Policy Synthesis #3
March 2010

Guiding Investments in Sustainable Agricultural Markets in Africa

Common Market for Eastern and Southern Africa Alliance for Commodity Trade in Eastern and Southern Africa

Downloadable at: http://www.aec.msu.edu/fs2/gisama/index.htm)

SMALLHOLDER MARKETING BEHAVIOR AND URBAN CONSUMPTION PATTERNS IN EASTERN AND SOUTHERN AFRICA

Introduction: Accurate information on farmer and consumer behavior is the foundation for identifying public investments and policies that can effectively promote national food security and income growth objectives. This policy brief summarizes recent findings from a study on smallholder crop marketing behavior and urban consumption patterns in Eastern and Southern Africa. The full report is downloadable from the website above.

Importance of various crop categories in smallholder farm incomes: The report highlights seven main findings about smallholder crop production and marketing behavior:

1. Maize is generally the single most important crop in smallholder farm incomes: When adding the value of production and sales, maize accounts for 44%, 41%, 26% and 23% of farm income in Malawi, Zambia, Kenya, and Mozambique, respectively, according to recent national surveys. The importance of maize varies greatly by region. Maize accounts for as much as 70% of farm income in some areas (generally those of relatively high agro-ecological potential), and less than 10% in others (generally the semi-arid areas). In general, maize accounts for a slightly higher share of total income on relatively large farms, except in Malawi (Tables 1a-d.)

Table 1a. Kenya - Household Share of Components in Total Gross Farm Income by Landholding Quintiles, National, 2007

Quintiles of total HH landholding size	Farm income ($US)	Maize retained	Maize sold	Other staple food crops retained	Other staple food crops sold	High-value food crops* retained	High-value food crops* sold	Traditional cash crops	Livestock products	Ag wage labor
		Mean share (%) in total gross farm income								
1-Low	672	22%	3%	6%	2%	23%	11%	11%	21%	.9%
2	950	20%	5%	6%	3%	19%	12%	14%	20%	1.1%
3-Mid	1,259	18%	5%	5%	3%	17%	12%	17%	22%	1.3%
4	1,465	19%	8%	4%	3%	16%	13%	14%	23%	.9%
5-High	2,711	15%	13%	3%	7%	10%	10%	12%	31%	.7%
Total	1,408	19%	7%	5%	4%	17%	12%	14%	23%	1.0%

Source: Tegemeo Institute/Egerton University Farm Household Survey, 2007. note: * primarily fresh fruits, vegetables, and legumes.

Table 1b. Zambia - Household Share of Components in Total Gross Farm Income by Landholding Quintiles, National, 2008

Quintiles of total HH landholding size	Farm income ($US)	Maize retained	Maize sold	Other staple food crops retained	Other staple food crops sold	High-value food crops* retained	High-value food crops* sold	Traditional cash crops	Livestock products	Ag wage labor
		Mean share (%) in total gross farm income								
1-Low	241	35%	3%	18%	1%	14%	4%	0%	12%	13%
2	336	37%	5%	21%	3%	15%	6%	2%	7%	4%
3-Mid	461	33%	7%	20%	3%	16%	7%	5%	8%	2%
4	609	33%	9%	15%	3%	15%	8%	6%	9%	2%
5-High	1,426	30%	15%	12%	4%	12%	9%	6%	12%	2%
Total	615	33%	8%	17%	3%	14%	7%	4%	9%	4%

Source: Central Statistical Office Supplemental Post Harvest Survey, 2008. note: * primarily fresh fruits, vegetables, and legumes.

Table 1c. Malawi - Household Share of Components in Total Gross Farm Income by Landholding Quintiles, National, 2007

Quintiles of total HH landholding size	Farm income ($US)	Maize retained	Maize sold	Other staple food crops retained	Other staple food crops sold	High-value food crops* retained	High-value food crops* sold	Traditional cash crops	Livestock products	Ag wage labor
		Mean share (%) in total gross farm income								
1-Low	75	48.1%	2.5%	9.8%	1.3%	12.5%	2.0%	2.0%	5.8%	16.1%
2	96	44.0%	2.9%	8.7%	2.1%	15.3%	4.2%	2.1%	5.0%	15.5%
3-Mid	108	43.9%	3.0%	8.1%	1.9%	14.9%	4.8%	4.4%	5.5%	13.6%
4	127	39.3%	2.7%	9.1%	2.6%	15.6%	6.2%	8.8%	6.3%	9.4%
5-High	314	30.9%	3.7%	8.4%	2.7%	13.1%	6.7%	18.5%	6.7%	9.3%
Total	144	41.3%	3.0%	8.8%	2.1%	14.2%	4.8%	7.3%	5.9%	12.7%

Source: National Statistical Office Agricultural Inputs Support Survey, 2007. note: * primarily fresh fruits, vegetables, and legumes.

Table 1d. Mozambique - Household Share of Components in Total Gross Farm Income by Landholding Quintiles, National, 2005

Quintiles of total HH landholding size	Farm income ($US)	Maize retained	Maize sold	Other staple food crops retained	Other staple food crops sold	High-value food crops* retained	High-value food crops* sold	Traditional cash crops	Livestock products	Ag wage labor
		Mean share (%) in total gross farm income								
1-Low	112.5	14.6	1.1	40.6	1.6	23.4	8.0	.4	2.7	4.5
2	138.4	18.3	1.5	39.3	1.2	21.5	8.6	1.3	3.0	3.2
3-Mid	170.6	20.8	2.5	35.0	1.7	18.4	9.2	2.7	4.2	2.6
4	213.9	21.6	2.9	34.3	1.4	17.9	9.1	4.6	3.9	2.4
5-High	382.3	24.1	4.6	28.5	1.5	14.2	8.4	8.8	6.1	1.2
Total	203.5	20.6	2.5	37.5	1.5	19.1	8.6	3.4	4.2	2.6

Source: Ministry of Agriculture and Rural Development and National Institute of Statistics *Trabalho do Inquerto Agricola* Survey, 2005. note: * primarily fresh fruits, vegetables, and legumes.

2. Fresh fruits and vegetables are becoming more important in smallholder cropping patterns and are now rivaling maize as the highest income-generating crops for smallholder farmers. While maize is still the dominant crop in terms of area cultivated, high-value food crops such as fruits, vegetables, and legumes account for a greater share of household income (29% of farm household income in Kenya and 28% in Mozambique, compared with 26 and 23% for maize, respectively). In Kenya and Mozambique, the smallest farms have the highest share of farm income from horticultural crops (Tables 1a-d).

3. *Maize will continue to play a crucial role in agricultural productivity growth even if its share of farm income and sales revenue may decline somewhat over time.* Smallholders' ability to diversify into higher valued activities will be influenced by the performance of staple food markets. If food is reliably available in markets at tolerable prices, smallholder farmers are likely to shift more of their land and labor into crops that provide higher returns and then use the proceeds to buy food from the market. Shifts toward higher-return activities can be a source of major productivity and income growth for smallholder farmers, but such a strategy depends on reliable availability of staple food to buy at tolerable prices.

4. Cassava production is rising in parts of the region. In countries such as Zambia and Mozambique, cassava is the most important crop contained in the "other staple food crop" category (sorghum, millet, rice, and wheat are the others, but they are generally very minor). This crop category accounts for 39% of farm income in Mozambique, 20% in Zambia, but only 11% and 9% in Malawi and Kenya. Traditional cash crops such as coffee, tea, sugarcane, and tobacco are relatively important in Kenya (14% of farm income) but account for less than 10% of farm income in the other three countries. There is substantial regional variation in the importance of these traditional cash crops.

5. The sale of traditional cash crops is also highly related to landholding size. In Zambia, Malawi, and Mozambique, the farm income share from traditional cash crops are from 7 times to over 20 times higher among households in the top landholding size quintile than in the bottom quintile. In Kenya, the farm income share of traditional cash crops is roughly constant across the landholding size quintiles, but in terms of absolute gross income, the relatively large farms derive 3-4 times more gross income from the sale of these crops than the smallest farm quintile.

6. *Livestock products form a large share of farm income only in one of the four countries examined, Kenya, where it comprised 23% of farm income.* This reflects the importance of commercialized dairy production among smallholders in Kenya. Livestock product income accounts for less than 10% of farm income in the other countries.

7. Smallholder ability to respond to crop marketing improvements is constrained by farm structure: over half of the small farms in the region are less than one hectare in size. One-quarter of the farms are less than 0.5 hectares in size. These farms cannot earn a viable livelihood through a maize commercialization strategy unless there is tremendous growth in maize productivity, which will require sustained and dedicated investment in crop science and extension. Even with major improvements in the performance of rural grain markets, inadequate access to land will prevent at least 30-40% of smallholder farmers from producing a grain surplus. The only caveat to this conclusion is if new technology is able to achieve dramatic gains in productivity growth, and/or if governments invest in opening up new areas for smallholder-led agriculture.

Hence, without the opening up of new land through public investments to encourage new settlement and/or substantial maize productivity growth, the gradual movement toward smaller farm sizes will compel households to adopt more diversified commercialization strategies capable of maximizing the value of output per scarce unit of land. In highly land-constrained areas, it should not be surprising to find households shifting out of relatively low-value maize toward horticulture, tobacco, cotton, and niche crops, and then using the revenue to buy their staple food needs. Thus, the trend toward structural maize deficits is not necessarily a sign of failure for the region if small farmers can shift into other activities that provide higher incomes. There is evidence to suggest that this is already happening at least for a sub-set of smallholder farmers in the region. Governments may promote more stable farm revenue and consumption patterns through supporting private systems of input delivery, finance, and commodity marketing for a wide range of crops given the increasingly dynamic nature of African and world agriculture. Such investments

would represent a shift from the strategy of price stabilization and price support for a dominant staple grain to a portfolio approach that puts greater emphasis on a range of higher-valued commodities while attempting to make the socio-political economy less vulnerable to the effects of food price instability.

Therefore, the finding that the eastern and southern Africa regions are moving into a structural staple food-deficit situation may be a consequence of rapid urbanization borne of population growth and land pressures, and diversification into other crops. Yet maize productivity growth will remain a crucial objective. If it can be achieved, it will reduce import dependence and remain a source of dynamism and growth for many small farmers in the region. However, broad-based improvements in rural livelihoods and incomes will require productivity growth for other crops: oilseed crops, horticulture, animal products, and other food crops such as cassava.

Smallholders' position in grain markets: Participation of smallholders in markets is determined by several factors including their asset position (e.g. land, labor, and capital) and access to markets. Owing to a highly inegalitarian distribution of land within the smallholder sector, the marketed grain output in the smallholder sector is extremely concentrated. In all the countries in the region for which survey data is available, there is a recurrent pattern in which roughly 2-3% of relatively commercialized smallholder farmers account for half or more of the total quantity of maize sold by the smallholder sector. Rarely do more than 40% of farmers sell grain in any given year, not because buyers cannot be found, but more fundamentally because the combination of limited productive assets and access to improved technology precludes them from being able to produce a meaningful farm surplus.

Available evidence from nationwide farm household surveys for maize indicates that only a very small proportion of households buy and sell grain in the same year. Small-scale farm households generally fall into one of the following four categories with respect to grain markets:

i) Sellers of staple grains: Roughly, 20 to 35% of the smallholder farms sell maize in a given year. Of course, this figure will rise in good harvest years and fall in a drought year. However, there are two sub-groups within this category:

- a very small group of relatively large and well-equipped smallholder farmers with 5 to 20 hectares of land, usually in the most favorable agro-ecological areas. These farm households comprise 1 to 3% of the national smallholder farm population in most countries and account for 50% of the marketed output from the smallholder sector. The marketed grain surplus is extremely concentrated.
- a much larger group of smallholder farms (20 to 30% of the total rural farm population) selling much smaller quantities of grain, usually between 50kgs to 200kgs per farm. These households tend to be slightly better off than households that buy grain, but the differences are not very great in absolute terms. Most of these households do not consistently produce a surplus – according to repeat panel survey data, only about 10-15% of smallholder farmers consistently sell grain.

ii) Buyers of staple grains: these rural households generally make up 40-60% of the rural population, higher in drought years and lower in good production years. These households are generally poorer and have smaller farm sizes and asset holdings than the median rural household. They are directly hurt by higher mean grain prices.

iii) Households buying and selling grain within the same year: In all of the nationwide surveys, relatively few households both buy and sell maize in the same year (Table 2). Of those who do, many of these are relatively large and food secure farms with a preference for highly refined commercial maize meal; they sell grain and buy back lesser amounts of processed meal. About 3 to 11% of the farm households nationwide are found to sell grain after harvest only to buy back larger quantities later in the season. While it is commonly believed that the majority of smallholder households make distress sales at low prices after harvest followed by purchases later in the season when prices are high, to our knowledge there is virtually no evidence from household survey data to indicate that this kind of marketing behavior applies to more than 10% of the smallholder farm population (row 4 of Table 2).

Table 2. Distribution of Small-Scale Farm Population According to their Position in the Staple Grain Market, Selected Countries

Household category with respect to main staple grain:	Zambia (maize)	Mozambique (maize)	Kenya (maize)	Malawi (maize)	Ethiopia (maize and teff)
	---------- percent of rural farm population ----------				
Sellers only:	21	13	18	7	15
1. top 50% of total sales*	2	2	2	1	2
2. bottom 50% of total sales**	19	11	16	6	13
3. Buyers only	33	51	55	56	60
4. Buy and sell (net buyers)	3	12***	7	5	11
5. Buy and sell (net sellers)	5		12	3	7
6. Neither buy nor sell	39	24	8	29	7
	100 percent	100 percent	100 percent	100 percent	100 Percent

Notes: *after ranking all households by quantity sold, this row shows the percentage of households in the smallholder sector accounting for the first 50% of total maize sale; **percentage of households accounting for the other 50% of total maize sales. ***The survey in Mozambique was not able to ascertain quantities of maize purchased, therefore, whether these households are net buyers or net sellers is unknown. Roughly half of the households in category 5 (who buy and sell in the same year) are relatively well-off households producing large maize surpluses and buying small amounts of processed industrial maize meal.

iv) Households neither buying nor selling staples: these households account for between 8% of the smallholder sample in Kenya, to roughly 25 to 40% in Zambia, Mozambique, and Malawi. These households tend to be those residing in the cassava zones, where storing cassava in the ground and digging it up when needed substitutes for maize purchases. There are large portions of the region, especially in Zambia, Mozambique, Malawi, and Tanzania, where cassava is a major staple, and in these areas, a sizable fraction of the rural population at the national level is autarkic with respect to maize.

Trends in Urban Food Consumption Patterns: The report highlights three main findings and their implications for food policy:

1. Rising Importance of Wheat in Urban Staple Food Consumption: Urban consumption of wheat is rising rapidly and has become the dominant staple in many cities of East and Southern Africa. Table 3 presents the importance of the main staples – maize, wheat, rice, and cassava, in urban consumers' diets. These surveys consistently attest to the rising importance of wheat products in staple food consumption patterns (Muyanga et al. 2005; Tschirley and Abdula 2007; Mason and Jayne 2009). In Zambia, per capita wheat consumption has virtually tripled within a 15-year period. However, maize is still the dominant staple among the 30% to 40% of the poorest urban consumers.

The rising importance of wheat products in urban consumption patterns in the region has several underlying causes: i) Urbanization and growing preferences for convenience foods; and ii) the price of wheat products has declined in many cases relative to the price of maize products. We note a strong decline in the inflation-adjusted price of wheat bread over time, compared to a more modest decline (in Zambia and Kenya) or increase (in South Africa, Malawi, and Mozambique) in the real price of maize meal. The gradual decline in the retail price of wheat products compared to maize meal has contributed to the shift in urban consumption patterns over time.

The rising importance of wheat and rice also partially reflect African governments' inability to stoke smallholder farmers' potential to produce enough domestically produced staple food to feed their rapidly growing urban populations.

Table 3. Staple Food Budget Shares, Urban Centers in Kenya, Mozambique, and Zambia

Urban center	Year	% share of food group in total value of consumption of main staples[a]				% share of the 4 main staples in total food consumption
		Maize	Wheat	Rice	Cassava	
Nairobi, Kenya	1995	42.4	35.3	22.4	0.0	--
	2003	36.3	39.0	24.7	0.0	28.4
Urban Maputo Province	1996	2.6	50.7	35.0	11.7	42.8
	2002	8.9	57.4	28.9	4.8	27.0
Urban Northern Mozambique (includes Nampula city)[b]	2002	32.6	8.2	14.7	44.4	47.5
Lusaka, Zambia[c]	2007/8	39.0	49.4	10.7	0.9	19.5
Kitwe, Zambia[c]	2007/8	42.5	45.3	10.3	2.0	23.2
Mansa, Zambia[c]	2007/8	45.8	28.2	10.0	16.0	23.8

Sources: Mason et al (2009a) derived from data in Tschirley and Abdula (2007), Muyanga et al. (2005), Mason et al. (2009b). *Notes:* [a]Main staples refers to maize, wheat, rice, and cassava. Budget shares of these four staple foods sum to 100% +/- 0.1%. Shares for Nairobi and Northern Mozambique are % of total food purchases. [b]Cassava category also includes potatoes for urban Northern Mozambique (separate figures for cassava only not available). [c]Excludes foods purchased and consumed away from home. -- Information not available.

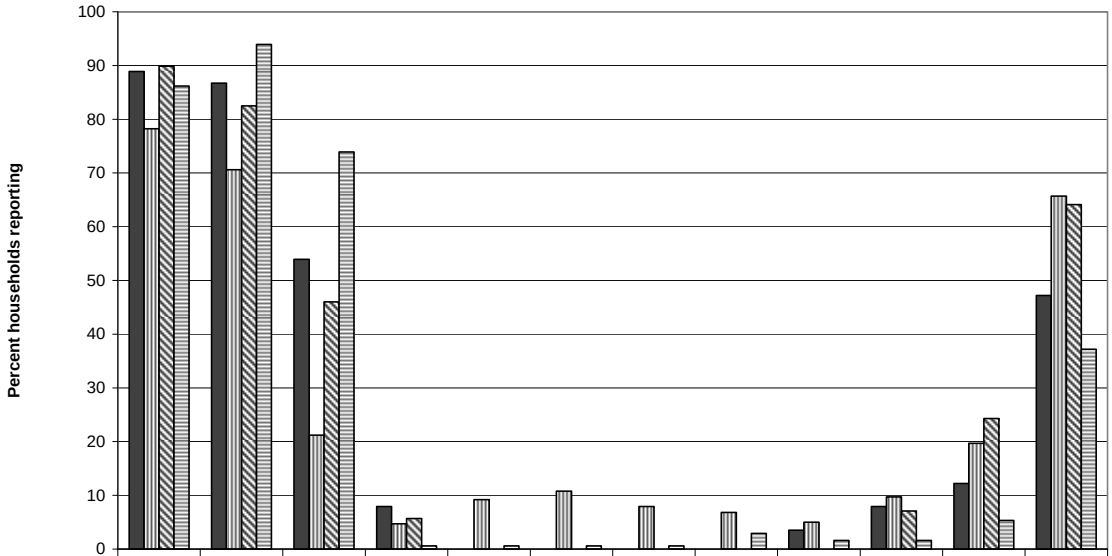
Wheat is currently not well-suited for smallholder production in most of Africa. Wheat production usually requires capital-intensive investment in irrigation and other production technologies. As a result, scale economies in production cannot be achieved unless large areas can be put under production, which is beyond the means of almost all smallholders. For these reasons, the growth in wheat consumption presents a dilemma. Ideally, economic growth is best achieved by rural-urban synergies in which urban populations create a market for rural producers, while the income received from agriculture is used to meet the demand for goods and services produced by urbanites. To the extent that urban consumption patterns increasingly emphasize products produced only by large-scale farmers or procured in international markets, the growth in demand for staples produced by smallholder farmers will be mitigated.

2. Rapid investment in medium- and small-scale staple food processing and retailing are largely responsible for the reductions in marketing margins and retail food prices that have been documented in much of the region: In inflation-adjusted terms, the unit price of commercial maize meal has declined by 30 to 35% in Kenya and Zambia over the 1995-2009 period. Market liberalization has resulted in rapid investment in grain milling, which put pressure on the formerly oligopolistic commercial milling industry to reduce their margins. As long as grain is circulating in informal markets, consumers can buy grain and mill it at a neighborhood hammer mill, of which there are thousands dotted throughout the country. At this time, the structure of the market is highly competitive and milling/retailing margins are low. In any given area, a few large milling firms are competing against scores of small-scale millers and retailers for consumers' business. However, later in the season when maize sales off the farm tend to dwindle, the informal markets become very thinly traded. A scarcity of maize grain in local markets means that the small- and medium-scale processing sector are unable to operate. At this time, the structure of the market becomes more concentrated, and the demand for large-scale commercial millers' products jumps up as consumers now can only procure maize meal from this source. Consumers pay substantially higher prices for staple maize products at this time.

3. Grain is often unavailable to buy at certain times of the year: Figure 4 shows the responses of urban consumers to the question "are there times of the year in which you would want to buy maize grain in the market but it is not available? Yes/no. If yes, what are the most frequent months in which maize grain is unavailable to buy?" The harvest in Zambia comes in April/May, and it is evident from Figure 4 that local maize supplies in informal markets tend to dry up in the 3-4 months prior to the harvest.

Why does this occur? Even when there are adequate maize supplies nationally, once grain is purchased by the larger traders or by government marketing agencies, it generally cannot be accessed

Figure 4. Percentage of Urban Consumers Indicating That Maize Grain Is Unavailable to Buy in Local Markets, Four Cities in Zambia, 2007/08.



	January	February	March	April	May	June	July	August	September	October	November	December
Lusaka	88.9	86.7	53.9	7.9	0	0	0	0	3.5	7.9	12.2	47.2
Kitwe	78.2	70.6	21.2	4.7	9.2	10.8	7.9	6.8	5	9.7	19.7	65.7
Mansa	89.9	82.5	46	5.7	0	0	0	0	0	7.1	24.3	64.1
Kasama	86.2	93.9	73.9	0.6	0.6	0.6	0.6	2.9	1.6	1.6	5.3	37.2

by informal small-scale millers or retailers. Large public and private traders sell mainly to commercial millers and other industrial buyers. These commercial maize products are then distributed through a variety of retail channels, including informal channels, but these products are relatively expensive compared to the less processed and less value-added products distributed thorugh informal channels which are preferred by most low-income consumers. The drying up of informal markets during the hunger season exacerbates low-income consumers' access to food and contributes to food insecurity.

During times of regional production shortfalls, these problems are accentuated. In such cases, imports from South Africa or international markets are required. Large-scale imports are usually supplied in large transactions to the large millers only, again effectively sidelining the small and medium-scale processing sector that the poor rely on and which exert competitive pressure on the large-scale processing sector to trim their margins.

Conclusions: While improved access to markets will support smallholders' participation in food markets, survey data reveal that limited land and capital are often the primary reason why the majority of smallholder farmers do not sell staple foods. Even with major improvements in the performance of food markets, a large percentage of smallholders will continue to be unable to produce a surplus that would enable them to link to markets. An important conclusion appears to be, therefore, that "access to markets" may not be the primary constraint for the bottom 50% of smallholders with inadequate land or productive assets to produce a staple food surplus in the first place. For this bottom 50% of the rural farm population, governments face the double burden of providing the means to put improved farm technology in their hands that is appropriate for their conditions, and ensuring that smallholders have access to markets that minimize marketing costs. This boils down to simultaneous improvements in farm technology (including for semi-arid conditions in which a large fraction of the smallholder populations in the region reside), access to credit, improved rural road, rail and port infrastructure, and hospitable conditions for private investment in rural input retailing and crop assembly. For the top 50% of smallholders ranked by land and productive potential, the main

challenges are reducing the transaction costs of marketing output and protection against downside price risk.

There are major opportunities to improve low-income rural and urban households' access to staple food by facilitating the development of informal marketing channels, specifically by ensuring informal traders' access to imported supplies, not just selectively channeling them to the large-scale millers. This will ensure greater competition in the milling and retailing stages of the food system and drive down the cost of staple food to urban consumers as well as the large majority of rural farm households that are buyers of maize.

Making markets work for smallholder farmers and consumers will require actions from many different kinds of actors, both in the private and public sectors as well as from international financial and donor organizations. Our premise, however, is that the public sector role is decisive. If public sector policy choices do not reduce the currently high levels of risk and uncertainty in African food markets, and if governments use their scarce resources in ways that do not provide greater investment incentives for the private sector, then there will be very limited scope for the development of a market-oriented system to provide smallholder farmers with the access to markets that they need. A highly uncertain policy environment will also continue to scare off bank financing for needed investment in the sector. This path will lead to frustration over the private sector's apparent unwillingness to invest in support of smallholder agriculture.

On the other hand, if African governments define their roles clearly, implement these roles transparently and consistently, and use their scarce resources to invest in public goods that provide new profitable opportunities for private sector investment, then this approach is likely to fuel private sector investment in support of smallholder agriculture. Private capital tends to seek out profitable opportunities with tolerable exposure to risk. If the conditions are created for profitable and stable private investment, the private sector has in other parts of the world grown and responded, and there is little reason to believe Africa is different. Hence, private sector investment patterns and the supply of bank financing for private investment, are largely *outcomes* of public sector behavior – its policy choices, integrity of its institutions, and the ways it spends its funds through the treasury. For these reasons, attention should mainly be focused on what the public sector can do in the first place to generate the incentives for system-wide private investment in staple food markets. Attention is also needed on how African governments can best address situations of market failure, i.e., where the returns to investment are high from a social welfare standpoint but not from the standpoint of a private firm.

REFERENCES:

Mason, Nicole and T.S. Jayne. 2009. *Staple Food Consumption Patterns in Urban Zambia: Results from the 2007/2008 Urban Consumption Survey*. Working Paper No. 42. Lusaka, Zambia: Food Security Research Project.

Muyanga, M., T.S. Jayne, G. Argwings-Kodhek, and Joshua Ariga. 2005. *Staple Food Consumption Patterns in Urban Kenya: Trends and Policy Implications.* Working Paper No. 16. Nairobi, Kenya: Egerton University.

Ndibongo-Traub, L. and T.S. Jayne. 2008. The Effects of Price Deregulation on Maize Marketing Margins in South Africa. *Food Policy* 33.3: 224-36.

Tschirley, D. and D. Abdula. 2007. Toward Improved Marketing and Trade Policies to Promote Household Food Security in Central and Southern Mozambique: 2007 Update. Working Paper No. RP62E. Maputo, Mozambique: Ministry of Agriculture.

ACKNOWLEDGEMENTS:

This policy synthesis draws on a Michigan State University-led study entitled *Patterns and Trends in Food Staples Markets in Eastern and Southern Africa: Identification of Priority Investments and Strategies for Developing Markets and Promoting Smallholder Productivity Growth* *(downloadable).*

The study is based on research funded by the Bill and Melinda Gates Foundation under the *Guiding Investments in Sustainable Agricultural Markets in Africa* (GISAMA) Project, a collaboration between Michigan State University, the Common Market for Eastern and Southern Africa, Egerton University's Tegemeo Institute, University of Malawi, University of Zambia, University of Pretoria, and IER. The findings and conclusions contained within are those of the authors and do not necessarily reflect positions or policies of the Bill & Melinda Gates Foundation. For further information: http://aec.msu.edu/fs2/gisama/index.htm.