

**ANALYSIS OF RICE MARKETING SYSTEMS IN MPANDA DISTRICT OF  
TANZANIA**

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**A DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT OF THE  
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## ABSTRACT

Rice is the second most important cereal in Tanzania and mostly used as a cash crop. The cultivated area of 681 000 ha represent 18% of Tanzania's cultivated land. The general objective of this study was to examine the rice marketing chain in Mpanda district of Tanzania. Specifically, the study intended to carry out the value chain mapping; analyse economic efficiency of rice marketing system; assessing the distribution of gains and; examine the competitiveness criteria of rice marketing chain. Primary data were collected from four wards in which 120 rice producers were selected. In addition, interviews were undertaken with selected key stakeholders along the chain namely transporters, wholesalers, millers, retailers and consumers. Data analysis involved different techniques such as actors' linkage matrix, marketing margin and profitability analyses. It was found that wholesalers enjoy the largest share of the marketing margin, where at cross boundary markets, the wholesalers' profit goes as higher as Tsh. 821/kg as compared to Tsh. 533/kg which is the price received by farmers. This indicates unequal distribution of benefits among actors, where reward to traders is extremely higher than that of producers. The study recommended improvement of effectiveness of warehouse receipt system and village markets in order to secure high prices during off-season. Furthermore, lack of adequate agricultural infrastructure and market information systems was observed to be critical areas of policy concerns. Policies for microcredit institutions on provision of credits to rural farmers are also recommended to improve rice productivity by capacitating smallholder farmers to use modern agricultural machinery.

## DECLARATION

I, Albert Samwel Moshi, do hereby declare before the Senate of Sokoine University of Agriculture, that this dissertation is my own work done within the period of registration and that it has neither been submitted nor being concurrently submitted for degree award in any other institution.

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Date

The declaration above is confirmed by

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Date

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## **DEDICATION**

I dedicate this thesis manuscript to my mother Edith Moshi, for her encouragement throughout my studies despite the family responsibilities. Further, to my lovely wife Matilda Henry and the son Ebenezer Albert for their moral and material support.

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## LIST OF ABBREVIATIONS

ACT	-	Agricultural Council of Tanzania
ACDI/VOCA	-	Agricultural Cooperative Development International /Volunteers in Overseas Cooperative Assistance
DRC	-	Democratic Republic of Congo
ESRF	-	Economic and Social Research Foundation
FAO	-	Food and Agricultural Organization
GMA	-	Gross Margin Analysis
GM	-	Gross Margin
GMM	-	Gross Marketing Margin
GDP	-	Gross Domestic Product
HBS	-	Household Budget Survey
ITC	-	International Trade Center
NBS	-	National Bureau of Statistics
NMM	-	Net Marketing Margin
MVIWATA	-	Mtandao wa Vikundi vya Wakulima Tanzania
REPOA	-	Research on Poverty Alleviation
RIU	-	Research in Use
SPSS	-	Statistical Package For Social Sciences
SWOT	-	Strengths, Weaknesses, Opportunities and Threats
UNIDO	-	United Nations Industrial Development Organization
UNDP	-	United Nation Development Programme
USAID	-	United States Agency for International Development
UNCTAD	-	United Nations Conference on Trade and Development

VCA	-	Value Chain Approach
VCD	-	Value Chain Development
WFP	-	World Food Programme
WRF	-	World Report Fall



## **CHAPTER ONE**

### **1.0 INTRODUCTION**

#### **1.1 Background**

Rice is a staple food for more than half of the world population and in Asia alone more than 2000 million people obtain 60-70 percent of their calories from rice and its products (FAO, 2004). It is also the most rapidly growing source of food in Africa, and is of significant importance to food security and food self-sufficiency in an increasing number of low-income food deficit countries (Gebremeskel, 2010). Rice cultivation is the principal activity and source of income for millions of households around the globe, and several countries of Asia and Africa are highly dependent on rice as a source of foreign exchange earnings and government revenue.

Rice is the second largest produced cereal in the world. At the beginning of the 1990s, annual production was around 350 million tons and by the end of the century it had reached 410 million tons (Indiamart, 2009). Production is geographically concentrated in Western and Eastern Asia, accounting for 90% of the world's production and consumption of rice. China and India, which account for more than one-third of global population supply over half of the world's rice. Rice production in India accounts for 20% of overall production, while Brazil stands as the most important non-Asian producer, followed by the United States (Indiamart, 2009).

In Tanzania, rice is the second most important crop and mostly used as a cash crop. Tanzania is the second largest producer of rice in Southern Africa after Madagascar, with production level of 818 000 tones (Matchmaker, 2010). The cultivated area is 681 000 ha

and this represents 18% of Tanzania's cultivated land. About 71% of the rice grown in Tanzania is produced under rain fed conditions, where irrigated land presents 29% of the total land with most of it in small village level traditional irrigations with the average yield of 1-1.5 t/ha (Kibanda, 2008). Farmers grow a number of traditional varieties which have long maturity and yield but are affected with irregular rainfall pattern and occurrence of pests which contribute to decline in the yield. Rice consumption in Tanzania is estimated to be 930 t/year, and rice imports of 55 t/year (Kibanda, 2008).

In Tanzania, per capita consumption of rice is roughly 16 kilograms, contributing 8% of the caloric intake among the Tanzanian population (NBS, 2007). This makes rice the third most important source of calories in Tanzania after maize (33% of caloric intake) and cassava which makes 15% (NBS, 2007). Rice is a preferred grain in the sense that as income rises, consumers shift from sorghum and maize toward rice and wheat products. As a result of steady economic growth in Tanzania over the past seven years, per capita rice consumption has increased, stimulating both increased domestic production and rising rice imports. About half of the production is concentrated in Morogoro, Shinyanga, and Mwanza regions and virtually, 99% of rice is grown by smallholders in Tanzania, although some of them are part of large-scale rice irrigation schemes that were formerly state-managed farms (NBS, 2007).

Rice is more commercialized than other staple food crops. According to the 2002-03 National agricultural sample censuses, 42% of rice production is marketed, compared to 28% of maize and just 18% of sorghum (NBS, 2007). Tanzania is both an importer and an exporter of rice. Tanzanian rice imports averaged 71 000 tons over 2005/2007, mostly from Asia, and represents about 8% of apparent domestic consumption (NBS, 2007). Rice

exports over this period were about 10,000 tons, mostly to Kenya, Zambia, and other countries in the region (Delgado et al., 2005). Imported rice is considered inferior to local rice by Tanzanian consumers and thus sells at a discount compared to domestic rice.

## **1.2 Problem Statement and Justification**

Rice is one of the most popular crops grown in Tanzania. In some areas rice has shifted somewhat from being a mere food crop to commercial one. This is from the fact that its demand for both internal and external market is increasing with time. The main factors for existence of huge supply of rice are the availability of favorable land and climatic condition for paddy production, and diversification of production from cash to food crops. Because of its increasing popularity and production over time, rice has the potential to bring significant changes in the livelihood of rural Tanzanians. Despite this potential rice marketing chain is poorly organized. In the traditional selling system, farmers produce commodities that are pushed into the marketplace. Farmers are generally isolated from end consumer and have little control over input costs or profit received for their goods. In most traditional selling systems, farmers tend to receive minimal profit (RIU, 2010).

There is inadequate knowledge especially on the study area, on how rice market is organized, how the various key actors are performing in terms of distribution of gains along the chain. The challenges facing actors along the rice value chains in the country and their feasible solutions are not clearly known. Thus, research on rice sub sector is important so as to provide insights on the marketing conduct and channels, distribution of accrued benefits and associated challenges. This study attempts to address the issues highlighted above using a case of Mpanda district of Tanzania. The results from this study provide areas deserving policy attention for improving rice production in Tanzania.

### **1.3 Objectives of the Study**

#### **1.3.1 General objective**

The general objective of this study was to analyse the rice marketing chain in Mpanda district, and recommend policy measures for improving efficiency of the rice marketing system in the study area.

#### **1.3.2 Specific objectives**

- i. To carry out the marketing chain mapping of stakeholders and policies influencing rice production and marketing in the study area.
- ii. To study economic efficiency of the rice marketing system in terms of market shares and margins.
- iii. To assess the distribution of gains among key stakeholders along the rice value chain.
- iv. To find out the competitive criteria of the rice value chain in terms of product quality, specification and differentiation.

#### **1.3.3 Research questions**

This study was guided by three research questions as outlined below:

- (i) Is rice marketing chain in Mpanda economically efficient?
- (ii) Are the income accrued along the chain equitably distributed among actors?
- (iii) Is the rice marketing systems competitive?

#### **1.3.4 Limitations of the study**

Most of the data obtained from respondents were mainly through interviews to farmers, traders, millers, transporters and consumers. In some cases, observation method was used for verification of given information. Their responses were subject to error due to poor

understanding, inadequate knowledge and inadequate ability to recall issues as farmers do not keep record. Homogeneity of farmer groups interviewed was also expected to have similar errors, indicating moderate level of reliability. Nevertheless, care was taken to ensure that collected data were reliable enough for empirical analysis. They also lack transparency especially on the questions touched household income. Besides, the study succeeded to tap income information from more than 88% of respondents, enough to generalize the results. Wholesalers were also reluctant to give information on the exact profit earned from their business but enough evidences were caught for the study. Where local units like bags and tins were used, conversion to metric estimations was done to have standard units for analysis. Villages were selected based on purposive sampling, in respect of high paddy producing villages in the study area, followed by random sampling using existing village farmers' registry book available in each village.

### **1.3.5 Organization of this report**

This report is organized into five chapters. The first chapter comprises of introductory part, problem statement and research questions set for the study. Chapter two is mainly literature reviews which included definitions of key concepts. The third one narrates methodologies used in this study, in line with description of the study area. The fourth chapter deals with the results and discussions of the findings, while conclusion and recommendations are presented in the fifth chapter.

## **CHAPTER TWO**

### **2.0 LITERATURE REVIEW**

#### **2.1 Theoretical Perspectives on Key Concepts**

##### **2.1.1 The value chain concept**

Value chain is defined as the full range of activities which are required to bring a product or service from conception, through the intermediary phases of production, delivery to final consumers, and final disposal after use (Kaplinsky and Morris, 2001). It include input suppliers, producers, processors and buyers, a range of technical, business and financial service providers, and the final markets into which a product or service is sold at local, national, regional and global level (ACDI/VOCA, 2011). Value chain analysis facilitates an improved understanding of competitive challenges, helps in the identification of relationships and coordination mechanisms, and assists in understanding on how chain actors deal with powers and who governs or influences the chain (ACDI/VOCA, 2006).

The established linkages between value chain approach and value chain development to marketing were proved right. Realizing the growth of markets and marketing development, International Labour Organization (ILO) contended that markets increasingly have very specific requirements that are often not known to farmers and development stakeholders and hence, their inability to effectively compete. Unless farmers meet market requirements, national and especially international markets will always remain closed to them. By focusing on the constraints that inhibit success along the chain and by involving buyers in value chain approach exercises, local stakeholders can better

understand market demand for their products and improve their ability to meet their needs (ILO, 2007).

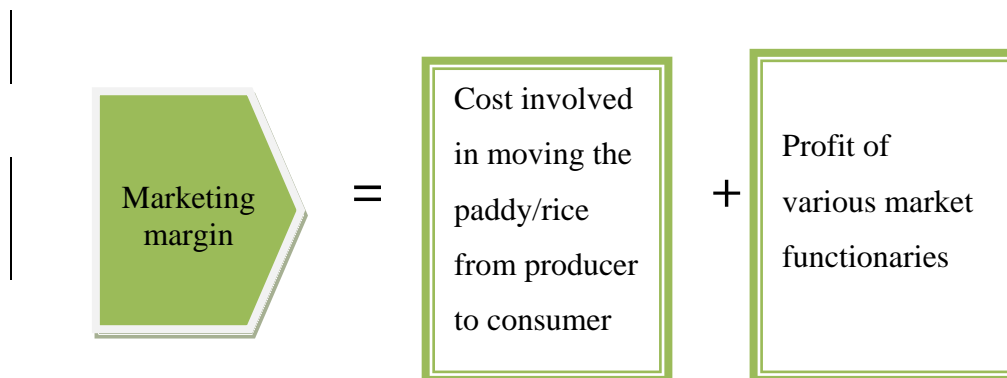
Value chain mapping to its side, refers to the process of developing a visual depiction of the basic structure of the value chain. A value chain map illustrates the way the product flows from raw material to end markets and presents how the industry functions (Kahsay *et al.*, 2008). It is a compressed visual diagram of the data collected at different stages of the value chain analysis and supports the narrative description of the chain (USAID, 2010). Through this mapping exercise, structural aspects of the value chain such as characteristics of actors, profit and cost structures, product flows and their destinations, and entry and exit conditions are assessed (Kaplinsky and Morris, 2001). The purpose of a visual tool in the analysis process is to develop a shared understanding among value chain stakeholders of the current situation of the industry (McCormick and Schmitz, 2001). The mapping exercise provides an opportunity for multi-stakeholder discussions to reveal opportunities and bottlenecks to be addressed in subsequent stages of the crop development. Maps also help to identify information gaps that require further research (USAID, 2010).

The objectives of value chain mapping includes; (a) to gain a basic overview of the value chain; to guide the full value chain analysis to be undertaken (b) identify constraints and possible solutions at different levels in the value chain (c) identify the location and position of the poor in the value chain (d) visualize networks to get a better understanding of connections between actors and processes; (e) demonstrate interdependency between actors and processes in the value chain and (f) to create awareness of actors to look beyond their own involvement in the value chain (Vong, 2009).

## 2.1.2 Agricultural Marketing Analysis

### 2.1.2.1 The marketing margin

Marketing margin refers to the difference between the price paid and received by a specific marketing agency such as a single retailer, or by any type of marketing agency, that are retailers or wholesalers or by any combination of marketing agencies in the marketing system as a whole (Achike *et al.*, 2010). Total marketing margin includes cost involved in moving the product from producer to consumer and profits of various market functionaries, and is calculated as percentage as follow:  $(\text{Farm gate price} / \text{retail price}) \times 100$ . The difference between retail price and farm gate price is calculated as  $(\text{Retail price} - \text{farm gate price}) \times 100$ , which will give the total mark up in percentage.



**Figure 1: Diagrammatic description of marketing margin**

Source: Agmarket, 2001.

Among the tasks of marketing margins is to describe the structure of the marketing chain, starting at the farm gate and tracing the product through the marketing intermediaries until it reaches the final consumer (Gabagambi, 2011).

### 2.1.2.2 The farmers' share approach

The farmer's share or a producers' share is an analysis of farmer income in relation to consumer money spent on the same product (Kennedy, 2011). This measure is used to



realize the share of a producer out of the total retail price per unit, be it a kilogram or any metric and non metric measures. The approach has been widely used in many cases related to agricultural produces in the world, and in Africa, it was used in Ethiopia during the analysis of rice profitability and marketing chain in South Gondar Zone, in 2010. In the United States, it was used by Keystone Agricultural Producers in 2011 during comparison of vegetable markets in the groceries of Prairie Provinces.

### **2.1.3 Profitability analysis**

Profit is a financial benefit that is realized when the amount of revenue gained from a business activity exceeds the expenses, costs and taxes needed to sustain the activity (Ghimiray *et al.*, 2007). Profit margin is a ratio of profitability calculated as net income divided by revenues, or net profits divided by sales. It measures how much out of every shilling of sales an individual farmer or businessman actually keeps from the money he earned through business (FAO, 2007). Gross margin (also called gross profit margin or gross profit rate) is the difference between revenue and cost before accounting for certain other costs. Generally, it is calculated as the selling price of an item, less the cost of produce sold, production or acquisition costs. (Alter, 2000).

There are several ways of analyzing profitability and one of them is costing-based profitability analysis. In this form, the costs and revenues are grouped according to values and defined costing-based valuation approaches (SAP, 2009). This is the same as values of sales of a product minus cost incurred in making and moving it to the market. Marketing margins can also reveal the profitability of actors at different nodes along the value chain. The marketing margin refers to the difference between the prevailing prices at the two ends of the marketing hierarchy at the time when transactions take place (Ajala and

Adesehinwa, 2008). The marketing margin shows the fraction of the consumer expenditure as a commodity that is received by the producer and each of the marketing agents. Thus, the marketing margin represents the price paid for a collection of marketing services and its size reflects the structural efficiency of the marketing system. The marketing margin is used to give a close approximation of the market performance. The marketing margin can be expressed either in nominal terms or in percentages. A high marketing margin indicates inefficiency because a high cost is incurred in the provision of marketing services. According to Ajala and Adesehinwa (2008), it assumes the following formula.

$$\text{Marketing Margin} = \frac{\text{Selling Price} - \text{Supply Price} \times 100}{\text{Selling Price}}$$

Where selling price is the retail price and supply price is the producers' price. Thus, the size of the marketing margin reflects the structural efficiency of the marketing system.

## **2.1.4 Market competitiveness**

### **2.1.4.1 Agricultural market competitiveness in Tanzania**

The government of Tanzania identified the suboptimal structure and functioning of the agricultural marketing system as a key area for attention. Liberalization policy has removed many of the old certainties but has not yet provided adequate basis for an efficiently functioning alternative (Kawa *et al.*, 2007). To meet this need, an investment program entitled Agricultural Marketing Systems Development was proposed to remove constraints to effective operation of the agricultural marketing system and to help smallholder producers acquire the tools needed to participate on favorable terms in the open market. The program consists of four components: producer empowerment and

market linkages; financial market support services; rural marketing infrastructure and agricultural marketing policy development (Kawa *et al.*, 2007).

#### **2.1.4.2 The policy options**

According to Robert Peston (2010), there are three ways of improving competitiveness in any product marketing, and these are; improvement of labour productivity by increasing spending on education and training to develop skills; to improve competition in product market by deregulating to reduce barriers to entry and to improvement level of investment by subsidies; tax incentives and maintaining fair interest rates. In Tanzania, Agricultural Marketing Systems Development Programme (AMDP) developed the three policy options in agricultural marketing. These are: (a) enacting legislation and regulations governing the marketing of food and cash crops; (b) harmonizing legislation and regulations to enhance fair and free marketing of food and cash crops; and (c) reviewing and rationalizing existing legislation and regulations, as well as enforcement mechanisms governing food and cash-crop marketing, to enhance efficiency, transparency, coherence, competition, and compliance (URT, 2011).

#### **2.1.5 Agricultural productivity**

This is measured as the ratio of agricultural outputs to agricultural inputs. Output is usually measured as the market value of final output, which excludes intermediate products. This output value may be compared to many different types of inputs such as labour and land. These are called partial measures of productivity (Beckman *et al.*, 1955). Some sources of agricultural productivity are mechanization, high yield varieties, fertilizers, irrigation facilities, herbicides, pesticides and Increased plant density.

### **2.1.6 Value chain and market map development**

The first step in mapping the market is to delineate the value chain. The chain actors who actually transact a particular product as it moves through the value chain include input suppliers, farmers, traders, processors, transporters, wholesalers, retailers and final consumers. A comprehensive mapping therefore describes interacting and competing channels, including those that perhaps do not involve farmers, and the variety of final markets into which these connect (Hellin and Meijer, 2006). It becomes complicated where more than one market destination exists. There are three tools for value chain research, and these are personal observation, semi structured interviews and questionnaires. The latter focused on what value chain actors are doing, while qualitative research provided a means to check the reliability of data from questionnaires and can also give more insight into why actors are doing what they do and how they formulate their decisions (FAO, 2006).

On the other side, the market map is a conceptual and practical tool that helps us identify policy issues that may be hindering or enhancing the functioning of the chain, and also the institutions and organizations providing the services like market information, qualities and standards that the different chain actors need in order to make better informed decisions (Hellin and Meijer, 2006).

The market map or marketing channel is made up of three inter-linked components, which are value chain actors, enabling environment and service providers. Enabling environment includes infrastructures and policies, institutions and processes that shape the market environment, while the service providers includes the business and extension services that support the operations (FAO, 2006). At the district and regional level, local authorities

from both public and private sectors stand at the two positions of enabling environment and service providers.

### **2.1.7 The Concept of marketing**

Marketing encompasses all of the business activities performed in directing the flow of goods and services from the producer to the consumer or final user (World Bank, 2006). These activities are usually classified into six stages. These are: production, assembly, processing, wholesaling, retailing and consumption (Goyal, 2010). In Sudan, Mendoza (1995) conducted study of marketing channels and margins to analyze the marketing of different products, including tomato, vegetable and potatoes. The study demonstrated that even when there were price variations at all market levels, the marketing margins became larger due to increases in the value added by the marketing system. He described marketing as a system because marketing usually comprises several interrelated structures along the production, distribution and consumption units underpinning the economic process.

From the view point of society, it is defined as all the process necessary to determine consumers' physical and societal needs and to conceptualize and affect their fulfillment (Brarson *et al.*, 1983). Marketing includes all activities of

exchange conducted by producers and middlemen in exchange for the purpose of satisfying consumer demand.

### **2.1.8 Marketing channel**

A marketing channel is a set of practices or activities necessary to transfer the ownership of goods, and to move goods from the point of production to the point of consumption and, as such, which consists of all the institutions and all the marketing activities in the marketing process (Armstrong, 2009).

Marketing channels have traditionally been viewed as a bridge between producers and users. However, this perspective fails to capture the complex network of relationships that facilitate marketing flows which are the movement of goods, service, information, and so forth between channel members (Edinburgh Business School, 2008).

### **2.1.9 Efficiency defined**

In production, efficiency is a relationship between ends or output and means or ways of achieving it. Economic efficiency is measured not by the relationship between the physical quantities of ends and means, but by the relationship between the value of the ends and the value of the means. Marketing efficiency is all about delivering effective marketing programs at the lowest possible cost (Dodd, 2010).

Increased efficiency is in the best interests of farmers, traders, processors, wholesalers, retailers, consumers and society as a whole. The efficiency of a marketing system is

measured in terms of the level and/or costs to the system of the inputs, to achieve a given level and/or quality of output. Such inputs are generally in the form of land, finance, time, manpower and materials. Typical outputs include the movement of a given amount of product to markets at specific distances, the supply of a particular level of service to target market segments and the supply of products at a target price (Brosen *et al.*, 1984). Hence resources are the costs and utilities are the benefits that comprise the marketing efficiency ratio (Kohls *et al.*, 1990).

#### **2.1.10 Overview of the forms of marketing efficiency**

Operational efficiency is where the costs involved in marketing of a commodity are reduced to maximize the profit accrued in a business. Improved operational efficiency is evident where marketing costs are reduced but outputs are either maintained or actually increase. Physical losses as commodities produce or products move through the channels of distribution are another aspect of operational efficiency (FAO, 1997). Lower level of operational efficiency is a result of higher operational costs, and vice versa. To the other side, pricing efficiency is concerned with the ability of the marketing system to allocate resources and coordinate the entire agricultural/food production and marketing process in accordance with consumer directives (FAO, 1997).

#### **2.2.11 The Commodity approach to marketing studies**

The commodity approach is one of the oldest approaches in marketing studies. It is based on the study of marketing phenomena by investigating products or classes of products. Although it was the predominant approach, it is perceived declining in terms of its importance (Mount, 1969). Besides, the approach is still visible in the marketing literature. Mount regarded the commodity approach as fundamentally descriptive, that the study of

the particularities of commodity is relevant approach to the discipline of marketing. The approach laid a foundation in various study of the discipline, but it has its drawbacks. By studying the products or classes of a product, some elements like participants linkages can easily be skipped.

### **2.1.12 The Structure Conduct Performance (SCP) approach**

Structure, Conduct, and Performance (SCP) analysis was developed by Bain (1968). This theory tells us that the market structure (the environment) determines market conduct (the behavior of economic agents within the environment) and thereby sets the level of market performance (Takele, 2010). It is an attempt to compromise between formal structures of economic theory and empirical observations of organizational experience in imperfect markets. It is a standard tool for market analysis (Duc Hai, 2003).

Market performance is the extent to which markets result in outcomes that are deemed good or preferred by society. Market performance refers to how well the market fulfils certain social and private objectives. These include price levels and price stability in long and short term, profit levels, cost, efficiency and qualities and quantity of food commodities (Kizito, 2008).

The two major indicators of market performance are net returns and marketing margins. Estimating net returns and marketing margins provide indication of an exploitive nature when net returns of buyer are much higher than his fair amount. Net returns can be calculated by subtracting fixed and variable costs from gross returns. The mathematical formulation is  $NR = \sum (P_i - V_i) - FC$ , where, NR is Net Return,  $P_i$  is price,  $V_i$  is amount, FC is fixed cost and VC is variable cost (Takele, 2010).



## **2.2 Review of Empirical Researches**

### **2.2.1 Value chain researches worldwide**

Value chain studies have been done in many countries with varying crop and livestock focuses. The study conducted on whether public policies enhance or impede innovation in fish, banana and vegetable value chain in Uganda pointed out that policies have two dimensional influences on innovation in value chain irrespective of sectors, policies that constrain innovation and those that support innovation. The former include lack of favorable credit facilities and no subsidy policy, lack of infrastructure, lack of government support in value addition of local products, stringent and ever changing international market demands, and weak enforcement of existing laws and regulations. On the other hand they maintained that policies perceived to enhance agribusiness innovations include non-taxation of agricultural exports, liberalization of trade and service delivery enabling pluralistic service providers (Kibwika, 2006).

In Bhutan, the status of the rice commodity chain was evaluated using the functional, flow and economic analysis methods. More over the study utilized SWOT analysis to identify the challenges and opportunities and chain mapping to show the flow of rice along the chain. The study identified the various actors in the value chain, strengths, weaknesses and opportunities of each actor. Currently, the different agents or stakeholders in the chain include farmers, commission agents, extension agents, researchers, millers, exporters and urban retailers. The rice production is largely subsistence farming and not directly linked with the market.

There are several gaps and weaknesses in the production, processing and marketing of rice. The low seed replacement ratio and use of modern varieties affects production. Farmers mostly rely on organic manures to supply nutrients to the rice crop, which is not sufficient for raising production. Irrigation water is a core input in rice cultivation, but the problem of inadequate water supply affects a large proportion of rice growers (Ghimiray, 2007). This study carried in Bhutan concentrated on the factors affecting the crop at production level.

Another study in rice has been carried in Cambodia, where the chain was linked with reduction of income poverty. What necessitated this were disparities between citizens, and especially those living in urban areas versus rural domain. It was found that about 40% of Cambodians were lived below poverty line in rural areas during 1997 to 2000 (Agrifood, 2002). Rice plays an integral role in the economy of rural Cambodia. The percentage of rice growers went as higher as 80% playing as a major source of income and sustenance and thus, of critical importance in the formulation of any type of agricultural policy (Agrifood, 2002). The same value chain study was done in Ethiopia in 2010 by Biruhalem Gebremeskel at the areas of Metema and Gondar, where opportunities and challenges for innovation in rice production were identified. On the other side, Gebremeskel identified areas where pro-poor policies have to concentrate to improve the living standards of rice farmers.

### **2.2.2 Rice value chain studies in Tanzania**

In Tanzania, Rice value chain surveys relevant to this were done in the Mbeya, Morogoro, Arusha, Iringa and Dar es Salaam regions of Tanzania by the Matchmaker, contracted by the Agricultural Council of Tanzania (ACT) in 2010. The survey described the rice sub

sector market and functions, mapping the sub sector, description of primary actors and their activities as well as secondary actors. This study was good and broad, but was too general for policy makers and development partners. Though it build a good start in terms of investment centers and opportunities in these districts, deep study is calling to assess the efficiency of markets and individual challenges of each category of actors. Mpanda is the district of the region which is within the big seven regions of Tanzania in grain production, but the survey was biased to regions along the main roads. To avoid blanket recommendations, study must also be done in other regions and districts like Mpanda, so as to study the chain behavior and efficiency in production and marketing in diverse conditions.

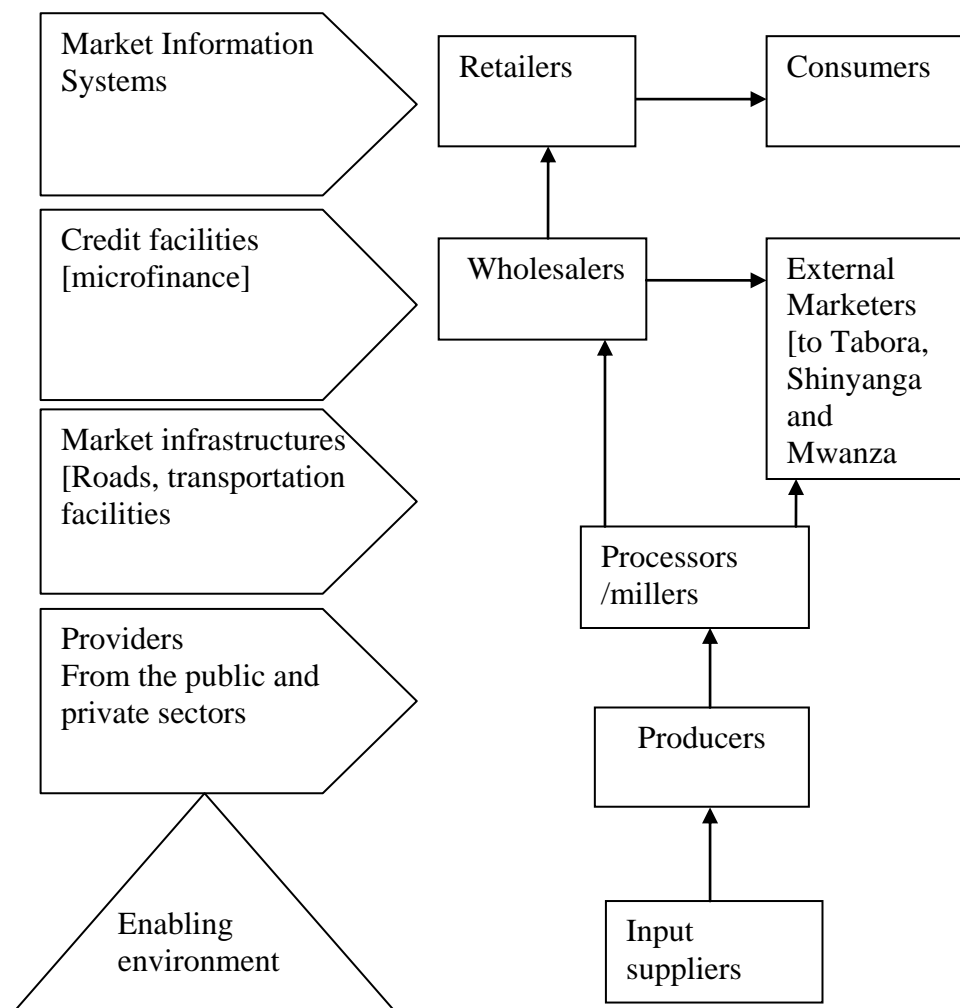
In the Lake Zone one value chain survey was carried. This study surveyed three villages important for rice production in Maswa District, namely Shishiyu, Mwanhegele and Bukangilija. The study paid a special attention to the rice based cropping system and its contribution to poverty alleviation relative to other activities in the farming system (Ngailo *et al.*, 2007). Furthermore, the researchers stated the economical contribution of rice to food security and conclude generally by stating a need for improvement. But improvement can be done categorically based on the number of groups involved in the chain, based on production and markets as key components of profitability. World Report Fall (2006) proclaimed that value chains approach is often about improving access to markets and ensuring a more efficient product flow while ensuring that all actors in that chain benefit. This study used value chain map in description of actors involved in the chain, and SWOT analysis as a tool for description of challenges facing rice sub sector.

Matchmaker Associates (2010) during their study on food crop value chain for Southern Agricultural Growth Corridor of Tanzania (SAGCOT) programme, claimed that although the share of rice in Africa overall agriculture production base remains small (just 1.48% in 1961), that share is rising quickly, accounting for 2.34% in 2007. Although still accounting for a small portion of Africa's overall agricultural production, rice is clearly a commodity with a promising future. Part of that promise relates to the decline of rice production in Asia where the largest share of rice is still produced and consumed. Production of rice has been declining in both the Philippines and Indonesia until the recent rice price crisis. Production in these countries as well as in China and India is expected to continue declining marginally over the longer term. This therefore provides significant opportunities for Africa and in particular Tanzania. This study generalizes the areas for investment in rice production for regions along the cluster.

In all researches done in various places of Tanzania, no one has identified the key factors affecting rice marketing as an important element in the chain. Some of them generalizes that rice sub sector has significant contribution to household welfare, without considering the expense incurred by farmers and the hidden costs which are in most cases, ignored by producers. In the study area, no research has been done in rice subsector and in cereals generally, which can be used as a base for policy makers in development of effective goal-oriented strategies. This study provides broad knowledge of the general conduct of rice marketing, distribution of benefits and factors affecting the levels of profits and challenges faced by each category of actor. Furthermore, it puts clear the areas for improvement and investment and unknown opportunities in rice/paddy business.

### 2.3 The Conceptual Framework for the Study

In a Value Chain marketing system, farmers are linked to the needs of consumers, working closely with suppliers and processors to produce the specific goods required by consumers. Using this approach, and through continuous innovation and feedback between different stages along the value chain, the farmer's market power and profitability can be enhanced. Rather than focusing profits on one or two links, players at all levels of the value chain can benefit. Well functioning value chains are said to be more efficient in bringing products to consumers and therefore all actors, including small-scale producers and poor consumers, should benefit from value chain development (World Report Fall, 2006).



**Figure 2: Conceptual framework****2.4 Factors Affecting Rice Production in Tanzania**

Rice marketing in Tanzania is affected by a number of factors, which reduces efficiency. Benefits accrued by participants found to vary in many places of the country. Ashimogo *et al.* (2003) identified the factors affecting marketing as low or fluctuating producer prices, lack of credit facilities, unreliable market outlets, and high price of modern inputs. The most important household factors are lack of capital to buy inputs and for land preparation, chronic illness in the family, expensive hired labour and lack of knowledge about yield improving farming techniques.

**2.5 The Rice Market Situation in Tanzania**

Rice Marketing System in Tanzania has been developed by the private sector since the government accepted the structural reforms in 1986 (Senda, 1999). From the social points of view, lack of storing provision functions in current rice marketing system is a serious problem. Infrastructures such as establishing credit system, expanding transportation, repairing roads are essential for the stabilization of year-round supply and the rationalization of rice distribution. Farmers need to improve cultivation and post harvest by reducing the ratio of broken rice, removing impurities, adopting irrigation and systems because the qualities of rice have been gradually standardized in large cities (Senda, 1999).

## **CHAPTER THREE**

### **3.0 APPROACH AND METHODOLOGY**

#### **3.1 Description of the Study Area**

This study was conducted in Mpanda district in Rukwa region, but during the study Mpanda was split from Rukwa to acquire regional status. The newly formed region has two districts, Mpanda and Mlele. Selected wards were found to fall into two mentioned districts. Rukwa region belongs to one of the six highly agriculture productive regions in Tanzania.

##### **3.1.1 Location**

Mpanda is boarded by Urambo District (Tabora Region) in the north, Sikonge District (Tabora Region) and Chunya District (Mbeya Region) to the east, Sumbawanga District (Rukwa Region) in the south-east, Nkasi District (Rukwa Region) in the south, Democratic Republic of Congo (DRC) in the west (separated by Lake Tanganyika) and Kigoma District (Kigoma Region) to the northwest. The district has a total area of 47 752 sq km of which 932 136 hectares are ideal for crop production, 2 801 163.7 hectares are under forest reserve, 860 000 hectares are under game reserve (Katavi national park), 168 400 hectares are water bodies and the rest of the area is used for other economic activities.

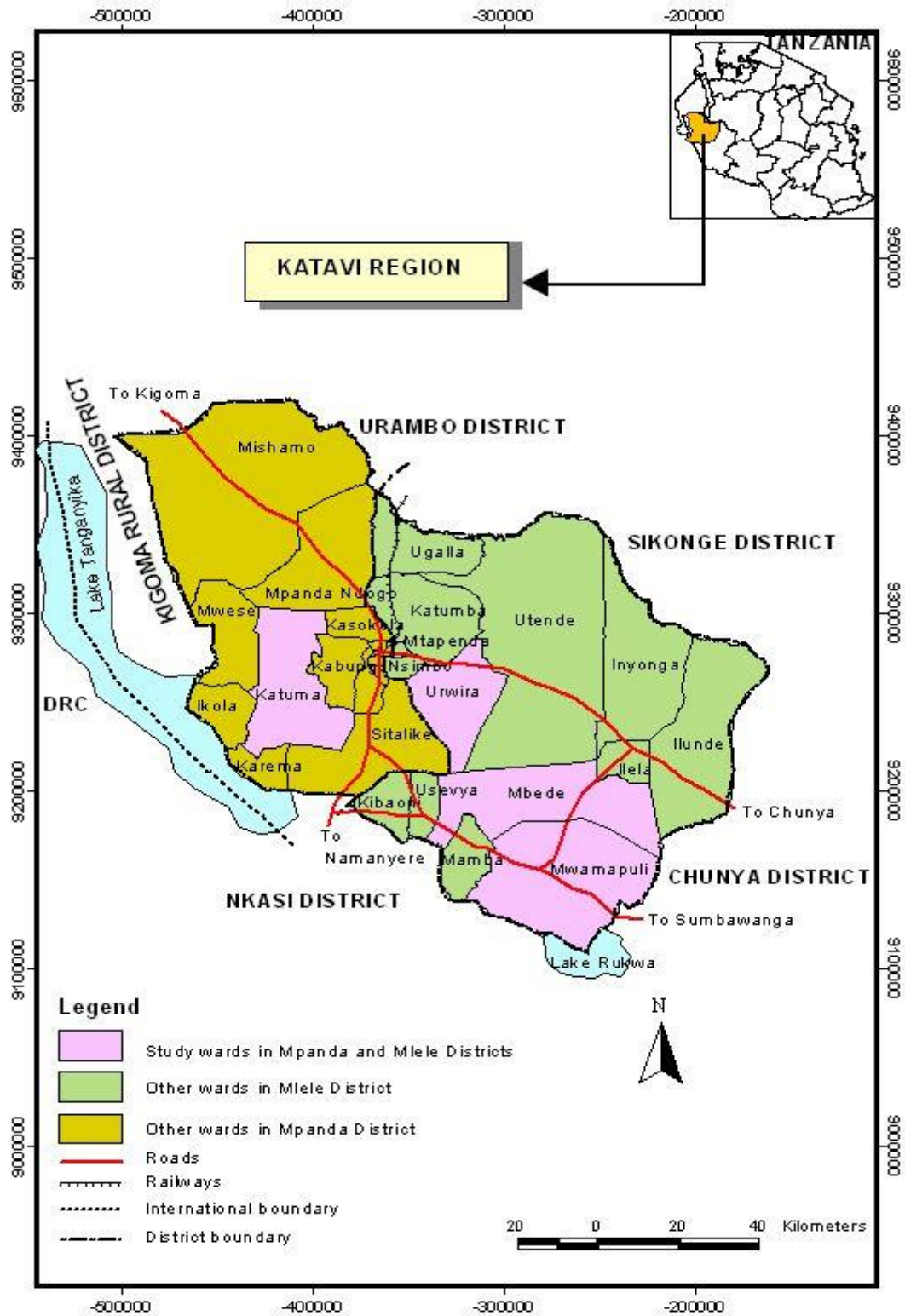


Figure 3: Map showing the study wards



### **3.1.2 Climate and topography**

#### **3.1.2.1 Demography**

According to the national census 2002, the region has a population of 256 487. The current trend indicates rapid growth of population in the district. According to Mpanda district information office, the region had 41 452 people in 1978 and 60 808 in 1988, where the population increased by 5.9%. In the year 2009 the district population was estimated to be 441 094.

#### **3.1.2.2 Climate, vegetation and topography**

The highlands are found in Mwese and Lyambalyamfipa, bordering Nkansi district. Temperature in these areas ranges between 13<sup>0</sup>C and 24<sup>0</sup>C, and 1000mm of rainfall as minimum and 1300mm as maximum rainfall annually. Predominant vegetation is miombo woodland, bush land and grasslands (District profile, MDC). Rukwa valley are lowlands, and are extended from the Great Rift Valley from Lake Rukwa. It has a temperature ranging between 16 and 17<sup>o</sup> C and rainfall between 800mm and 900mm. The area is covered by tropical wooded grasslands, and is one of potential areas for rice production. Grasslands are found in the valley of Ugalla and Rungwa, Katuma River along Lake Tanganyika shores and Lake Rukwa valley. Temperature ranges from 15<sup>o</sup>C to 29<sup>o</sup>C and rainfall between 900mm and 1000mm as maximum and minimum respectively, annually. Vegetation consists of grass and reeds. Swamps are found along Lake Rukwa shores and Ugalla river valley. It has a temperature ranging from 19<sup>o</sup>C and 27<sup>o</sup>C, and rainfall between 900mm and 1000mm per annum. It is characterized by Miombo climate, having one rainy season followed by a long dry period.

### 3.1.3 Agriculture potentials

#### 3.1.3.1 Crops and livestock

The region has a total of 923 300 ha of arable land (2 308 250 acres) suitable for crop production. Main crops grown in the region are maize, tobacco, paddy, beans, groundnuts, sunflower, Simsim, coffee and Jatropha. As per agriculture office in Mpanda district, the region has 140 000 cattle, 18 000 goats, 12 000 sheep, 5 200 pigs and 275 000 chickens.

#### 3.1.3.2 Natural Resources

**Table 1: Natural resources of Mpanda, coverage and ownership**

<b>Resource</b>	<b>Covered area (ha)</b>	<b>Ownership</b>
Natural Game reserves	2 801 100	Central and local government
Forestry	860 000	Tanzania National Parks
Water bodies	168 400	Central and local government

#### 3.1.3.3 Agro-economic zones

The district has five agro economic zones as per information from district statistical office. The first one is Katumba plains located at Nsimbo division, with altitude ranging from 1000 to 1500 meters above the sea level. Soils are sandy with moderately good drainage, receiving rainfall of 92mm and 1000mm as maximum and minimum levels. Main crops grown in this area are maize, cassava, tobacco, beans, groundnuts, sunflower and sugarcane. The second is Mwese Highlands, which has the altitude of 1100 to 2500 meters, having sandy and loamy soils with good drainage and hilly soil as the main soil order. Main crops grown in these highlands are maize, cassava, beans, banana, coffee and Irish potatoes. Livestock kept are cattle, sheep, goats and chicken.

Karema depression is the third zone and is located at Karema division with altitude ranging 1000 to 1300 meters, receiving rainfall averaging 1200 annually. Main crops grown are maize, cassava and paddy and livestock are cattle, goats, sheep and chickens. Other activities are fishing, lumbering and beekeeping. Fourth is Lake Rukwa valley, located at Mpimbwe division with altitude ranging 1000 to 1100 meters at the north and 800 to 900 meters along Lake Rukwa shores. Soils are sandy loamy and the area receives about 1250mm of rainfall annually, suitable for growing maize, paddy, finger millet and sorghum. This area is very potential in rice production among producing areas in Mpanda.

Lastly is Lake Tanganyika zone, which is also located at Karema division with altitude of 770 to 1300 meters above the sea level, characterized by sandy loamy soils and vertisol as main soil. It receives between 950 and 1200mm of rainfall annually, and the main crops grown are maize, cassava, palm oil and paddy. Livestock kept are cattle and goats and in some areas people are engaged in beekeeping. Fishing is important activity in this area, having significant contribution to household income of farmers.

### **3.2 Justification for Selecting the Study Area**

This study was conducted in Mpanda district, which was split into two districts during the study. Data for this study were collected from Mbede, Mwamapuli, Uruwira and Sibwesa. The district belongs to one of the highly agriculture productive zone in Tanzania. In Mpanda, rice has moved from being food crop to commercial crop, employing a significant number of people in various activities. It is the crop of top priority receiving serious attention from local government and other development stakeholders due to its potential in poverty reduction. In a way, this study also aimed at breaking the habit of many researchers to concentrate on easily accessible places and areas along the main roads, and it was discovered that no empirical research was done in rice sub sector in the region.

### **3.3 The Research Design**

#### **3.3.1 Sources and types of data**

The data for this study were collected from both primary and secondary sources. Primary data were collected from the respondents directly from the field during the survey. Sources of primary data were smallholder farmers, traders (wholesalers and retailers), transporters, rice millers and consumers. Secondary data were obtained from web based materials, national agriculture library at Sokoine University of Agriculture, Economic and Social Research Foundation (ESRF) and from the information office of the ministry of agriculture and food security.

#### **3.3.2 The Sampling procedures**

In this study probability sampling was applied throughout the process of selecting villages and respondents. Mixed methods were employed to get detail and diverse information on the rice and paddy value chain. According to Kabuje (2008), mixed methods are helpful in triangulating the reliability of the expected information. It is usual for researchers to employ mixed method designs to investigate different aspects of the same phenomenon. Cross sectional type of research design was used. The method used on this survey is similar to the one used by Gebremeskel in 2010 when analyzing rice value chains in Metema and Gondar, Ethiopia.

#### **3.3.3 Primary data from producers**

In this study, two divisions were selected purposively (Mpimbwe and Kabungu) to obtain four wards and four villages where 120 farmers were obtained. Villages obtained were Minyonso, Ukingwamizi, Uruwira and Sibwesa.

**Table 2: Distribution of respondents by wards and villages**

<b>Ward</b>	<b>Village</b>	<b>Counts</b>	<b>Percentage</b>
Mbede	Minyonso	30	25
Mwamapuli	Ukingwamizi	30	25
Nsimbo	Uruwira	30	25
Katuma	Sibwesa	30	25
<b>Total</b>		<b>120</b>	<b>120</b>

From smallholder farmers, data related to production and sales of paddy, access to markets and agriculture inputs, accessibility to extension services and training were collected. Others are socioeconomic and demographic information useful for studying the determinants of productivity and participation in marketing.

### **3.3.4 Primary data from other marketing chain actors**

One hundred respondents were selected randomly from five categories of wholesalers, retailers, transporters, local millers and consumers. Each category contributed 20 respondents to the sample, making a number of 100 people.

**Table 3: Distribution of respondents by categories in Mpanda town**

<b>Actor(s)</b>	<b>Number of respondents</b>
Wholesalers	20
Retailers (Vendors)	20
Transporters	20
Millers	20
Consumers	20
<b>Total</b>	<b>100</b>

This made the sample size from the primary data source being 220 respondents. Consumers were interviewed to capture the information on how the desire is met in terms of product quality and convenience based on their own preferences. Information from these categories was taped from local markets, district markets and local milling machines based on semi-structured interview (checklists) and personal observations. It was found that actors were concentrated in town and partially in villages especially in the peak season.

### **3.3.5 Sources of secondary data**

Secondary data were obtained from libraries, web-based literatures and past studies of value chains in Tanzania and other places of the world. Research on Poverty Alleviation (REPOA), Economic and Social research Foundation (ESRF) and Vice Presidents' Office were used to obtain data of income and poverty status in Tanzania. Ministry of agriculture information centre was useful in obtaining various statistics related to paddy production in Tanzania. Current studies from electronic web based materials were reviewed accordingly.

## **3.4 Data Analysis**

### **3.4.1 Qualitative analysis**

#### **3.4.1.1 Marketing chain mapping**

Stakeholders mapping in marketing chain was used to describe the identified channels of rice. In line with this, actors' linkage matrix was used to describe the relationships and combination of activities among actors themselves. In fact, every actor traditionally has a link with the other, but this matrix describes only what was found in the study area. Though matrix seems to be similar to actors linkage map, the former is more descriptive and broad as compared to linkage map. Presence of the two provides detailed information

of the relationships studied in this work. In some reviewed empirical studies, the linkage matrix was used by Astewel Takele (2010) in his study on analysis of rice profitability and marketing chain in Fogera Woreda, Ethiopia. Also, Stephen Biggs and Harriet Matsuert (2004) applied this method when they were developing poverty reduction programmes by using actors' oriented approach in natural resources in Bangladesh.

### 3.4.2 Quantitative analysis

#### 3.4.2.1 Marketing margin and profitability analysis

The Marketing margin was calculated by using the following formula:

$$PS = \frac{P_x}{P_r}$$

Where:

PS = Producers Share

P<sub>x</sub> = Producers' price of rice

P<sub>r</sub> = Retail Price of rice

Profitability analysis was calculated by using the following formula.

$$\text{Gross Profit} = V - C = PQ - \sum P_i q_i$$

Where;

P = Price of produce per kg

P<sub>i</sub> = price of input i,

q<sub>i</sub> = quantity of input i,

V Value of production

Q Total production

C = Total cost of production

Lastly, the grain sizes, tastes, aroma and information on proportion of rice sold to cross boundary market were done. These data were taped from the second group of interviewees which composed 100 respondents from five categories of actors along the marketing chain, and were concerned with product specification and differentiation, volumes of sales at different market destinations and consumers' preference.



## CHAPTER FOUR

### 4.0 RESULTS AND DISCUSSION

#### 4.1 Social Economic Characteristics of Household Heads

Socio-economic characteristics have significant implications on how the household behaves in production and marketing. The interaction of these variables can influence negatively or positively, the level of output in rice farms. Marketing structure alone cannot improve the whole system of production, and it will depend largely on how the social structure is organized. Household is the basic unit of production in all sectors of the economy as it provides labour to farms and industries, management, and source of all other people involved in the marketing chain.

##### 4.1.1 Age of respondents

It was found that age structure in the study area concentrated on over 45 years, which are 37% for Minyonso, 63% for Ukingwamizi, 43% for Uruwira and 57% for Sibwesa. As per literature, the segment has cognition, is visible and has ability to solve problems (Williams *et al.*, 2012). This indicates the ability of these farmers to produce rationally, participate wisely on marketing and other economic related activities. In between 20 and 30 was 33% for Minyonso, 14% for Ukingwamizi, 23% for Uruwira and 13% for Sibwesa. This also indicates that young generation at this productive age participates in rice farming.

**Table 4: Age composition of respondent (farmers) in percentages**

Range of years	Villages			
	Minyonso	Ukingwamizi	Uruwira	Sibwesa
20 - 30	33	14	23	13
30 – 35	10	10	13	13
36 – 45	20	13	21	17
Over 45	37	63	43	57
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>

The results obtained during the Household Budget Survey (HBS) conducted in 2000/2001, showed that more than 40% of household heads in Tanzania mainland were aged between 30-44 years (URT, 2007). The results found may reveal high life expectancy among farm families in Mpanda district as per NBS statistics.

#### **4.1.2 Gender of respondents**

The survey found that most of the respondents were males far beyond the number of females. These farmers were selected randomly from the farmers' record books available in the villages, indicating that the frequency of male farmers is higher as compared to females. Though the percentage of women is low among interviewed segment (17, 20, 17, 27 percentages for Minyonso, Ukingwamizi, Uruwira and Sibwesa respectively), they play a crucial role in ensuring supply of food as food vendors and post-harvest processors of farm and non farm products.

**Table 5 Gender of respondents in respective villages (in percentages)**

Sex	Villages			
	Minyonso	Ukingwamizi	Uruwira	Sibwesa
Male	83	80	83	73
Female	17	20	17	27
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>

These activities are important in product marketing. Women are also major buyers of family food and meal makers and they also ensure adequate food security (UNDP, 1997). Any improvement in rice marketing systems should consider women in all in-line activities, including consumers' preferences (Meena, 1997; Guilmoto, 2007).

**Table 6: Influence of gender to profitability on rice**

Profit per kg of rice in Shillings	Sex of Respondent (counts)		
	Male	Female	Total
0	5	0	5
10 - 50	3	0	3
50 – 100	4	2	6
150 – 200	14	7	21
200 – 300	48	10	58
300 - 400	22	5	27
<b>Total</b>	<b>96</b>	<b>24</b>	<b>120</b>

It was found that the rate of profitability is higher for males as compared to females. The highest profit per kilogram found to be 400 per kg, and 22 males were getting the profit

ranging 300 to 400 shillings as compared to five females. This lacks reality to the truth that number of female respondents is low as compared to females (Table 7). It is then sound better to say generally that 27 out of all 120 interviewed farmers were getting higher profit. Fifty eight farmers were getting between 200 and 300 shillings, and five are not gaining anything. This shows limitation of gross margin calculations, which give a general impression that paddy production is a profitable venture to all smallholders.

#### 4.1.3 Level of education of respondents

It was found that higher percent of respondents had primary education (77% for Minyonso, 63% for Ukingwamizi, 65% for Uruwira and 69% for Sibwesa). Grade four and eight were classified as primary education in this study. Lockheed (1980) said that due to increase of agriculture sector in terms of size and number of stakeholders involved, there raised a need for trained manpower to commercially move the sector forward, hence rescuing rural farmers who are still wallowing in a quagmire of indigence. Lockheed (1980) contended that any emphasis on rural development where the agriculture sector is a dominant activity requires a huge expansion of education. Education level is evident to have impact in all development activity of a human being (Quartey, 2011).

**Table 7: Level of education of farmers**

Education level	Villages			
	Minyonso	Ukingwamizi	Uruwira	Sibwesa
No schooling	20	37	35	31
Primary school	77	63	65	69
Secondary school	3	0	0	0
College	0	0	0	0
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>

Having a higher percent of people concentrated on primary education indicates that the group is able to learn and acquire skills related to rice production. Secondary education would be rather better for rationality in commercial agriculture, but it composed of only 0.8%.

**Table 8: The influence of education on rice productivity**

Yield in kg	Level of education			Total
	Illiterate	Primary school	Secondary school	
500 - 999	6	19	0	25
1000 - 1499	20	25	1	46
1500 - 1999	7	40	0	47
2000 - 2499	2	0	0	2
<b>Total</b>	<b>35</b>	<b>84</b>	<b>1</b>	<b>120</b>

Most of the interviewed farmers were concentrated on primary school level. 40 respondents had a profit ranging 1500 and 1999 kg of rice (Table 9). The overall figures show that farmers with primary education did better in production efficiency. It is difficult to conclude that post primary education has no influence, since the category holds only 3.3% (Table 8).

#### **4.1.4 Production levels versus paddy storage duration**

A level of production is among the determinants of storage time for farmers. Very small scale producers have less storage time as compared to medium scale producers, but there is also a distance to the market and bulkiness as another factor affecting storage time. It

was found that 62% of respondents sell their produce before time for solving family matters like education, health and social responsibilities, which also indicates the lower level of off-farm activities as alternative source of income to households. Farmers sell their produces in peak season because of the multiple factors (Table 9).

**Table 9: Factors influencing farmers to sell paddy**

<b>Factor for selling</b>	<b>Counts</b>	<b>Percent</b>
Good prices	13	11
Family matters	74	62
Price fluctuations	5	4
Reinvestment	28	23
<b>Total</b>	<b>120</b>	<b>100</b>

#### **4.2 The Paddy Marketing Channels**

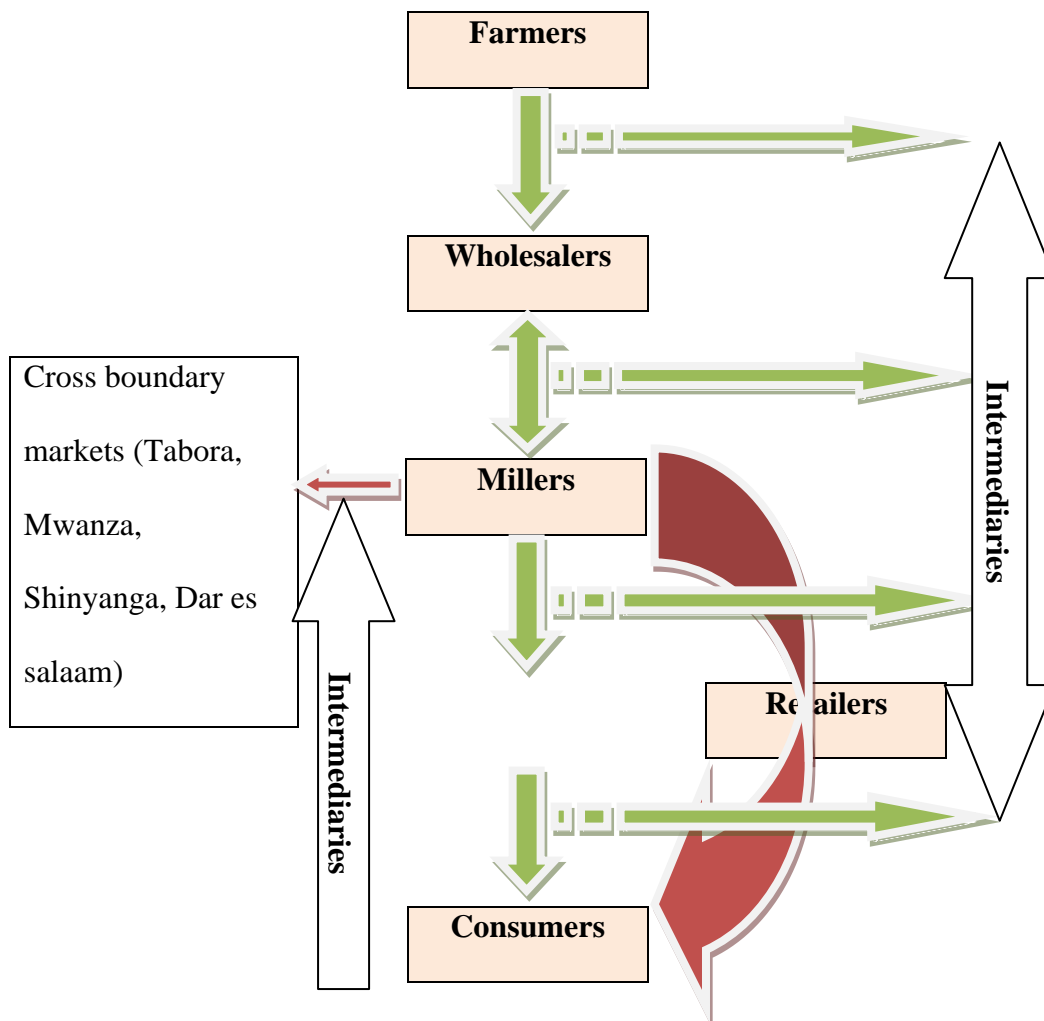
Marketing of paddy/rice involves various operations such as harvesting, warehouse services, handling, transportation and selling. Sales of rice usually channels to wholesalers, though retailers are partly engaged in buying directly from the producer.

The survey data aimed at getting the information on market outlets and participants involved therein. The individuals involved in activities along the chain include producers, traders (wholesaler and retailers), processors, transporters and consumers.

Producers reside in their villages, with paddy as their main cereal production, serving both for food and for cash. Traditionally, farmers sell their products to wholesalers directly and through intermediaries. It was found that intermediaries are the key players in rural markets, buying directly as agents of wholesalers. Farmers are not involved in any

processing, and they sell their produce as paddy to intermediaries and wholesalers. Intermediaries are to the large extent the agents for wholesalers, buying with unspecified interest per bag, though some are doing as their own business.

Wholesalers are then resell the produce to retailers through millers, and to cross border markets in Tabora, Shinyanga, Mwanza and little to Dar es salaam. Wholesalers who are bearers of capital buy from farmers through intermediaries or directly during the harvesting period, stock as paddy in warehouses and mill the produce during low season. Warehouse service is costless to wholesalers, since the service is provided by millers with agreement of using the later machine in processing.



**Figure 4: Paddy/rice marketing channels in Katavi region**

Few farmers are linked directly to actors along the chain, selling to them every season while others are not. 18% of all interviewed farmers were found to have a direct link with wholesalers, while 28% were linked with intermediaries.

#### **4.2.1 The actors' linkage matrix**

For clear understanding of the actors along the marketing chain, it was found better to study the interactions among themselves. To understand patterns of interaction between different actors and organizations, it is first important to map linkages in general ways, but then it is also necessary to understand the nature and purpose of these linkages (Hall *et al*, 2007).

The marketing chain actors' linkage matrix shows the interaction among players, describing the five categories studied, which are input suppliers, producers, wholesalers, millers, retailers and consumers. It was found that existing is horizontal linkage between input suppliers, producers, wholesalers, millers and consumers. No vertical linkage with other supportive institutions was found, implying that more effort should be used to link stakeholders identified with institutional setups like local administration and research centers. Cooperative societies are also the important components missing in this interaction. Linkages identified has the varying purposes, and at varying levels. For producers, the interaction aims at exchanging seeds, technologies, capital, ploughs and draft animals. For transporters, interaction is based on exchange of the transport means, routes and sometimes setting fixed transport cost for paddy from villages. Linkages differ in terms of strength among groups in the chain, where some are weak and others are strong, but the strength of each actor was out of the scope of this study.



**Table 10: Mpanda marketing chain actors' linkage matrix**

<b>ACTORS</b>	Agro dealer	Producer	Transporters	Processors	Rice Traders (Wholesalers and retailers)	Consumers
Agro dealer	Sharing of market trends, transport of input, pricing	Supply of inputs (agrochemicals, fertilizers, farm simple machinery)	Transport of input to shops and to farms			
Producer	Source of agricultural inputs	Sharing of the input and market prices	Transport of produces from farms		Trading of paddy/rice	
Transporters	Transporting inputs from factories to shops	Transporting inputs to farms	Sharing experiences, vehicles, routes, pricing	Transport of paddy to the milling sites	Transporting rice to the defined markets	Rice delivery to consumers' conveniences
Processors			Transport of paddy to the milling sites	Price setting, exchange of spares, warehouses, securities	Conversion from paddy to rice	Quality assurance (milling quality)
Rice Traders (Wholesalers and retailers)		Buyers of paddy from the farms	Transport of paddy from farms to milling machines and markets	Conversion of produces from paddy to rice	Exchange of ideas, capital, pricing mechanisms	Supply of rice to shops
Consumers		Source of desired standard of rice	Delivery of rice to convenient shops		Direct and indirect supply of rice to households through shops	Exchange of views on quality and prices

#### 4.2.2 The Marketing information systems

Efficiency in marketing systems depends also on the system of information flows. Almost all respondents relied on single information source, which may not be reliable due to individuals' profit maximization strategy. It was found that 30.8% of farmers are accessing market information from friends, 58% from intermediaries and 11% through cellular phones (Table 11). High reliability of information from intermediaries indicates high concentration of the same in these villages, and the information given to them, though from different intermediaries, there is a danger of distorting it through collective pricing strategy. There was no reliable channel of market information identified during the study.

**Table 11: Sources and usefulness of market information**

<b>Information source</b>	<b>Counts</b>	<b>Percent</b>
Friends	37	31
Intermediaries/traders	70	58
Cellular phones	13	11
<b>Total</b>	<b>120</b>	<b>100</b>
<b>Usefulness of information</b>		
Useless	3	2
Moderate	80	67
Good	37	31
<b>Total</b>	<b>120</b>	<b>100</b>

Assessment of the situation shows that farmers are satisfied with the information brought to them (67% moderate), but they could not said otherwise in absence of modern system to

compare with. Poor system of information on marketing to producers and heavy reliance on information from traders, who are likely to defend their own interests, indicates inefficiency in marketing.

### 4.3 The Producers' Share

Producers' share decreases as rice sold to cross boundary markets (44% for Mpanda rural, 33% for Mpanda urban and 25% for cross border markets). Where the produce is sold in domestic market, the producer share increases due to decreased marketing costs, but again as it was reported, domestic consumption for rice is still low. Though expenses incurred by wholesalers seem to be high, it shows that the reward to wholesalers is higher than that of producers. This is also the effect of longer storage duration (waiting for higher demand and low supply), and availability of enough capital to invest in the business. If the warehouse receipt system was efficient, this could be solved so as to distribute the reward rationally among actors. In the study site, almost all middlemen were agents of wholesalers of Mpanda urban, and the percentage of intermediaries who owns their own capital is insignificant.

**Table 12: Producer shares per kilogram of rice at three markets**

<b>Market</b>	<b>Producer price of rice</b>	<b>Producers' share (PS=P<sub>x</sub>/P<sub>r</sub>)</b>	<b>Marketing margin for wholesalers</b>	<b>Marketing margin of retailers</b>	<b>Total marketing margins</b>
Mpanda rural	532	0.44	252	183	435
Mpanda town	532	0.33	565	177	742
External Markets	532	0.25	755	333	1 086

PS=producers' share; P<sub>x</sub> = producers' price; P<sub>r</sub>=retail price

This variation is very significant because it has direct effect to profit gained by producers. For retailers, though there is variation in terms of marketing margins and profit margins in these three market sites, is not much higher as compared to wholesalers because it was studied that the later do store paddy for several months to win high market prices at low supply and higher demand. Longer storage duration of paddy results into higher profit margin to wholesalers.

#### **4.4 The Profitability Analysis (Gross Margin Results)**

The effect of profitability to farmer is positive since the value of production is above the value of costs incurred (485 946Tsh). The average income from selling output per acre is 1 015 979.5Tsh and the average variable cost is 530 033.3Tsh (Appendix 2).

Besides, this statistics were calculated from the average values of production costs. Individually it is difficult to generalize that each farmer reaches the stated amount of profit, because some will have very low and some very high, and some average. Also, the cost of production found (1,015,979Tsh) could be higher for some, and lower for some due to variations in input combination and total yield/acre.

Though the profitability analysis shows profit of 485 946Tsh, the case is not always the same when the test is done to every individual. The figure resulted from calculation is too general as it was based on average costs of production and average revenues. Descriptive statistics shows that 4.2% of all 120 respondents did not get anything, 17.5% in between 50 and 150Tsh, and 48.3% getting in between 200 and 300 shillings. This indicates greater variation of production efficiency among farmers.

#### 4.5 The Marketing Margins, Profit Margins and Distribution of Benefits

**Table 13: The marketing and profit margins for three market levels**

	<b>Details</b>	<b>Wholesaler</b>	<b>Retailer</b>
<b>Mpanda Rural</b>			
a	Average buying price/kg (rice)	533	1000
b	Average selling price/kg (rice)	1000	1200
c	Average variable cost	182.2	16.67
d	Marketing margin (b-a)	467	200
e	Profit margin (d-c)	284.8	183.3
<b>Mpanda Urban</b>			
a	Average buying price/kg (rice)	533	1400
b	Average selling price/kg (rice)	1400	1600
c	Average variable cost	267.8	23.3
d	Marketing margin (b-a)	867	200
e	Profit margin (d-c)	599.2	176.7
<b>External Markets</b>			
a	Average buying price/kg (rice)	533	1700
b	Average selling price/kg (rice)	1700	2100
c	Average variable cost	345.5	66.7
d	Marketing margin (b-a)	1167	400
e	Profit margin (d-c)	821.5	333.3

The profit margins vary as much as traders move away from the production area. At domestic market in Mpanda town, the marketing margin of wholesaler is 467Tsh and the profit margin is 284.8Tsh, while in cross border markets the marketing margin is 1167Tsh and profit margin of 821.5Tsh (Table 13). For the reward of traders being higher than that of producers indicates inefficiency, the area for attention for improving productivity. The average buying price is the price paid for a kilogram of rice, and the only reward for producers, paid constantly regardless of changes of price in different market levels.

#### **4.6 The Effect of Storage Duration to Producers' Profit**

Wholesalers' super profit is resulted from their ability to stock paddy from the peak to lower season, and farmers are stocking from 1-6 months. It was found that 30% stores paddy from 1-3 months, 60.8% from 3-6 months and 9.2% over six months. There is a direct correlation between the longer stocking of paddy and its profitability, so the longer the storage time, the higher the profitability and vice versa. Profit of producers can be increased by encouraging them to stock their produce for three to six months. By storing the produce for six months (June to November) the profit to producer will increase by 417Tsh per kilogram of rice, a change which is very significant in profitability, where conversion of paddy to rice is 1:0.745. This means that every 1kg of paddy gives up 0.745kg of rice after processing.

**Table 14: Variation of rice farm gate price levels in during 2010/2011 season**

April – June	July – September	October – December	January – March
533	600	950	1200

In the study conducted on impact of maize storage on rural household food security in Northern Kwazulu Natal, the efficiency of storage systems was determined by the two factors, namely storage length and incurred losses (Thamaga-Chitja *et al*, 2004). For paddy, the crop state stored by farmers, losses as a result of rodents and changes in quality can be controlled by farmers at low cost, assuming that the produce will be stored at their homes. The negative effect of price changes and profitability to producers can be solved in presence of effective warehouse system.

#### **4.7 Rice Consumption and Cross-border Market Trade**

The study revealed that the level of rice consumption in Mpanda is very low, and cannot absorb the output released from the field. Out of 20 interviewees, two of them (10%) consume rice more than three times a week, while those consuming once a week were 11 (55%).

**Table 15: Consumption rate and consumers' preferences**

<b>Rice Consumption Frequency</b>	<b>Counts</b>	<b>Percentage</b>
Once a week	11	55
Twice a week	7	35
More than three times a week	2	10
<b>Specifications</b>		
Aroma	10	50
Grain size and aroma	8	40
Grain size and color	2	10

It was further found that 40% of the interviewed retailers sell in between 20 and 40kgs, and only 10% are selling more than 100kgs per day. The implication here as have been said, reflects low consumption level in domestic markets of Mpanda.

**Table 16: Average volumes of sales in retail shops**

<b>Volume of sales (rice in kg)</b>	<b>Percent</b>
Under 2	30
20 – 50	40
50 – 100	20
Over 100	10
<b>Total</b>	<b>100</b>

It was also noted that where there is a deficit or emergency, retailers are selling the produce back to wholesalers at small profit margin. In the urban area, vendors are concentrated on railway stations and main roads, indication that reliable buyers are on-transit segment.

The total production varies from year to year, but the average is 13 500mt. Out of this huge number, the produce sold to cross boundary markets are 6 050mt. In fact, the system lacks coordination and proper record keeping, and the outlets are not well regulated because the correct statistics for the last three years were not found. Information on these volumes is important in planning for development of rice production, and the market infrastructural needs.



## **4.8 Other Factors Affecting Rice Production and Productivity**

### **4.8.1 Farmers' access to credits**

Among important contributing factors to crop development in rural areas is access to finance for investing in agriculture (Shepherd, 2004). Unfortunately, microfinance institutions are not ready to finance agriculture related activities due to high risks associated with it. Farmers are getting their loans through friends/neighbors (2.5%) and money lenders (15%), where financial regulations are not complied (Appendix 5). Out of 120 farmers interviewed, only 25 farmers (20.8%) accessed credit for rice production, of which only 3 farmers (2.5%) acquired credit from commercial bank. This calls for purposive mobilization of microfinance institutions to finance agriculture.

The use of credits vary among farmers accessed it and 12.5% were for purchase of ploughs; 4.2% for paying hired labour and 4.2% for paying rented oxen. Important determinant of increased productivity and acreage is presence of farm implements, but few households were found to own modern farm machines. No any household had tractor and harrow, and unfortunately some found not to own even a plough, and some have incomplete sets. Many academics suggest that the provision of credit to rural areas of developing countries would allow landowners to increase crop yields by employing more sophisticated inputs and techniques (McAlpin, 1999).

Formal lenders avoid financing agriculture for a host of reasons, and these are: (a) high cost of service delivery; (b) information asymmetries; (c) lack of branch networks; (d) perceptions of low profitability in agriculture; (e) lack of collateral, high levels of rural poverty, or low levels of farmer education and (f) financial literacy (Wenner, 2010). So is to say, informal money lenders existing in most of the rural domain have a negative effect

on agriculture, due to high unregulated interest rates, which may end up with undesirable practice in agriculture, contract farming.

#### 4.8.2 The Component of farmers training

Regular trainings to farmers have significant impact on agricultural development. The category may have low literacy level, but access to theories and practical on agriculture related aspects has the capacity to improve their performance on both production and marketing. One of the methods used is farmers field schools (FFS) conducted by extension officers, only if the system is working in rural Tanzania.

**Table 17: Training impact in rice production**

Sex	Count	Training provider				Total
		Local government	Private development partners	Research/training institutions	Field extension officers	
Male	19	2	2	6	9	19
Female	3	0	0	3	0	3
<b>Total</b>	<b>22</b>	<b>2</b>	<b>2</b>	<b>9</b>	<b>9</b>	<b>22</b>

It was found that, out of 22 respondents participated in training, only three were females and 19 were males. Trainees are 18.3% out of 120 producers interviewed, where research institutions and field extension officers trained 7.5% each. Since agricultural officers are present down to village level, they can provide service significantly to farmers for sustainable agriculture development.

IFPRI (2010) explained that such schools use experiential learning and a group approach to facilitate farmers in making decisions, solving problems, and learning new techniques. However, there is limited or conflicting evidence as to their effect on productivity and poverty, especially in East Africa. Collet and Gale (2009) insisted that trainings to women will have very positive impact as women are key players in agriculture, especially in developing world. The recent research mainly in sub-Saharan Africa has indicated a number of successful innovations in agricultural education and training has generally been unresponsive to changing patterns of demand for trainees, which are influenced by the changing roles of public and private sectors.

Much can be done to improve the design and management of extension training, and to strengthen the policy framework through which support and direction are channeled. Involvement of private sector can have contribution on this educational strategy to farmers (Wallace and Nilsson, 1997). The importance of training needed to agrarian societies even in developed countries like United States of America as a result of changing production patterns and international agricultural trade (Grants *et al.*, 2000). The effect of trainings to farmers, especially on regular basis is important to both farm and non-farm activities, because of the interrelationships of household income generating processes.

## **CHAPTER FIVE**

### **5.0 CONCLUSION AND RECOMMENDATIONS**

#### **5.1 Conclusion**

The present study conducted in Mpanda district, drew the sample from 120 producers and 100 respondents from five categories of actors in the marketing chain. The later came from wholesalers, transporters, millers, local vendors and consumers, where the checklists were used to tap information on the levels of consumption at local and regional level, operating cost of each stakeholder and the benefit accrued by producers, wholesalers and retailers. The empirical analyses carried out in this study provides useful information for stakeholders in agriculture sector and allied sectors in the effort of improving productivity for producers, placing market infrastructure and other pro-poor policy strategies, not only in Mpanda, but to the nation at large.

The study has general objective of analysing the rice marketing chain in Mpanda district, and recommend policy measures for improving efficiency of the rice marketing systems. Hereunder are four specific objectives and their main resulting conclusion.

The first specific objective was to carry out value chain mapping of stakeholders and policies influencing rice production and marketing in the study area. The analysis was qualitative, by developing the rice marketing chain map which clearly showed the actors at each step the product pass from production to consumption. It was further supported by well established actors' linkage matrix, which indicated the interrelationships among actors themselves, and the areas or activities brought them together.

The second objective was to study the economic efficiency of the rice marketing system. Here, the farmers' share and marketing margins of marketing actors were calculated. It was found that marketing system is not efficient, and there were irrational distribution of benefit accrued in the marketing chain. Producers' share varies accordingly decreasing as rice sold to cross boundary markets (44% for Mpanda rural; 33% for Mpanda urban and 25% for cross boundary markets).

The third objective was to assess the distribution of gains among key stakeholders along the rice value chain. Profit margin was found higher for wholesalers than it is for producers. For cross boundary markets (Tabora, Shinyanga and Mwanza, the margin for wholesalers is about 822Tsh, far from the price paid to producer, 533Tsh/kg.

The fourth objective was to find out the competitive criteria of the rice value chain in terms of product quality, specification and differentiation. To answer this objective, information from traders, transporters, millers and consumers were taped. It was revealed that consumption level is very low within the locality, and out of 13 500mt produced per year (average), 6050mt is sold to cross boundary markets. From the consumer segment interviewed, 55% consumed rice once a week, 35% twice a week and 10% once a week. Satisfaction level is moderate, which is 55%. Issues related to farmers trainings and credit amenities were supplemented in this objective, where trainings and their impact was studied. Trained farmers were only 18.3% of the total interviewees, farmers accessed credits for marketing activities and production were 25.8% and the use of credits vary among farmers accessed. It was revealed that 12.5% were for purchase of ploughs; 4.2% for paying hired labour and 4.2% for paying rented oxen.

## **5.2 Recommendations**

### **5.2.1 Rice/paddy production**

One cannot talk of marketing systems devoid of looking the production side, which determine the quantities and qualities of what we are selling. As it was realized, farmers are getting little in the business as a result of a number of factors, one being record keeping. Local government and stakeholders should organize a time-to-time trainings, by the use of extension officers, research and training institutions on agribusiness aspects. This will impart knowledge to them on how to encounter every cost in the production process, including the family labour. Efficiency in input combination is also a knowledge gap need to be filled by trainers. Off farm activities and other farm but non crop should be insisted, due to seasonality property of rice production. This will sustain the family during low season and enable them keeping their produce longer for higher reward.

### **5.2.2 The marketing systems**

Disorganized marketing system is one of the reasons as to why distribution of benefits among actors differs much. Government as the owner of national resources should ensure that the marketing system is regulated in favour of all stakeholders. Export ban to agricultural produces has serious effect on the price paid to producers because of minimal competition.

#### **5.2.2.1 The markets**

Market infrastructure is missing in the study area, and probably in many rural Tanzania. Farmers need to have a meeting point with traders from different parts, to encourage them selling rice in the market. Competitiveness among traders is the opportunity for farmers to

fetch good price. The strategies on agricultural development and initiatives like Kilimo Kwanza and SAGCOT should concentrate on the establishment of these structures.

#### **5.2.2.2 The Warehouse Receipt System (WRS)**

Could the WRS work properly, there would be superb to farmers through access to money, enough to cover the family costs. The family matters ranked higher among the factors which make farmers to sell rice before time. Inability to sustain the family from season to season is caused by lacking the alternative source of money. Livestock keeping should also be insisted to farmers, as the practice is not very seasonal in terms of return. Dairying, piggery and poultry farming are useful in filling this gap.

#### **5.2.2.3 The market information flow**

The flow of information is important for farmers to make decision on how to sell, when and where to sell their rice. Information centers are not present in the rural areas, and other mobile services supported by the Ministry of agriculture is not known to farmers. The local government and other stakeholders should advocate this. Services offered by MVIWATA and other stakeholders need not to be only established where these organizations are operating, but transmission to other areas might be useful.

#### **5.2.2.4 Distribution of income among actors**

In this globalized world, there is no sole price for the produces and is the demand and supply force that determine the price and market clearance. But as an effort of ensuring farmers are prospering at this early stage of agricultural revolution, prices need to be regulated at least at the lower level. It is not easy to control businessmen who are fetching a lot after storing for some time, but at least doors should be opened to external

businessmen, ensuring the product is identifiable in other markets for attraction of traders and consumers.

### **5.2.3 Supportive factors**

#### **5.2.3.1 Credit amenities**

Credit facility is highly recommended to farmers especially in rural areas. Farmers are lacking collaterals and commercial financial institutions are not ready to offer credits to risky businesses like agriculture. The approach used by Asians in bringing agriculture forefront during green revolution, should be used if we want to commercialize agriculture. Credits will enable farmers to increase acreage, and many traders to engage themselves in marketing associated activities like processing and packaging.

#### **5.2.3.2 Trainings**

Marketing requires skills, to win confidence of whomever one is doing business with. It is then recommended that regular training as was suggested earlier, together with training to traders and other players in the chain is important in making rational decision in agricultural trade.

#### **5.2.3.3 The Public-Private Partnership (PPP)**

As it was addressed in the pillar number three of Kilimo Kwanza document, the partnership is highly insisted in this document (URT, 2011). This will improve the information systems, technologies in agriculture, marketing, markets and market sources as well as exposing produce demand to farmers. This will by one way increase efficiency in the marketing chain for rice.



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## APPENDICES

### Appendix 1: Summary of marketing costs of wholesalers and retailers

Cost items	Marketing costs (mean Tshs); 90kgs of rice		
	Wholesalers	Mpanda rural	Mpanda town
Storage	500	500	1500
Transportation	2500	9000	15000
Loading/offloading	600	1400	1400
Milling costs	5000	6000	6000
Packaging (bags)	1000	1000	1000
Levy	-	1000	1000
Watchmen	800	1200	1200
Reward to intermediary	4000	2000	2000
Handling costs	2000	2000	2000
Total	16,400	24,100	31,100
Cost/kg (Wholesaler)	182.2	267.8	345.5
16400/90kg bag			
<b>Retailers</b>			
Transferring	1500	2500	3000
Merchandising costs	-	600	3000
Total	1500	2100	6000
Cost/kg (Retailer)	16.67	23.3	66.67
Grand total	19,400	27,200	37,100
Cost/kg(GT/90)	16.67	23.3	66.67
Marketing Cost/kg	215.5	302.2	412.2
Wholesale prices	1,000	1,400	1,700
Retail prices	1,200	1,600	2,100

GT=grand total

**Appendix 2: Summary of average production costs incurred by producers**

<b>Farm activity</b>	<b>Average cost/acre (Grouped data)</b>	<b>Average cost /acre (individual)</b>
Soil tilling and planting	7 400 000	154 383.3
Weeding	4 655 000	58 187.5
Harvesting	5 592 000	69 900
Shelling	4 375 000	54 687.5
Storage	3 748 000	46 850
Labour	3 682 000	146 025
Sub total	63 604 000	
<b>Divide by 120. (n)</b>	<b>530 033.3</b>	<b>53 0033</b>

**Costs are in Tanzania shillings**

**Appendix 3: Factors influencing farmers to sell paddy**

<b>Factor for selling</b>	<b>Counts</b>	<b>Percent</b>
Good prices	13	10.8
Family matters	74	61.7
Price fluctuations	5	4.2
Reinvestment	28	23.3
Total	120	100

**Appendix 4: Farmers accessed credit for rice production and their purpose**

<b>Access to credit</b>	<b>Counts</b>	<b>Percentage</b>
Accessed	25	20.8
Not accessed	95	79.2
Total	120	100
<b>Sources of credit n=25</b>		
Commercial banks	3	2.5
NGOs	1	0.8
Private lenders	18	15
Relatives/neighbors	3	2.5
Total	25	
<b>Purpose of credit n=25</b>		
Payment for hired labour	5	4.2
Purchase of ploughs	15	12.5
Payment of rented oxen	5	4.2
<b>Total</b>	<b>20</b>	

## Appendix 5: Questionnaire set for producers

### Analysis of rice marketing systems in Mpanda and Mlele districts of Tanzania

District: \_\_\_\_\_

Name of Village: \_\_\_\_\_ Ward \_\_\_\_\_

Date of interview: \_\_\_\_\_

Name of enumerator: \_\_\_\_\_ Signature: \_\_\_\_\_

Questionnaire code: \_\_\_\_\_

#### 1.0 Demographic characteristic of sample respondent

s/n	Name of	Sex	Age	Marital	Educational level	Occupation
	HHH	Male=1 Female= 2	Years	status Single =1 Married =2 Divorced =3 Widowed =4 Never married =5	Illiterate, no schooling =1 Primary school=2 Secondary school=3 College =4	Farming =1 Off-farm =2 Non-farm =3 1&2 =4 1&3 =5 2&3 =6

#### 2.0 Farm Characteristics and Rice Production Condition

##### 2.1 Farm size and farm ownership

2.1.1 Do you own arable land? 1. Yes 2. No

2.1.2 If yes, how much land do you own? Arable land \_\_\_ Grazing land \_\_\_\_\_ (in acres)

2.1.3 Is there any land which is rented? \_\_\_\_\_ (acres)

2.1.4 If yes, how many acres? \_\_\_\_\_

2.1.4 What are the terms of payment?

## 2.2 Rice Production

2.2.1 How much land have you allocated for rice production from your total own/sharecropping/ rented land in the last cropping seasons?

<b>Year</b>	<b>Total land Holding (acres)</b>	<b>Total land under rice</b>	<b>Variety used</b>	<b>Average yield per acre.</b>
2010/2011				

2.2.3 What suggestions do you have to tackle such challenges and enable you to produce and benefit from rice production?

1. Improve extension services
2. Improve seed and chemical supply
3. Improve rice marketing
4. Access to credits

2.2.4 Have you ever used agricultural inputs (fertilizer, chemicals, farm implements, etc.) for the production of improved rice varieties? 1. Yes 2. No

2.2.4.1. If no, what was the main reason behind? \_\_\_\_\_



2.2.4.2. If yes, which type and from which source did you get such agricultural inputs in the rice production process?

<b>S/n</b>	<b>Type of input(s)</b>	<b>Source</b>	
	Seeds		1. District Agriculture office
	Fertilizer		2. Local markets
	Herbicide/pesticide		3. Cooperative Union
	Farm implements		4. Development agents
			5. Local Suppliers
			6. Friend/relative
			7. Neighbor farmer
			8. Other (specify)

2.2.5 Why did you prefer the chosen sources to get the needed inputs? \_\_\_\_\_

2.2.6 How did you get the input from the mentioned sources?

<b>No</b>	<b>Input used</b>	<b>Mode</b>	
<b>1</b>	Seeds		1. Purchase
<b>2</b>	Fertilizer		2. In credit
<b>3</b>	Herbicide/pesticide		3. As a gift
<b>4</b>	Farm implements		4. Exchange
			5. Others (Specify)

2.2.7 Do you always get inputs at the right time? 1. Yes 2.No

2.2.7.1 If no, what are the reasons? 1. Unavailability 2. Far distance 3. Others (specify)

2.2.8 Do you always get inputs in the quantities that you need every year? 1. Yes 2.No

## 2.2.8.1 If no, why?

1. Not available
2. Too expensive
3. Cash shortage
4. I am not sure of benefit
5. Not available on time
6. Others (Specify) \_\_\_\_\_

## 2.2.9 Have you encountered problems in accessing these inputs in the last two seasons?

1. Yes 2. No

## 2.2.9.1 If yes what are the problems?

1. Unavailability
2. Long distance
3. Not needed
4. Not applicable

## 2.2.9.2 How much do you paid for a unit of listed output in Tshs?

(Costs are for inputs sufficient for one acre)

No	Input used	Price per unit	Not applicable
1	Seeds		
2	Fertilizer		
3	Herbicide/pesticide		
4	Farm implements		

2.2.9.3 What is the cost of producing one acre of paddy (in total Tshs \_\_\_\_\_?)

Give the cost incurred in the following farm activities:

S/N	Activity	Source of labour	code	Cost estimates/acre
1	Land clearing	1.Family members		
2	Soil tilling and initial preparation			
3	Planting/sowing	2. hired labor		
4	Weeding	3.Friends		
5	Harvesting	4.Community support		
6	Shelling/threshing			
7	Storing			
8	Other (specify)			

2.2.10. What is the maximum and minimum wage for farm hired worker in your place?

2.2.11 Traditionally, how much units of paddy you are getting in one acre? \_\_\_\_\_

(Units)

2.2.12. Do you store your grain before marketing? 1. Yes      2 No

2.2.12.1. If yes, for how long and how much?

1. Less than three months
2. Above three months
3. Above three months

2.2.12.2 Do you incur any losses during storage?

2.2.12.3 If yes, which are they?

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_

2.2.12.4 If No, why? \_\_\_\_\_ (give reasons)

2.2.13 Do you process your produce before marketing? 1. Yes \_\_\_\_\_ 2. No \_\_\_\_\_

2.2.13.1 If yes, what challenges you are facing during processing?

1. \_\_\_\_\_
2. \_\_\_\_\_

2.2.12 What challenges you always face during storage?

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_

2.2.13 what are factors that influence you to sell your produce? (tick one)

1. Good price
2. Family matters
3. Price fluctuations
4. Reinvestment

2.2.14 What are the challenges that you faced in production in the last two seasons?

1. Weather
2. Markets

### 3. Farm productivity

#### 2.3 Access to credit

2.3.1 Did you borrow money for rice production before?            1. Yes            2.No

2.3.2 If yes, from where and for what purpose did you collect the credit?

Source		Purpose
Bank		1. Payment for hired labor 2. Purchase of fertilizer & seed 3. Purchase of farm implements 4. Payment for rented oxen 5. Others (specify)
NGOs		1. Payment for hired labor 2. Purchase of fertilizer & seed 3. Purchase of farm implements 4. Payment for rented oxen 5. Others (specify)
Private lenders		1. Payment for hired labor 2. Purchase of fertilizer & seed 3. Purchase of farm implements 4. Payment for rented oxen 5. Others (specify)
Relatives/neighbors		1. Payment for hired labor 2. Purchase of fertilizer & seed 3. Purchase of farm implements 4. Payment for rented oxen 5. Others (specify)
Others		1. Payment for hired labor 2. Purchase of fertilizer & seed 3. Purchase of farm implements 4. Payment for rented oxen 5. Others (specify)

## 2.4 Information/knowledge flow

### 2.4.1 Training

2.4.1.1 Have you ever participated in rice production system training in the last three years? 1. Yes 2. No

2.4.1.2 If no, why?

1. No arrangement
2. Limited number of trainees
3. Distant from home
4. No money to pay for
5. Not applicable

2.4.1.3 If yes, on which aspects, by whom and for how long you have got the training?

No	Training type	Provider	Duration	Year
1	Rice seed production mechanism			
2	Crop management			
3	Rice marketing			
4	Pre and post harvest handling			
5	Composition of all			
6	N/A			

2.4.1.4 Was the training you get easily understandable and practicable? 1. Yes 2.No

2.4.1.5. Was the information/knowledge you got through training useful?

1. Yes      2.No

2.4.1.6 Which aspects were not useful? \_\_\_\_\_

2.4.1.7 Were you able to employ the new knowledge you acquired? 1. Yes 2.No

2.4.1.7 Where do you get information about the market trends?

1. Friends
2. Intermediaries/traders
3. Cell phones
4. Radio and newspaper

2.1.4.8 How useful the information is? 1. Useless\_\_\_ 2. Moderate\_\_\_ 3 Good\_\_\_

(Tick one)

### 3.0 Marketing

3.1 Did you sell rice in this season? 1. Yes\_\_\_\_\_ 2. No.\_\_\_\_

3.2.1 If no, why you did not sell?

1. No markets available
2. Long distance to the market
3. Low price
4. N/A

3.2.2 If yes, how much and to whom did you sell your production?

Total production	Amount for home consumption	Amount sold in Kgs.	To whom	1. Other Farmers as Seed/Grain 2. Consumer 3. Intermediaries 4. Retailers 5. Whole Sellers 6. Others(Specify)

Destination	1. Other Farmers as Seed/Grain 2. Consumer 3. Intermediaries 4. Retailers 5. Whole Sellers 6. Others(Specify)
-------------	---

2.2.3. How much you are getting when selling one unit of paddy? \_\_\_\_\_ (price per unit)

3.2.4. Why have you preferred the mentioned consumers/ markets to sale your produce?

1. Accessibility
2. Good price
3. Quick payment

3.3 Distance of market center from your home/farm \_\_\_\_\_minutes, \_\_\_\_\_km

3.4 Means of transportation used

1. 1.Vehicles
2. Animals
3. Manpower
4. Others (specify)\_\_\_\_\_

3.5 If you were used vehicles, was it easily accessible? 1. Yes 2. No



3.6 If you did not use vehicles, why?

1. Too expensive
2. Not available
3. Poor roads
4. Not applicable

3.7 Was there any other problem you faced in rice marketing? 1. Yes 2. No

3.7.1 If yes, what was the problem? Tick

1	Lack of market information	
2	Poor linkage with other value chain actors (retailers, traders, consumers, etc.)	
3	Low consumer demand	
4	Non-availability of market/limited access to market	
5	Low quality product that meet consumer demand	
6	Absence of rice polisher	
7	Market distance	
8	Absence/ limited access to transportation	
9	Others (specify)	

3.8 How did you solve these problems? \_\_\_\_\_

3.9 Are there market related opportunities that motivate you to produce rice before and in the future time? Yes 2. No

3.9.1 If yes, what are they?

1. High consumer demand for consumption of rice
2. High demand for rice seed from farmers in nearby areas
3. Presence of boarder market
4. Institutional support
5. Others (specify) \_\_\_\_\_

3.10 Do you have linkage with the following commercial value chain actors?

- 1) Retailers
- 2) Whole sellers
- 3) Consumers
- 4) Others (specify) \_\_\_\_\_

3.11 Are there marketing cooperatives/ farmers' organization who are working on rice? 1.

Yes      2. No

3.11.1 If yes, what services do they provide?

1. Micro credits
2. Market advices
3. Collective marketing
4. Warehouses
5. N/A

3.12 Sources of market information

No	Input market information	No	Output market information

### **Appendix 6: Interview Check List for FGD**

Actors involved and the role they played:

- Actors involved (both private and public organizations)
- Role/ function they play
- Are the actors involved appropriate for the nature of the sector, the stage of development of the

Market and the institutional setting?

- Potential actors' missed-role/functions/ contribution they play

### **Appendix 7: Checklist for transporters**

- i. How much it cost to transport one bag of paddy to town? \_\_\_\_\_
- ii. Does road condition affect your charging strategy? \_\_\_\_\_
- iii. Do you have any limitation in transporting paddy? 1. Yes 2. No
- iv. If yes, what are they
  - 1) \_\_\_\_\_
  - 2) \_\_\_\_\_
  - 3) \_\_\_\_\_

### **Appendix 8 : Checklist for local millers**

- i. What is the capacity of your machine per day? \_\_\_\_\_(tons)
- ii. Is the flow of clients and paddy enough to keep you busy full time? \_\_\_\_\_
- iii. How much do you charge per 100 kilogram bag of paddy? \_\_\_\_\_
- iv. Do you charge any storage cost? 1. Yes 2 No
- v. If yes, how much per bag? \_\_\_\_\_

- vi. Do you have any other charge? 1 Yes 2 No
- vii. If yes, what are they? \_\_\_\_\_
- viii. How do you grade the rice grain?

### **Appendix 9: Checklist for vendors**

What is the price of rice in 20 kilogram pack? \_\_\_\_\_

Do you use weighing scales of traditional units? \_\_\_\_\_

If yes for traditional units, what are they? \_\_\_\_\_

How do you grade the quality of rice? \_\_\_\_\_

What is the preferred size of grain by most of the consumers? \_\_\_\_\_

Do you face any problem to meet clients' quality requirements? 1. Yes 2. No

If yes, what are the problems?

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

What is your pricing strategy? \_\_\_\_\_

What is your average sale per day? \_\_\_\_\_

To whom you usually sell the product? \_\_\_\_\_

Do you have any other charges, like tax and market fee? 1. Yes 2 No

If yes, what are they? \_\_\_\_\_

Is there any barrier to enter this business? 1. Yes \_\_\_\_\_ 2. No \_\_\_\_\_

If yes, what are they?

\_\_\_\_\_

\_\_\_\_\_

How much you are incurring during storage of rice? \_\_\_\_\_(Shs)

What causes price fluctuations within the season?

**Appendix 10: Checklist for consumers**

How often do you buy rice for home consumption? \_\_\_\_\_ (Rice meal per week)

Do you find any problem in getting rice? 1. Yes 2. No

What is your specification when buying rice?

1. Grain size \_\_\_\_\_
2. Aroma \_\_\_\_\_
3. Color \_\_\_\_\_