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Strategies to Promote Market-Oriented Smallholder Agriculture in Developing Countries: A Case of Kenya

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Abstract

Smallholder Agriculture is key to livelihoods of many rural households in developing and transition economies. In Kenya, small farms account for over 75% of total agricultural production and nearly 50% of the marketed output. Despite favourable trends in global development drivers such as rising population, per capita incomes and emerging urban dietary preferences, most smallholder farmers remain poor. This study sought to characterize agricultural commercialization trends, identify and prioritize constraints to participation in markets, analyse determinants of percentage of output sold, and explore strategies to promote market-oriented production. A participatory Rapid Rural Appraisal approach, household survey and a Truncated Regression model were used. A sample of 224 farmers: 76 of them growing maize, 77 involved in horticulture (kales and tomatoes) and 71 practising dairy, were interviewed in one peri-urban and one rural district (Kiambu and Kisii, respectively). Results show that in rural areas, lower levels of output are sold and fewer farmers participate in markets compared to the peri-urban areas. Opportunities for profitable commercial agriculture are observed in growing demand, emerging food preferences and intensive farming. At village-level, market participation is hampered by poor quality and high cost of inputs, high transportation costs, high market charges and unreliable market information. At the household-level, the determinants of percentage of output sold are producer prices, market information arrangement, output, distance to the market, share of non-farm income and gender. Strategies are suggested to improve rural input supply, institutional and regulatory framework, enhance value addition and strengthen market information provision.

Key words: Smallholder Agriculture, Market Participation, Commercialization, Kenya.

Introduction

Smallholder agricultural commercialization and economic development

Agriculture supports the livelihoods of about 80% of Kenya's 33 million people, 70% of them based in rural areas. The sector provides food, employment and income. It accounts for 25% of the national Gross Domestic Product (GDP) and is the second largest sector after service sector. Small-scale farmers (with about 2-5 ha farm land, and less than 20 head of livestock) account for over 75% of total agricultural output and about 50% of the marketed produce (Republic of Kenya, 2005). The concept of market-orientation or commercialization refers to the percentage of marketed output from total farm production (Haddad and Bouis, 1990).

Agricultural commercialization involves a transition from subsistence to increasingly market-oriented production and use of high quality inputs. This process is mainly driven by forces of globalization, urbanization, migration and rising per capita incomes.

Research problem and rationale for market-orientation

The contribution of smallholder agriculture to national income, employment, food and nutrition is recognized in various development strategies. However, smallholder farmers' participation in commercial agriculture is low despite the envisaged benefits of market-orientation, as well as favorable trends in drivers of commercialization. Access to emerging high-income agricultural markets (e.g. supermarkets) is seen to be skewed in favour of large-scale suppliers. Although previous studies attribute the low market participation to different challenges, there is seldom any framework for ranking the impediments at village-level, at least in Kenya. As a result, prioritization and adaptation of interventions becomes difficult. Consequently, there is duplication of efforts and

resource wastage, leading to a rise in food insecurity and widespread poverty (Balint, 2003).

Improvements in market participation are necessary to link smallholder farmers to markets in order to expand demand for agricultural products as well as set opportunities for income generation. (Pingali, 1997). Market-orientation enhances consumers' purchasing power for food, while enabling re-allocation of household incomes by producers to high-value non-food agribusiness sectors and off-farm enterprises (Davis, 2006). The rationale for enhancing participation in commercial agriculture also stems from the potential to accelerate attainment of the Millennium Development Goals on food security and poverty reduction through utilization of untapped opportunities in commodity value chains. Specific opportunities exist in non-trade distorting measures such as irrigation, intensification, extension and input supply. In addition, niche markets for differentiated products, contracts with village-level institutions (e.g., schools, hotels), and investments in value addition are areas where smallholder farmers would considerably benefit if challenges to their effective participation were addressed (Republic of Kenya, 2005).

Objectives of the study

The study explores strategies to promote smallholder farmers' participation in market-oriented agriculture. Specific objectives were to:

- Establish trends in smallholder agriculture commercialization;
- Analyze determinants of percentage of marketed output;
- Prioritize constraints to smallholder participation in markets;
- Suggest policies to promote market-orientation by smallholder farmers.

Methodology

Data types and sources

This paper uses a Rapid Rural Appraisal (RRA) of sixteen villages sampled from a peri-urban Kiambu district and a relatively poor and distant rural Kisii district in Kenya. Eight villages were selected from each of the two districts using a market access-integration framework (Table 1). The RRA captured data on general agricultural commercialization trends and prioritization of the key constraints in different villages. A household survey was also used to gather farm-level data on determinants of percentage of output sold.

Descriptive and regression analysis

The study uses descriptive measures and a Truncated Regression Model (TRM). The TRM is applied to analyze determinants of percentage of farm output sold. The TRM is more appropriate than censored regression in this analysis because observations on households who do not sell their produce are excluded. The data is thus considered truncated at zero with 100 as the upper ceiling.

Table 1: Village selection matrix

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

Market participation is proxied by the observed percentage of output Y_i^* that is actually sold in the market. The truncated regression model (Equation 1) assumes normal distribution with constant variance (Greene, 2003).

$$Y_i^* = \beta_i X_i + \mu_i \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(1)$$

Where Y_i^* is the percentage of output sold, β_i is the vector of parameters, X_i is the set of exogenous explanatory variables and μ_i is the error term. The specific regressors in the estimated model are gender, distance to point of sale, unit price, market information arrangement (formal or informal), proportion of non-farm income in total household income, and quantity of output for the particular commodity. A separate equation is estimated for each of the three commodities (Maize, Dairy and Horticulture).

Results and discussion

Trends in commercialization

The proportions of output sold as well as the percentage of farmers who supply the marketed output are important indicators of economic progress (Reardon and Berdegue, 2002). In this study, village-level analysis shows there is a higher degree of commercialization in peri-urban villages compared to remote rural villages (about 67% and 52%, respectively). The proportion of farmers who participate in the markets is lower than actual output sold; 55% and 50% in peri-urban and rural villages, respectively. The main market channels are brokers in peri-urban villages, and open air markets in the rural areas. With regard to market access-integration grid, there is an upward trend of commercialization for all commodities investigated in all the rural villages (Figure 1). Enterprise competition is low and changes in enterprise combination are limited.

In the peri-urban areas, there is an upward trend in commercialization of most commodities except maize (Figure 2). Transaction costs decline with increased urbanization, improvements in market access and degree of market integration, while enterprise competition intensifies. This leads to a transition from low value cereal crops (e.g. maize) to more profitable enterprises such as dairy and horticulture. Even among such high-value enterprises, there is still potential for more value addition activities.

Challenges to market-orientation at village level

Village-level results of the focus group discussions showed varying levels of relative importance of production and marketing constraints in various villages.

- Production challenges

In maize production, farmers in villages with bad market access and low integration in both rural and peri-urban areas are mainly constrained by poor quality inputs (seeds and fertilizer) and high input prices. 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 as dry cereal grains. Although the order of ranking differs, some of the constraints to maize production in Kenya are similar to those reported by Gale *et al.*, (2005) who identified poor access to land, inputs, price instability and peak season labour shortages as the main impediments to maize cultivation by farmers of all scales in China. The main constraint in horticulture production in peri-urban villages 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), inadequate water availability and pollution from residential and industrial waste in the nearby city of Nairobi. In the distant rural villages, horticulture production is hampered by frequent hailstones in villages with bad market access and low integration; high disease incidence in villages characterized by bad market access and high integration, as well as those with good market access but low integration, and low soil fertility in areas with good market access and high integration. In peri-urban areas, the main constraint to dairy farming is lack of fodder. This can be attributed to competing high-value land-use alternatives such as rental estate construction in the city of Nairobi, besides other factors. Dairy farmers in the remote villages experience poor access to artificial insemination services and inadequate capital.

- Barriers to market participation

In nearly all cases, farmers experience different bottlenecks in commodity marketing. In maize, villages with bad market access and low integration experience low prices offered by brokers and exploitation in weighing units. Farmers in villages with bad market access and high integration incur high

transportation costs. In the villages with bad market access and low integration, commercialization efforts are hampered by high market charges (both legal and illegal) and frequent harassment by county councils. Maize farmers in villages with good market access and high integration often incur losses from theft on farm and in store. Horticultural producers in all village categories surveyed 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, farmers incur high transportation costs and losses due to perishability. Lack of reliable information generally hampers commercialization especially in villages with bad market access. Dairy farmers in villages with bad market access in per-urban areas experience delayed milk collection and delayed payments. Milk rejection by co-operatives (based on unofficial quality requirements) is also a common challenge to farmers, especially during seasonal oversupply. In remote rural areas, lack of storage facilities is a major constraint to farmers.

Market participation issues at farm-level

In all the three enterprises (maize, horticulture and dairy), producer prices, access to formal market information and quantity of output produced have positive significant effects on the percentage of produce sold by households (Table 2). Positive coefficients of producer price and production capacity reflect the motivation for supply response in a rational economic system and the basis for stability in market participation, respectively. Formal market information arrangements guarantee producers a steady flow of insights on market requirements and opportunity sets that enable farmers to plan effectively on enterprise choices and efficient resource allocation.

However, a unit increase in the distance between farm-households and the points of sale reduces the percentage of output sold in each of the three sub-sectors. Distance acts as a barrier to market participation by imposing transportation costs. A greater percentage of high-value farm output (e.g. dairy) is sold in male-headed households compared to female-headed households. This could be explained by the inherent skewed resource endowments (e.g., ownership of land, capital), access to information, membership to development associations and benefit-sharing schemes, that often favour men at the disadvantage of women irrespective of the latter's level of effort and multiple roles. As the share of non-farm income rises, the percentage of output sold for all the commodities declines i.e. there is a shift from agriculture to high-value off-farm enterprises. This is desirable to reduce the dependency burden by a large proportion of the population (especially women and youth) in agriculture.

Recommendations

Comparable countries such as Guatemala have made successful attempts to address similar issues on small-scale vegetable farms through decentralized private sector-led contracts. Also, Brazil and China focus on strengthening bilateral agricultural trade based on differences in their respective production and value addition capacities (Jales *et al*., 2006). The following strategies are suggested in order to enhance smallholder farmers' participation in commercial agriculture in Kenya:

- Promote public-private partnerships between research, manufacturing and regulatory institutions to facilitate provision of affordable inputs and adoption of good agricultural practices such as organic farming for sustained high farm output.
- Train farmers to target off-peak season production so as to overcome low prices during over-supply. Opportunities for supplementary irrigation should be explored.
- Encourage partnerships between commodity market information agencies, media, research and academic institutions on provision of timely, affordable, niche market-specific and easily applicable information through formal arrangements.
- Emphasize gender balanced investments in high-value enterprises (e.g. horticulture and dairy) to promote commensurate benefits to family labour with due consideration to socio-cultural norms.
- Harmonize marketing charges, digitize weighing scales and tools; and routinely monitor their usage.
- Upgrade roads and support establishment of more points of sale in farming areas in order to lower transportation costs and promote market participation.
- Enhance collaboration between extension service providers and private businesses in low-cost local value addition.

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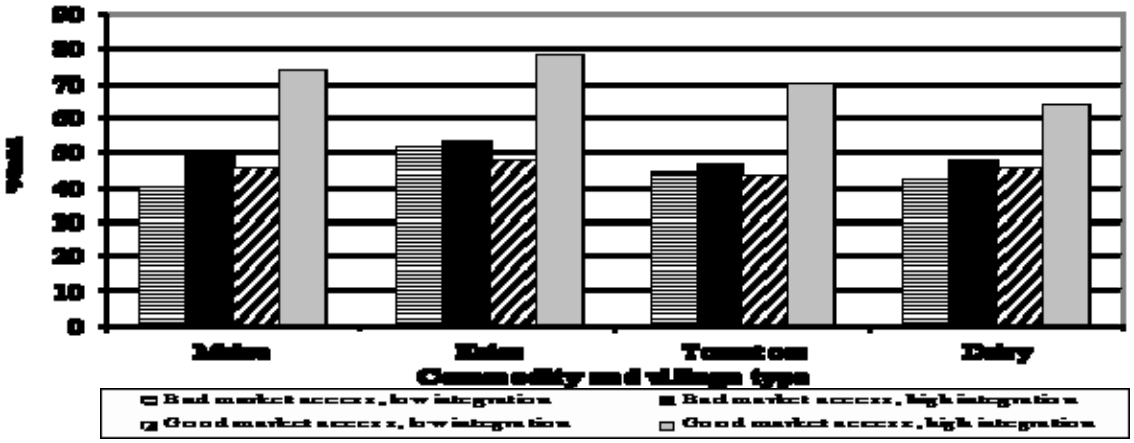

Figure 1: Commercialization in rural areas

Source: KIPPRA-FAO Survey Data (2006).

Table 2: Household –level determinants of market participation in Kenya

Variable	Maize			Horticulture (Kales)			Dairy		
	Coeff	Std error	t-ratio	Coeff	Std error	t-ratio	Coeff	Std error	t-ratio
Constant	0.476	0.288	1.653	0.395	0.232	1.703	0.413	0.274	1.507
Gender	0.818	2.754	0.297	-0.055	0.028	-1.964*	0.502	0.148	3.392*
Unit price	0.197	0.025	7.880**	0.134	0.027	4.963**	0.317	0.139	2.281*
Market information source	0.271	0.104	2.606*	0.325	0.141	2.305*	0.538	0.271	1.985*
Non-farm income	-0.494	0.134	-3.687*	-0.067	0.039	-1.718	-0.068	0.007	-9.714**
Distance	-0.508	0.116	-4.379**	-0.597	0.124	-4.812**	-0.249	0.105	-2.371*
Output quantity	0.730	0.180	4.055**	0.532	0.157	3.389*	0.528	0.269	1.963*
	N = 76			N = 77			N = 71		
	Log likelihood = -86.35			Log likelihood = -77.93			Log likelihood = -61.58		
	R^2 =0.401			R^2 =0.437			R^2 =0.483		

* significant at 5%, ** significant at 1%

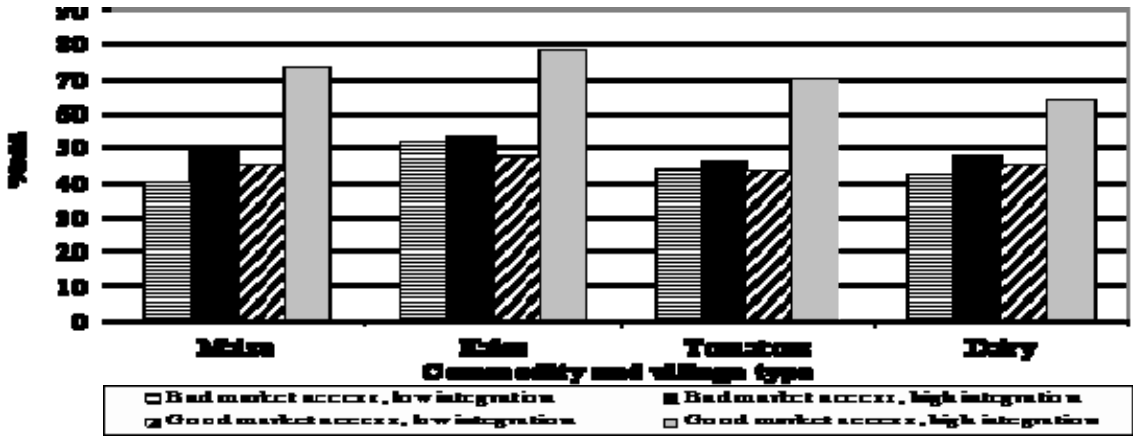

Figure 2: Market orientation in peri-urban areas

Source: KIPPRA-FAO Survey Data (2006)