



POLICY SYNTHESIS

for Cooperating USAID Offices and Country Missions
<http://www.aec.msu.edu/fs2/psynindx.htm>



Number 89

September 2011

STRENGTHENING STAPLE FOOD MARKETS IN EASTERN AND SOUTHERN AFRICA: TOWARD AN INTEGRATED APPROACH FOR CAADP INVESTMENT PLANS

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This note highlights the major challenges facing governments and international agencies in their efforts to strengthen the performance of staple food markets in Eastern and Southern Africa. The analysis synthesizes recent analyses by Michigan State University's Food Security Group.**

Our analyses highlight the fact that even in countries that have achieved impressive grain production growth in recent years, such as Malawi and Zambia, this growth has been heavily concentrated among a small proportion of farmers. In most of the countries for which nationwide farm survey data is available, about 75% of the marketed maize output comes from 10% of the farms (Jayne et al 2010). The value of these farms' crop and animal product sales is almost as much as the other 90% of farms. Because most poor smallholder farms have limited land and other productive assets, over half of the smallholder population is bypassed by this production growth and remain staple food buyers. For these and other reasons, rural poverty rates have remained stubbornly high even where aggregate grain production has risen dramatically. A major challenge for CAADP Investment Plans is therefore how to effectively reach the least productive half of the

smallholder population. Doing so will require a combination of strategies: (1) investing in agricultural research and farmer skills to transfer technologies that are appropriate for one-hectare farms; (2) reducing the costs of putting food on consumers' tables so as to raise the disposable incomes of urban and net grain-buying rural households; (3) encourage the adoption of more predictable, rules-based forms of state operations in food markets to promote more rapid private investment in the food systems; and (4) support the development of alternative commodity value chains to provide incentives for smallholders to raise their incomes through the diversification of cropping patterns from low-value staples to higher-return crops. The remainder of this note elaborates upon these points.

1. African farmers' ability to respond to market incentives is constrained by farm structure. Recent events in Malawi and Zambia have confirmed a longstanding empirical fact -- it is possible to achieve impressive food production growth without having any meaningful impact on poverty reduction. Farm sizes are declining over time as rural populations grow and families sub-divide their land to the next generation (Table 1).

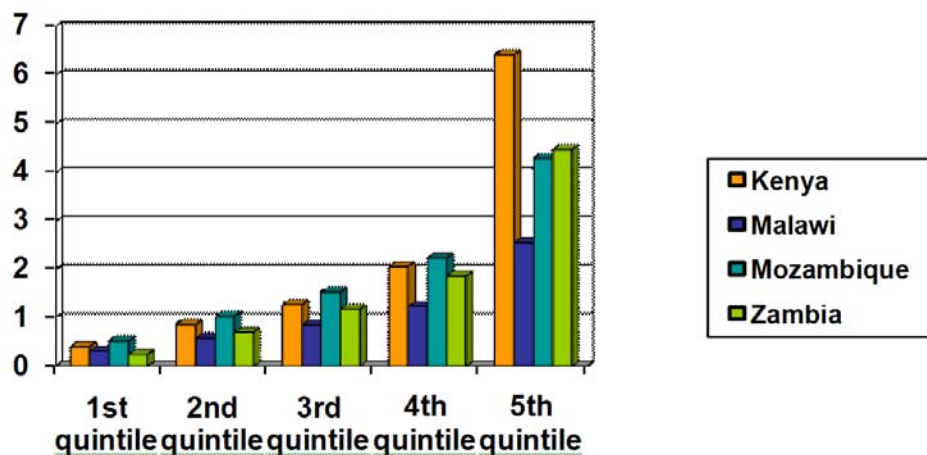
Table 1. Ratio of Cultivated Land to Agricultural Population

	1960-69	1970-79	1980-89	1990-99	2000-09
	Cultivated hectares per agricultural person				
Ethiopia	0.501	0.444	0.333	0.224	0.218
Kenya	0.462	0.364	0.305	0.264	0.219
Malawi	0.580	0.466	0.357	0.304	0.307
Mozambique	0.356	0.337	0.320	0.314	0.294
Rwanda	0.212	0.213	0.195	0.186	0.174
Uganda	0.655	0.569	0.509	0.416	0.349
Zambia	0.643	0.607	0.398	0.342	0.297

Note: Land to person ratio = (land cultivated to annual and permanent crops) / (population in agriculture).

Source: FAOStat website: www.faostat.fao.org/

Figure 1. Landholding Size of Smallholder Farms, Hectares per Household



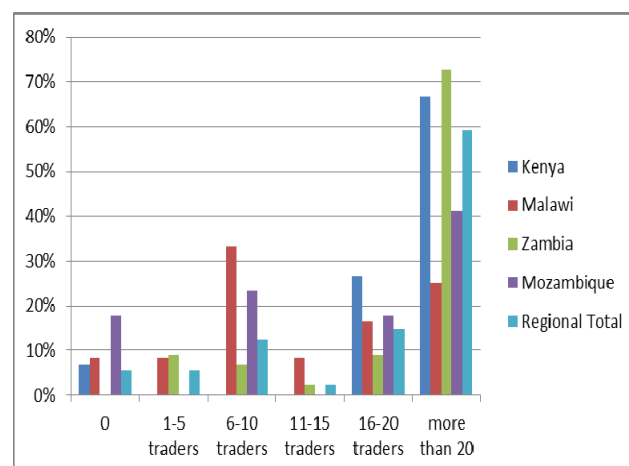
Source: Jayne et al 2010

In the four countries examined in Figure 1, over 50% of the farms are below one hectare in size. As average farm size falls below one hectare, a staple food-based agricultural system under a primarily rain-fed system with one growing season using low-input technology is in most areas not going to provide a viable pathway out of poverty. Even with major improvements in the performance of rural grain markets, inadequate access to land in many areas will prevent at least 30-40% of smallholder farmers from producing a grain surplus. These farms are not likely to escape from poverty 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.

2. Smallholder farmers are less isolated from markets than commonly thought: According to recent national farm surveys, smallholders report improvements in their access to crop buyers and services. The number of private traders coming into the village to buy maize from farmers after the harvest is usually more than 10 and in many cases more than 20 (Figure 2). The median distance travelled by farmers to sell their maize in Malawi, Zambia, and Kenya is zero, indicating that most farmers sell their maize to traders who come right into their villages, even in inaccessible and remote areas. Interestingly, no statistical relationship was found between the “degree of remoteness” as defined by the distance from the farm to the nearest district town and the distance traveled to sell maize, indicating that private traders are penetrating deeply into remote areas to buy grain from farmers. The evidence from

nationwide household surveys in these countries provide evidence of major improvements in farmers’ access to grain buyers over the 20 years since private grain trade was legalized. These findings also call for a re-examination of the meaning and measurement of “access to markets” and the extent to which access problems are a major constraint on farmer participation in markets. It appears that, for most smallholder farmers, their inability to participate in markets is driven more by insufficient productive assets and knowledge than by isolation from markets. This puts the main burden on the generation of improved farm technology, management practices, and access to land and other productive resources so that more farmers are capable of relating to markets as sellers.

Figure 2. Farmer Responses to the Question: How Many Traders Came into this Village to Buy Maize from Farmers in the 2008/09 Marketing Season.



Source: Jayne et al. 2010.

3. *Farmers receive about 60% to 90% of the price of maize grain observed in district retail markets:* By matching farm-gate prices received by interviewed farmers with prices observed in the nearest retail markets during the same period, it is found that farm prices are roughly 60% to 90% of retail prices in Zambia, Kenya, and Malawi. Yet farmers in the same villages obtained widely varying prices for their maize in the same month, indicating major differences among farmers in negotiation ability and understanding of their marketing options. These findings indicate potentially high returns to farmer marketing training, such as those conducted by the Kenya Market Development Programme, to raise their incomes from surplus grain production.

4. *Competition in maize milling and retailing has led to significant reductions in marketing margins:* Efforts to improve farm-level productivity are absolutely critical to achieve broad-based rural income growth and food security. Yet the potential for future farm-level income and productivity growth in the region are likely to be intimately tied to future cost-reduction in the marketing system. Marketing and processing costs still account for the lion's share, 45% to 55%, of the cost that consumers pay for commercial maize meal. This implies that new marketing technologies or institutional innovation within the marketing system that would reduce marketing costs by 10%, for example, would benefit consumers more than a 10% reduction in farm production costs brought on by new farm technology. Fortunately, inflation-adjusted milling and retailing marketing margins for maize meal have declined steadily in several countries since the liberalization process began in the early 1990s (Figures 3 and 4). Real wholesale maize prices have fallen slightly over the 1994-2010 period whereas retail maize meal prices have declined more substantially. The reduction in marketing margins in the maize value chains in Kenya and Zambia are due to significant additional investment in milling and retailing since the beginning of the liberalization process in the early 1990s.

5. *There is very limited grain storage in rural areas.* Traders frequently indicate constraints on availability of storage facilities and disincentives to engage in intra-seasonal storage. There are six main causes of disincentives to store grain and invest in storage facilities:

i) *Staggered harvest seasons in some areas:* In regions with multiple harvests per year, such as Kenya, Uganda, and northern Tanzania, there is relatively small intra-seasonal price rise. Maize production is hitting the market at various times throughout the year. This shifts the emphasis of marketing from intra-seasonal storage to spatial arbitrage, shifting grain from places where the harvest is hitting the market to areas experiencing demand at that time.

Figure 3. Maize Grain and Retail Breakfast Meal Prices (Real 2010 kwacha/kg), Lusaka, Zambia

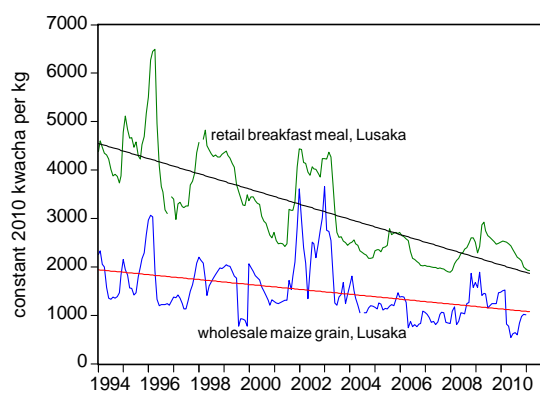
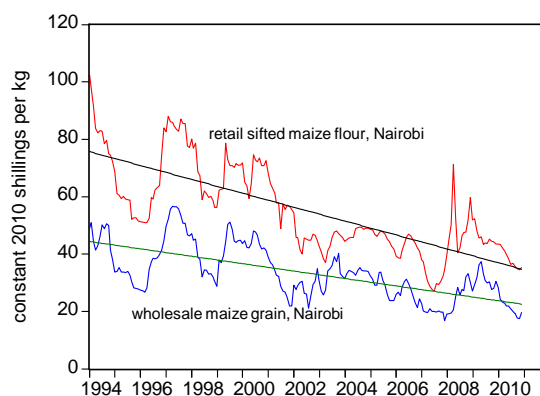


Figure 4. Maize Grain and Retail Maize Flour Prices (Real 2010 Shillings/kg), Nairobi, Kenya



ii) *Unpredictable government operations in grain markets:* Highly discretionary government policies create major risks for grain storage. Export bans, sudden modifications or removal of import tariffs, and stock releases from government silos at concessionary prices are all examples of government activity that can undermine the returns to intra-seasonal storage.

iii) *The resulting grain price uncertainty inhibits commercial bank investment in grain storage and makes investing in government*

instruments relatively attractive: Most governments in the region are running deficits, which they finance by offering high-interest bills and bonds. Local banks naturally are content to earn a safe return investing in these government bonds rather than making loans to finance highly risky investments in grain arbitrage. Reducing the policy risk in markets will encourage greater bank investment in African agriculture.

iv) *Uncertainty over disposition of current marketing board storage facilities:* Most of the silo capacity in countries such as Kenya, Malawi, and Zambia remains in public sector hands. The potential for selling parastatal storage facilities at concessionary prices as part of some future privatization plan acts as a deterrent to new commercial investment in storage. This pattern of bank investment also shifts major investible liquidity in a country into government operations and programs rather than private sector investment.

v) *Threat of grain confiscation:* Recent events in Malawi, Ethiopia, and Kenya demonstrate that there is some risk of stored commodities being confiscated or destroyed.

vi) *Lack of quality standards with respect to moisture content:* Assembly traders and wholesalers make little effort to discourage the buying of wet maize or to separate it from higher quality dry maize. If anything, the tendency is to combine wet and dry maize in order to mask the ability to detect wet maize by the next buyer. The storage of high-moisture content maize results in rotting and high storage losses.

6. *Disincentives to store grain also exacerbate the flow of grain out of informal markets and contribute to a circuitous flow of grain* from surplus-producing farmers in grain deficit areas to urban areas, only to be milled by large-scale processors and then re-distributed back to the grain-deficit rural areas in the form of expensive commercially milled meal. This problem contributes to redundant transport costs and higher food costs for consumers, many of whom are poor grain-deficit rural households.

7. *Unpredictable state interventions undermine investment and coordination among the players in the staple food value chains:* In a six-country study, Chapoto and Jayne (2009) found that the two countries most aggressively pursuing price stabilization through marketing

board and trade controls over the 1994-2009 period (Zambia and Malawi) experienced by far the highest degree of maize price instability. Such findings indicate that many governments' well-meaning attempts to stabilize prices may actually destabilize them. Future food prices are more difficult to predict in an environment in which the extent and composition of marketing board operations are frequently changing and where cross-border trade policies also change in ways that are difficult to anticipate. There is increasing evidence that private trade and investment develops more slowly and more tentatively in countries where government policy is particularly unpredictable.

Moreover, The South African Futures Exchange (SAFEX) price discovery process, which could be so useful to governments and marketing firms and contribute to the development of more structured markets throughout the region, is frequently disrupted due to highly discretionary state operations in markets.

While private trading systems will always result in price variation – potentially very wide price swings in landlocked countries with poor transport infrastructure – they tend not to cause the frequent food crises due to policy mistakes and inaction that are commonly seen in the region. However, these findings do not suggest that governments have no role to play in maize markets. The findings rather indicate that the price instability and unpredictability could be mitigated more effectively by limiting the state's role to adopting a rules-based and transparent approach to state operations in markets so that the private sector understands the specific market conditions that will trigger government interventions.

8. *Many "market failures" commonly observed in the region reflect chronic underinvestment in productivity-enhancing public goods.* The costs of participation in markets are unusually high in most of Africa due to limited investment in transport infrastructure, ports, rail, road, and electricity. The rail system and ports in eastern Africa are in a state of decay and the high costs involved in importing fertilizer and other goods act as a tax on farmers as well as the entire economy. Farmer participation in staple food markets is also constrained by weak investment in crop science, especially relevant for semi-arid conditions, and effective extension services for farmers. Ironically, while reviews of the

Asian green revolution experience underscore the very high payoffs to public investment in R&D and physical infrastructure in terms of agricultural growth and poverty reduction (Fan, Gulati, and Thorat 2007; Economist Intelligence Unit 2008), these public goods investments account for a very low percentage of national budgets among most African nations and in some cases are crowded out by large-scale input promotion programs with uncertain long-term effects.

IMPLICATIONS FOR CAADP INVESTMENT PLANS:

Well-conceived CAADP investment plans will focus on raising on-farm productivity as well as improving markets and in a way that effectively reaches the bottom half of the rural population in terms of poverty by focusing on technologies and delivery systems appropriate to one-hectare farms. In this way, agricultural growth can more meaningfully contribute to poverty reduction, something that has been elusive in countries focusing on farm price supports and input subsidies that are captured largely by better-off farmers.

A well-conceived CAADP investment plan will also recognize the importance of policy in determining the impacts of agricultural investment. Appropriate policies and public investments can leverage much greater investments by the private sector in support of smallholder-led development. By the same token, policies that are unpredictable and/or crowd out private investment can cause an otherwise good CAADP Investment Plan to create little enduring benefit.

Smallholders' ability to progressively diversify into higher-valued activities will rest on 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. For these reasons, programs to reduce the costs of food production and marketing will be at the heart of effective CAADP investment plans. By reducing the costs of delivering staple foods to consumers' tables, CAADP strategies

can achieve the twin goals of improving consumers' access to food and promote income growth on smallholder farms through productivity growth and progressive diversification to higher valued crops. 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.

The potential remains for broad-based smallholder-led agricultural development, and this is indeed necessary to achieve meaningful reductions in rural poverty. In many areas, however, this will require overcoming the land-related constraints on a successful smallholder-led agricultural development strategy. In countries where a large proportion of the smallholder population reside in densely populated rural areas, such as Malawi, Kenya, and Uganda, well-conceived CAADP investment plans will call for governments to invest in infrastructure and services to open up currently underutilized areas to encourage smallholder-led settlement and agricultural commercialization. There remains ample scope for such a strategy in many, but not all countries in the region. But the recent transfer of massive amounts of land for large-scale commercial investment and the massive amounts of public resources that have sometimes accompanied these large-scale land investments may impede needed access to land for future generations of smallholder farmers (Jayne et al. 2010).

Achieving on-farm productivity will acquire a holistic approach that transfers knowledge, management skills, and improved technologies, and provides a hospitable environment for private investment in input delivery systems to improve smallholder farmers' access to these technologies and services. Likewise, the improvement of smallholder farmers' access to markets will primarily entail providing the public goods investments in physical infrastructure and a predictable policy environment, which will then provide the private sector with strong incentives to aggressively promote surplus production and domestic supply chains because, in a food import environment, domestic production will

be the least costly source of supply to meet the rapidly rising demand for food in rapidly urbanizing areas of Africa.

The apparent structural shift to higher global food prices provides an opportunity for well-conceived CAADP investment plans and agricultural policies to have far-reaching benefits for African agriculture. As long as these investment plans and policies are inclusive of the poor, through focusing on technologies and services that make a difference on one-hectare farms, then rapid reduction of rural poverty can be achieved. The potential is there and, by and large, there is broad agreement of the kinds of investments and policies needed to achieve this potential. So, a great deal hinges on the design of CAADP investment plans and how they are translated into implementation.

SELECTED BACKGROUND

REFERENCES

- Abbinck, K., T.S. Jayne, and L. Moller. 2011. The Relevance of a Rules-Based Maize Marketing Policy: An Experimental Case Study of Zambia, *Journal of Development Studies* 47.2: 207-230.
- Byerlee, D., T.S. Jayne, and R. Myers (eds). 2006. Managing Food Price Risks and Instability in a Liberalizing Market Environment. *Food Policy* 31.4.
- Chapoto, A. and T.S. Jayne. 2009. *The Impacts of Trade Barriers and Market Interventions on Maize Price Predictability: Evidence from Eastern and Southern Africa*. [International Development Working Paper No. 102](#). Michigan State University.
- Economist Intelligence Unit. 2008. *Lifting African and Asian Farmers out of Poverty: Assessing the Investment Needs*. Research report for the Bill and Melinda Gates Foundation. New York: The Economist Intelligence Unit.
- Fan, S., A. Gulati, and S. Thorat. 2007. *Investment, Subsidies, and Pro-poor Growth in Rural India*. Discussion Paper No. 716. Washington, D.C.: International Food Policy Research Institute.
- Jayne, Thomas S., Nicole Mason, Robert J. Myers, Jake Ferris, David L. Mather, Nicholas Sitko, Margaret Beaver, Natalie Lenski, Antony Chapoto, Duncan H. Boughton, 2010. *Patterns and Trends in Food Staples Markets in Eastern and Southern Africa: Toward the Identification of Priority Investments and Strategies for Developing Markets and Promoting Smallholder Productivity Growth*. MSU [International Development Working Paper 104](#). April. East Lansing: Michigan State University.
- Jayne, T.S., D. Mather, and E. Mghenyi. 2010. Principal Challenges Confronting Smallholder Agriculture in Sub-Saharan Africa. *World Development* 38.10: 1384-1398.
- Smale, M., D. Byerlee, and T.S. Jayne 2011. *Maize Revolutions in Sub-Saharan Africa*. Policy Research Working Paper 5659, Washington, D.C.: Development Research Group, World Bank.

ACKNOWLEDGMENTS: This policy synthesis is published with funding provided by the American people, via the Food Security III Cooperative Agreement (GDGA-00-000021-00) between Michigan State University and the United States Agency for International Development, through the Bureau for Food Security, Office of Agriculture, Research, and Transformation, and through the Africa Bureau, Office of Sustainable Development.

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** See the selected references for evidence and analysis underlying these conclusions, as well as the broader range of studies at the Food Security Group Website: <http://www.aec.msu.edu/fs2/>