FINDINGS FROM THE MOI UNIVERSITY AGSHARE SURVEY OF STAKEHOLDERS IN THE MAIZE VALUE CHAIN.

ABSTRACT

Maize is the most important cereal crop in Kenya. It forms an important part of the food and feed system, and contributes significantly to income generation for rural households. It is the main staple food for the people of Kenya, providing more than a third of the caloric intake. In terms of land usage, maize accounts for about 56% of cultivated land in Kenya. About 98% of the 3.5 million small-scale farmers in Kenya are engaged in maize production. The small- and medium-scale sector produces about 75% of the nation's maize crop, while the large-scale sector (farms over 25 acres) produce the other 25%. On average, 1.5 million hectares are planted to maize annually, with annual production ranging between 26 and 36 million bags (2.3 and 3.3 million metric tons (MT)) depending on weather and market conditions. National maize consumption is about 37 million bags (2.9 million MT) annually. Yet, despite the centrality of maize to the Kenyan food system, the country has for the last several decades been trending toward a structural deficit in maize. Effectively coping with recurrent maize deficits is critical for enhancing food security in Kenya and promoting economic growth in the smallholder farmer sector.

The sector is whoever, both technologically and organizationally complex mainly due to dynamic nature of farming characterized by low productivity and low use of farm inputs, poor infrastructure, lack of rural finance and poorly developed markets. The major constraints affecting growth of the maize sub-sector include low soil fertility, unreliable rainfall, pest infestation, poor infrastructure, marketing and policy bottlenecks and low profitability attributed to a combination of low yields and poor marketing strategies (GOK, 1997; ICIPE 2000)

The study was to identify the roles and functions of agents, in the maize value chain, find out if the farmers are following the recommended practices for maize production and Come up with possible solutions to various issues affecting the value chain and its actors

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INTRODUCTION

Maize is the most important cereal crop in Kenya. It forms an important part of the food and feed system, and contributes significantly to income generation for rural households. It is the main staple food for the people of Kenya, providing more than a third of the caloric intake. Maize is also the primary ingredient used in animal feeds in Kenya, accounting for over 80% of feed rations. In terms of land usage, maize accounts for about 56% of cultivated land in Kenya. About 98% of the 3.5 million small-scale farmers in Kenya are engaged in maize production. The small- and medium-scale sector produces about 75% of the nation's maize crop, while the large-scale sector (farms over 25 acres) produce the other 25%. On average, in the last five years, 1.8 million hectares are planted to maize annually, with annual production ranging between 26 and 36 million bags (2.3 and 3.3 million metric tons (MT)) depending on weather and market conditions. National maize consumption is about 37 million bags (2.9 million MT) annually. Shortfalls in production are met through imports from Uganda, Tanzania, and the world market. Yet, despite the centrality of maize to the Kenyan food system, the country has for the last several decades been trending toward a structural deficit in maize. Effectively coping with recurrent maize deficits is critical for enhancing food security in Kenya and promoting economic growth in the smallholder farmer sector.

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Production and marketing are a continuum in the development process and consequently an efficient marketing system is a pre-requisite for increased and sustained development of the products as it stimulates production

As a product moves from the producer to the consumer, a number of transformations and transactions take place along a chain of interrelated activities,

and value is added successively at each stage of the chain. The term value chain is used to characterize the set of interconnected and coordinated links and linkages that take place as a product moves from the primary production unit to the final consumer. Kaplinsky and Morris (2001) define the chain as the full range of activities that are required to bring a product from conception, through the intermediary stages of transformation, delivery to final consumers, and final disposal after use.

Production, processing, and distribution of agricultural products are increasingly being organized into value chains, where flows of inputs, products, financial and information resources take place among farmers, processors, retailers and other economic actors. The aim of value chain analysis is to analyze the organization and behavior of all the participants in the value chain, to diagnose the constraints and problems that they face, and to identify public actions that may enhance the performance of the value chain and contribute to national policy objectives. Strategies and policy changes broadly considered to promote value chain performance and national policy objectives may adversely affect some stakeholders.

Value chain analysis recognizes that different arrangements of actors may affect outcomes along the chain by influencing capabilities and levels of bargaining of the actors.

The analysis can be useful in:

- creating a shared vision among chain participants with regard to challenges and opportunities, hence facilitating the development of collaborative relationships;

- promoting enterprise development;

- enhancing food quality and safety;

- determining the quantitative measurement of value addition and understanding of the distribution of returns amongst the various players;

- promotion of coordinated linkages among producers, processors and retailers; and

- improvement of an individual firm's competitive position in the market place.

The methodology specifically involved: Identifying the outline of the chain and the position of the various economic agents within it–all who contribute to production, transformation and marketing of a specific product;

- Identifying the roles and functions of these agents, including those who perform multiple roles;

- Showing interactions among agents;

- Mapping key policies and institutions along the value chain that influence the functioning of the chain; and

- Finding out if the farmers are following the recommended practices for maize production.

- Establishing key drivers, trends, and issues affecting the value chain and it actors.

- Come up with possible solutions to various issues affecting the value chain and its actors

Understanding how the maize sub-sector can become more competitive requires a systemic view of the markets, and the participants that comprise them. Improving the competitiveness of the sub-sector in a meaningful way requires a framework that examines the fabric of relationships between participants in the sub-sector to identify and prioritize the opportunities and constraints to improving industry competitiveness

METHODOLOGY

The study was carried out in two regions: the maize surplus areas (Trans-Nzoia and Uasin-gishu Counties) and maize deficit areas (Machackos County). These districts were selected due to the centrality of maize production as a livelihood strategy to farmers.

Machakos District covers more than 600,000 hectares of the Eastern Province of Kenya and has a population of over 1 million. Rainfall is bimodal, with an annual average of between 500-1,500 mm depending on location and altitude, and about 85% of the region is classified as semi-arid to arid. There are two growing seasons that each last from 90-119 days (Kassam et. al., 1991). Soils in the lowlands of Machakos range from shallow to very deep and are well drained, with topsoil's of loamy sand to sandy loam in many places

Farming is mainly subsistence-oriented cultivation of crops such as maize, beans, pigeon peas, and sorghum and fruit trees. Most farmers also keep local breeds of cattle, goats and poultry. The average farming household in the lowlands of Machakos has a freehold smallholding of about 2.5 ha, and earns roughly 22% of its total income from agricultural activities.

Uasin-Gishu and Trans-Nzoia counties are part of the larger Rift Valley province. The province covers an area of 173854 km² and has a population of 8,786,300 inhabitants making it the largest and most populous province in the country.

According to the Uasin Gishu district annual report 2005 the district lies between 340 501-350 371 east and 00-00 551 north. The district has a total area of 3218km2 and is divided into six administrative divisions. About 90% of the district is arable; about 2000km2 is high potential. The district has an estimated 135,629 household and a population of 828,274 according to the 2009 census. It has a mean altitude of 1900 m above the sea level and a mean temperature of 17.5c. The average annual rainfall is between 900-1100mm. the rainfall distribution during the year is unimodal with the first peak in April and second in august. The main economic activities in the district are crop production and livestock rearing.

Study design

Data for this study was generated through a survey carried out in November 2010. During the survey 60 respondents were selected using systematic random sampling and interviewed using a structured questionnaire. The interviews were conducted from a range of actors in the maize production and marketing system; farmers, traders, millers and other key informants. The sample comprised of 36 farmers, 10 traders 3 transporters, 3 millers and 8 consumers. Data collected included biological and socio-economic; household profile, yield trends, credit, sources of incomes, sales and purchases made and prices.

Separate questionnaires were prepared for the various key actors in the maize value chain including farmers, maize millers, traders and transporters. These survey instruments were designed to explore, in a rigorous way, the structure, conduct, and behaviour of Kenya's maize market.

For the purpose of this study, specific regions were identified purposively as sites for analysis. The criteria for the selection of regions were:

> 1. Maize is the primary crop grown in local farming systems. This selection criterion ensured that multiple actors in the value chain, including producers, assemblers, and wholesalers could be interviewed within a single region; and
>
> 2. The major maize surplus-producing districts were purposively selected as well as at least one deficit district to explore variations in the marketing behavior of actors operating within high surplus and low surplus/deficit regions.

Data analysis was done using statistical package for social scientists (SPSS) and Microsoft excels computer programmes which were used to generate correlation coefficients.

Gross margin analysis was done to compare level of profitability of an ideal and average maize farm

Descriptive statistics such as bar charts percentages and measures of central tendency were used to describe emerging relationships between variables.

RESULTS AND DISCUSSIONS

Table 1 presents data on comparison of recommended practice in maize production. The farmers in both areas are not using the recommended rates of inputs. Additionally there gross margins are far below recommended margin this can be attributed to the use of less input. Similarly the yields in both areas are below the potential of these areas

Table 1: Comparison of farmers and best practices

	Deficit areas(ha)		Surplus areas(ha)	
Comparison category	Farmers practice	recommended	Farmers practice	recommended
Gross margin	Kshs.415	Kshs.4,890	Kshs.8,260	Kshs.11,170
Maize seed	7Kg	20Kg	11Kg	25Kg
DAP	25Kg	80Kg	50Kg	150Kg
CAN	10Kg	80Kg	50Kg	150Kg

Source: Authors(2011)

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Graph 1: Yield per region
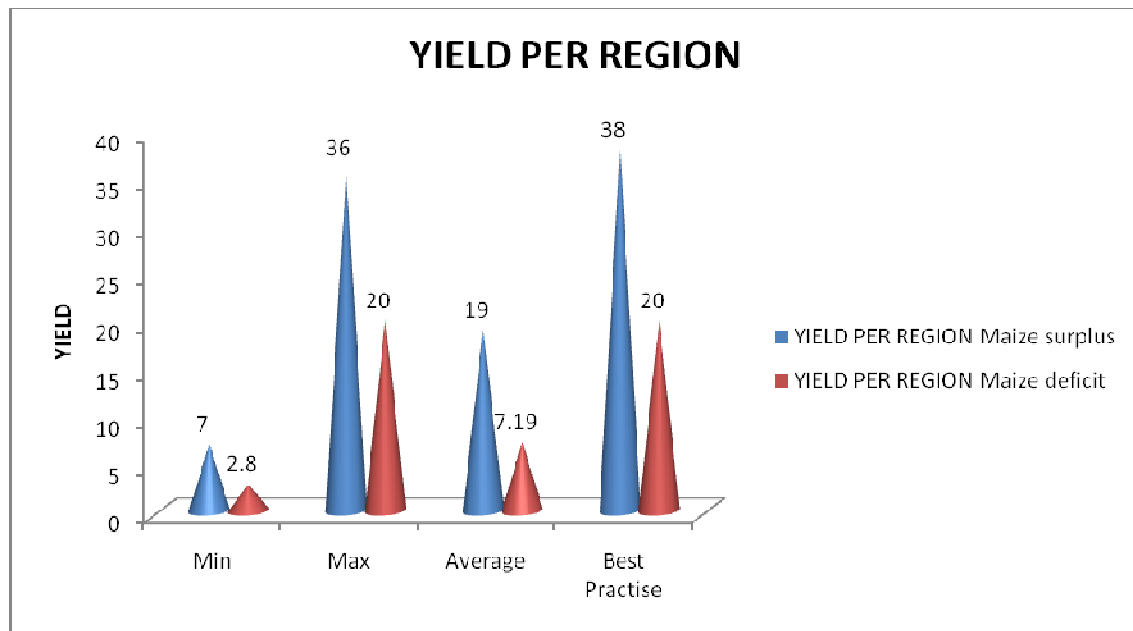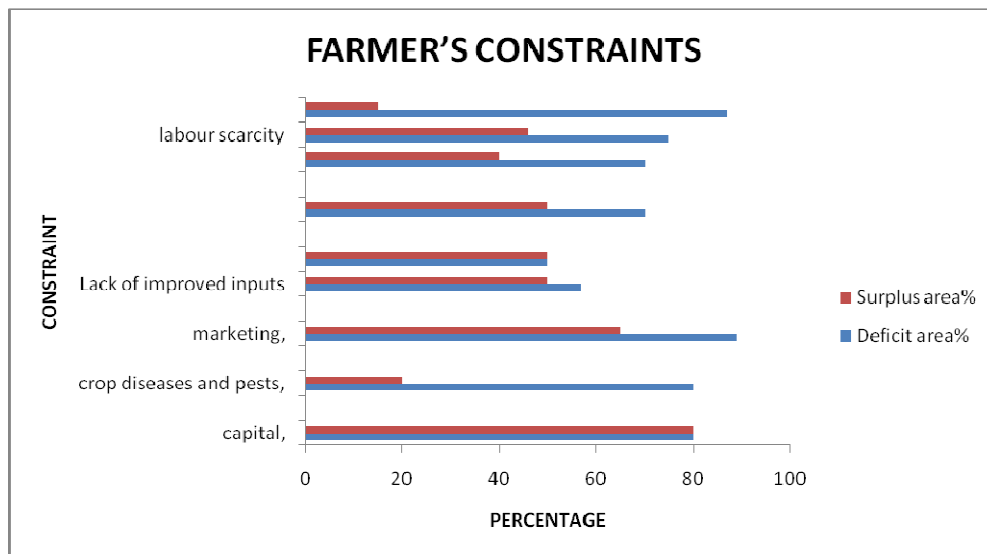

Source: Authors(2011)

In the maize deficit area of Machakos, drought was ranked as the severest constraint to increased maize productivity, followed by capital scarcity. Many respondents expressed lack of cash for purchasing or hiring farm inputs such as seed or oxen for ploughing. This in turn is reportedly due to low volumes and prices of marketable product surpluses and inaccessibility to commercial credit. Crop diseases and pests are the third most important constraint in this region. Frequent pests include birds and army worms, the latter coming especially at the on-set of rains following prolonged dry spells and stalk borers. The fourth constraint is poor infrastructure, i.e. lack of roads in many areas, poor roads that are impassable during wet seasons and lack of public transport vehicles. Other constraints include: inadequate extension service (lack of or insufficient skills); lack of improved inputs (lack of hybrid seeds, fertilizers, machinery, low yields); labour scarcity (labour shortage, weeding problem, lack of enough time to work on the farm); and marketing (lack of or poor markets, low output prices, price fluctuations, delayed payment for marketed crops.

From the survey it was evident that most people in Machakos use local maize seed and do not top-dress their maize which they attributed to the hybrid seed and

the fertilizer being expensive while others said they were not aware of its importance in maize production.

Constraints are identified and ranked by survey site to determine any differences in spatial distribution. While drought is ranked number one constraint in Machakos it is not a major constraint in the maize surplus areas. The number one constraint in maize surplus area is capital, followed by poor infrastructure and lack of improved inputs. Spatial variation in type and ranking of constraints could be expected to become more pronounced with distance. This would call for more caution generalising constraints over large geographical areas.

Graph 2: Farmer's constraints

Source: Authors(2011)

One striking observation about the suggested solutions is that most respondents view government as the source of solutions to most of their problems(graph 3). This view is not conducive to development. It encourages people to sit and wait for the government to provide solutions to problems that they themselves can solve or do something about. People ought to be educated "by the government" about the need to find or initiate solutions to constraints facing them by themselves rather than wait for the government to provide the answers. Admittedly, many of the constraints identified would require government action such as improvements in infrastructure and marketing, research and extension as

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pre-conditions or pre-requisites for any significant development initiated by the people themselves.

Graph 3: Farmer's solutions
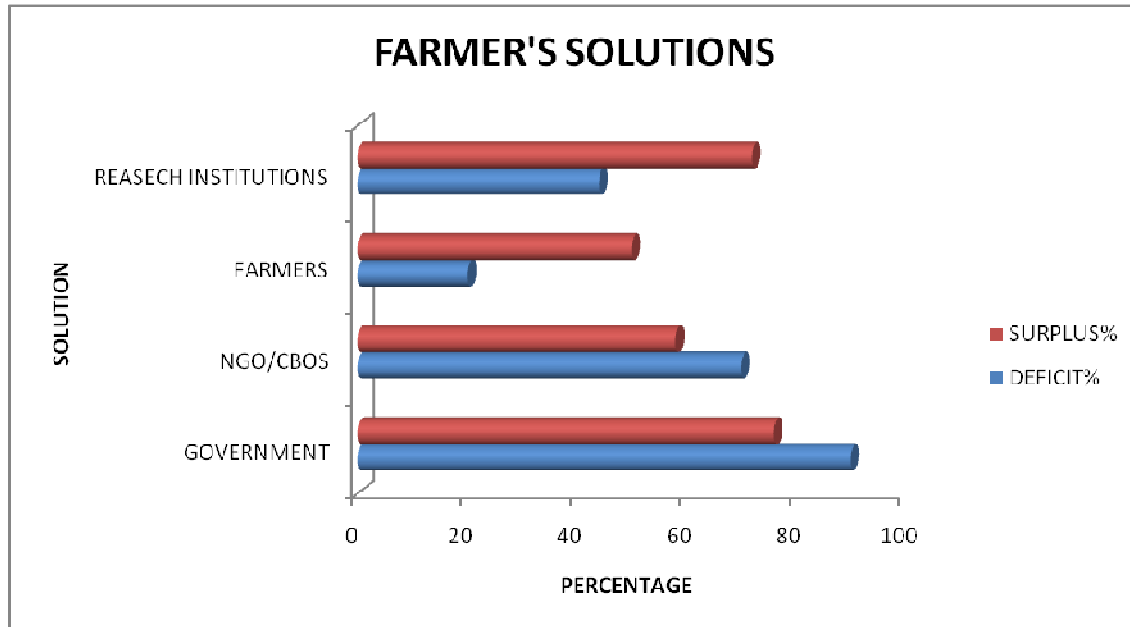
Source: Authors(2011)

Many of the constraints identified are interrelated. Solutions to some may alleviate others. For instance capital is ranked the second constraint considering all farms together. But the capital constraint is related to marketing constraints. For instance improved marketing would improve producer prices or increase volume of marketed farm produce, resulting in higher cash in-flow. This action would have the tendency of relaxing the household capital constraint.

The structure of Kenya's maize market change significantly depending on national production levels; when there is plenty of maize the price of maize deeps and when there is less the prices rise.

Small-scale farmers have a variety of potential markets through which to sell maize including small-scale assemblers operating at the village level and are attributed to liberalization of the maize, market in 1995 by the Kenyan government. The importance of NCPB as a market option for farmers has also been decreasing over the years.

The performance of the millers in the value chain is highly dependent on the functioning of the traders and transporters. Limited transportation capacity in the country limits the efficiency of maize markets as it leads to delays in the movement of the product from one actor in the value chain to the other.

Another finding is that most traders don't store grain as assumed by many people because they don't want to incur production cost which are very high in the context of maize storage.

Consumers in urban areas show a decrease in their consumption of maize grain compared to their counterparts in the rural areas. Likewise Market channels for acquiring maize vary across income groups; those in high income groups getting from the super markets and those in the low income groups from the posh mills.

Spatial price margins between surplus and deficit regions are also low.

CONCLUSION AND RECOMMENDATIONS

Maize farmers in both regions perceive the following as the constraints limiting increased maize productivity, listed from the most to least severe: capital, crop diseases and pests, infrastructure, extension services, improved inputs, , land scarcity, labour scarcity, marketing, drought, soil erosion and theft. The ranking of these constraints varies slightly between the two regions.

The majority of farmers view the government as the major source of solutions to most of the constraints. Admittedly in infrastructure and marketing, farm inputs, research and extension services as prerequisites for any significant development initiated endogenously. This is not good for any development, therefore People ought to be educated about the need to find or initiate solutions to constraints facing them by themselves.

Maize marketing system has improved in the recent years especially after liberalization of the sector in 1995 because now there are many actors in the chain which eliminates monopolistic tendencies and brings about competition. This is very vital particularly in the input and output markets.

As most of the constraints are interrelated and affecting the same goal of increasing agricultural production, an interdisciplinary approach in the context of maize production research would be an appropriate strategy to follow in addressing the constraints.

All the actors in the chain feel that they are getting the best from the market due to certain hitches or inadequacies especially in the market which need to be dealt with urgently.

Policy suggestions

In the short-term to stimulate production fertilizer/seed support for short rains season should be targeted and land under irrigation be expanded

In the Long-run Productivity enhancing investments like Expansion of irrigation; roads & railway infrastructure; R&D should be considered

The government should improve access productivity enhancing inputs by working with private sector to improve access to seeds and fertilizer by farmers

Examine options for bringing more land in Kenya under potential cultivation by smallholder farmers unless the land constraint in currently densely populated rural areas of Kenya are relieved is unlikely that a large portion of farmers in Kenya that own less than one hectare will be able to rise out of the semi-subsistence conditions that keep them trapped in poverty.

Support training programs to enable smallholders to develop more effective marketing strategies and to negotiate more effectively with traders, in order to raise the prices that they receive for their maize.

It should also explore options for improving public and private extension programs to enable farmers to adopt farm technologies generated by research.

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