

**Participatory Prioritization of Issues in
Smallholder Agricultural
Commercialization in Kenya**

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Abstract

Participation in commercial agriculture has considerable potential for improving the livelihoods of many smallholder farmers. However, numerous constraints hamper their efforts in market-oriented production. This study uses a participatory Rapid Rural Appraisal (RRA) to assess the various constraints in the production and marketing of some important agricultural commodities. The study also uses the views of participants in various stakeholder workshops to understand the drivers of change in agri-food systems and opportunities in agricultural commercialization in one peri-urban and one rural area in Kenya.

The findings demonstrate the relevance of participatory methodologies in investigating pertinent issues in agricultural commercialization. Special considerations for adaptation of the Rapid Rural Appraisal technique are noted. There is a gradual increase in commodity commercialization, especially in peri-urban areas, but fewer smallholder farmers actually participate in the markets directly due to a variety of constraints. There is limited value addition for most commodities at the village level. Furthermore, the importance of production and marketing constraints varies considerably with the mix of market access and market integration at the village level. Notably, areas with poor market access are characterized with poor quality and high cost of inputs, high transportation costs, and exploitation in commodity measurement, while those with high market integration mainly experience widespread on-farm theft, high market charges and unreliable market information.

Various policy measures are recommended to improve commodity production and marketing. In production, the policy focus should be on quality and cost of inputs, water availability, pests and diseases control, and improved rural security. Better pricing, contract enforcement, road maintenance, value addition, cost-effective market information, harmonization of standards, and regulation of the type and frequency of market charges are suggested to enhance market participation and efficiency. Strategies to sustain smallholder farmers' participation in prioritization of key issues in commercial agriculture are proposed.

Further research is suggested on the broader adaptation of the Rapid Rural Appraisal methodology to improve the quantitative rigour in the approach, and incorporate dynamic community-level understanding of agricultural commercialization processes in policy formulation and implementation.

Abbreviations and acronyms

AEZs	Agro-ecological Zones
AI	Artificial Insemination
CBS	Central Bureau of Statistics
CGA	Cereal Growers Association
CRS	Catholic Relief Services
ECAPAPA	Eastern and Central Africa Programme for Agricultural Policy Analysis
FAO	Food and Agriculture Organization
FDI	Foreign Direct Investment
FGD	Focus Group Discussion
FSR	Farming Systems Research
GDP	Gross Domestic Product
HCDA	Horticultural Crops Development Authority
HIV/AIDS	Human Immune Virus / Acquired Immune Deficiency Syndrome
IPM	Integrated Pest Management
KARI	Kenya Agricultural Research Institute
KCC	Kenya Cooperative Creameries
KDB	Kenya Dairy Board
KENFAP	Kenya National Federation of Agricultural Producers
KEPHIS	Kenya Plant Health Inspectorate Service
KFHC	Kenya Federation from Hunger Council
KIPPRA	Kenya Institute for Public Policy Research and Analysis
KRA	Kenya Revenue Authority
MDGs	Millennium Development Goals
MNCs	Multinational Corporations
NCPB	National Cereals and Produce Board
NGOs	Non-Government Organizations
NIB	National Irrigation Board
PRSP	Poverty Reduction Strategy Paper
RRA	Rapid Rural Appraisal
SRA	Strategy for Revitalizing Agriculture
SSA	Sub-Saharan Africa

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1. Introduction

This section provides an overview of agricultural commercialization in the context of poverty reduction in Kenya, and highlights the research problem, objectives of the study, justification and organization of the report.

1.1 Agricultural Commercialization and Poverty Reduction

Agriculture plays a pivotal role in Kenya's economy, particularly in terms of food security, income generation and employment (Gross Domestic Product of about 23% in 2005). Smallholder farmers constitute the bulk of agricultural producers in Kenya. The smallholder farmers derive their livelihood from land holdings that are about 2-5ha, and at most own 20 heads of livestock, with a mix of commercial and subsistence production; have a greater share of family labour in production, and the farm is the main source of income (Davis, 2006). Smallholder farmers in Kenya and other comparable regions of Sub-Saharan Africa (SSA), Asia and South and Central America are the poorest category in the world population (Narayan and Gulati, 2002).

Commercialization refers to the percentage value of marketed output to the total farm production (Haddad and Bouis, 1990). Agricultural commercialization involves a transition from subsistence to increasingly market-oriented patterns of production and input use. Rural households adapt differently to agricultural commercialization depending on their resource endowments, economic and social conditions, as well as government policies at national and sub-national levels. The potential benefits of higher product prices and lower input prices due to commercialization are effectively transmitted to poor households when market access is guaranteed (IFAD, 2001). Low levels of market access for agricultural commodities contributes to poor sectoral performance in developing countries, and prevents most people from utilizing domestic

and export trade opportunities to uplift their livelihoods. Mass participation in a labour-intensive export trade is beneficial to poor countries through higher producer prices, increased demand for labour, and higher government spending from increased tax revenues (Anderson *et al.*, 2005). Commercial orientation of smallholder agriculture leads to gradual decline in real food prices due to increased competition and lower costs in food marketing and processing (Jayne *et al.*, 1995). These changes improve the welfare of smallholder farmers in two ways: for consumers, low food prices increase the purchasing power for food while, to producers, a decline in food prices enables reallocation of limited household incomes to high value non-food agribusiness sectors and off-farm enterprises.

Promoting investments in agricultural commercialization could reduce poverty, but requires great shifts in priority setting, more so in the rural areas of Kenya (Geda *et al.*, 2001). Improvements in value addition and marketing are some of the interventions that would sustain agriculture's contribution to livelihood betterment (Republic of Kenya, 2005a; Republic of Kenya, 2003). Globalization trends, urbanization, migration and rising per capita incomes are some of the forces that drive changes in consumption behaviour towards high value agriculture. These trends create market niches for commodities such as fresh fruits, vegetables, processed and semi-processed maize meal, and dairy products.

1.2 Research Problem

Despite growing demand for high value agricultural products, smallholder farmers who depend on these commodities for food and incomes remain poor. Access to emerging markets and benefit-sharing patterns from food trade is largely skewed in favour of large scale suppliers (Davis, 2006). Although opportunities for growth and poverty reduction through commercialization of agriculture are immense, identification of these opportunities as well as the constraints seldom incorporates smallholder

farmers as primary beneficiaries. In addition, there is poor coordination of interventions by implementing institutions due to lack of consensus in priority setting (Republic of Kenya, 2005a). This leads to resource wastage on non-priority areas, duplication of efforts and low participation of farmers in commercialization (Balint, 2003). Consequently, food insecurity and widespread poverty continue to be daunting challenges.

Improvements in market incentives are necessary to facilitate not only a shift from subsistence to commercial agriculture, but also to guarantee smallholder farmers equitable benefits from market integration (Pingali, 1997). It is imperative to adopt a more broad-based participatory approach in needs assessment in order to target interventions in line with the priority constraints facing the poorest segments of the agrarian population. This would promote responsibility, ownership and sustainable involvement by these stakeholders in agricultural commercialization.

1.3 Objectives of the Study

The general objective of the study was to adapt participatory methodologies in the prioritization of challenges, opportunities and interventions in market-oriented agri-food systems. The specific objectives were to:

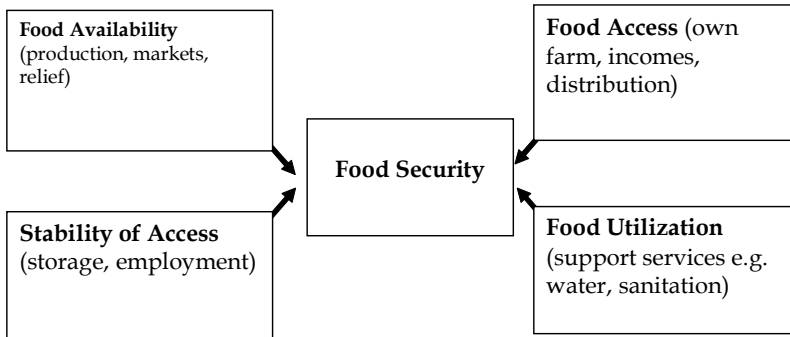
- (i) Explore methodological issues in the application of participatory Rapid Rural Appraisal;
- (ii) Establish the level of commercialization and relative importance of constraints in different village types;
- (iii) Highlight opportunities and drivers in commercialization; and
- (iv) Identify desired policy, technology and investment measures to promote commercialization.

1.4 Justification

Integrating traditional smallholder farmers into the exchange economy is important for stimulating growth, rural and overall economic development, food security and poverty alleviation. Market orientation of smallholder agriculture provides an opportunity for addressing the numerous challenges that characterize subsistence production, low profitability, a high degree of uncertainty, lack of ability to meet the ever-changing consumer preferences, high transaction costs, lack of reliable and timely market information, and absence of economies of scale. In recognition of the contribution of agriculture to Kenya's GDP, various policy measures are required to facilitate implementation of the Strategy for Revitalizing Agriculture (SRA) 2004-2014 with the objective of reducing national poverty from 56 percent in the year 2000 to 26 percent in the year 2010, as well as reducing the number of food poor people from 48.4 percent in the year 2000 to less than 10 percent in the year 2010 (Ayuko, 2005).

By definition, food security exists only when all people have physical, social and economic access to sufficient, safe and nutritious food that meets dietary needs and food preferences for an active and healthy life at all times (World Bank, 1986; FAO, 1983). Food security entails food availability (through production, markets and safety nets, for example relief food; access through own farm supply, better incomes, and efficient distribution systems; stability of access (value addition, for example through processing and storage, employment and income stability) and utilization (for instance, safe water, sanitation and health facilities) at all times for all people (Figure 1). Food security has spatial dimensions such as household, community, national or regional levels.

Efforts to promote small-scale farming have been made in the past but much more needs to be done to make a positive difference in terms of ensuring integration to urbanized/globalized markets. Research is,

Figure 1: Elements of food security

Source: Adapted from Diru (2005).

therefore, needed to identify policy options that will stimulate the transition of smallholder farmers to become commercial operators. Policy interventions and institutional innovations are needed to overcome the constraints so as to move from the current dominant subsistence farming to sustainable commercial agriculture. Proper investment incentives combined with targeted support for smallholder farmers, particularly in some important sub-sectors within agriculture, are called for. This paper is motivated by global transformations characterized by:

- (i) Emergence of high value commodity chains, especially supermarkets;
- (ii) Increasing participation by women in employment and the need for convenience foods;
- (iii) Rapid urbanization trends and changing food preferences;
- (iv) Varied technology in food processing; and
- (v) Increasing concerns for food safety and quality standards in high value markets.

The key policy question for researchers, government planners and other development partners is how smallholder farmers can be enabled to

participate in sustainable commercial agriculture (ECAPAPA, 2006). Smallholder farmers and other stakeholders should be actively involved in 'farming as a business' right from identification and prioritization of issues influencing agricultural commercialization.

Three key sub-sectors were selected for this study, i.e. maize, horticulture and dairy. Maize is a staple food in Kenya, consumed in various forms by 96 percent of the population. It is produced on 49 percent of the arable land systems. About 20 percent of the country's total land (58 million ha) is suitable for crop cultivation (Republic of Kenya, 2005b). Maize production is characterized by high smallholder participation and its development would have a positive impact on rural incomes, poverty reduction and food security. There are opportunities in maize marketing for value addition for emerging dietary preferences, among other issues.

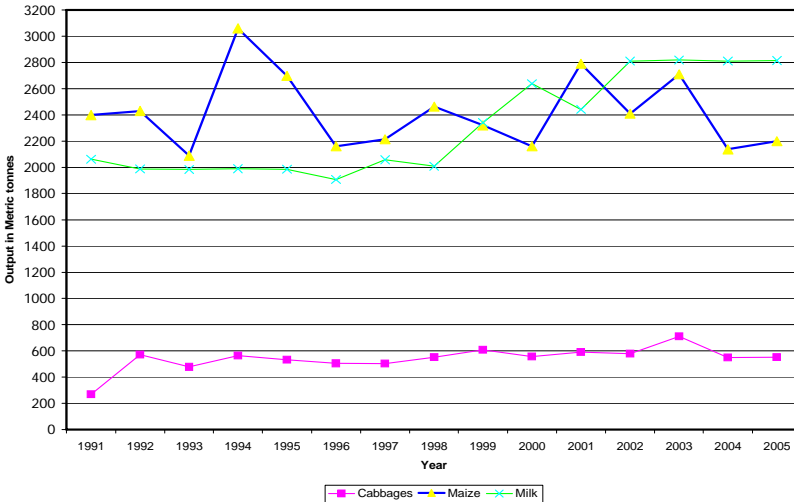
Horticulture is an important source of income for the smallholder farmers, who account for over 70 percent of its total production (McCulloch and Ota, 2002). It has higher returns than most cash crops and is suitable for production on the currently declining farm sizes in varying agro-ecological zones (Minot and Ngigi, 2003). It continues to be one of the key growth-driving economic sectors, contributing about 23 percent of total export earnings for the country (CBS, 2006). The main horticultural crops grown by smallholder farmers for both subsistence and commercial purposes in Kenya include cabbages, tomatoes, kales (*Sukuma wiki*) and onions.

The dairy sub-sector is an important source of income and food for majority of the population. It supports more than 650,000 smallholder farmers and an increasing number of small-scale entrepreneurs in the marketing system. Annual national milk production is about 2.8 billion litres (Muriuki *et al.*, 2003; Omore *et al.*, 1999). Consumer demand for milk is estimated to grow at 3.6 percent per year. The increase in demand for dairy products such as milk, yoghurt, cheese and butter is largely due to increase in population and improvement in purchasing power.

Commercialization of the dairy sub-sector would allow farmers to adopt modern farming practices and improve productivity to meet the growing consumer demand.

The production trend for these three essential commodities has been fairly stable in the last fifteen years (1990-2005), and this offers scope for improving national food security and incomes (Figure 2). It is necessary to design all-inclusive bottom-up policy interventions that would enable smallholder farmers to respond to the changing agri-food systems.

Figure 2: Commodity production trends in Kenya, 1991-2005



Source: FAOSTAT Data (2006)

1.5 Organization of the Report

This report is organized into five sections. The study context has been introduced in section one to highlight the importance of agricultural commercialization for poverty reduction among smallholder farmers, state the research problem, objectives and justification. Section two reviews

general commercialization processes in agri-food systems and the relevant trends in Kenya. The participatory methodology applied and the emerging adaptation issues are outlined in section three. Key results from the study are discussed in section four, while section five provides the main conclusions and policy recommendations.

2. Literature Review

Various forces and effects of market-oriented changes in agri-food systems are discussed in this section. Emphasis is laid on commercialization processes in developing and transition economies in Latin America, Asia and Africa, with respect to observable trends in Kenya. This section aims to draw replicable lessons for Kenya from comparable experiences in other regions that share common features, such as a large rural population, a large share of the rural labour force employed in agriculture, and a declining share of agriculture in GDP.

2.1 Overview of Commercialization Processes in Agri-food Systems

During the process of agricultural commercialization, there is a shift by farmers from subsistence food production to cultivation of cash crops and rearing of livestock for commercial purposes. Commercialization also entails modernization of agriculture, which depends heavily on the intensification of production processes, as well as the introduction of new technology and mechanization. As marketed share of agricultural output increases, input utilization decisions and product combinations are progressively guided by profit maximization objectives. This process leads to systematic substitution of non-traded inputs with purchased inputs, gradual decline of integrated farming systems and emergence of specialized farm enterprises (Bruan and Kennedy, 1994).

The main forces that drive commercialization at the farm level include high opportunity costs of family labour (due to better alternative off-farm employment opportunities) and increased market demand for food and other agricultural products arising largely from rapid population growth. While modernization and mechanization can improve farm productivity and income, they can also reduce the need for manual labour and, therefore, reduce employment and income options in rural communities.

Gender impacts vary from region to region depending on whose tasks are mechanized, how workloads are affected, and who loses opportunities for paid work (Haddad and Bouis, 1990).

Different levels of commercialization have been recorded by farmers across developing and transition economies in Latin America, Asia and Africa, often arising from various drivers and leading to location-specific implications. For instance, advances in biotechnology have transformed the Brazilian agriculture into a more commercially-oriented sector, with improved contributions to the country's economy, while the influence of globalization has been noted as the key driver of agri-food systems changes in China, India, and other Asian countries (Narayan and Gulati, 2002). Most of the Asian countries (both the highly populated ones such as Bangladesh, China, India and Indonesia, as well as the smaller ones such as Cambodia, Sri Lanka and Vietnam) benefited from adoption of new high-yielding varieties of food grains – Green Revolution (ADB, 2005).

The Chinese experience offers some replicable lessons of agricultural commercialization. First, emerging urban consumer class had huge potential for trade creation for the Chinese farmers. Second, between 1995 and 2003, per capita purchases by China's rural households increased for most food items due to strong growth in the rural economy and commercialization of rural food expenditures. Third, many households increased their consumption of self-produced pork, beef, mutton, poultry, eggs, milk, fruit, and nuts by 17 percent. The cash share of food expenditures rose for rural households at all income levels, but the increase was especially fast for low-income rural households while low-income households commercialized fastest (Gale *et al.*, 2005).

In Africa, Peters (1999) noted that between 1986 and 1997, although the process of agricultural commercialization led to a general increase in per capita household income in Malawi, the greatest benefits went to the better-off households. Changes in income sources indicated that

households in the top income quartile increased the proportion of their income earned from agricultural sales relative to off-farm sources, while those in the bottom quartile made a reverse shift. The Malawian case showed that the proportion of households in each income decile selling maize was higher in the bottom decile than the middle deciles. However, as sellers, they sell early in the season when the prices are at their lowest, and as buyers, they buy in the deficit season in local markets or villages when prices are highest. Similar experiences have been reported from Kenya's maize sub-sector (Mbithi, 2000).

2.2 Commercialization Trends in Kenya

Important changes have been observed in Kenya's agri-food systems during the colonial, post-colonial and post-liberalization periods. In the colonial era (1920-1960), commercial agriculture was limited to foreign-owned land (White settler farms). Maize marketing was governed by the restrictive Native Foodstuffs Ordinance of 1922, the Marketing of Native Produce Ordinance of 1935, and Provincial Maize Boards in 1941-1962 (Thomas *et al.*, 1997). The colonial government initiated measures to encourage production of horticultural crops, but marketing was purely done by private individuals (Minot and Ngigi, 2003). For dairy farming, there was commercial orientation by European settlers in the high potential areas of Central, Rift Valley and Eastern provinces from 1920s to 1954, when the Swynnerton Plan opened up participation in commercial agriculture by indigenous farmers (Muriuki *et al.*, 2003).

With political independence in 1963, the policy focus shifted to increased participation by the indigenous Africans in commercial agriculture. There was also increased state control on production and marketing of commodities. These changes served to increase both the commercial commodity range and scale of production in most parts of the country. The National Cereals and Produce Board (NCPB) was established with

the mandate to achieve price stability and food security. The Board marketed 60 -70 percent of maize, the rest being sold by farmer cooperatives and private traders. In horticulture, the creation of the HCDA in 1967 to coordinate participants in the industry, and the flow of Foreign Direct Investments (FDI) from various Multinational Corporations (MNCs), for instance the Del Monte Company in Kenya's pineapple production and processing, contributed to rapid growth of the agricultural sector (Swanberg, 1995). Active government support in the provision of livestock clinical services and Artificial Insemination (AI) in mid 1960s contributed to growth of the dairy herd and milk output (Omiti *et al.*, 1993). A great share of the milk market was then dominated by the state-run Kenya Cooperative Creameries (KCC).

Kenya's economic liberalization, which began in the early 1980s opened both the input and output markets to forces of demand and supply in most agricultural commodities. On a more general front, liberalization has led to increased input sources, increased output market channels, wide variations in both input and output prices, and wide fluctuations in seasonal commodity production (Freeman and Omiti, 2003; Nyangito, 2001). Liberalization has also contributed to increased enterprise competition and farm commercialization. Widespread inefficiencies at the NCPB, together with liberalization of maize market in 1988, increased producers' options on maize marketing channels – cooperatives, private millers, roadside markets, etc. Over this period, the horticulture sub-sector experienced rapid growth arising mainly from changing dietary preferences, increased participation of women in the labour market, and emergence of various market outlets for fresh fruits and vegetables (supermarkets, wholesalers, retailers, assemblers etc (Katinka and Lumpkin, 2005). The milk market has undergone a major transformation since its liberalization in 1992. This ended KCC's monopoly in urban areas and opened up the dairy industry to private sector investors in input provision and marketing, with resultant redistribution of socio-

economic pay-offs to smallholder farmers, market actors and consumers (Omiti and Muma, 2000; Omore *et al.*, 1999; Staal and Shapiro, 1994).

Rising trends in urbanization, emergence of supermarkets and changing consumer preferences offer potentially high-value niche markets for smallholder farmers of developing economies such as Kenya, especially for dairy, maize and horticultural products (BIRTHAL *et al.*, 2005; Oli, 2005; Reardon *et al.*, 2005; Minot and Ngigi, 2003; Strasberg *et al.*, 1999; Dijkstra, 1997). However, Diao and Hazell (2004) observe that poorly functioning markets, weak domestic demand, and lack of export possibilities could constrain the potential for agricultural growth.

Technological innovations necessitated by commercialization require complementary investments in efficient rural factor markets. In addition to initiating various reform processes, and multi-stakeholder participation in the transformation of smallholder producers, the public sector has a crucial responsibility to assist smallholders in developing market-oriented agriculture that is sustainable economically, socially and environmentally (Kisamba-Mugerwa, 2005). Governments and the international development community face a major challenge of ensuring that smallholder farmers and other rural people benefit from commercialization, either through participation in the market, or by successfully exiting agriculture and finding employment in different sectors (Pingali *et al.*, 2005). While most previous studies have focused on the process of agricultural commercialization, its determinants and impacts, no documented evidence exists on assessment of smallholder farmers' participation in prioritization of market-oriented issues. Addressing this gap would, thus, inform policy on the extent and desired strategies to strengthen local farmers' involvement in investment decisions.

3. Methodology

This section illustrates the relevance of stakeholder participation in markets and provides a justification for participatory research approaches. The process of participatory Rapid Rural Appraisal is discussed in detail. Key methodological issues pertaining to its adaptation are highlighted. In addition, focused stakeholder workshops are discussed as useful tools of data gathering and consensus building.

3.1 Conceptual Framework

This study uses the farm-firm theory in which profit maximization and growth are the main objectives that rational producers pursue (Reynolds, 1988). The producers seek to maximize profits subject to constraints in the supply chain. In order to overcome the constraints to commercialization, the producers adopt strategies such as commodity bulking, product differentiation, target pricing and collective action. In the long-run, a growth-oriented firm may invest more in technology and information so as to expand production capacity. Commercialization is broadly visualized as the orientation to market-led production, processing and efficient supply chain management. Within the context of agrarian economies, some of the viable commercialization strategies include: (i) beneficial movement from low-value agriculture to high-value agriculture, (ii) opportunistic management practices such as irrigation; (iii) off-season production, and; (iv) targeting of niche markets.

Commercialization often induces price changes for both producers and consumers. Price changes result in multiple effects on rural households since they are producers and consumers of food and other farm output. High prices for farm products reinforce substitution effect of a price increase by encouraging farm households to sell food products to the market instead of consuming them on-farm (Gale *et al.*, 2005). Higher food prices indirectly

increase farmers' income, which potentially increase farmers' demand for food, thus offsetting the substitution effect. For urban households, food consumption is more sensitive to price changes triggered by rural agricultural commercialization or large imports. Consequently, the effect of higher prices on food consumption could be either positive or negative, depending on whether the substitution effect or income effect is larger. The net effect of commercialization tends to improve food security and household disposable incomes for sustained economic growth.

Participatory analysis of agricultural commercialization requires involvement of all stakeholders (Figure 3). This entails collaboration at micro, meso and macro levels of policy in order to identify critical constraints, opportunities and strategies for maximizing beneficial outcomes for resource-poor farm-households. The participatory collaboration must take a problem-solving orientation. In addition, multiple methods that fully utilize local people's knowledge and creativity need to be employed to generate socially acceptable, economically feasible and environmentally sustainable interventions. Moreover, experts at both district/province and national/international levels should facilitate (but not influence) the process of needs identification, constraint ranking and priority setting for different interventions. This approach ensures ownership and responsibility in programme design by stakeholders, particularly the village-level participants whose livelihood improvement quintessentially forms the key development challenge.

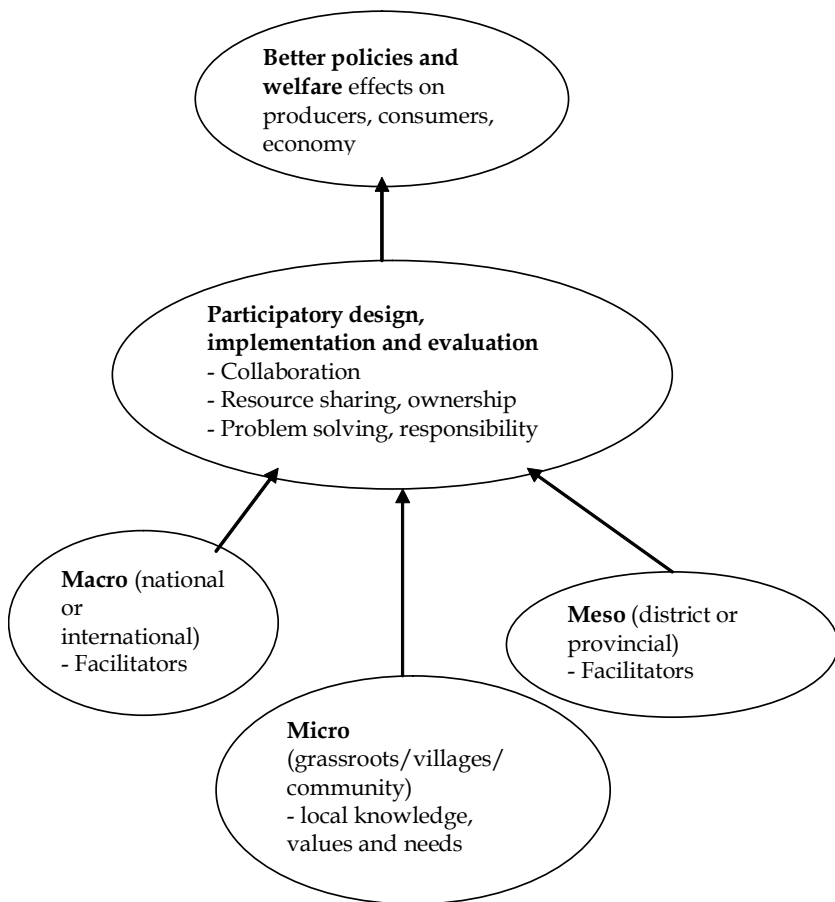
3.2 The Need for a Participatory Assessment

Previous studies on agricultural commercialization have used either cross sectional data, panel data or time series data, all gathered through individual household surveys, market surveys or formal institutional analysis. Such data, while providing actual independent respondent interpretations of concepts and issues, fail to provide a means to collate

group views or to validate responses. Formal surveys often present problems of:

- (i) time lags required to produce results;
- (ii) high cost of administering surveys;
- (iii) low levels of data reliability due to interview-bias; and

Figure 3: Maximizing gains through stakeholder consultation



Source: Adapted from FAO (2002) and Narayan (1998)

- (iv) irrelevance of many of the questions for specific implementation purposes.

In addition, individual respondent surveys do not offer a mechanism for full participation by diverse groups in society. Hence, in such approaches, the opinions of part of the target population could be lost in the policy formulation process. As a result, some projects implemented from recommendations of individual respondent surveys are often seen by wider society as lacking their priority concerns, thus, the people are not involved as core participants but rather as recipients in the process of needs identification.

Resource scarcity of many poor smallholder farmers and a dwindling trend in public capacity to finance development investments call for a clearly focused priority setting mechanism that allows optimal allocation of resources (financial, human and physical) – both public and private – in profitable and sustainable ventures. Bruan and Kennedy (1994) observe that household-level studies should be supported with 'Learning from experiences in different village settings' in order to obtain practical knowledge needed to stimulate and supplement the process of agricultural commercialization in the interests of the poor. Moreover, a more participatory and bottom-up approach to needs-assessment or constraints identification is essential to support policy formulation in a liberalized market, and to fully address the missing links in smallholder livelihood improvement strategies (Doward *et al.*, 2003). Participatory planning methods in research provide opportunities for involving farmers in decision-making about programme priorities and for systematically incorporating information about client's needs. Indeed, participation enhances farmers' ability to express demand, act as an external pressure group, and serve as viable partners in development initiatives (Collion and Merrill-Sands, 2005).

Some participatory approaches such as Participatory Rural Appraisal (PRA) have been utilized to study household poverty levels and determinants in Kenya (for instance, Marenya *et al.*, 2003; Narayan and Nyamwaya, 1996). Community-based methodologies have also been designed and applied to assess household understanding of poverty and poverty dynamics in rural settings (Krishna *et al.*, 2004; Kristjanson *et al.*, 2004). Although commercialization is a viable pathway out of poverty for most agrarian societies, none of the previous studies has attempted to prioritize various issues of agricultural commercialization in a participatory manner in Kenya or elsewhere. To overcome these limitations, this paper uses a Rapid Rural Appraisal (RRA) methodology and stakeholder policy workshops to elicit opinions on drivers of change, to rank constraints, and identify opportunities and desired policy interventions to promote smallholder agricultural commercialization.

3.3 Overview of the Rapid Rural Appraisal Approach

Informal participatory survey methods such as RRA are gaining relevance in gathering data at various stages of programme implementation especially among rural communities. Three key principles underlie participatory informal data collection approaches. These are:

- (i) Multidisciplinary team work;
- (ii) Flexibility and triangulation (intentional collection of information from several different perspectives – team members with different levels of experience and gender; selection of different units of analysis such as farmers' groups, households or individuals); and
- (iii) Use of different techniques such as scoring, mapping, diagramming (FAO, 2006a and 2006b).

The RRA is a process and methodology of learning about rural conditions in an intensive, interactive, expeditious and iterative manner (Grandstaff

and Grandstaff, 1987). Unlike other investigative methods, rapid appraisals attempt to create dialogue with the project clients/beneficiaries, allowing the respondents to lead the inquiry. This feature enables analysis of the local conditions under which proposed interventions are to be implemented, since it facilitates collection of data on values, opinions, objectives, indigenous technical knowledge, bio-physical and economic information.

A broad range of previous studies present cases where the RRA has been successfully utilized to investigate rural issues such as problems of seasonality of production, intra-family food sufficiency, gender roles and the importance of traditional crops (for instance, Heywood *et al.*, 1986). Besides being interdisciplinary and flexible, well planned RRA surveys offer three main strengths to research:

- (i) interview techniques are more open-ended than statistical survey questionnaires and reduce non-sampling errors;
- (ii) these techniques provide a structure to the discussion that allows researchers and interviewees to see the situation from a shared perspective; and
- (iii) the RRA methods allow for re-evaluation of the hypotheses during the course of field work, so that questions can be adjusted in light of new information.

Like other participatory approaches, the RRA may be prone to limitations such as response bias, self-selection bias and lack of quantitative rigour. Successful adaptation of the RRA, therefore, requires proper planning, consultation, design, administration and stakeholder participation. The RRA has been applied in Farming Systems Research (FSR) as a periodic evaluation tool to quickly assess where problems lie and to provide a basis for designing more formal or in-depth studies (Chambers and Jiggins, 1987). The technique can also be conducted on a regular basis, thereby

building upon the understanding of specific problems among project implementers.

3.4 Steps in the Participatory Rapid Rural Appraisal

Three main steps were utilized to implement the Rapid Rural Appraisal (RRA).

3.4.1 Priority selection of study sites

The study was conducted in two districts: Kiambu and Kisii. The two districts were chosen on the basis of their differential levels of poverty and degrees of commercialization (CBS, 2005). Kiambu District in Central Province was selected mainly because of its proximity to Nairobi, where there is a potentially huge lucrative urban market for maize meal, dairy and horticultural products. Generally, food production systems in Kiambu are relatively commercialized, with good infrastructure as compared to other parts of the country. Kisii District, about 400km from Nairobi in south-western Kenya is characterized by a modest level of commercialization and relatively modest state of infrastructure (road, water, etc). The two districts were chosen through a stakeholder consultative workshop from sixteen districts that were initially considered to be representative of Kenya's agricultural transformation process (Bungoma, Kakamega, Kiambu, Kirinyaga, Kisii, Kwale, Machakos, Makueni, Meru, Nakuru, Nyandarua, Nyeri, Rachuonyo, Thika, Trans Nzoia and Uasin Gishu). High potential areas such as Uasin Gishu and Trans Nzoia were omitted due to relatively smaller proportions of smallholder maize farms compared to large scale plantations. Comparable districts like Bungoma, Kakamega and Meru were dropped because of budgetary limitations and logistical constraints. Districts with extreme levels of poverty and bad infrastructure (particularly those in the North

Eastern part of Kenya) were not selected because of very low levels of agricultural commercialization and absence of all the three essential commodities: maize, horticulture and dairy.

Kiambu District is divided into four topographical regions: Upper Highlands (70%), Upper Midlands (20%), Lower Highlands (5%) and Lower Midlands (5%). The district has reddish brown volcanic soils and natural water supply from springs. The total land area in the district is 1,458.3 km² (97%) of which is arable. About 90 percent of the arable land is under smallholdings while the rest is under large farms. Altitude ranges from 1,500m to 2,591m above sea level, while the average temperature is 26°C. The average annual rainfall is 1,239.6mm occurring in a bimodal pattern; long rains from April to May and short rains from October to November. The main crops grown include coffee, tea, horticultural crops, potatoes, bananas, maize and beans. The main livestock activities include dairy farming under zero grazing, poultry, piggery, bee keeping and goats/sheep rearing. Over 70 percent of the dairy cows are Friesian, while the rest are Ayrshire, Guernsey, Jerseys and their crosses (Republic of Kenya, 2001a). The average population density was 526 persons per km² in 1999 (CBS, 2003).

Kisii District has three agro-ecological zones comprising the Upper Midlands (75%), Lower Highlands (20%), and Lower Midlands (5%). The District has a highland equatorial climate, red soils and several permanent rivers and streams that drain into Lake Victoria. Total land area is 1,200km². The altitude is in the range of 1,000 to 1,800m above sea level, with a mean temperature of 22°C. There are two rainfall seasons: long rains in February to June and short rains in September to November, recording an average annual rainfall of 1,500mm. About 78 percent of the land is arable, 58 percent of which is cropped. The major crops cultivated include tea, coffee, pyrethrum, bananas, maize, vegetables, sugar cane, groundnuts, avocados and other fruits. The main livestock kept in the

district include cattle, sheep, goats, chicken and donkeys. Over 80 percent of cattle in Kisii are local zebu and their crosses, while only 10 percent of the cattle population is improved dairy herd (Republic of Kenya, 2001b). The main livestock production systems are extensive grazing and tethering. The average population density was approximately 647 persons per km² in 1999 (CBS, 2003).

Despite comparable typologies in land holdings and farm enterprise combinations in Kiambu and Kisii districts, differences in poverty incidences, distance to main urban centre—Nairobi—and levels of infrastructure are useful delineating factors in assessing agricultural commercial orientation. Within each of the two districts, the RRA survey was conducted in eight villages selected on the basis of differential poverty indicators (CBS, 2003 and 2005) and the levels of market access as well as the degree of integration of the agri-food systems into commercialization (Table 1). The selection was done in consultation with District Agricultural Officers, District Livestock Production Officers and District Veterinary Officers. Market access was influenced largely by the state of roads and the proportion of households with electricity in their homes. It is envisaged that households with electricity and in villages that have good roads can conveniently undertake basic-post harvest activities such as refrigeration of farm output (e.g. milk) and access markets. The degree of market integration was measured by the distance to the nearest town/urban centre and the main type of market outlets (such as open air, roadside, supermarkets, retail shops, etc.) in that centre. Villages located at most 2km from the nearest town centre, and at least one supermarket and/or wholesale store/milk cooperative were considered to have high market integration. A list of the villages covered is presented in Table 2.

In both districts, two villages were selected representing each of the four categories, namely:

Table 1: Village selection matrix

	Integration into commercialized food systems		
Market access	Low		High
	Bad	Type one (2 villages)	Type two (2 villages)
	Good	Type three (2 villages)	Type four (2 villages)

- (i) Type one: villages where farmers had bad market access and low integration in commercialized food systems
- (ii) Type two: villages where farmers had bad market access and high integration in commercialized food systems
- (iii) Type three: villages where farmers had good market access and low integration in commercialized food systems, and
- (iv) Type four: villages where farmers had good market access and high integration in commercialized food systems.

By choosing different villages within a location that corresponds to different types (as categorized above), fixed effects due to government administration and, to a lesser extent, agro-climate, history and culture were controlled for.

3.4.2 Sampling of farm-level participants

In each of the selected villages, farmers involved in the production of at least one of the three commodities (maize, horticulture and dairy) were invited to participate in the RRA survey. Identification of the farmers in each village was done collaboratively between the research team, Ministry of Agriculture and Livestock officers (at the district, division, location and village levels) and the provincial administration (location chiefs and assistant chiefs). In each village, about 40-50 farmers were invited to the

Table 2: Villages sampled in the Rapid Rural Appraisal

Quadrant	Village	Sample (n)	Sub-Location	Location	Division	District
Bad market access and low integration	Gitumba	30	Gitumba	Kirenga	Lari	Kiambu
	Matimbei	18	Matimbei	Kamburu	Lari	Kiambu
	Obosando	27	Metembe	Kegogi	Marani	Kisii
	Bonyunyu ¹	21	Charachani	Keera	Nyamaiya	Kisii
Bad market access and high integration						
	Miumia	16	Miumia	Githunguri	Githunguri	Kiambu
	Ngenia	20	Ngewa	Ngewa	Githunguri	Kiambu
	Kionganyo	28	Kionganyo	Sensi	Marani	Kisii
	Mwogeto	31	Sensi	Sensi	Marani	Kisii
Good market access and low integration						
	Kamung'aria	26	Tiekunu	Ndeiya	Ndeiya	Kiambu
	Ndiuni	15	Ndiuni	Ndeiya	Ndeiya	Kiambu
	Bomwancha	33	Bomwancha	Bomariba	Suneka	Kisii
	Ititi	24	Gesoni	Bogeka	Mosocho	Kisii
Good market access and high integration						
	Gachie	25	Gachie	Kihara	Kiambaa	Kiambu
	Kabae	21	Ndumberi	Ndumberi	Kiambaa	Kiambu
	Matongo ¹	38	Kitaru	Kiangeni	Borabu	Kisii
	Amatiga	36	Kegati	Kegati	Kiogoro	Kisii

Source: Survey Data (2006)

¹These two villages are in the neighbouring Nyamira District, which was carved from the larger Kisii District.

RRA survey. Discussion leaders tried to ensure a balanced mix of gender, age, socio-economic background, and education levels of the participants. They also targeted local leaders and more experienced community members to participate in the discussions.

The location agricultural extension officers and the area chiefs in each of the sample villages were requested by the research team to invite the selected farmers to a meeting at a common point (nearby school compound, chiefs' meeting point or any other common local training venue) in the village on an agreed date and time. The invitations were done one week before the actual survey, and the meeting time was based on the local agricultural officers' past experiences in the respective villages (meetings were held in two villages each day – one in the morning and another in the afternoon). During the invitation, the primary objective of the RRA was clearly explained to the farmers and other participants. The research team emphasized to the invitees that the RRA was a policy survey aimed at facilitating smallholder agriculture commercialization and food security efforts. This was useful in making the participants to understand that no tangible benefits would accrue to anyone from participating (or not) in the RRA study. There was a high turn up in the village discussions with an average of 26 farmers in each village – this being nearly 10 percent of the average village population (CBS, 2003).

3.4.3 Focus group discussions

The RRA survey was conducted through participatory Focus Group Discussions (FGDs) in each village using a two-part checklist questionnaire. The first part of the questionnaire was administered to village leaders and it captured general information on the average level of commercialization in both districts. Part two of the questionnaire was administered to groups of farmers (8-12 people) dealing with any of the three sub-sectors in each village. Participants in each village were divided

into three separate commodity groups depending on individual farmer interest. The key aspects addressed in the questionnaire included the degree of commercialization at village level, production and marketing constraints, and the desired policy changes.

Prior to the RRA survey, field assistants were rigorously trained on the field questionnaires that were then pre-tested and adjusted appropriately. Field staff from the Ministry of Agriculture played the role of introducing the research team to the participants and language translation where necessary during the discussions. The research team commenced the discussions by giving brief explanations on the main objectives of the RRA survey and its relevance to the participants.

After the introductions, members of the research team proceeded to the respective commodity groups for detailed discussions. In the FGDs, the research team led the discussions by introducing questions in the checklist questionnaire and then giving all the participants enough time to suggest various answers individually, and then agree collectively on what they considered the best answer. Where there was consensus on an answer, the research team noted it as the main point from the discussion.

In situations where the participants failed to agree on issues, it was noted as an area that needed individual respondent survey. Thus, the RRA questionnaire was used as an open-ended guide for discussion, and not as a strict question-answer instrument. Indeed, each answer agreed or issue raised by the participants at each stage of the discussion prompted further probing by the research team in order to fully understand the issues addressed in the survey. Sketch maps were made on large sheets of paper (flip charts) to stimulate group discussions, especially on issues that required mathematical computations and historical trends. Each group discussion lasted for an average of three hours. After the interview, the research team thanked the interviewees for their participation.

3.5 Critical Methodological Issues

Successful adaptation of the RRA methodology to diverse agricultural commercialization aspects requires consideration of the following key areas in the design and implementation:

- (i) *Site selection*: The research scope should be limited to locations where there is agro-climatic possibility of diversifying out of low-value cereal production. The commodities chosen should be relevant to smallholder farmers; they should not all be subsistence staples, they should not all have the same primary market, and they should have different production and market trends. To avoid correlation between market access and market integration in village sampling, different number of villages of each type should be sampled to correspond with their frequency.
- (ii) *Time efficiency*: The interviewer should provide an estimate of how long the interview will take to the interviewees. This should be clearly indicated in the invitation letters and adequately explained to the participants before any FGD commences.
- (iii) *Response bias*: The research team should take care when briefing the field support staff to help with translations but not to interfere with the discussions or influence responses.
- (iv) *Focus Group Discussions*: Farmers should be organized into smaller groups (8-12 persons) to facilitate more focused commodity-specific discussions. This can be based on the farmers' individual preferences (for instance through questions such as 'if you wish to help us understand the dairy sub-sector, join this facilitator; if you wish to help us understand the horticulture sub-sector, join that facilitator), or arbitrarily by the researchers (using random numbers), if there is reason to believe that all respondents are comfortable responding to questions about any selected sector.

- (v) *Questioning approach:* The research team should treat the RRA questionnaire as a launching point for discussion, not a survey of disjointed questions. This requires the team to be flexible and follow up on key issues as they arise in conversation where the questionnaire does not anticipate these issues.
- (vi) *Stimulating participation in discussions:* Interviewers should refer to non-political memory reminders (e.g. an earthquake) if possible to enhance participants' recall for retrospective questions. Interviewers should be willing to utilize different techniques to encourage active participation in discussions. Display tools are particularly effective. Facilitators or even respondents themselves can also record answers and sketch maps on flip charts to stimulate group discussion.
- (vi) *Data validation and interpretation:* The research team's initial interpretations of and reactions to the interviews are a valuable resource for the entire research project. After interviews are completed in a village, the research team should debrief with the field support staff to discuss their reactions to the interview. Some questions that should be addressed in the debriefing session include: Were the interviewers surprised by any of the answers? Did they agree/disagree with them? Were there any inconsistencies in answers between the groups? If so, what were they and why might they have arisen? Within one day of concluding an interview, the research team should transcribe the notes into a form that could be understood by anyone who was not present at the interview.

3.6 Stakeholder Workshops

In addition to the RRA survey, two policy workshops were held in Nairobi with stakeholders on agricultural commercialization. An initial workshop was held to sensitize the stakeholders on the need for a study on agricultural commercialization, adapt the RRA methodological design to

village-level surveys in the Kenyan context, identify key drivers to changes in food marketing systems, and to identify policy needs. A second workshop was later held to highlight emerging opportunities in the agricultural commercialization process and to collate views from village-level respondents (in the FGDs) and policy stakeholders on feasible recommendations, and the necessary institutional, technological and investment requirements for implementation. These discussions were ostensibly meant to promote smallholder farmers' participation in market-led agricultural growth.

The stakeholder workshops were structured into two parts: presentations by the research team and participatory plenary discussions. Participants in both workshops consisted of planners and senior officers from relevant government ministries/ departments, research and academic institutions, commodity agencies/boards, farmer organizations, and development partners. A list of the stakeholders is shown in Table 3.

3.7 Data Analysis

This study puts much emphasis on the methodological approach adapted and uses descriptive statistics to highlight the main findings. The data was analyzed, presented and discussed using structured descriptive approach (adapted from FAO, 1991). This involved matrix ranking, percentage measures, line graphs, bar graphs, pie charts and simple averages on a market access-market integration nexus.

Matrix ranking has been used to show the importance of various constraints with regard to different levels of market access and integration. This would enable suggestions of policy recommendations that address the most binding constraints to commercialization in different localities. The proportion of commodities sold and the level of smallholder participation in the markets were explained using percentage measures. This was necessary to show the extent of smallholder participation in

Table 3: Institutional participation in the stakeholder workshops

Category of stakeholder institution	Number of participants
Ministry of Agriculture	28
Ministry of Livestock and Fisheries Development	14
Research Institutions	12
Commodity Agencies and Boards	5
Donor Organizations (e.g., FAO)	4
Farmer Organizations (e.g., producer associations)	4
Public Administration	4
Academic Institutions (e.g., universities)	2
Ministry of Cooperative Development and Marketing	2
Ministry of Water and Irrigation	2
Non-Government Organizations	2
Ministry of Energy	1
Total	80

markets and sharing of benefits from commercialization (between farmers and middlemen).

A line graph was drawn to show trends in commodity production, in order to justify the relevance of the commodities chosen in this study. In addition, the average levels of commercialization were illustrated using bar graphs. Variations in the proportions of commodities sold with changes in the degree of market access and integration were also depicted in bar graphs. The main drivers of change, opportunities and policy needs in agricultural commercialization have been summarized in tables and discussed.

4. Results from Participatory Surveys

The main findings from the study are structured in terms of village level commercialization aspects, smallholder participation in the markets, policy constraints to smallholders, drivers of change in food change systems and the overall economy, opportunities in commercialization, and policy needs in Kenya's agricultural development.

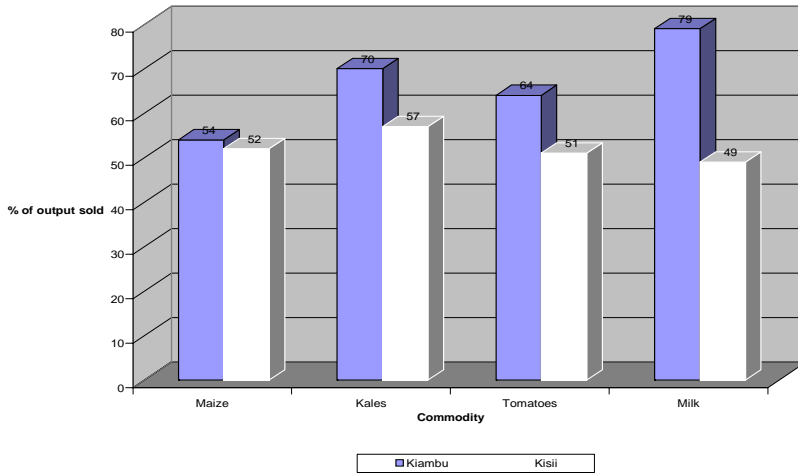
4.1 Participatory Rapid Rural Appraisal Findings

Participants in the Focus Group Discussions highlighted pertinent aspects in agricultural commercialization. Variations in the extent of commercialization at district and village levels (with respect to market access and market integration), and the key constraints that hinder smallholder farmers' participation in emerging commercialized agri-food systems show the need for prioritization of interventions.

4.1.1 Average level of commercialization

Kiambu District, which is closer to the main urban centre – Nairobi – has a higher degree of commercialization than the far-flung Kisii district (average percentage of output sold being 67 and 52, respectively) for all commodities investigated. Milk and kales (Sukuma wiki) have the highest percentage sold from Kiambu District than the other commodities (Figure 4). This shows higher demand for these two commodities compared to maize and tomatoes. Due to changes in nutritional preferences and cost of living, milk and kales constitute a major component in the food budgets of many households. Variations in sales also reflect differences in market conditions for various commodities. Marketing decisions are largely influenced by price incentives, market charges, transaction costs and stability of demand over a given period. Producers sell more of a commodity whose trade entails lower costs. Tomato is a highly perishable commodity,

Figure 4: Average level of agricultural commercialization in study sites



Source: Survey Data (2006)

and its market is largely dependent on season, quality and timeliness of delivery. Milk is perishable but can be preserved using low-cost technology in the short-run during market search. The purchase and consumption of maize varies seasonally due to competition from other crops such as Irish potatoes and bananas.

Commercialization and food security are interlinked; access to adequate nutritious food can be obtained through own production and/or purchase from the market. Thus, participation in well-functioning markets would provide incomes for buying food. Reliance on food from own production under household control is an insurance policy of households in response to high transaction costs and risks related to markets, employment and production (Bruan and Kennedy, 1994). For essential commodities like milk, whereas these findings show lower proportion being sold from Kisii compared to Kiambu, there exists a balance between milk consumed at home and that sold. Indeed, with 51 percent of milk consumed at home, households in Kisii are better off in terms of child nutrition. This is important in achieving the Millennium Development Goals (MDGs) on

'Eradication of extreme poverty and hunger' and 'Reducing child mortality by two thirds by 2015'.

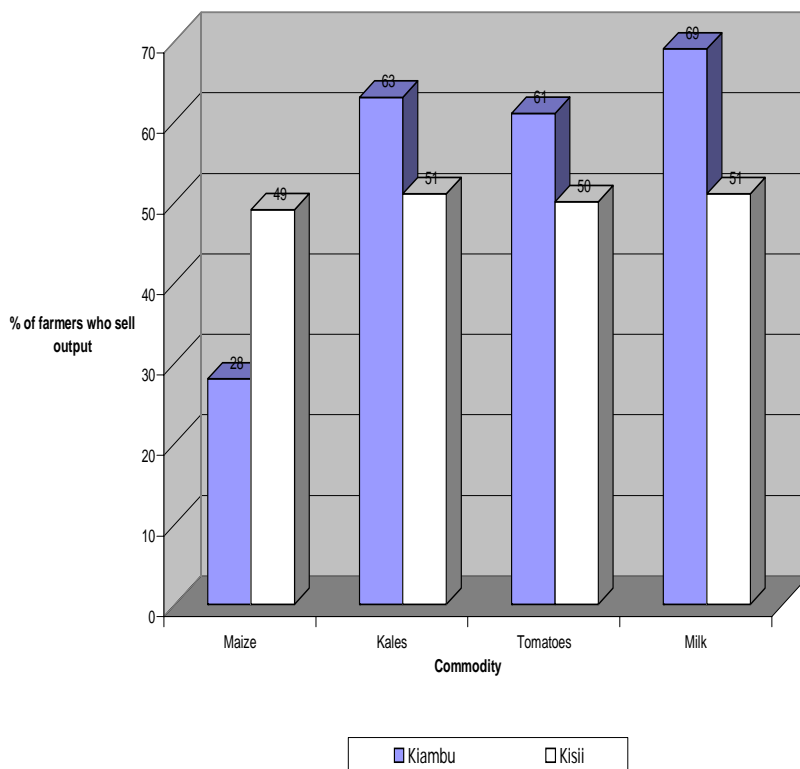
4.1.2 Participation in the markets

The proportions of output sold as well as the percentage of farmers who supply the marketed output are important indicators of economic progress. If market opportunities exclude majority of poor smallholder farmers, then wealth creation and development prospects for resource-poor agrarian communities will remain elusive. Precisely, the existence of smallholder producers, small traders, small businesses and roadside food markets is under threat if commercialization leads to concentration of food trade in the hands of a few retailers and large market intermediaries (Pingali *et al.*, 2005; Reardon and Berdegue, 2002).

This study shows a discrepancy between the percentage of output sold and the percentage of farmers involved in commercialization. Despite the rising level of output sold, fewer smallholder farmers participate in the commercialization (Figure 5). This indicates existence of commodity bulking and selling by a few farmers, thus distorting farm gate prices and incentives. Most of the farmers in Kiambu sell kales, tomatoes and milk, while those in Kisii sell maize. The findings on higher output sold from Kiambu than Kisii conform to IFAD (2001) observation that remoteness restricts access to information about new technologies and changing prices, leaving the rural poor unable to respond to changes in market incentives.

Farmers in villages that have bad market access and low market integration in Kiambu and Kisii sell more milk and kales, respectively (Table 4). Households in these villages consume most of the maize produced on-farm, and sell smaller proportions. Kales and tomatoes are also sold in moderate levels mainly to neighbours and nearby open-air markets. Smallholder farmers' participation in the markets, as reflected by the

Figure 5: Average smallholder participation in markets



Source: Survey Data (2006)

percentage of farmers who supply the marketed output is higher in Kiambu than Kisii for all the commodities, except maize in these villages.

In villages with bad market access and higher market integration, more maize is sold than the other commodities. The proportions of marketed output for all the commodities in both districts generally show an increasing trend (Table 5). This could be explained by reduced transport costs to market outlets. The percentage of farmers who sell their produce in these villages increases for all the commodities except maize. This gradual shift to more profitable enterprises (tomatoes, dairy and kales) in the peri-urban villages could be due to the influence of better transport

Table 4: Marketing characteristics in villages with bad market access and low market integration

Commodity	Variable	Kiambu	Kisii
Maize	% of output sold	53	40
	% of farmers selling	48	50
	Product form	Green cobs	Dry grains
	Main buyer	Brokers	Open air markets
Kales	% of output sold	63	51
	% of farmers selling	58	49
	Main buyer	Brokers	Open air markets
Tomatoes	% of output sold	60	44
	% of farmers selling	46	38
	Main buyer	Brokers	Open air markets
Dairy	% of output sold	66	42
	% of farmers selling	57	36
	Product form	Fresh milk	Fresh milk
	Main buyer	Brokers	Neighbours

Source: Survey Data (2006)

infrastructure, efficient information systems and higher degree of interaction in modern market outlets.

Villages with well maintained roads and good access to electricity but far away from town centres exhibit lower marketed output for most commodities. However, more milk is sold from the villages with the above characteristics in Kiambu (Table 6). The degree of farmer participation in the markets for all commodities is higher in these villages compared to those areas that have bad market access.

The similarity in commodity marketing between the villages characterized by good market access and low market integration, and those with bad market access and low integration, shows that market infrastructure influences commodity trade differently. Poor road condition has negative effect on proportion of tomatoes sold, mainly due to high perishability.

The villages with good market access and high integration, exhibit diversification of high-value commodities (as evidenced by increased

Table 5: Commercial orientation in villages with bad market access and high market integration

Commodity	Variable	Kiambu	Kisii
Maize	% of output sold	75	50
	% of farmers selling	8	40
	Product form	Green cobs	Dry grains
	Main buyer	Brokers	Open air markets
Kales	% of output sold	66	53
	% of farmers selling	52	43
	Main buyer	Brokers	Open air markets
Tomatoes	% of output sold	61	46
	% of farmers selling	49	40
	Main buyer	Brokers	Open air markets
Dairy	% of output sold	70	47
	% of farmers selling	59	40
	Product form	Fresh milk	Fresh milk
	Main buyer	Brokers	Neighbours

Source: Survey Data (2006)

Table 6: Marketing features in villages with good market access and low market integration

Commodity	Variable	Kiambu	Kisii
Maize	% of output sold	45	45
	% of farmers selling	25	40
	Product form	Dry grains	Dry grains
	Main buyer	Open air markets	Open air markets
Kales	% of output sold	58	47
	% of farmers selling	43	35
	Main buyer	Brokers	Brokers
Tomatoes	% of output sold	51	43
	% of farmers selling	60	54
	Main buyer	Brokers	Brokers
Dairy	% of output sold	82	45
	% of farmers selling	63	57
	Product form	Fresh milk	Fresh milk
	Main buyer	Cooperatives	Neighbours

Source: Survey Data (2006)

production of tomatoes, dairy and kales produced by farmers in mixed systems). This could be explained by declining transaction costs as the distance to the market decreases. In addition, high demand from a rising urban population and better prices from the working population segment

in towns could also account for the increase in sales of kales. The findings in this village category confirm those by Gale *et al.*, (2005) and Diao and Hazell (2004), which indicated some growth linkages from commercialization, diversification and income growth. They showed evidence of increased stability and diversification of household incomes arising from participation in agri-food markets, with specific cases of sugarcane in Kenya and the Philippines (Asia), export vegetables in Guatemala (Latin America), dairy development in India (Asia), and maize in Malawi (Africa).

Generally, these findings show the absence of value addition in the commodities and villages studied; all are sold in primary forms such as green maize, dry maize and fresh milk. Also, despite the existence of various market outlets, there is limited direct participation by smallholders in such outlets. Commodity trade in Kiambu is dominated by brokers, while in Kisii the majority of farmers commonly sell to consumers in open-air rural markets.

Table 7: Commodity marketing in villages with good market access and high market integration

Commodity	Variable	Kiambu	Kisii
Maize	% of output sold	43	73
	% of farmers selling produce	31	68
	Product form	Green cobs	Dry grains
	Main buyer	Brokers	Open air markets
Kales	% of output sold	92	78
	% of farmers selling produce	98	76
	Main buyer	Brokers	Open air markets
Tomatoes	Percentage of output sold	84	70
	% of farmers selling produce	90	69
	Main buyer	Brokers	Open air markets
Dairy	% of output sold	98	63
	% of farmers selling produce	96	68
	Product form	Fresh milk	Fresh milk
	Main buyer	Cooperatives	Restaurants/kiosks

Source: Survey Data (2006)

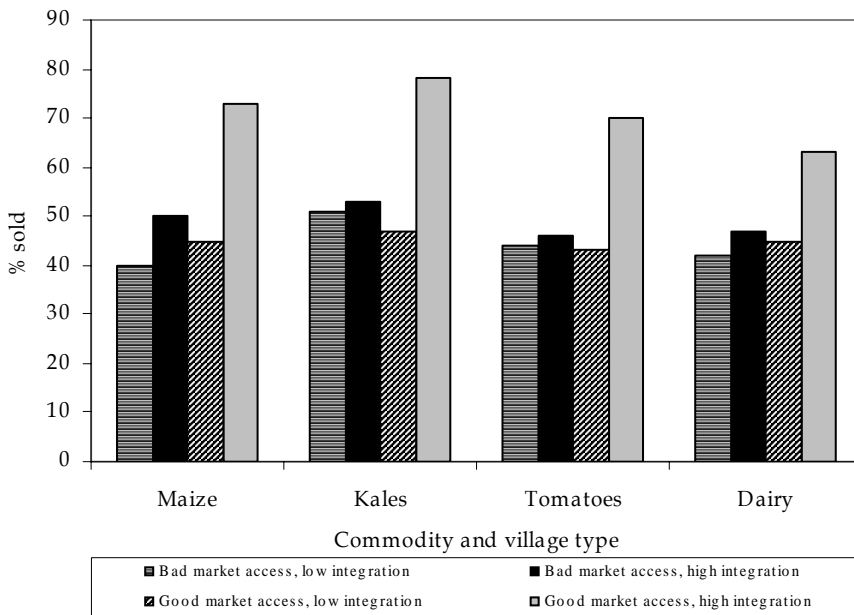
The overall commercialization trend in distant rural areas (Kisii) is upwards for all commodities investigated (Figure 6). This shows that all these commodities are very important for household food and income generation in the far-flung villages.

In the peri-urban districts (Kiambu), there is an upward trend in commercialization of most commodities except maize (Figure 7). Due to their proximity to markets, reduced transaction costs and high competition in enterprise profitability, households in these areas grow less maize but can easily purchase it with sales proceeds from other enterprises.

4.1.3 Major constraints to smallholder farmers

The relative importance of constraints varies by commodity and from one place to another, and their effects are not easily generalizable. Participants

Figure 6: Commercialization trends in remote areas (Kisii)



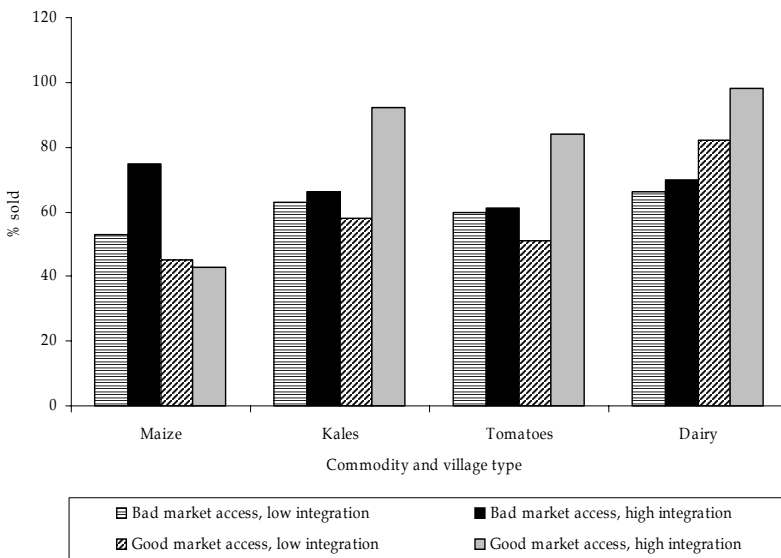
Source: Survey Data (2006)

in the Focus Group Discussions noted various production and marketing constraints (and ranked them in order of importance) to the three sub-sectors in various village categories.

(a) Production challenges

In maize production, farmers in villages with bad market access and low integration in both districts face poor quality inputs (seeds and fertilizer) and high input prices. In addition, high incidence of pests and diseases is a common main constraint to maize production in both districts. Villages with good market access experience on-farm theft, which forces most farmers to harvest and sell green maize before it attains the right moisture content for consumption (Table 8). On-farm theft also reduces farm margins and discourages investments in maize farming. Another main production constraint is inadequate information provision/knowledge on production. Although the order of ranking differs, some of the constraints to maize production in Kenya are similar to those by Gale *et al.* (2005) who

Figure 7: Market orientation in peri-urban areas (Kiambu)



Source: Survey Data (2006)

emphasized poor access to land, inputs, price instability and peak season labour shortages as the main impediments to maize cultivation by farmers.

The most critical constraint in horticulture production in all village types of Kiambu District is high cost of water for small scale irrigation. This can be attributed to high demand for water for multiple commercial purposes (e.g. construction of rental houses, car wash services and hotel industry) in Nairobi, inadequate water availability and pollution from residential and industrial waste.

In the more distant Kisii District, horticulture production is mainly hampered by frequent hailstones in villages with bad market access and low integration; increased disease incidences in villages with bad market access and high integration, and good market access and low integration;

Table 8: Ranking of maize production constraints in Kiambu and Kisii

District		Low market integration	High market integration
Kiambu	Bad market access	i) Poor quality seeds and fertilizer ii) High seed and fertilizer prices iii) Pests and diseases	i) Poor fertilizer quality ii) High fertilizer prices iii) Pests and diseases
	Good market access	i) Pests and diseases ii) On-farm theft iii) High seed and fertilizer prices	i) On-farm theft ii) Poor seed and fertilizer quality iii) Unreliable rainfall
Kisii	Bad market access	i) Pests and diseases ii) High seed and fertilizer prices iii) Poor seed and fertilizer quality	i) High fertilizer prices ii) Pests and diseases iii) Lack of production skills/knowledge
	Good market access	i) Pests and diseases ii) High seed and fertilizer prices iii) Poor seed quality	i) Poor seed and fertilizer quality ii) Pests and diseases iii) Unreliable rainfall

Source: Survey Data (2006)

and low soil fertility in those areas with good market access and high integration (Table 9). Declining farm sizes was a common constraint in both districts, partly due to rapid expansion of business and residential estate construction in both sites.

In peri-urban areas (Kiambu District), the main constraint to dairy farming is lack of fodder. This can be attributed to competing high-value investment alternatives such as rental estate construction in the main urban city of Nairobi, besides other factors. Dairy farmers in the far-flung and relatively remote Kisii District experience poor access to Artificial Insemination (AI) services and inadequate capital availability (Table 10).

These findings show that the most binding production constraints for the three sub-sectors in both districts are:

- (i) Poor quality of inputs such as seeds, fertilizers and AI
- (ii) High cost of inputs

Table 9: Ranking of horticultural production constraints in Kiambu and Kisii

District		Low market integration	High market integration
Kiambu	Bad market access	i) Inadequate water ii) Low operating capital	i) Poor water accessibility ii) Lack of quality inputs iii) Small farm sizes
	Good market access	i) High cost of water ii) Low operating capital iii) Poor quality agro-chemicals	i) High cost of water ii) Poor seed quality iii) Small farm sizes
Kisii	Bad market access	i) Frequent hailstones ii) High cost of inputs	i) Increased disease incidences ii) Poor quality inputs iii) Unpredictable weather iv) High cost of inputs
	Good market access	i) High incidence of crop diseases ii) Small farm sizes iii) Frequent hailstones iv) Poor quality inputs v) High cost of inputs	i) Depletion of soil fertility ii) Unpredictable weather iii) Small farm sizes iv) High incidence of diseases

Source: Survey Data (2006)

- (iii) Pests and diseases
 - (iv) Lack of production skills/inadequate extension service
 - (v) Lack of operating capital
 - (vi) Small land sizes
- b) Impediments to commodity marketing

In addition to the production constraints, producers in both districts experience various bottlenecks in commodity marketing. In maize, the critical constraints in villages with bad market access and low integration

Table 10: Ranking of dairy production constraints in Kiambu and Kisii

District		Low market integration	High market integration
Kiambu	Bad market access	<ul style="list-style-type: none"> i) Lack of fodder ii) High cost of inputs iii) Unqualified AI technicians iv) Lack of water v) Inadequate veterinary services vi) Lack of credit 	<ul style="list-style-type: none"> i) Lack of fodder ii) Inaccessible AI iii) High cost of feeds iv) Poor quality feeds v) High diseases incidences vi) Low management skills
	Good market access	<ul style="list-style-type: none"> i) Lack of fodder ii) High cost of clinical services iii) High cost of feeds iv) Unqualified AI providers v) Poor quality feeds 	<ul style="list-style-type: none"> i) Lack of fodder ii) High cost of feeds iii) Small sizes of land iv) Poor quality feeds v) Low management skills vi) Ineffective AI service
Kisii	Bad market access	<ul style="list-style-type: none"> i) Poor access to AI services ii) Poor extension services iii) Lack of water iv) Ineffective and expired drugs v) Poor quality feeds vi) Lack of fodder 	<ul style="list-style-type: none"> i) Lack of capital ii) Inaccessibility of AI services iii) High cost of clinical services iv) Poor market access v) High cost of feeds vi) Lack of management skills
	Good market access	<ul style="list-style-type: none"> i) Lack of capital ii) Poor road network iii) Lack of clinical and AI services iv) Lack of extension services 	<ul style="list-style-type: none"> i) Lack of quality breeding stock ii) Lack of credit facilities iii) Poor roads iv) High cost of farm inputs v) High cost of AI services vi) Inadequate extension services

Source: Survey Data (2006)

in both districts include low prices by brokers and exploitation in weighing units. Also, farmers in villages with bad market access and high integration in both districts incur high transportation costs due to bad roads. In the villages with bad market access and low integration, smallholder maize farmers' commercialization efforts are constrained by high market charges/taxes (both legal and illegal) and frequent harassment by County Council, leading to loss of merchandise. Maize farmers in villages with good market access and high integration often incur losses from theft on farm and in store (Table 11).

Horticultural producers in both districts (in all village categories) incur high market charges and obtain low prices due to seasonal gluts in the markets. In the villages with bad market access due to poor roads, many farmers incur high perishability and transportation costs (Table 12). Lack of reliable information also hampers commercialization in villages with bad market access.

Table 11: Ranking of maize marketing constraints in Kiambu and Kisii

District		Low market integration	High market integration
Kiambu	Bad market access	i) Low prices by brokers ii) Exploitation in weighing	i) Low prices ii) High transportation prices
	Good market access	i) Low prices ii) Exploitation in weighing	i) Theft on farm and in store ii) Low prices
Kisii	Bad market access	i) Low prices ii) Harassment by County Council iii) High taxes/market charges	i) Low and uncertain prices ii) Bad roads iii) Storage pests (weevils)
	Good market access	i) Low prices ii) Exploitation in weighing	i) Low prices ii) Harassment by County Council

Source: Survey Data (2006)

Dairy farmers in villages with bad market access in Kiambu experience delayed milk collection and delayed payments. Milk rejection by co-operatives (based on unofficial quality requirements) is also a common challenge to farmers in all village types in the district, especially during seasonal oversupply. In Kisii District, lack of storage facilities is a major constraint to farmers in all the village types (Table 13). This is also attributed to high poverty and inaccessibility to electricity supply. Other location-specific constraints especially in the villages with high market integration include exorbitant registration fees in co-operatives in Kiambu, and contract violation by co-operatives in Kisii.

Overall, the main marketing constraints common in the three sub-sectors in both districts include:

- (i) Low and unstable output prices;
- (ii) Poor state of roads;

Table 12: Ranking of horticultural marketing constraints in Kiambu and Kisii

District		Low market integration	High market integration
Kiambu	Bad market access	i) Poor information flow ii) Seasonal oversupply iii) No standard bags, e.g. in kales	i) Poor roads ii) Unreliable market information
	Good market access	i) Oversupply in market ii) Poor state of roads iii) High market charges iv) Inadequate market information	i) Seasonal oversupply ii) Poor roads iii) Lack of reliable information
Kisii	Bad market access	i) Poor road network ii) Seasonality of production iii) High perishability iv) Lack of reliable information	i) Oversupply in market ii) Poor roads iii) Lack of reliable information
	Good market access	i) Unreliable market access ii) High market charges	i) High market charges ii) Seasonal oversupply

Source: Survey Data (2006)

- (iii) High transport costs;
- (iv) Exploitation in weighing/ measurement of produce;
- (v) Lack of storage facilities;
- (vi) Contract violation;
- (vii) Lack of reliable market information; and
- (viii) High market charges (both legal and illegal).

Most of the production and marketing constraints identified in this study are similar to the challenges and determinants of agricultural productivity

Table 13: Ranking of dairy marketing constraints in Kiambu and Kisii

District		Low market integration	High market integration
Kiambu	Bad market access	<ul style="list-style-type: none"> i) Late payment by cooperatives ii) Poor timing of milk collection iii) Milk rejection iv) Non-payment by brokers v) Low prices vi) Unreliable market 	<ul style="list-style-type: none"> i) Late payment ii) Milk rejection iii) High cost of registration in cooperatives iv) Wide price fluctuations
	Good market access	<ul style="list-style-type: none"> i) Low prices ii) Milk rejection iii) Poor state of roads iv) Non-payment by brokers v) Lack of quality standards 	<ul style="list-style-type: none"> i) Milk rejection ii) Non-payment iii) Delayed payment iv) Low prices v) Wide price fluctuations vi) High cost of dairy cooperative
Kisii	Bad market access	<ul style="list-style-type: none"> i) Lack of access to better market ii) Low prices iii) Lack of storage facilities 	<ul style="list-style-type: none"> i) Poor state of roads ii) Low prices iii) High cost of storage iv) Delayed payments v) Contract violation by cooperatives
	Good market access	<ul style="list-style-type: none"> i) Poor road network ii) Lack of market iii) Lack of storage facilities iv) Lack of market information 	<ul style="list-style-type: none"> i) Poor roads ii) Lack of capital iii) Poor access to better markets iv) Lack of storage facilities v) Low prices

Source: Survey Data (2006)

and marketing noted in previous studies (e.g., Diru, 2005; Barrett *et al.*, 2004; Odhiambo *et al.*, 2004; Omiti *et al.*, 2004). In comparable countries such as Guatemala, successful attempts to address similar constraints on small-scale vegetable farms have been made through contracts characterized by private-sector involvement and decentralized control, often incorporating business-oriented growers, cooperatives and smallholder farmers. Other developing countries such as Brazil and China focus on strengthening bilateral agricultural trade based on differences in their respective production and value addition capacities, with useful lessons on the role of research investments for productivity growth and efficiency gains in the agribusiness sector (Jales *et al.*, 2006).

The novelty of this study draws from addressing previous caveats through village-level participatory prioritization of the constraints. This provides clear indications on the order in which policy, investment and other interventions should be targeted to address problems for the improvement of smallholder livelihoods in different geographic locations. A participatory approach to decision making is a timely initiative especially during the on-going implementation of the SRA in Kenya, since it fills the critical gap of community empowerment in making markets work for the poor.

4.2 Stakeholder Deliberations on Development Priorities

Policy stakeholders discussed various trends that are visible in Kenya's food systems and noted the critical forces that drive changes in agricultural commercialization process. The food system was conceptualized to incorporate the entire commodity value chain from farm inputs, production process, processing activities, retail, distribution and ultimate consumption.

4.2.1 Drivers of change in agri-food systems

There are numerous drivers (both negative and positive), which shape the transition process from subsistence to commercial agriculture. There was concurrence of opinions regarding key drivers of change that hamper commercialization in the RRA and the policy workshops. These drivers build on the broad categories of forces of change noted by Ng'ethe *et al.* (2004) and provide specific factors that characterize market dynamics in the agri-food systems. Some of the negative drivers of change include:

- (i) declining land sizes;
- (ii) declining soil fertility;
- (iii) dilapidated physical infrastructure (roads, electricity, and storage);
- (iv) fluctuation in both domestic and international market prices;
- (v) stringent rules, regulations and standards requirements on commodity supply; and
- (vi) influx of imports due to economic liberalization/regional and global trade arrangements.

Despite the inhibiting factors, various initiatives have been undertaken to address the constraints in commercialization. Furthermore, emerging forces of change in the food systems provide the impetus for growth in agri-food markets. Some positive drivers are:

- (i) Technological improvements in quality seed production, Artificial Insemination and production skills;
- (ii) Expanding demand for food from the growing population in both rural and urban areas;
- (iii) Emerging food preferences (especially increased demand for high quality products) due to urbanization;

- (iv) Renewed focus on improving nutrition quality (e.g. through fortified maize meals) in order to contribute to the achievement of MDG number four on 'Reducing child mortality' and MDG number six on 'Combating HIV/AIDS';
- (v) Increased demand for convenience foods targeting women in formal employment (time saving product forms such as packaged vegetables, maize meals, heated milk);
- (vi) Rising opportunity cost of farm land due to steady shift to high value non-agricultural enterprises (especially residential estate and commercial building construction in the peri-urban high potential agricultural zones);
- (vii) Rising competitive pressure from multiple industry participants (for instance, maize millers, supermarkets, assemblers, cooperatives and milk bars/kiosks);
- (viii) Strengthened input and output quality monitoring for maize and dairy products by the Kenya Plant Health Inspectorate Service and the Kenya Dairy Board; and
- (ix) Increasing incomes in some population segments (such as the newly employed, retirees on pension, those with periodic upward income adjustments).

4.2.2 Opportunities in smallholder agriculture commercialization

There is considerable potential for up-scaling the current level of smallholder agriculture commercialization in Kenya. The stakeholders noted that constraints and drivers of change provide opportunities that should be harnessed to improve farmers' participation in the markets. Some of the opportunities at the production/farm level include:

- (i) Intensification of agricultural practices/activities;

- (ii) Increased investments in input quality monitoring;
- (iii) Participatory or decentralized agricultural extension system;
- (iv) Public-private partnerships in inputs and credit provision;
- (v) Effective governance structures and lobbying mechanisms in rural institutions; and
- vi) Supplementary irrigation during drought periods.

In addition, prospects for improving the livelihoods of smallholder farmers exist in various aspects of agricultural markets:

- (i) Demand for training regarding on-farm value addition by farmers;
- (ii) Growing demand for differentiated products in niche markets such as green maize market, fortified foods for sick people and processed time-saving foods for employed women;
- iii) Need for joint storage facilities to minimize post-harvest losses and costs;
- (iv) Formation of farmers' groups/organizations in order to reduce per unit production and marketing costs; and
- (v) Contracts with institutional buyers within villages (schools, hospitals, churches, hotels).

4.2.3 Promoting agricultural development initiatives

Stakeholders in the policy workshops highlighted critical areas that require urgent information for effective planning and implementation of development programmes:

- (i) Reliable climate data;
- (ii) Farmer-research-extension collaboration;

- (iii) Timely information dissemination to enable utilization of research findings in investment decisions at village level;
- (iv) Consistent monitoring and evaluation (and feedback) of all agricultural investments at village level to allow appropriate adjustments; and
- (v) Affordable, sustainable and client-specific recommendations.

5. Conclusions and Recommendations

5.1 Conclusions

Participatory approaches are useful for eliciting relevant information on various aspects of agricultural commercialization. Adaptation of the RRA technique needs careful consideration of site issues, response bias, time efficiency, group size, questioning skills, group participation and data management. There is higher commercialization in areas near main urban centres than those far away. Furthermore, villages in remote locations balance farm output between competing needs for subsistence use and market orientation, while those closer to the urban centres sell more and buy it later from the market. There is a general upward trend in commodity commercialization. However, fewer smallholder farmers participate in the markets; much of the commercialization gains are harnessed by middlemen, especially brokers.

Agricultural commercialization in Kenya is characterized by limited or lack of value addition. Maize, tomatoes, kales and milk are marketed in different primary forms. The degree of commercialization increases gradually as the level of market integration improves. Slightly durable commodities (such as maize) are mainly grown in villages with bad market access, while the highly perishable ones such as tomatoes are cultivated in areas that have good market infrastructure. This reflects the concern over high post-harvest losses when market infrastructure is poorly developed. High market integration and good market access stimulate diversification into high-value mixed enterprises. This is evident from the increased production and sale of tomatoes, milk and kales, while production of maize declines in villages with good market access and integration.

Production and marketing of different commodities are hampered by different constraints in varying levels of importance depending on the

degree of market access and integration. The main impediments to production include poor quality and high cost of inputs, pests and diseases, and lack of better production skills. In marketing, the key challenges are poor pricing, high market charges, high transportation costs and unreliable market information. Despite these challenges, there are positive growth trends in the agri-food systems mainly arising from technological improvements, expanding demand for food in both urban and rural areas, changing food preferences, and rising competitive pressure from various stakeholders, among other forces. These changes point to the need for dynamic and vibrant roles of various agents of change, particularly: the political elite; Executive, Judicial and Legislative arms of government; academic and research institutions; civil society organizations; media and the private sector.

Current policy needs in agricultural development call for renewed focus on hitherto neglected policy aspects such as provision of reliable climate data, farm-research-extension collaboration, timely dissemination of research findings, and consistent monitoring and evaluation. Opportunities that would facilitate up-scaling of production exist in intensification, input quality monitoring, participatory extension service provision, public-private collaboration in credit provision, improved governance in institutions, and irrigation.

5.2 Policy Recommendations

Improvement of smallholder livelihoods requires feasible policy interventions that would enhance progress in agricultural commercialization. There are non-trivial market opportunities in processing, product differentiation, and contract farming. Some of the desired interventions include:

(a) Addressing agricultural production constraints

(i) *Input supply*

Public-private partnerships should be promoted to facilitate provision of affordable inputs (seeds, fertilizers, AI) particularly in villages with bad market access. For instance, a scheme could be established whereby public companies provide seeds, private agro-chemical suppliers provide fertilizers and pesticides/insecticides, public regulatory agencies monitor quality, while public and private extension providers train farmers in different regions at the start of every season to improve input access, maximize effective utilization and farm output.

(ii) *Water provision*

Individual farmers as well as companies should invest in small-scale commercial irrigation in order to tap opportunities in high-value diversified agriculture. These investments should be guided by regulations that protect water catchment areas and environmental quality. Possible sources of water would include underground water, recycled waste water from domestic and industrial uses, and conserved water from run offs/floods. There is need to promote more efficient management of surface run-off during the rain season to be used for supplementary irrigation. Kenya wastes too much water to the envy of many other water-deficit countries.

(iii) *Pests and diseases*

There is need for strong collaboration amongst public and private extension service providers in adaptive research on pests and diseases to develop more affordable preventive measures. Various national and international research institutions could collaborate with environmental regulatory authorities to promote the adoption of Integrated Pest Management (IPM) practices that improve crop-livestock yields while conserving biodiversity.

iv) Theft of agricultural produce or stock

The government should establish more police stations to strengthen security in villages with high market integration. The judiciary and local communities should tighten the Penal Code and community policing, respectively. Faith-based groups could promote the use of peer pressure to monitor village security. With the establishment of the National Youth Fund, it would be prudent to decentralize project investments to village-level, especially among farming households that are most affected by rural crime. This would reduce rural idleness and provide a safer environment for commercial agriculture investments.

(b) Overcoming agricultural marketing challenges

(i) Pricing

Extension personnel should train farmers to target off-season production for different commodities in order to avoid over-supply and the inherent low seasonal prices. Civil society organizations, research and academic institutions should encourage farmers to form organizations promoting collective action, such as farmer associations to train members on effective management skills in order to strengthen their collective bargaining power in commodity marketing as well as enjoy economies of scale in their other operations.

(ii) Contract enforcement

There is urgent need to streamline regulations on the Co-operative Act to ensure that all formal and informal contracts made in co-operatives have legal strength. Enforcement of these contracts requires clear penal codes that would effectively deter violation. Farmers could lobby (through Members of Parliament and Civil Society Organizations) for establishment of a 'contract violation tax' that would compensate the affected farmers and traders in smallholder agricultural contracts.

(iii) *Road infrastructure*

In order to reduce transportation costs and perishability of commodities, the need to upgrade and maintain roads in farming areas cannot be over-emphasized. Civil society organizations, farmers and the media should play an active role in highlighting infrastructural problems and level of progress periodically. More research is required to highlight the alternative social and economics costs of bad infrastructure to various segments of society, particularly the rural poor.

(iv) *Value addition*

Promotion of low-cost processing would reduce perishability and increase farm gate prices. This requires collaboration between extension service providers and private businesses in pilot processing at the farm level as well as in packaging and market promotion.

(v) *Market information*

Commodity market information institutions need to build partnerships with the media, research and academic institutions to facilitate smallholder access to timely, affordable and niche-market focused information. Such information should be synthesized beyond general price data to enable producers to respond appropriately to market dynamics.

(vi) *Market barriers to commercialization*

Local government should harmonize legal market charges (licenses) and eliminate all illegal charges (bribes, road blocs) that hinder commodity transportation and trade. Effective enforcement of these measures will require concerted monitoring and evaluation efforts by various anti-corruption watchdogs and the public. In addition, human rights' institutions should collaborate with trade unions and the political elite to stem harassment of traders by the local government.

(vii) *Weights and standards*

There is need to harmonize weighing scales and tools, and monitor their consistent application in agricultural commodity markets to minimize and penalize cheating on weights by some unscrupulous traders or their agents.

(c) Mechanisms to sustain smallholder participation

Involvement of farmers in agricultural research and development needs to move from passive participation to inclusive participation. This will require that smallholder farmers are adequately consulted in the determination of research priorities and co-financing of the research, thus empower them to have a strong incentive to control proper allocation and use of the resources. The necessary steps towards continuous sustainable smallholder participation would include design of a training manual/operational guideline by research institutions on the role of farmers in priority setting and project implementation. The research institutions, government departments and private entrepreneurs should also liaise with the media in highlighting smallholder farming as a 'viable business' in order to promote long-term local participation.

(d) Suggestions for further research

(i) *Methodological adaptation*

Studies using the Rapid Rural Appraisal need to broaden and quantify the indicators of market access and market integration within different village types and local circumstances. Further research is necessary on the criteria for weighting qualitative ranks generated in Rapid Rural Appraisal surveys. This would facilitate harmonization of recommendations for effective policy action.

(ii) *Participatory commercialization*

There is need to develop community definitions and measurement of agricultural commercialization concepts, and integrate them into the broader conventional approaches in literature. This would improve the understanding of agricultural commercialization dynamics in different sub-sectors and village settings.

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