POLICY BRIEF

TEGEMEO INSTITUTE FOR AGRICULTURAL DEVELOPMENT AND POLICY

No. 7 *(Downloadable at: http://www.tegemeo.org)* *July* 2006

CAN THE MARKET DELIVER?
LESSONS FROM KENYA'S RISING USE OF FERTILIZER FOLLOWING LIBERALIZATION

By

Joshua Ariga and T.S. Jayne*

POLICY MESSAGES: Fertilizer use is notably lower in most of Africa than in other developing regions. Too little irrigation and varieties unresponsive to fertiliser may explain this to some degree. But more often the finger is pointed at lack of credit, long distances between farmers and the nearest fertilizer retailer, and weak market infrastructure. Indeed, in many countries the transition to liberalized input markets has seen fertiliser use fall as commercial distribution systems compete with subsidized government programs. Kenya, however, stands as a notable departure from this parallel input marketing model. In the early 1990s fertiliser markets were liberalised, government price controls and import licensing quotas were eliminated, and fertilizer donations by external donor agencies were phased out. Subsequently fertiliser use has almost doubled from the 1980s to recent years, much of the increase being registered on small farms. Rates of fertiliser application on maize crops compare well with those seen in Asia and Latin America.

How has this been achieved? Liberalization, implemented for nearly 15 years without competing government subsidy programs, has induced tremendous private investment in fertilizer importation and retailing. The average distance a farmer needs to travel to get fertiliser has fallen from more than 8 km in 1997 to just over 4 km in 2004. Wholesalers and dealers have cut the cost of domestic marketing from US$245 to US$140 a tonne. Sustaining this momentum will require a pro-active role for government: rehabilitating the rail system and port facilities, and supporting the integrity of market institutions and arrangements designed to promote input credit and output market access for small farmers.

BACKGROUND: Fertilizer use has increased dramatically in Kenya since the fertilizer market was liberalized in the early 1990s. Kenya is the only country in Sub-Saharan Africa that has achieved at least 30% growth in fertilizer use per cropped hectare over the past decade and which already started from a relatively high base (25kgs per hectare or more by the early 1990s, Table 1). Using national consumption figures, prior research has been unable to show whether small farmers or large farms and estates are driving this growth, whether the increased fertilizer consumption is being devoted to smallholder food crops or mainly industrial crops such as tea and sugarcane, or whether the growth in fertilizer use is attributable to any particular type of fertilizer delivery supply chains. Our study sheds light on these three issues.

OBJECTIVES: The study aimed to identify the factors responsible for the impressive growth in fertilizer use in Kenya since the early 1990s, and thereby provide policy lessons both for Kenya as well as for other African countries.

Table 1. Fertilizer Use Intensity and Growth Trends in Sub-Saharan Africa

Intensity of fertilizer use, 96-2002	% growth in fertilizer use intensity (kg/ha cultivated) (mean 1996-2002 / mean 1990-95)	
	< +30%	> +30%
< 25 kg/ha	DRC (0.5, -47%) Angola (0.7, -69%) Niger (0.9, +5%) Guinea (2.0, -4%) Burundi (2.3, -6%) Madagas. (2.9, -8%) Maurit. (4.0, -64%) Tanzania (4.8, -47%) Gambia (5.2, +15%) Nigeria (5.6, -73%) B. Faso (5.9, -28%) Zambia (8.4, -34%) Mali (9.0, +7%)	Uganda (0.6, +237%) Rwanda (1.8, +89%) Mozambique (3.2, +142%) Ghana (3.6, +68%) Chad (4.3, +93%) Cameroon (5.9, +77%) Togo (7.0, +30%) Cote d'Ivoire (11.8, +53%) Botswana (11.8, +294%) Senegal (13.2, +67%) Ethiopia (14.4, +71%) Benin (17.6, +76%) Lesotho (23.2, +35%)
> 25 kg/ha	Swazi. (30.5, -40%) Malawi (30.8, +9%) Zimbab. (48.3, +9%)	**Kenya (31.8, +33%)**

Note: numbers in parentheses are mean kgs of fertilizer per hectare cultivated, and the percentage growth in fertilizer use intensity between 1990-1995 and 1996-2002. Source: FAOStat website: http://faostat.fao.org/faostat/collections?subset=agriculture

DATA AND METHODS: The main data come from a nationwide panel of 1,364 smallholder households surveyed across four years between 1995/96 and 2003/04 by Egerton University's Tegemeo Institute. These were used to examine trends in fertilizer use by crop, region, and type of fertilizer supply chain.

FINDINGS: Over the past 10 years, fertilizer use per cropped hectare has risen by 35%. Total consumption has risen from a mean of roughly 180,000 tons per year during the 1980s, to 250,000 tons per year during the early 1990s, to over 325,000 tons in the 2000-2003 periods. In the most recent year for which data is available, 2004/05, Kenyan farmers consumed 351,776 metric tons of fertilizer.

The evidence suggests that growth in fertilizer consumption is occurring on smallholder farms – it is not driven by large-scale or estate sector agriculture. The proportion of small farmers using fertilizer has increased from 43% in 1995/96, to 51% in 1996/97, to 65% in 1999/00 to 69% in 2003/04. These rates vary considerably throughout the country, ranging from less than 10% of households surveyed in the drier lowland areas to over 85% of small farmers in Central Province and the High-Potential Maize Zones of the North Rift (Table 2). Interestingly, across the entire sample of households, mean fertilizer use per hectare is virtually constant across farm size, suggesting that even small and poor farmers are increasingly gaining access to fertilizer.

Kenya's growth in fertilizer consumption is a phenomenon covering both food crops (mainly maize and domestic horticulture) as well as export crops such as tea, sugarcane, and coffee. Fertilizer use per hectare of maize cultivated has increased dramatically in all but the semi-arid parts of the country. About 87% of small-scale farmers in the high-potential maize zones of Western Kenya now use fertilizer; those that use fertilizer apply roughly 163 kg per hectare on maize, higher than mean levels obtained in South and East Asia. The intensity of fertilizer use on maize has increased in spite of cutbacks in maize price supports by the government. However, fertilizer use remains limited in the drier regions because of low profitability (Table 2.)

Table 2. Percent of Small-scale Households Using Fertilizer, by Region and Crop Year

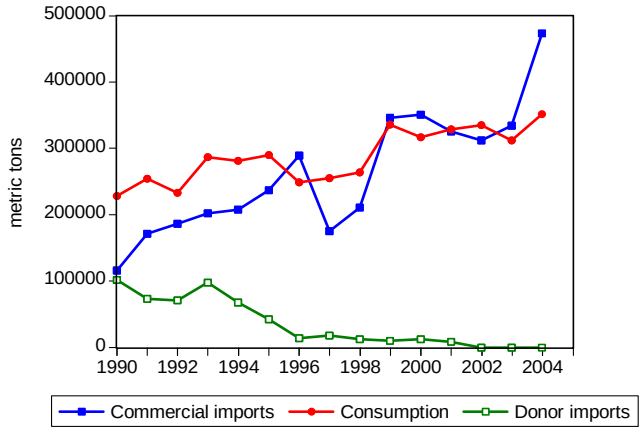
Region of Kenya	95/96	96/97	99/00	03/04
Coastal Lowlands	2%	3%	5%	6%
Eastern Lowlands	19%	30%	37%	46%
Western Lowlands	2%	3%	4%	8%
Western Transitional	29%	32%	59%	61%
High Potential Maize Zone	67%	69%	86%	90%
Western Highlands	52%	57%	73%	74%
Central Highlands	63%	78%	90%	93%
Marginal Rain Shadow	12%	20%	22%	27%
Nationwide Sample	43%	51%	64%	69%

Source: Tegemeo Institute/MSU Agricultural Monitoring and Policy Analysis Household Surveys of 1995/96, 1996/97, 1999/00, and 2003/04.

The impressive growth of fertilizer consumption in Kenya has been achieved without subsidies – in fact, fertilizer consumption has taken off rapidly since the early 1990s when the fertilizer market was liberalized and when fertilizer donations by external donor agencies were phased out. Commercial fertilizer imports are now roughly 3 times higher than levels achieved during the late 1980s and early 1990s (Figure 1).

Four main factors account for the expanded use of fertilizer by small farmers in Kenya: First, the Government of Kenya has pursued a relatively stable fertilizer marketing policy since 1990.

Figure 1. Fertilizer Use Trends in Kenya



After the elimination of retail price controls, import licensing quotas, foreign exchange controls, and the phase-out of external fertilizer donation programs that disrupted commercial operations, Kenya has witnessed rapid investment in private fertilizer distribution networks, with over 10 importers, 500 wholesalers and 7,000 retailers now operating in the country.

Secondly, and as a direct result of an increasingly dense network of fertilizer retailers operating in rural areas, the mean distance of small farmers to the nearest fertilizer retailer has declined from 8.4 km to 4.1 km between 1997 and 2004. This has greatly expanded small farmers' access to fertilizer, reduced transaction costs, and increased the profitability of using fertilizer.

The third factor is intense competition in importing and wholesaling. Pressure to cut costs and innovate in logistics has cut domestic fertilizer marketing margins from $245 to $140 per ton. Despite rising world prices, farm-gate fertilizer prices in Kenya have remained roughly constant over the past 10 years, thanks to this 55% reduction in fertilizer marketing costs from Mombasa to western Kenya.

And fourth, the relative profitability of the domestic horticulture market -- 96% of all horticultural product sales in Kenya go into the domestic market, not the export market -- has raised farmers' incentives to fertilize maize intercropped with horticultural crops.

INSIGHTS FOR POLICY IN KENYA: Kenya's experience is a success story but it is fragile. Sustaining the momentum will depend on commitment to supportive public investment and policy choices. First, governance problems are jeopardizing the sustainability of many interlinked credit-input-crop marketing programs that worked well in the 1970s and 1980s, and which provided a solid commercial base for subsequent growth in other supply chains. Continued access to input credit for small farmers in many parts of the country will require government commitment to limit the potential for politicization and interference in the management of these interlinked market systems. Second, investment is needed in Kenya's eroded rail, road, and port infrastructure. Third, for the first time in over a decade, the Kenyan government has, in the past two years, begun to sell fertilizer to farmers in high-potential areas, and the threat of government operations being expanded has sparked great uncertainty among private suppliers. Much of the impressive growth in commercial fertilizer supply channels since 1990 has been due to a clear policy environment in which the private investment incentives were not undermined by large-scale input subsidy programs that depressed commercial demand and created uncertainty about the viability of future investment, as witnessed in other African countries that initiated input market reforms.

BROADER LESSONS: Are there lessons from Kenya for other Sub-Saharan African countries? This study suggests the following:

1. Fertilizer promotion requires action across several fronts. It is not simply a technical or logistical problem of delivering fertilizer to small farmers. Achieving sustained growth in fertilizer consumption involves building farmers' effective demand for fertilizer, by making its use profitable, and building durable output markets that can absorb the increased output without gluts that depress producer prices. This involves two major commitments from government:

(a) *a supportive policy environment that attracts local and foreign direct investment in building sustainable fertilizer and crop output markets.* The case of Kenya shows how a stable policy environment has generated an impressive private sector response that has helped to make fertilizer accessible to most small farmers. Importantly, this has involved reforms to the financial market (elimination of foreign exchange controls) as well as to fertilizer and crop markets.

In other countries, the implementation of large subsidy programs has inhibited the type of private investment response seen in Kenya, due to the risk of huge losses that such programs inflict on commercial firms.

(b) *A forward-looking approach to input market development also requires attention to the various factors affecting farmers' willingness to pay for fertilizer.* Governments have a major role to play in raising farmers' willingness to pay for fertilizer: invest in rural infrastructure, efficient port facilities, and standards of commerce to reduce the costs of distribution; fund agricultural research to produce seeds that respond to fertilizer; determine and disseminate fertilizer use recommendations that are appropriate for different areas (as opposed to one blanket recommendation for an entire country); nurture the development of rural financial systems, market information systems, institutions for contract enforcement, and telecommunications to attract new investments by commodity marketing firms. These "public goods" investments, often considered outside the scope of fertilizer marketing policy, nevertheless strongly affect the demand for fertilizer and hence whether sustainable markets for fertilizer can arise.

2. Credit facilities for low-income farmers are a priority. Many Kenyan farmers have been able to finance fertilizer through the credit offered in the integrated input-output chains for crops such as tea, sugar, and coffee. These integrated marketing arrangements have also provided the means for farmers to obtain fertilizer for their food crops, since the companies can recoup their loans for other crops as well when the farmers sell their cash crop back to the company. But in areas where fertilizer use on a particular crop is profitable, such as maize in Western Kenya and horticulture in most parts of the country, most farmers have achieved reasonable levels of fertilizer use without credit.

3. Good governance is critical for fertilizer promotion and agricultural development in general. The coffee sub-sector illustrates how governance problems can cause farmers to dis-invest in fertilizer and exit from the integrated credit-input-crop marketing systems that worked well in previous decades.

4. Promising innovative systems to promote fertilizer use in the semi-arid parts of the country need to be expanded. Programs such as the Farm Inputs Promotion (FIPS) and dealer credit and training programs combine farm extension knowledge and supply chain development to raise the profitability of supplying fertilizer by small dealers and of using fertilizer by small farmers.

5. What about subsidies? Several countries in Africa are being urged to consider distributing free fertilizer to millions of small farmers as a means to reduce poverty and "kick-start" productivity growth. From a welfare and poverty alleviation standpoint, a compelling case can be made to provide free or subsidized inputs for the poor. But such programmes suffer from the difficulties of effective targeting and may stymie the development of sustainable commercial input delivery systems. Above all, the costs can be high, effectively crowding out public funding of other important investments to help reduce poverty and promote agricultural growth. Moreover, there is little evidence from Africa that subsidies or other intensive fertilizer promotion programs have "kick-started" productivity growth among poor farmers in Africa enough to sustain high levels of input use once the programs end.

Given scare resources, we must learn as much as possible from successful experiences in Africa and elsewhere. The experience of Kenya shows how a stable policy environment that is supportive of commercial investment can foster an impressive private sector response that supports smallholder agricultural productivity and poverty alleviation. Ironically, many of these same goals – poverty alleviation, increased fertilizer use, and growth in small farm productivity – remain elusive in countries lacking a sustained commitment to the development of viable commercial input delivery systems.

For the full report, visit the Tegemeo Institute website. Funding for this study was provided by USAID/Kenya under the Tegemeo Agricultural Monitoring and Policy Analysis Project, and the Food Security III Cooperative Agreement, funded by AID/Washington's Global and Africa Bureaus.

* Ariga is a research fellow at Tegemeo Institute and a graduate student at Michigan State University. Jayne is Professor, International Development, at MSU. The authors thank J. Nyoro, V. Kelly, M. Weber, and Steve Wiggins for extensive comments and discussions on an earlier draft.