimum age was 18 years and the maximum age is 75 years. On the other hand, the average age of a traders was about 37 with the standard deviation of 10 and minimum of 22 years with maximum of 65 years

40 years. The implication is that African eggplant marketing along the market chain is performed by the economically active group in the population.

Table : Age category of the respondents

Age category	Farmers (N=120)		Traders (N=39)	
	Frequency	Percentages	Frequency	Percentages
<20	11	9.2	0	0.00
21-40	50	41.7	27	69.23
41-60	45	37.5	10	25.64
>60	14	11.6	2	5.13
Total	120	100.0	39	100.0

The age of the head of household is considered as an important factor, since it determines whether the household benefits from experience of an older person, or has to base her/his decision on the risk-taking attitudes of the young farmers. Study by Makhura (2001) on overcoming transaction costs barriers to market participation among smallholder farmers in the Northern Province of South Africa found that, older farmers have more experienced (45%) in marketing management and tend to have stronger networks and more credibility, thus experience lower transaction costs. Further more, similar finding was addressed by Basnayake and Guraratne (2002) when revealed that age of a farmer is one of the factors that explain the level of technical efficiency. Age affects experience, wealth and decision making, all of which affect how individual works (Table 3).

4.2.2 Sex

Result in Table 4 shows that, there is great difference in participation in African eggplant production and marketing between male and female. Majority of the household farmers (79.2%) are male and only (25.8%) are female while for traders side 82.1% were women and only 17.9% are male. Studies by (Onyango, (2007) also found the same and emphasizes that in vegetables marketing activities were done exclusively by women.

One of the reasons why AIVs crops are considered important in the context of developing countries is the role women play in producing, harvesting and marketing the crops (Chweya and Eyzaguirre, 1999). However, their involvement varies by type of activity; it is most important for harvesting and bringing the product to the market, while weeding, which is also considered to be a typical women's activity, is actually mostly shared between men and women. As a whole, more activities were recorded for men alone than for women alone, and joint work as a family (either adults only, or together with their children) was also recorded more frequently for men than women alone (Table 4).

Table : Distribution of sex of respondent in farming and trading activities

Sex	Farmers (N=120)		Traders (N=39)	
	Frequency	Percentages	Frequency	Percentages
Male	95	79.2	7	17.9
Female	25	20.8	32	82.1
Total		120	39	100.0

4.2.3 Education Level

Education is one of the factors that influence vegetables crops production and marketing. Results indicated a moderate rate of literacy level which showed that, about 64 % of the interviewed farmers had primary education, 28 % had informal education and only 8 % having secondary education. Similar trend was reported in Coastal region by the study on the assessment of the agricultural marketing information needs (MAFC, 2006). Although the level of education attained by the respondents (heads of household), who normally are the decision makers, is relatively low but it is expected to enable a person to have ability to do basic communications for business purpose (selling of their crops).

The educational level of the respondents is one of the factors affecting the adoption of new innovations and is thought to influence attitudes towards market participation (Gloy *et al.*, 2000). In the view of Balint (2005) it was expected that when farmers are either poorly or highly educated, would not sell. Furthermore, Gloy *et al.* (2000) argue that skill and education increases working efficiency and productivity making the household able to use and adopt new agricultural technologies resulting into more income (Fig. 6).

64%

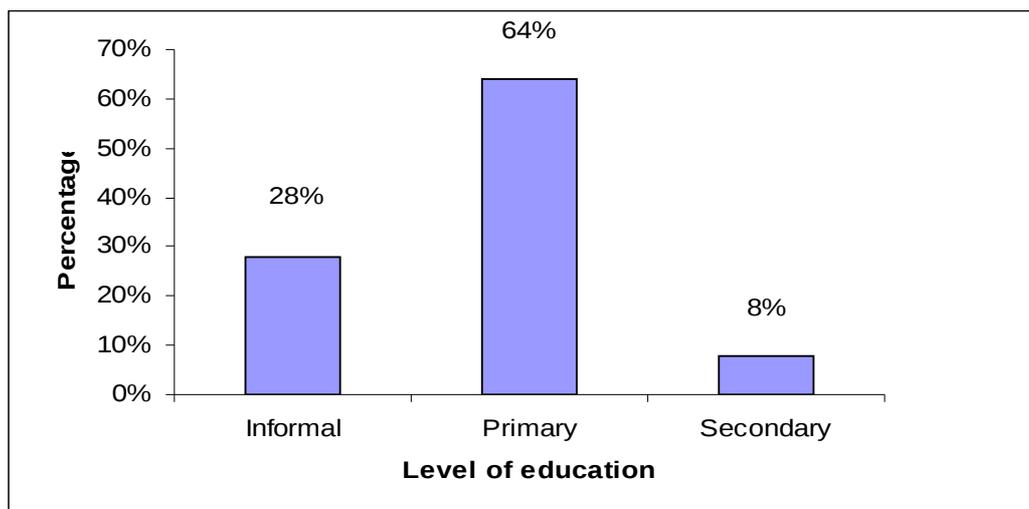


Figure : Education level of respondent

4.2.4 Major occupation of the household in the study area

Agriculture is the heart of the livelihoods of many people in Kahama, as in many parts of Tanzania. About (83.3%) of the farming households surveyed were engaged in crop production as their major source of income. Results also revealed that apart from farming, 32.5% are engaged in livestock keeping. Other activities which contributed to the Farmers income in the study area were artisan/handcraft (8.3%), and only 6.7% for small business. These finding are in line with the report by (Eskola, 2005) that agriculture is the main

employer for majority of the Tanzania population by 80%. This suggests that there is a high level of crop and livestock trade activities integrated among the farming household. Livestock particularly, cattle are kept by farming households to provide milk and draft power. However as the results of newly gold mine in the study area, town growth due to increased population created job opportunity hence laborers are required for artisan and handcraft works (Table 5).

Table : Major occupation of respondents (N=120)

Occupation	Frequency	Percent
Crop production	100	83.3
Livestock keeping	39	32.5
Business	8	6.7
Artisan/handcraft	10	8.3
Traditional healer	9	7.5

4.3 Identification of AIVs

4.3.1 Types of AIVs and their importance (Local and International)

Most of these crops are wildy found, with few being domesticated in small traditional farm for subsistence purposes. The AIVs sub sector can be traded both locally, inter-regional and international when good marketing chain, proper technology employed and good infrastructure has to be set due to their many benefits in diet. In this study, major target market is the local market. However, the sub sector in this study is defined as a basket of commonly demanded African indigenous vegetables, and higher value vegetables demanded in the urban market and produced by the smallholders' farmers in the study area. The African indigenous vegetable basket was identified to include African eggplant, Amaranths, sweet potato leave, cassava leaf, okra,

pumpkin, cowpeas, and wild cucumber. Summary of the AIVs found in the study area are presented in Table 6

Table Common African Indigenous Vegetables in study area (N=120)

Botanical name	Common name	Swahili name	Parts used	Number of peoples	%
<i>Abelmoschus esculentus</i>	Okra	Bamia	Fruit, leaf	54	45
<i>Amaranthus spp</i>	Amaranth	Mchicha	Leaves	75	63
<i>Cleome gynandra</i>	Bastard mustard	Mgagani	Leaf,stem	15	13
<i>Corchorus spp</i>	Jute	Mlenda	Leaf	5	4.2
<i>Curcubita spp</i>	Pumkins	Maboga	Leaf,Fruit	78	65
<i>Ipomea batata</i>	Sweet potato	Viazi vitamu	Tubers,Leaf	118	98.
<i>Manihot esculenta</i>	Cassava	Majani ya Mhogo	Tubers,Leaf	86	72
<i>Solanum aethiopicum</i>	African eggplant	Matole/Ngog	Fruit	120	100
<i>Solanum nigrum</i>	Black	we Mnavu/Mnafu	Leaf	35	29
<i>Vigna unguiculata</i>	nightshade Cowpeas	Kunde	Leaf,pods, pea	21	18
<i>Colocasia esculentua</i>	Taro (Dasheen)	Magimbi	Tubers	8	7
<i>Cucumis sativus</i>	Wild Cucumber	Malimbe	Fruit	79	66

4.3.2 Area under cultivation

Land is the major resource in agricultural production. The results indicate that the land holding for selected AIVs ranges between 0.35 to 2.085 acres with mean of 0.575. On the other hand farmers cultivate between 0.24 to 3 acres of African eggplant with the mean of 0.45 acre. The implication of these results (Table 7) is that majority of small scale farmers grow AIV not for commercial purpose.

Table : Area (acre) of farm size for selected AIVs (N=120).

Standard measure of the sample	African Eggplant	Cassava	Amaranths	Okra	Overall
Mean	0.45	1.24	0.35	0.26	0.575
Standard Deviation	0.32	0.85	0.65	0.14	0.49
Minimum	0.24	0.55	0.45	0.16	0.35
Maximum	3.0	4.5	0.55	0.29	2.085

For commercialization to succeed, farmers need to produce and supply market a considerable volume. For this purpose, farmers need to allocate more size of land and produce larger quantities of the African eggplant vegetable crops. A number of factors could influence both size of land allocated for a specific crop and the volume of vegetable to be supplied to a market. Similar study by Rehima (2007) have reported among production and market related variables production level, total size of land holding, distance to market, product prices, and market information were found to be important determinants. However, it must be noted that the importance of these variables in explaining market supply level could be different depending on the crop type, region/area of production and degree of commercialization. With reference to the study area, there is a low level of production regardless of the ample size of the available land.

4.3.3 Purpose for cultivation of AIVs

Fig. 7 summarizes the main purposes for growing AIVs. It was found that 47 % of African eggplant was produced for both commercial and home consumption purposes, while 18 % was produced for commercial purposes alone, and the remaining 35 % of the respondents cultivate African eggplant for home consumption alone. A similar study by Ngugi *et al.* (2006) revealed that African indigenous vegetables were grown only on subsistence basis and any surplus was sold to nearby informal markets or to brokers, often fetch very low prices (Fig.7).

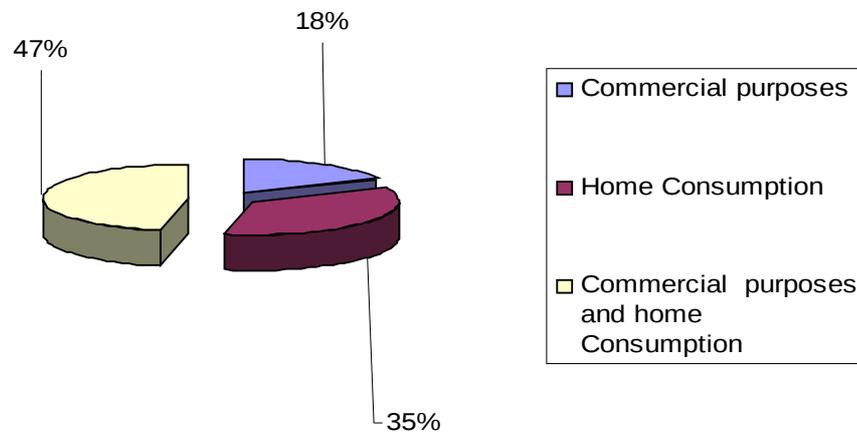


Figure : Main reasons for cultivating AVIs

4.3.4 The importance of African eggplant compared to other AIV

The importance of African eggplant compared to other AIVs were identified through interview with farmers and other stakeholders by ranking method aiming to identify AIVs mostly disposed in the market when compared to others. This is because, producer interest normally focusing on the high income commodity at less manageable costs. In conducting ranking of high income among 7 varieties of AIVs, tastes and preferences as well as other cultural reasons were the bases for ranking vegetable cultivars. The concept of consumers' preference means the personal choice for a particular product or commodity in the market place. A number of factors can be used to guide the person choice. Among other factors these may involve palatability (taste) of the vegetables, colour, fruit size, texture and longevity. Other factors for choice includes yield, resistant to disease and pests.

A result shows frequency of the multiple responses of the farmers as they were asked to identify the most important AIVs in terms of high income earning. The results indicate that African eggplant ranking the first. This implies that African eggplant can be

harvested for long period compared to other AIVs. In that regards there is prolonged supply which lead to more consumption of African eggplant in the area. Summary of ranking for 7 types of African indigenous vegetables are provided in (Table 8).

Table : Most AIVs with high income earning (N=120)

Types of AIVs	Frequency	Percent	Ranks
African eggplant	38	31.7	1
Amaranthus	29	24.2	2
Okra	19	15.8	3
Sweet potatoes	15	12.5	4
Pumpkin	14	11.7	5
Cowpeas	4	3.3	6
Wild cucumbers	1	0.8	7
Total	120	100.0	

Furthermore, constant supply and consumption of African eggplant lead to provisional of dual functions of vegetable such as *physical and mental health* since it provides essential micro nutrients in the diets and *poverty alleviation* through increased income and job opportunities. Also it contributing to food security for the farm families. Amaranthus came next in the order of importance due to it simplicity in production resulting to fulfillment of the customers/personal choice. In this study implied having available round the year (off season and during the season). Furthermore, Okra was identified as the third choice. Farmers explained that small plot of okra can give substantial amount of cash for family's need. Some of these crops serve as insurance such that they can be harvested at anytime to make up for debt or some other sudden needs.

4.4 Actors in AIV

4.4.1 Identification and characterization of actors

Results in Table 9 show the key actors in AIVs their roles and characteristics. As shown in Table 9, the AIVs market chain is dominated by farmers (N=120) while input suppliers and traders constitutes only small part. On the other hand females constitute a large part (82%) of AIVs traders while most of input suppliers are male (70%)

Table : Key actors: Their roles and characteristics

Key Actors	Roles/Characteristics	Gender Distribution
Input suppliers	They supply agriculture inputs like fertilizers, pesticides, fungicides and vegetable seeds. Also sell farm equipment, including irrigation equipment.	(N=20) Female =30% Male =88%
Producer	Mainly small scale producers (production),Packaging, Transportation and Marketing (sales locally and regularly taken to town markets	(N=120) Female =12% Male = 88%
Middleman/ Commission agents (Dalali)	Help farmers sell African eggplant, provide market information to farmers; and sometimes store African eggplant before disposal time.	(N=3) All males 100%
Wholesalers/ Bulk purchasers/ traders	Bulking packaging; storage; transport/import African eggplant from external market; They are very few usually work in between urban market and production area, sell African eggplant to retailers. They have work capital. Take big risks some times offer credit to retailers	(N=3) All males 100%
Retailers	Break off bulk; transport African eggplant to retail point. Storage, direct sale to consumers (e.g. individual consumers, hotels, restaurant, hawkers and institutes like Schools). Mainly sold on tables or ground in the market place	(N=36) Females=82% Male=17%
Buyers	Go to the market several times a week to obtain food, vegetables and AIV inclusive from, retail markets, street venders and farmers (point of purchase) to home transport. They can relay on steady supply, but the price can fluctuate.	(N=10) All females 100%

4.4.2 Role of actors in AIV in marketing and distribution

4.4.2.1 Producers and market

The activities of farmers in African eggplant production have been reported fully in existing literature (Chadha, 2003; Ngungi *et al.*, 2006, Onyango, 2007 and Camanzi *et al.*, 2009). However the major role of the producers is the production of African eggplant. This section therefore focuses on the post harvest activities of producers, specifically as they relate to getting the African eggplant to the market.

As shown in Fig. 8, the AIVS marketing chain in Kahama district starts from input provision. Input providers supply seeds, pesticides and fertilizers to farmers. However, the use of these inputs is very minimum. Farmers on the other hand are responsible for farm to farm gate movement of the produce. This is normally done by headportering usually provided by members of farmers' households and/or farm labourers. From this point the African eggplant is transported to Kahama market by use of bicycles or ox-cart depending on the volumes of produce. Sometimes, the African eggplant is sold to the wholesalers or retailer at the farm gate. In such a situation it is the wholesalers or retailer who arranges and pays for transporting the African eggplant to Kahama town market or any other retailing points. It was observed that producer (farmers), have more than one place for selling their produces. The places identified were farm level², town market, village market and garden³. According to informal interview with some producer and traders, mostly their customers come directly to negotiate prices in the farm and gardens where by customers harvest the crops upon agreement on the prices. According to Maro

² Farm level refers to large field located some distance away from homestead

³ A garden (kitchen) is commonly located few steps from the homestead

(2008), the operational definition for production area can also be called selling spot. However, town markets are places where large population of all sort of trading activities takes place and is operating throughout the week. Villager markets were regarded as seasonal market having specific days of the week for service delivery (operating).

Consumers

Retailers

Wholesalers⁴

Transport

Production

Inputs

⁴ Apart from supply of African eggplant in Kahama, there is also small amount supplied from Geita by the wholesalers.

Figure : Overview of AIVs sub sector map

In this regards, producer markets are dictated by the market forces. They are usually lowest during in-season when compared to off-season (June –December) when demand for African eggplant is high. Sometimes; few farmers buy African eggplant from their fellow farmers and sell in urban market. But, commonly producer usually operates in rural areas while traders (wholesalers, retailers and street vendors) operate their business in urban market. The result shows that majority of farmers 40% prefers to sell most of their crops in town markets, 32 % are sold in the village market. However, few farmers 31% prefers to sold their crops at farm level (Table 10).

Table : Producer’s main places for selling African eggplant

Place of sale	Crop	
	Frequency	Percentage
Farm	39	33
Garden	16	13
Village market	38	32
Town market	48	40

4.4.2.2 Wholesalers and market

These are known for purchase of bulky products with better financial and information capacity. They buy AIVs particularly African eggplant at the farm gate, from assemblers and /or road side with a larger volume than any other marketing actors do. Other Wholesalers used the system of negotiation with the farmers on the price. When agreed on price, they harvest the produce on their own cost and transport to town. Each wholesaler

mainly uses bicycles, oxcart and lorry when taken from outside the district to load African eggplant, cucumber and other AIVs supplied to market.

Generally, wholesalers are relatively fully engaged in wholesale buying by wandering to other areas outside the district in the other months of the year finding for the commodity to sell. Wholesalers resell African eggplant produce to retailers and hawkers synonyms to urban food vendors; sometimes some supply constantly to institutions (e.g. Kwema and Rocken hill English medium Primary Schools).

4.4.2.3 Retailers and market

These are known for their limited capacity of purchasing, handling of products, low financial and information capacity. Retail traders tend to buy African eggplant from wholesalers, farmers or any other middlemen. Mostly, they are the ultimate actors in the market chain that purchase and delivered African eggplant to consumers. They are very numerous as compared to wholesalers and small group of urban vegetable/food vendors. Their main functions were to sell to final consumer in pieces and on retail basis after receiving larger volumes from wholesalers or farmers.

Retailers and wholesalers mostly exchange the marketable AIV crops on credit basis. This alleviates working capital shortage of retailers. In this regards retailers have the opportunity to take the amount they demand and were expected to pay back at the end of one or two market days depending up on the speed of the market and the volume handled. The

common types of vegetables they handled were African eggplant, Okra, onion, tomato, potato, and leafy vegetables.

From the survey particularly in wakulima market, it was observed that the retail area was poorly marked out to retailers that creates problem in the course of buying and selling due to the existence of narrow gap between different retail stalls. On top of these, stalls were either in open air, or poorly made of plastic and wood constructed for sun and rain protection. Products were exposed to different contamination agents. There was strong lack of consideration in improving the market place by concerned body. On top of this they did not get any training that can capacitate their bargaining power and business thinking. The major buyers from retailers were clearly final consumers (households), hotels and restaurants.

4.4.3 Factors influencing market linkages

4.4.3.1 Distance from the village to the market place

Distance to the nearest market is the proxy factor relating to transaction cost. Where transaction cost comes from factors relating to location and access to information. It is assumed that, households located closer to the market center were expected to experience lower transaction cost since they can get information more easily. At the same time access to information was assumed to reduce transaction costs and also allow them to present the products to the market in time. As such, proximity to the market centre is positively related to market participation and that as

the distance from the market increases, participation to the market decreases. The results shown that 33% of the respondents are within the range of 12-17 km from production site to the market place (Table11).

Table : Distance to market place (N=120).

Distance category	Frequency	Percent
< 5 Km	19	16
6-11 Km	27	23
12-17 Km	40	33
18-23 Km	13	11
> 24 Km	21	17
Total	120	100.0

The finding furthermore indicated that, 16% of farmers are living less than 5 km from the market place, while 17% of the respondents live above 24 km from the market place. From this finding it easy for farmers living below 18 km to reduce transaction cost and become well informed than those living from 18 km and above. Distance from the production site to the selling point and input source was expected to have negative sign. This mean that as the distance increases transport and transaction cost increases too, but if transport charges do not depend directly on the distance, there is implicit time factor which influenced by road condition. A similar study by Nkhori (2004) in Botswana found out that transportation cost of cattle and crops increases with the increase of the distance to the market.

4.4.4 Market chain analysis of AIV

Market chain of African eggplant involves actors, costs, opportunities and obstacles. Some of which are explained in sub section 4.4. However a detailed African eggplant market chain was shown in Fig. 8 which involves operation such as production, harvesting, handling, transportation selling and finally buying of the final produce. This analysis was based on survey data and observations to get information on market performance which involves among the main actors involved in African eggplant marketing in this case producers and traders (wholesalers and retailers). In the following sections, the costs and profitability analysis including producers' constraints and opportunities are elucidated.

4.5 Profitability of African Eggplant by the Smallholders Farmers

4.5.1 Marketing margin along the African eggplant marketing chain

The assessment for marketing performance measures was done in which gross margins were calculated. Gross margin was used to measure producers' performance while retailers and wholesalers performance were determined by market margin. First after harvesting of African eggplant, sack and polythene bags was used for packing before transferred to the market. Sales are mostly done per tin in the market. In order to determine the weight of tin⁵, weighing scale were used for measurement. In this study result of the analysis Table 12 present the average producer's total quantities yield and quantities sold.

Table : Total yield and quantity sold of African eggplant

African eggplant	Total yield (Kg)	Quantity sold (Kg)	Average price (Tshs/kg)	Total Revenue (Tshs)
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⁵ One tin is equal to 12kg of African eggplant

950.97	804.50	242.68	195,236.12
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4.5.2 Producer's gross margin

Table 13 summarizes results of the analysis of price of production cost and margin for African eggplant. At the producers' level, market efficiency was measured using gross margin analysis. Gross margin for farmer were calculated as the different between total revenue and the total variables cost incurred. Results indicated that farmer gross margin is small compared to retailers and wholesalers gross margin along the market chain. This difference is caused by the following reasons: Firstly, total variables cost incurred by the farmers in vegetables production are relatively higher when compared to other actors (wholesalers and retailers) since the analysis does not take into account the implicit costs associated with family labor. Similar studied by Scheltema (2002) emphasizes that vegetable production is significantly more labor-intensive than maize and bean production. Furthermore, he noted that French bean production requires 1300 mandays per hectare per year, and chili, okra, tomatoes, onions, and brinjal require 540-690 person-days, but maize and beans require just 175 person-days. Given the seasonality of labour demand and the need to grow food crops, few households have sufficient family labor to grow more than 0.25 acre of African eggplant vegetables. Secondly, African eggplant under poor management harvesting can not last for one year before replanting again hence increasing cost of operations in order to prolong the harvesting period. In order to achieve these more cost are to be incurred by the farmers. Moreover, African eggplant like other fruits and vegetables are subject to more

production risk than staple crops, due to attack from pest and/or poor weather, as well as greater marketing risk, due to its perishability.

Table : Producer gross margin analysis of eggplant

Variable cost	Amount
Average inorganic fertilizer cost	47,032.63
Average organic fertilizer (FYM) cost	14,775.58
Average cost of seed	3,699.97
Average cost pesticides	21,121.06
Average cost of rice husk	1,968.42
Average cost of Total inputs	88,597.66
Cost of farm operation	
Farm preparation	17,685.25
Weeding/watering	21,033.34
Fertilizing and spraying	7,322.55
Harvesting	12,704.00
Transportation and marketing	17,844.00
Total cost of farm operations	76,589.14
Total average variable costs	165,186.80
Total Revenue	195,236.12
Gross Margin	30,049.32
Gross Margin/Kg	37.35

4.5.3 Wholesalers and retailers market margins

In order to understand the wholesalers and retailers gross margin along the market chain, analysis was done to determine market margin and gross margin for both retailers and wholesalers. Accepting the gross margins estimated provided in the table below, it appears that the returns per kg is between Tshs 114.62 and 42.78 for retailers and wholesalers respectively. This result seems to imply that although retailers own less bulks of African eggplant for sale compared to wholesalers in the market but they are the one receiving higher gross margin Kg sold when compared to the wholesalers along the market chain ($\chi^2=6.8$, with $p<0.05$). Generally, retailers receive high margins because of the small quantities they trade daily. Similar study by Ali (2006) on Horticultural development for the poor found that, retailing

in large quantities, such as by big grocery stores, can reduce cost thus lead to receiving high gross margin. However, such an option is not feasible at a low development stage because of high capital cost and the low accessibility to these stores. Moreover, these stores reduce opportunities for the self-employed small retailers (Table 14).

Table : Mean quantity purchased and sold by traders

African eggplant	Retailers	Wholesalers	χ^2
			6.8*
Quantity purchased (Kg)	1142.57	1311.06	
Quantity sold (Kg)	936.36	1041.10	
Revenue (Tshs)	367,454.8	357,024.42	
	6		
Total Variable Cost (Tshs)	260,135.0	312,486.16	
	1		
Gross Margin	107,319.	44,538.16	1.3**
	85		
Gross Margin/Kg	114.62	42.78	0.2 (NS)

Note: NS= not significant; *Significance at $p < 0.1$; **=Significance at $p < 0.05$

4.6 Constraints Facing African Eggplant Producers

Water scarcity was mentioned to be a critical problem among the farmers especially during the dry season (Table 15). Prevalence of poor irrigation equipments/technology was also reported by farmers as compounding the problems. For examples the use of several deep wells around the field hinders natural drainage of streams; similarly the use of buckets for large African eggplant plots is a tiresome jobs as well as time consuming; the use of locally constructed canal lose water through infiltration; the water lost through infiltration would have been spent by other farmers in other places nearby.

Adding to water scarcity there is a problem of water conflicts. Study by Ngugi *et al.* (2006) when conducting a study on land use changes and hydrological impacts in Upper Ewaso Ng'iro river basin in Kenya found that conflicts over water resources mainly during the dry season when most streams dry up.

Table : Constraints facing African eggplant producers

Variables	Frequency	Percent
Seasonality	34	28.3
Water scarcity	25	20.8
Pesticides and disease	41	34.2
Limited access to information	20	16.7
Total	120	100.0

Furthermore, seasonality of African eggplants production was listed as another major constraints facing African eggplants market supply. African eggplants marketers were sometimes unable to meet their customers' requirements throughout the year hence results to importing African eggplant from outside the district (Table 15). In addition, pests and disease were mentioned yet as another major problem during the rain season, which in turn reduce yields. This problem is forced by prohibitive pesticides and chemicals which farmers claimed to be of high price. Same finding was observed by Nyange *et al.* (2000) whereby pesticides and appropriate chemicals were reported as being unavailable to farmers whenever the need for them arose.

Another constraint was the access to marketing information for African eggplant which was reported as limited among the actors. Generally, farmers depend on traders for information in order to sell their produce. Similarly retailers were found to rely on wholesalers' information. These findings are similar to those of Nyange *et al.* (2000) when

studied fresh fruits marketing in Tanzania who found that, the flow of market information at farm level are still poor in Tanzania.

4.7 African Eggplant and Marketing Opportunities

The opportunities offered by domestic market and high value markets would be exploited if the production of African eggplants can be achieved within the district. This means that the value chain can serve wider market and many market segments than it is serving now. This is due to the fact that Kahama is among the newly growing town in the country with high population growth rate of 3.3%. In addition there is enough land 847 695 ha (URT, 2005). Enough land for agricultural production presents great opportunities for investment in the AIV sub-sector. Furthermore, land is one of the capitals that can be efficiently utilized to support the development of the sector.

CHAPTER FIVE

5.0 CONCLUSION AND RECOMMENDATIONS

The overall objective of this study was to assess the current marketing chain of African Indigenous Vegetables (AIVs) in Tanzania with emphasis of African eggplant (*Solanum aethiopicum*) among smallholder farmers in Kahama district. The choice of the crops intentionally based their relative importance and currently increased marketability. More specifically, the study aimed at: - (i) To identify African indigenous vegetables with high value marketing potential have grown in the study area. (ii) To identify market chain actors (iii) to determine role played by different actors along the market chain (iv) To determine the profitability of African eggplant by small holder farmers. A very wide number of respondents at all stages of the market channel were interviewed. The analysis was made with the help of descriptive and econometric tools employing SPSS and Excel soft ware.

A total of 120 farmers from 5 villages namely (Kilago, Mpunze, Lowa, Nyashimbi, and Ngogwa), 39 traders combining both retailers and wholesalers from 2 town markets in Kahama namely (Central market and Soko la wakulima) and 10 consumers were drawn at the district and they were interviewed using structured questionnaires. Rapid market appraisal with focus group discussion and key informant interview was conducted. Secondary data on basic agricultural and population was also collected.

5.1 Summary of the Major Findings

In Tanzania, African indigenous vegetables have been identified into two major group namely domesticated and undomesticated. However, composition of species varies to great extent in the different agro-ecological zones as well as the five different phyto-

geographical regions of the country. Furthermore, the importance and number of AIVs species used are quite distinct between the zones.

It was noted that area under cultivation for African eggplant is small ranging between 0.24 to 3 acres. It was however found that, when compared with other vegetables African eggplant contributing more in provision of dual functions of vegetables in physical and mental health and poverty alleviation due to its long harvesting period hence long duration in market supply unlike other AIVs in the area.

The finding also shows that main actors in this sub-sector are producers, traders (wholesalers retailers), and consumers. Furthermore, it was found that producers have more than one place for selling their produce. In addition, it was found that retailers gross margin per Kg is higher (Tshs 144.62) compared to other actors where GM/Kg was Tshs 42.78 and 37.35 for wholesalers and producer respectively.

5.2 Conclusion

5.2.1 Importance of African eggplant compared to other AIVs

In an attempt to identify AIVs with high value market potential grown in the study area, it was found that farmers are basically scientists in their own right, having been able to successfully select their own landraces to suit their own environment and thus meet their subsistence and surplus for market demand.

Knowledge about the indigenous vegetable, especially with regards to their nutritional status, resistant to adverse weather, high yields leading to high income and long production period may be the leading factor for smallholders' farmers when conducting the ranking of the AIVs potentiality in study area. Table 10 provides a summary of indicators

when conducting ranking of 7 types of African indigenous vegetables by the respondents from the list (Table 7) however, list in Table 10 consist of only few AIVs grown in small traditional farm for subsistence purposes and marketing. The results shows African eggplant having the leading one due to its wider range benefits by ensuring long time market supply compared with the rest of AIVs available in the study area.

5.2.2 Roles of actors in the marketing chain of African eggplant

Producers mainly play major roles of production and sales of produce in raw form, and thus no value addition are made along the chain apart from transporting the AIVs (African eggplant) to the selling point. This is corroborate with IPGRI (2006) that most fresh fruits and vegetables are only minimally storable, and are not processed before reaching consumers (except for slicing, dicing, mixing, and packaging for some high-end markets). These characteristics mean that the marketing system which links farmers' traders and consumers of fresh African eggplant produce has a preponderant effect on the level and stability of supply and prices, on the real comes of consumers and especially farmers, and on the quality and safety of these foods.

The AIVs sold by wholesalers are normally in bulk quantity. However there is no use of the scale for unit measurement. Traders normally sold AIVs in bunch or bundles tied with rope or sliced form. The quantity of bundles is greatly affected by the status of the AIVs weather fresh or dry, sizes of the fruits vegetables and categories of the customers. Volume may increase or decreased on the basis of the stated situation above.

It was a normal condition to see retailers and wholesalers selling their produces while exposed and uncovered just placed on the polythene bags on the tables or few centimeters from the ground. The results of the study showed conclusively that selling of vegetable is a female-dominated enterprise. While men are mostly engaging in the production aspect of vegetable. Generally poor infrastructure along the market chain from point of production to final consumers has great impact to the performance of various actors along the chains.

This being the case the following conclusions can be drawn from this study. Thus, the study attempt to identify supply chain actors and roles played along the market chain of African eggplant. It was expected that by identifying different actors and roles played along the market chain will assist the institutions in formulation of policy intervention that may stimulate smallholders' farmers' participation in production, and marketing of African indigenous vegetables particularly, the African eggplant in the study area.

5.3 Recommendations

Since vegetables were creating a wider employment and income opportunity to the rural households, production of vegetables has to diversify to include other vegetables, which have a production advantage and wider market potential in Kahama district. Through diversification purchasing power of farmers will be improved. This can be achieved if a proper linkage can be created between buyers and farmers through some kind of institutional arrangements like contract etc.

In fact, improving farmers' purchasing power through capacitating market information access should not be missed. Furthermore; an intervention with strong extension service

delivery would be imperative. Moreover, successful commercialization could be effective if supported with an efficient marketing system.

The increasing participation of farmers in production and marketing of African eggplant manifested by increasing number of consumers which in turn lead to more market actors. Marketing strategies through an established institution such a NGOs or Cooperatives should be developed to provide farmers' training on modern production techniques, quality control and standardization of selling units, in order to links farmers with the current market outlets in the supermarkets and groceries.

Sales could also be accompanied by proper record keeping. It is not enough to encourage local farmers to grow their traditional crops. The farmers need to work together in order to have a strong voice and unity as they need to negotiate for favorable prices for their produce. This is because a successful marketing is important in the effort of creating sustainable livelihoods.

Finally, further studies on marketing system should be conducted in all African indigenous vegetable growing areas other than Arumeru so that a well organized regional and national vegetable production and marketing can be implemented.

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APPENDICES

Appendix : Farmers questionnaires for African Indigenous Vegetables

Name of Enumerator.....Questionnaire number.....
Date of Interview.....

Part A: Socio-demographic and economic characteristics

A1 Name of Respondent

A2 Village.

A3 Ward.....

A4 Division

A5. District

A6. Age of household.....

A7. Sex of respondent :.....(01=Male, 02 =Female)

A8. For how long have you been in African eggplant activities.....(years)?

A9. Marital Status of household (Indicate by putting a tick)

[01 = Married, 02 = Single, 03 = Divorced, 04 = Widows, 05=Others]

A10.Level of education of household head (indicate by putting a tick)

1=Informal	2=Primary	3=Secondary	4=Others specify

A11.What is your major occupation?.....

01= Crop production, 02= Livestock keeping 03= Salary employment,

04= Business, 05= Artisan/handcraft, 06= Traditional healing/medicine,

07= Wage work, 08= Others (Specify)

A12. Please provides information of the household size and composition (only people belong to your family and share the same kitchen)

Age group	Males	Female
Below 17 years		
17-50 years		
Above 50 years		

A13 Please provides the information on farm size and land tenure (in acre)

Number of plots/farm	Plot/Farm Size(Acres under different land uses	Private (titled) land	Inherited land	Share cropped land	Borrowed land	Rented
Area dedicated For AIVs						
African eggplant						
Maize						
Paddy						
Cassava						
Grazing						

land						
Others (specify)						

PART B: Production information

B14. Do you supply African eggplant throughout the year?

01=Yes, 02=NO.....

B15. If No, which months /Season of the year you usually supply African eggplant to your Customers?.....

B16: What is the peak months of the African eggplant?.....

B17. What do you do to ensure constant supply of African eggplant?.....

01=Irrigate, 02=Practicing relay planting, 03=Buy from others, 04=Others (specify)

B18. Besides African eggplant do you grow other AIVs?

[01=Yes,..... 02=No.....

B19.If yes please complete the table below about the major AIVs grown 2008/2009

Crop	Area (acre) owned	Area (acre) rented
1.African eggplant		
2.		
3		
4		
5		
6		
7		

B20. From the question 19 above ranks yours crops according to the order of importance in income contribution in your house hold.

.....

B21. What is the main purposes for growing AIVs on your farm?(Tick all that apply)

- 1 Commercial purposes Subsistence Family consumption
- Both 1 and 2 Contract with traders' Other (specify)

PART C: Farm inputs information

C22. Did you purchase any inputs for farming? If yes indicate the inputs used

C23. Which types of inputs did you used in your farm? 01=Pesticides

02=Organic fertilizers,03=Inorganic fertilizers.....(Tick all that apply)

C24. Where is the source of fertilizer you are used ? (*Tick all that apply*)

01=From shop, 02=From NGOs,03=Neighbour,04=None,05Others (specify)

C25. Please fill the following tables on the cost incurred per Season/Year for African eggplant enterprises

Crop	Labour cost Tshs/acre	Inputs cost 1.Fertilizers (Kg) 2.FYM(Kg) 3.Compost (Kg) 4.Pesticides(Kg)	Unit price (Tshs)	Total cost
1.African eggplant				
2.				
3.				
4.				
5.				

C26. Which types of labour you are using in vegetables cultivation?

01=Family labour 02=Hired labour 03=Exchange labour ,04=Others (specify)

C27. Do you receive advice from extension agent on production and marketing of different AIVs crops? 01=Yes, 02 =No.

C28.If Yes what types of advice did you receive from the extension agent?(out line)

.....

C29. Do you grow AIV (i.e. African eggplant) under contract ?

[01=Yes,02= No.....]

C30. If yes are the contracts formal or informal? 01= Formal.....02 = Informal

PART D: Harvest and traded quantities / Sales information

D31. Please fill the following tables concerning the harvest and sales information

for an acre of land

i):

Crop	Quantity Harvested (kg/acre)	Quantity Consumed (Kg/acre)	Quantity Sold (Kg/acre)	Quantity deteriorated (Kg/)	Unit selling price Tsh /Kg
1.African eggplant					

2.					
3.					
4.					
5.					
6.					
7.					

ii):

Crop	Frequency of Harvest (days/week)	Main form sold (Tick all that apply) 1.Fresh loose unsorted 2.Fresh loose sorted 3.Fresh packed 4.Preserved 5.Othres (Specify)	Main market place of sales (Tick that apply) 1.Village market 2.Garden 3.At farm 4.Assembler 5.District market 6.Others (Specify)
1			
2			
3			
4			
5			
6			

D32. What are the criteria for market place section above? (Tick appropriate answer)

01 = High price ,02 = You can bargain with more buyers,03= No other option
04= Short distance from garden/farm, 05=other (please, specify)

D33. To whom do you sell your produce?(Tick appropriate answers)

01= Local consumers, 02= Wholesalers,03= Hotels /Restaurant,04= Retailers,
05= Others (Specify)

D34. Who sets the price for your produce during sales?

01= Farmers , 02= Wholesalers 03= Retailers 04= others (specify).....

D35. What is the method of payment? ?...(Tick all that apply)

01= Cash, 02= Credit, 03=others (specify).....

D36. What kind of measuring instrument do you normally use in determining unit of ales for African eggplant?

01= Scale, 02= “Fungu”, 03= “kopo”, 04= others (Please specify)

D37. What kind of market information are you receiving?....(Tick all that apply)

01=Price.....,02=Product quality.....,03=Crop highly demanded.....,04=Others...

D38.How do you collect information on market prices?...(Tick all that apply)

01= Direct visit to market, 02= Cross checking with middle men, 03= Hear from friends, 04= others (specify)

D39. How far is your house from this market? (Help with estimation if needed)
kilometers

D40. Do you transport the AIVs (African eggplant) from the garden/farm to your marketing place ? -----(01=Yes,02=No)

D41.How do you usually transport your produce to selling point?

Crop wgt in Kg/Bag	Means of transport	Cost (Tshs)

D41.What are your major marketing constraints (rank them accordingly)

1= Low producer price, 2= Higher transport cost,3= poor road to the market, 4= Poor market to information, 5= Lack of reliable transport cost, 6= others (Specify Rank.....)

D42.What is your annual incomes from African eggplant trades activities/acre

D43. Is there any institutions or association that influences bargaining power between you and consumers?01= Yes,02= No

D44. If yes what is the name of institutions and Explain.....

D45. On your opinion do you think there is any importance of having such institution/association?

E. Credit accessibility information

E46. Do you access to the credit facilities?..... [01= Yes 02 = No.....]

E47. If yes for question 51 above, what are the main sources? (Tick all that apply) [01= SACCOS, 02= Traders, 03 = Bank ,04=other farmers, 05= others (specify)]

F48. Do you keep records?..... [01= Yes 02= No...]

F49.If yes, what types of records?

[01= Quantity produced 02= Quantity sold, 03= Production cost, 04 = Both item 1-3 above, 05= others (please, specify)]

Thanks you for your cooperation and be blessed!

Appendix : Traders questionnaire for African Indigenous Vegetables

Name of Enumerator.....Questionnaire number.....
 Date of Interview.....

Traders (Wholesalers /Retailers) Questionnaire.

A. Traders identification

- A1. Name of the respondent
- A2. Name of the market
- A3. Ward.....
- A4. Village/Street.....

B House holds characteristics

- B5. Age of respondent
- B6. Sex of respondent..... [01=Male, 02=Female]
- B7. Marital status (Indicate by putting ticks)

Single	married	Widowed	Divorced	Separate

- B8. Level education of the respondent.....
 [01=None, 02= Primary education, 03= Secondary education ,4= post secondary]
- B9. How many people belong to your family and share the same kitchen?.....
- B10.What is the nature of the business?..... [01= Full time, 02= Part time]
- B11.Do you belong to assemblers/wholesalers/retailers marketing organization?(Tick only that apply).....

C. Source of the produce

C12.Please indicate the source and the price you pay in purchasing your produce

Supplier Market	Season of the year	Prices (Tshs/kg)
	1. Off season	
	2. In season	
1.Producers		
2.Assemblers		
3.Wholesaler		
4.Collectors		
5.Other trades		

- C13.What is the means of transport do you use?
 [01=Head load, 02=Bicycles, 03=Ox-cart, 04 lorry,05=Others (specify)]

D. Marketing Costs

D14.Indicate the expenses you incur in selling your produce.

Item	Description	Cost (Tshs)
1.Transport		
2.Labour charge		
3.Market fees		
4.Tax		
5.Other cost		

E. Market outlet and price

E15..Indicates market outlet where you do sell your produce and price received

Types of AIVs	Outlet market	Prices (Tshs/Kg)
	1. H/H consumers	
	2. Restaurant/ Hotels	
	3. Retailer/Wholesalers	
	4.Others (Specify)	

F. Quantity of produce handled

F16. How much of African eggplant do you normally handed /trade per months ?

Season	Quantity in (Kgs)		
	Purchased	Sold	Deteriorated
Off season			
In season			

G. General questions /chain actors relationships

G17.After purchase, what do you do with African eggplant?

01= Sorting ,02=Storing, 03=Sale direct to Consumers, 04=others (Specify)

G18. If sorting done explain how?.....

G19.Who set price of African eggplant ?

01=on going market price, 02= purchasing price consideration

03= bargaining 04= farmers ,05= others (specify)

G20. Do you have any kind of association /cooperatives?.....

[01=Yes.....,02=No.....]

G21 If yes what benefits do you get by being a members of the association or organization?.....

G22. Does association or organization (formal or informal) Marketing or producer group influences your bargaining power?

1=Yes 2 = No

G23. Do you have any contractual arrangements you're your trading partner (s) buyers/sellers you normally transact with ?..... [01=Yes...,02=No...]

G24.. What kind of market information are you receiving?....(*Tick all that apply*)

01=Price.....,02=Product quality.....,03=Crop highly demanded.....,04=Others...

G25. By experience, what prevent you to sell more of African eggplant and other AIVs?.....

G26. Do you face any problem(s) /challenges in marketing your African eggplant?

[01=Yes.....,02=No.....]

G27. If yes, can you e list those problems.....

G28.Do you keep record?..... [1= Yes..... 2= No.....]

G29. If yes what type of records do you keep?

01= Quantity Sold, 02= Quantity produced , 03=Cost of running business, 04=other (specify)

G30. What are the opportunities you think are associated with African eggplant trading?

.....

G31. Do you have access to credit facilities?.....

[01= Yes02= No.....]

G32. If yes for question 30 above what are the main source?.....

01= Bank ,02=other traders, 03= SACCOS, 04=other (specify)

G33.If no for question 18 above what do you think could be the reasons?

01=Credit not available...02= high interest rate ,...03=High risk

04=Return from AIVs are very low such that not afford make credit repayments

Thanks you for your cooperation and be blessed!

Name of Enumerator.....Questionnaire number.....

Date of Interview.....

A. Identification

A1.Name of the respondents at household / restaurant /hotel//others.....

A2.District.....

A3.Ward

A4.Village/ Street

A5.Sex of the respondent..... [01= Male..... 02= Female]]

A6.Age of the respondents

A7.Marital status

01= married,....02=singe.... 03=widowed.....04=divorced.....

A8. Education level of the respondents

[01=None,.....02= primary education.....03= secondary education, 04 =post secondary...]

A9.Main occupation

[01=self employment.....02=farming.....03=unemployed,.....04=others (specify)]

B. African eggplant consumption

B10.Where do you usually buy the African eggplant? (*Tick all that apply*)

[01= Town market,.....02=Food vendors, 03= Retailers.....04.Others (specify)

.....

B11.How often do you come to this market? (*Tick all that apply*)

[01=Daily,...02=Weekly,...03= Monthly

B12.Besides this market, do you get supplies from other source?

[01= Yes02= N0.....]

B13. Why do you use theses other markets?

[01= more products.....02=More sellers, 03=Closer location, 04= Better value
05=other (please, specify)].....

B14. How far from your house to the markets place ? (*Tick all that apply*)

01= < 1st.....km, 02= >2ndkm

B15. Do you think African eggplant can be available at this market throughout the year?

[01=Yes,02= No.....]

B16. If No what other AIVs do you normally buying to compensate African eggplant at this market? (outline by priorities of importance.....)

.....

B17. Do you also buy African eggplant from food vendors coming to your village /street? (Tick all that apply)

[01= Yes.....02= No.....]

B18. If yes how much higher are the prices charged by the food vendors compared to the other traders in the market place ? Explain

B19. Do you have enough information to know the right price of the goods and their availability at the markets?

[01= Yes 02= No

B20. Where do you get this information from? (Tick all that apply!)

[01=Hear from friends,..... 02= Cross checking with middlemen,03= Direct visit to the market,....04= others (specify)]

B21. What are the marketing problems with regards to African eggplant in this market (rank them starting with the main problem)

[01=Inadequate supplies, 02=Price fluctuations, 03=Low quality fruits 04=Rigid pricing methods /no bargaining, 05=any other problems (specify)

B22. What do you think should be done to rectify the situation above?

A.....

B.....

B24.If this was done, how would this change your behaviour?

.....
.....

25. Do you think you would rely more on the market for your daily consumption?

.....
.....

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Additional comments if any by the interviewee:.....

Thanks you for your cooperation and be blessed!