Agricultural Input-Output Linkages in the ESA Region
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This brief is the fourth in a series of quarterly briefs that provide updates on the food price situation in the Eastern and Southern Africa (ESA) region. The briefs are a follow up of an earlier study done on the impact of rising food prices in the ESA region. The study was done by the Association for Strengthening Agricultural Research in East and Central Africa (ASARECA) in collaboration with the Regional Strategic and Knowledge Support System for Eastern and Central Africa (Re-SAKSS-ECA) and the CGIAR Alliance. This update explores the linkages between agricultural input prices and output prices in the final quarter of 2009. Food prices, which slumped throughout 2009, showed a slight upward trend in the last quarter of the year. Over the same period, farm input prices remained subdued, but rose marginally in the last quarter of the year. Similarly, the trend of prices in the ESA region moved in tandem with global trends, exhibiting a positive linkage between agricultural input and output prices. Overall, the fast-changing agricultural commodity prices make it risky for farmers to invest in farm inputs.

Price Movements of Agricultural Inputs and Outputs
As the global prices of most food crops slumped in 2009 from the highs of mid-2008, the prices of farm inputs remained subdued throughout 2009. In the ESA region, farm inputs (fertilizers, seeds and fuel) are predominantly used in the production of cereals (wheat, maize and rice). In addition, the prices of electricity, petroleum and natural gas influence the costs of farm inputs, which in turn have a bearing on food prices.

On average, the Food Price Index (FPI) of the Food and Agricultural Organisation (FAO) rose by about 10 percent each month between October and December 2009 to signal a possible re-emergence of the food price crisis (Figure 1). Over the same period, food prices eased in most ESA countries except in Djibouti, Madagascar, Malawi and Zambia. Food prices in Egypt, Ethiopia, Seychelles and Uganda declined by 1% but increased in Malawi (Figure 1). In Djibouti, Madagascar, Kenya, Tanzania and Zambia, however, food prices remained stable (Figure 1).

While the declining food prices in Seychelles could be attributed to the introduction of macroeconomic reforms, the decrease in Uganda was due to increased food stocks as a result of favorable weather conditions in most parts of the country over the last quarter of 2009. In Malawi, food prices surged following a seasonal trend that has been observed to peak between the months of October and March of the subsequent year while they dip between April and September. The stable food prices in Djibouti, Madagascar, Kenya, Tanzania and Zambia could be attributed to increased food supplies following favorable rainfall over the last quarter of 2009.
Evolution of Cereal prices

The prices of individual cereals showed mixed trends in the final quarter of 2009. While aggregate food prices increased in the last quarter of 2009, international maize prices stagnated over the same period. Between October and November 2009, global maize prices rose by 3 percent but declined by the same rate between November and December. The supply of maize stocks in world markets is heavily dependent on the prices of seeds, fertilizers and fuel particularly diesel.

The last quarter of 2009 was characterized by divergent maize price trends in the ESA region. In Kenya and Uganda, maize prices eased mid-2009 in tandem with the global maize price trends which had dampened for the better part of 2009 while Zambia and Tanzania experienced some upward maize price movements contrary to the global trends. The high maize prices in the ESA region negatively affect the region’s food security.

Even though prices were more volatile in Uganda than in any other ESA country, they registered a sharp decrease of 17 percent between the third and fourth quarters of 2009 (Figure 2). This may be due to the maize harvest peak which normally occurs between October and November in both Uganda and Kenya. Over the same period, maize prices declined by 4 percent in Kenya (Figure 2). As a net importer of maize, Kenya holds the lowest maize stocks between May and September each year. However, Kenyan maize prices showed a declining trend beginning May 2009. This was probably due to the government’s intervention in efforts to boost food supplies through duty free maize imports and other direct market intervention measures such as reduced taxes, export bans and price controls. Unlike Kenya and Uganda, maize prices on average rose by about 10 percent each month in both Tanzania and Zambia in the fourth quarter of 2009 probably due to the imposition of export bans.

Unlike maize prices that were stable in world markets over the last quarter of 2009, global rice prices increased in tandem with the aggregate food price trends over the same period. On average, the FAO FPI rose by 8 percent each month between June and December 2009 and by 15 percent between November and December (Figure 3).

Contrary to the global trends, rice prices, though lower than the world price in most ESA countries except in Zambia, were on a declining trend (Figure 3). On average, rice prices in Djibouti, Uganda and Zambia declined by about 5 percent while they increased by about 10 percent in Ethiopia and Tanzania.
Relative to 2008, the international prices of wheat stabilized in 2009, but began to rise in the last quarter of the year. Between October and December 2009, the global price of wheat increased by about 10 percent (Figure 4). According to the FAO, the wheat price increase in late 2009 could be attributed to a decline in world wheat production and tight supply prospects for the new season. However, domestic wheat prices in the ESA region though higher than the international price declined throughout 2009 (Figure 4). Wheat prices in Kenya and Ethiopia were highly volatile in 2009. In contrast, wheat prices in Djibouti were relatively stable in 2009 and lower than the international price (Figure 4). Since almost half of the wheat consumed in the ESA region is imported, the trend of domestic wheat prices are positively correlated with international wheat prices hence any changes in the world markets have an effect on markets in the ESA region.

Evolution of Farm Input prices
Following the 2008 global slump in agricultural commodity prices, farmers around the world deferred farm input purchases as sharp falls in commodity prices squeezed their returns. As a result, prices of most farm inputs fell sharply over the same period. The collapse of international farm input prices in late 2008 resulted in many manufacturers and distributors of farm inputs being left holding large stocks of highly-priced inventory and production capacities in excess of existing demand. The result of the low global demand for farm inputs was that prices for manufactured farm inputs remained subdued throughout 2009.

Food and fertilizer prices are closely linked to energy prices. According to the International Monetary Fund (IMF, 2009), fuel prices fell in 2008 but have stabilized in 2009. The price of Murban crude oil stabilized in 2009 from its peak in 2008, but increased in the second half of 2009 (Figure 5). The high oil prices contributed to price increases for most agricultural crops by raising input costs on the one hand, and by boosting demand for agricultural crops used as feedstock in the production of biodiesel on the other hand.

Within the ESA region, diesel is the key source of energy for cereal production. The diesel price trends within the ESA region track those of international crude oil since almost all petroleum products in the region are imported. While diesel prices remained stable in Djibouti and Kenya in the second half of 2009, they increased in Ethiopia throughout 2009. Between October and December 2009, diesel prices in Kenya shot up by 4 percent (Figure 5). High diesel prices increase the cost of farm production and ultimately reduce farm returns.
Given that petroleum products are a major cost component in the manufacture of fertilizers, one would expect a positive correlation between the prices of fuel and fertilizers. The prices of Urea, DAP, TSP, Potassium chloride and phosphate rock were relatively stable throughout 2007 (Figure 6). In 2008, world fertilizer markets experienced a period of great volatility, despite the strong positive demand prospects envisioned at the beginning of 2008 (FAO, 2009). Indeed, the prices of international fertilizer imports rose to record levels by mid 2008, but fell rapidly throughout the second half of 2008. In late 2008, the fertilizer industry faced a slowdown of sales amid rising inventories, as farmers delayed purchases in expectation of further price reductions, volatile commodity prices and tightening financial conditions. In 2009, fertilizer prices have been stable, but on a downward trend in line with the global prices of agricultural commodities.

Most countries within the ESA region are net importers of chemical fertilizers. As such, domestic fertilizer prices in the region would be closely linked with world fertilizer prices. But fertilizer use in Africa is the world’s lowest—about 8 kg per hectare. The lack of fertilizers in Africa accentuates hunger and poverty. The unprecedented rise in fertilizer prices in 2008 created a fertilizer crisis for resource-poor farmers in the ESA countries. The rising price of fertilizers contributes to a rise in grain prices. As the cost of inputs increase, so do prices of food. To stimulate adequate fertilizer use, the purchasing power of the poorest of the poor must be enhanced through market-friendly safety nets so they can be included in the marketing process.

Conclusion
The link between food prices and input prices is inextricable. These linkages were demonstrated in 2009 when both global food and input prices stabilized. Lower demand levels have meant that global prices for manufactured farm inputs remained subdued throughout 2009. In response to this, manufacturers of farm inputs wound back production and the supply chain ran down inventories which could potentially have a marked impact on prices in case of a seasonal spike in farm input demand. The price outlook for 2010 has mixed indications. While international food prices are unlikely to increase given the large stocks that provide a buffer against price increases, the limited availability of farm input stocks could lead to a surge in farm input prices as seasonal demand picks up in 2010. In the ESA region, both input and output prices are expected to change in tandem with the international price trends since the ESA countries are small importing nations. Overall, the fast changing agricultural commodity prices make it risky for farmers to invest in farm inputs.

This bulletin is one in a series of updates based on an October 2008 report which is available at: [http://www.asareca.org/resources/reports/resp2food_pr_main.pdf](http://www.asareca.org/resources/reports/resp2food_pr_main.pdf) and subsequent development updates available at [http://www.ilri.org/research/Content.asp?CCID=96&SID=264&ContentPage=2](http://www.ilri.org/research/Content.asp?CCID=96&SID=264&ContentPage=2). For further information, mail to: j.karu@cari.org