*POLICY SYNTHESIS*

*FOOD SECURITY RESEARCH PROJECT – ZAMBIA*

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# SPATIAL AND REGIONAL DIMENSIONS OF FOOD SECURITY IN ZAMBIA

**By Steven Haggblade, Steven Longabaugh and David Tschirley**

**Key Points**

• Zambia's population clusters tightly in cities along the north-south line of rail and in the primarily rural areas of Eastern Province (Figure 1). Staple food consumption and purchases are similarly concentrated in these heavily populated clusters (Figures 4 and 5).

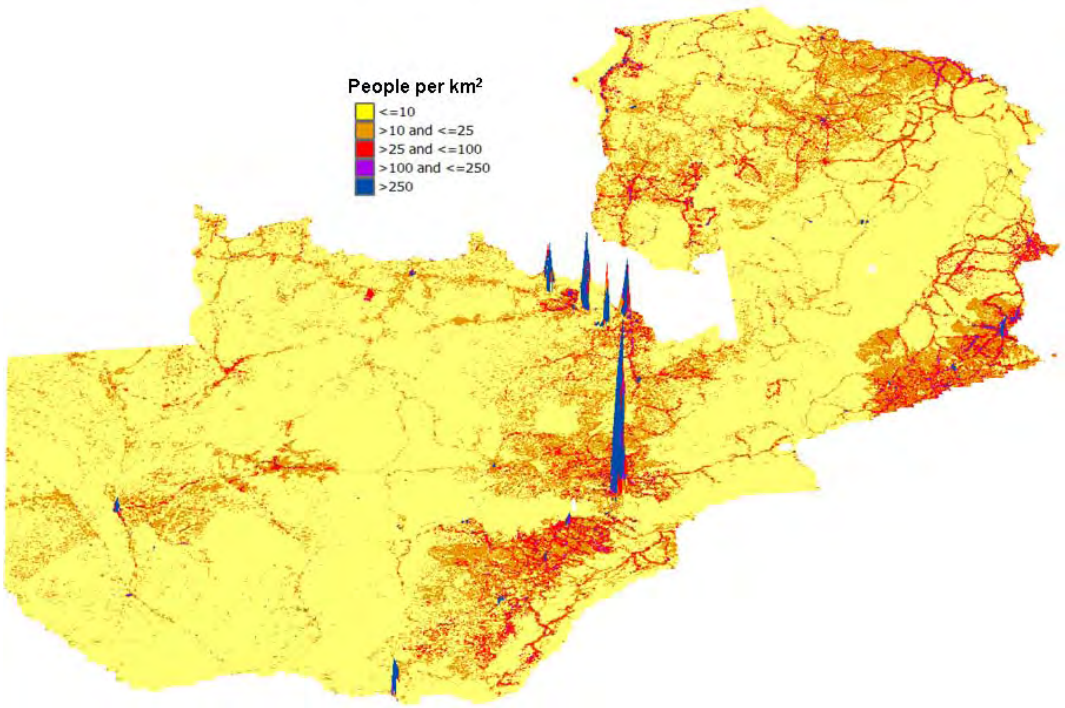
• Across the border, several high-density population centers lie close to the Zambian border — in the copperbelt cities of southern DRC, in the highlands of southern Tanzania, in Malawi and in Zimbabwe (Figure 2). This results in sizeable potential food markets for Zambian farmers across the border in southern DRC and, intermittently, in Zimbabwe and Malawi.

• Zambia's staple food production and sales likewise cluster spatially in three main areas: along the line of rail, in the large commercial farming blocks of north-central Zambia, and to a lesser extent in Eastern Province (Figure 6).

• This spatial clustering offers opportunities for Zambia to benefit from regional trade in food staples. In normal and good harvest years, significant export potential exists in matching the large cereal-producing blocks in north-central Zambia with the nearby copperbelt cities of both Zambia and DRC. Conversely, in years of domestic shortfall, significant import supplies may be available from cross-border farmers and traders in southern Tanzania, northern Mozambique and, in time, Zimbabwe.

• If Zambian farmers are to invest in the productive capacity necessary to serve these external markets, they will require consistent and predictable trade policies.

Figure 1. Population Distribution in Zambia



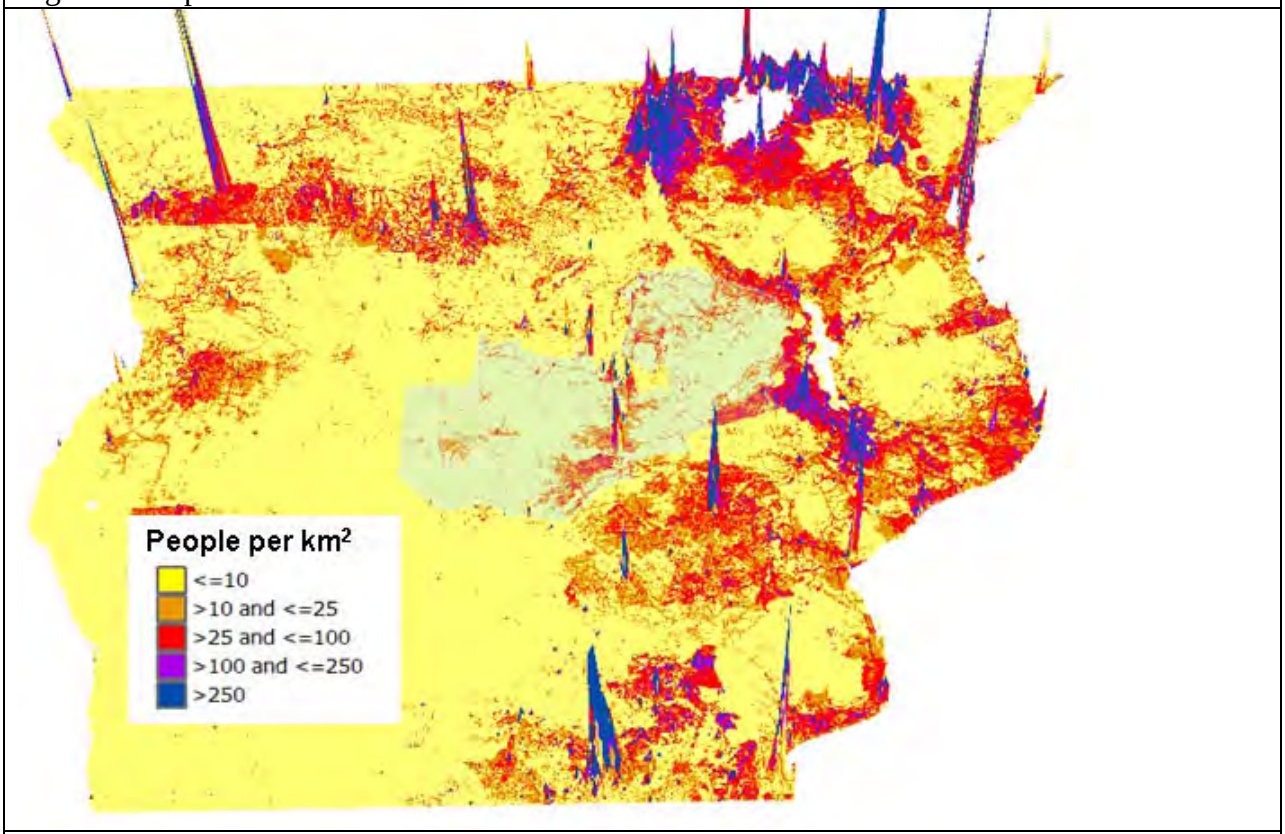
## Introduction

Natural resources, political borders, infrastructural investments and land allocation policies have all shaped the spatial distribution of population and economic activity in Zambia. Copper and related mineral deposits in the Copperbelt drove initial settlement of the mining towns there as well as the construction of a rail line from Livingstone to Lubumbashi. Allocation of large blocks of agricultural land along the north-south and TanZam rail lines attracted large scale commercial farming, beginning in the 1930s.

Superimposed on these natural and population resources are Zambia's political borders. Largely inherited, Zambia's political borders reflect demarcations made during a series of colonial era debates—the partitioning the central African copperbelt between Belgian and English European powers at the Berlin Conference in 1885, the integration of the Lozi Kingdom into Northern Rhodesia, and the breakup of the Federation of Rhodesia and Nyasaland. Today, Zambia belongs to two regional trade associations — COMESA and SAADC. Together, the spatial configuration of political, demographic and economic endowments shape economic incentives and opportunities throughout the region.

This policy brief examines the resulting spatial pattern of population, food production, consumption and trade. It summarizes and extends the results of a much larger working paper (Haggblade, Longabaugh and Tschirley, 2009). Discussion focuses on Zambia's two principal food staples, maize and cassava, using geographical information system (GIS) mapping techniques to explore issues affecting staple food production, consumption and marketing both in Zambia and within the broader subregion of South Eastern Africa.

Figure 2. Population Distribution in South Central Africa




Source: Landscan 2007 data base.

## Population

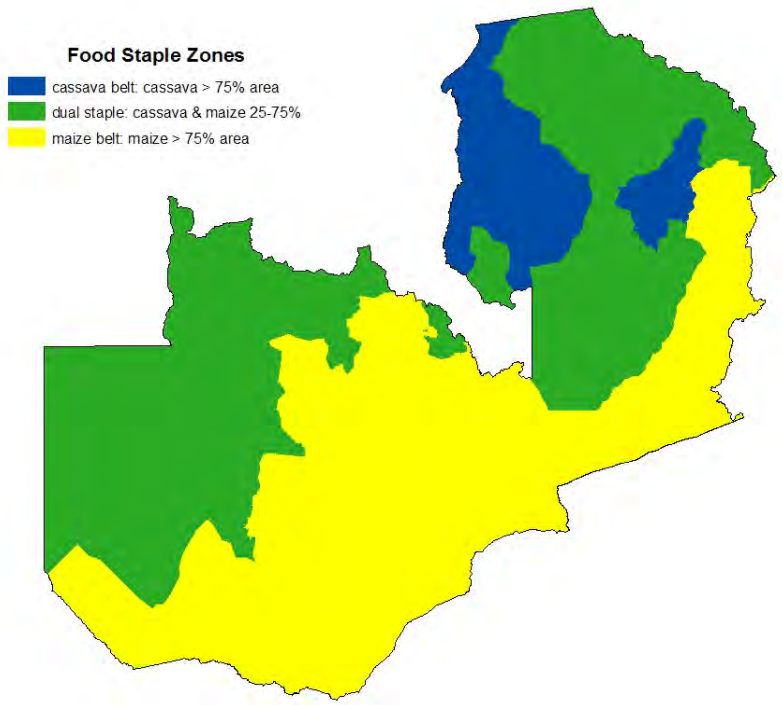
Despite the lowest population density in the region, Zambia's population clusters tightly in two main geographic areas: • along the line of rail running through the center of the country from Livingstone in the south to the Copperbelt cities in the north and • in densely populated Eastern Province, along the Malawian border (Figure 1).

Viewed in a regional context, Zambia finds large populations residing just across its border: • in the mining towns of southern DRC, • in the highlands of southern Tanzania, • throughout Malawi, • and in Zimbabwe (Figure 2). The proximity of these external population centers holds implications for staple food consumption, production and marketing within Zambia and throughout the region.

## Food Consumption

The composition of staple food consumption in Zambia differs across food staple zones, which we define based on the share of each crop in total cultivated area (Figure 3). These zones show a clear spatial pattern and correlate strongly with consumption patterns. In Zambia's northern cassava belt, caloric intake of cassava exceeds that of maize. In the dual-staple zones of northern and northwest Zambia, households consume roughly equal quantities of both cassava and maize. And in the maize belt of central, southern and eastern Zambia, maize consumption dominates staple food consumption (Table 1).

Figure 3. Food Staple Zones in Zambia




Source: Haggblade, Longabaugh and Tschirley (2009).

Table 1. Staple Food Consumption, by Food Staple Zone (kg/capita)

| | Food Staple Zone | | | National average |
|---|---|---|---|---|
| | maize belt | dual-staple | cassava belt | |
| Maize | | | | |
| rural | 161 | 92 | 57 | 124 |
| urban | 156 | 117 | 119 | 146 |
| national | 159 | 98 | 61 | 131 |
| Cassava (dry weight) | | | | |
| rural | 2 | 65 | 89 | 35 |
| urban | 3 | 26 | 38 | 9 |
| national | 3 | 56 | 87 | 27 |
| Maize plus cassava | | | | |
| rural | 163 | 157 | 147 | 159 |
| urban | 159 | 143 | 157 | 155 |
| national | 161 | 154 | 147 | 158 |

Source: Haggblade, Longabaugh and Tschirley (2009).

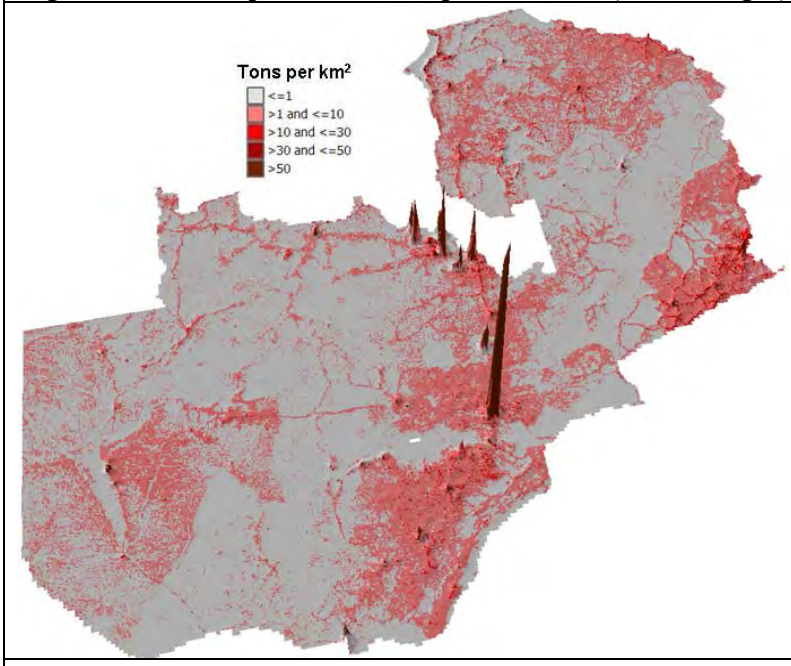
**Production and Sales**

Zambia's staple food production and sales likewise cluster spatially in three main areas: along the line of rail, in large commercial farming blocks of north-central Zambia, and to a lesser extent in Eastern Province (Figures 6 and 7).

As a result, significant export potential exists matching the large cereal producing blocks in north-central Zambia (particularly the Mpongwe and Mkushi farm blocks) with the nearby copperbelt cities of Zambia and the DRC. Given the close proximity of Lubumbashi and other DRC mining towns, Zambia's northern commercial farms are well-positioned to serve these external food markets. For this reason, Zambians have historically referred to Katanga Province of DRC and the tenth province of Zambia.

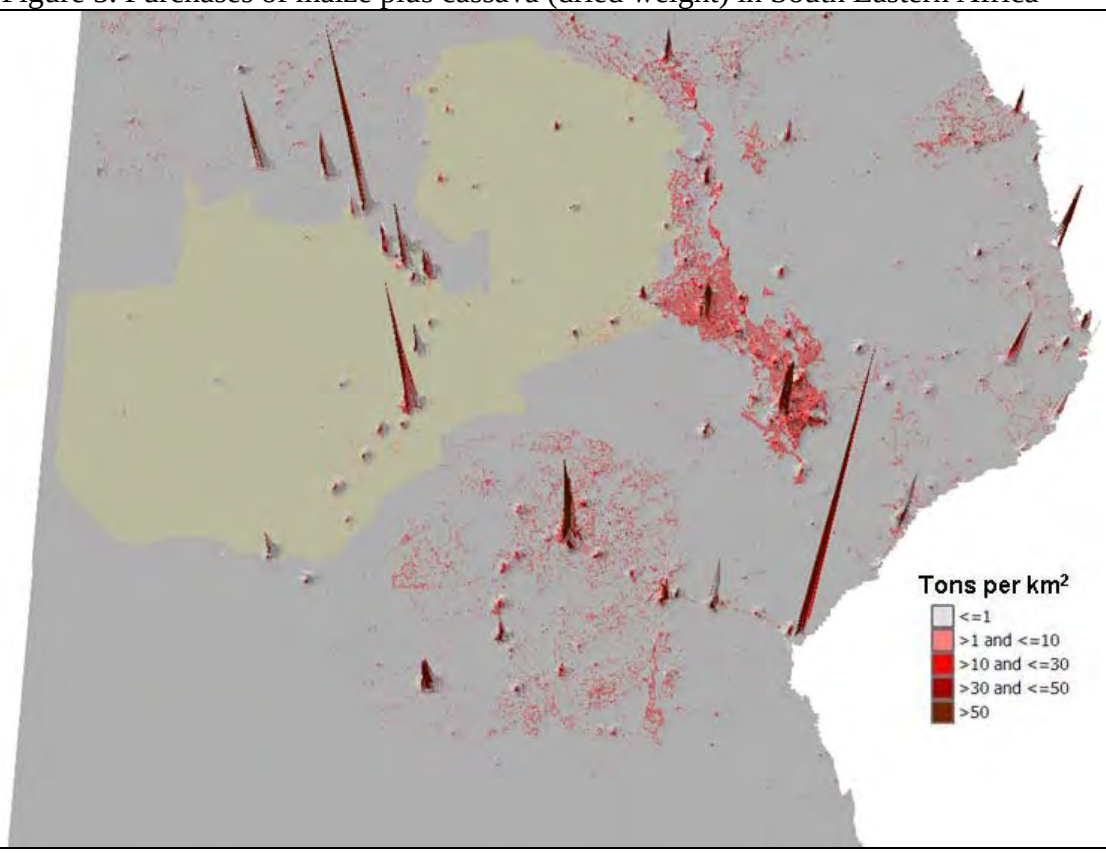
Conversely, large potential food imports may be available from cross-border suppliers in southern Tanzania, northern Mozambique and, eventually, from Zimbabwe (Figure 7).
The southern highlands of Tanzania, that country's most productive maize-producing region, lies far from coastal markets and is much better positioned geographically to serve deficit markets in Malawi, Zambia and DRC. Likewise, surplus food production from Tete, Nampula and Zambezia provinces of northern Mozambique are well-positioned to supply intermittent deficit markets in eastern Zambia, Malawi and Zimbabwe.

Figure 4. Consumption of maize plus cassava (dried weight) in Zambia



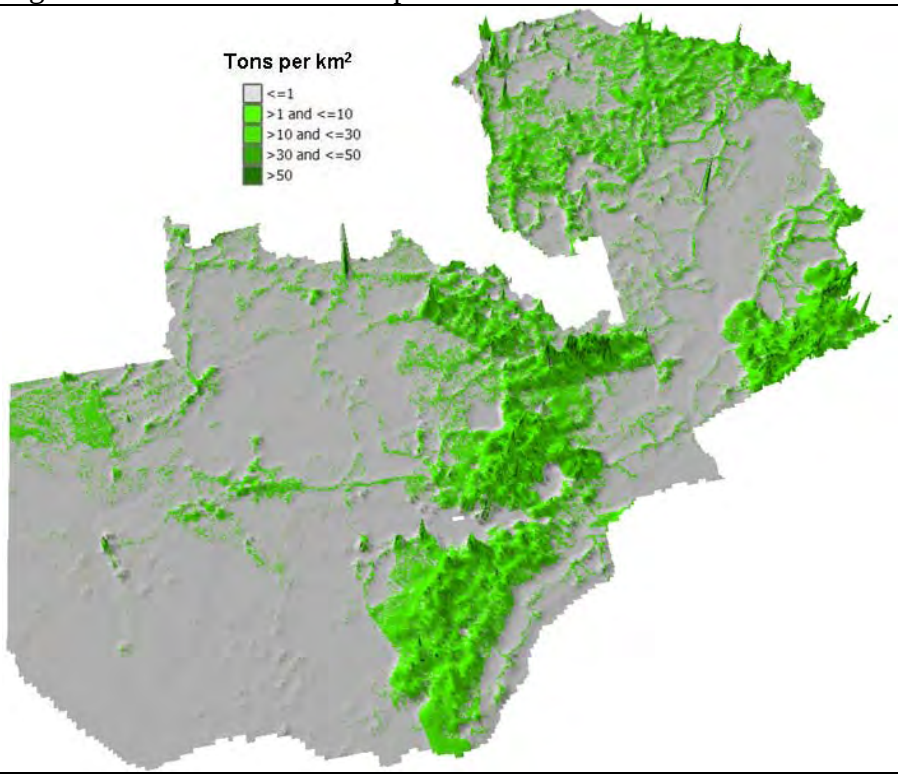

Source: Haggblade, Longabaugh and Tschirley (2009).

Figure 5. Purchases of maize plus cassava (dried weight) in South Eastern Africa



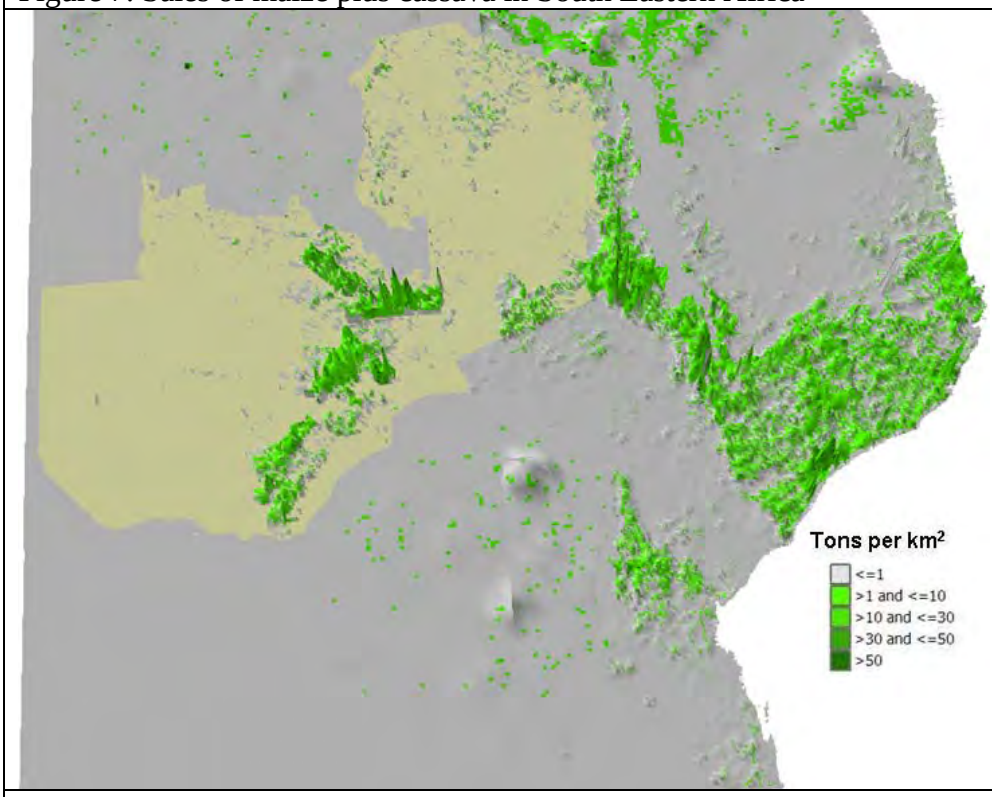

Source: Haggblade, Longabaugh and Tschirley (2009).

Figure 6. Production of maize plus cassava in Zambia




Source: Haggblade, Longabaugh and Tschirley (2009).

Figure 7. Sales of maize plus cassava in South Eastern Africa




Source: Haggblade, Longabaugh and Tschirley (2009).

## Regional Implications

These geographic relationships hold implications for policy makers involved in agriculture, food security and trade. Consider food security stocks. If the FRA sets its procurement price too high, they run the risk of procuring large volumes of Tanzanian and Mozambican grain. In 2006, for example, the FRA procured unusually large volumes of maize from border areas near Southern Tanzania and Tete Province of Mozambique (Table 2 and Figure 8). Many market observers believe that high procurement prices in Zambia have attracted informal maize imports from neighboring countries (Whiteside, 2003; The Post, 2007).

Under these conditions, agricultural policies aimed at stimulating staple food production and national food availability will need to recognize the proximity of surplus production zones nearby across international borders. A regional, spatial perspective thus becomes necessary for designing effective agricultural and food policies.

Trade policy also clearly matters. In normal and good harvest years, farmers in north-central Zambia are well-positioned to export maize and cassava northward, if given access to DRC markets. In bad years, Zambia requires food imports into its main cities. Southern cities import most economically from South Africa or Zimbabwe while Tanzanian farmers in the maize-surplus southern highlands are well positioned to supply Zambia, Malawi and DRC.

If Zambian farmers are to invest in productive capacity to serve neighboring external markets, they require consistent and predictable trade policies. In the absence of predictable export policies from Zambia, large Congolese buyers will be forced to seek alternate supply sources (mostly from South Africa) if Zambia proves an unreliable supplier of staple foods.

Figure 8. FRA Border Purchases of Maize, 2006

Source: FSRP (2007).

Table 2. High-Side Outliers Among Food Reserve Agency Purchases in 2006

| Province District | Marketed Volumes* 1999/2000 | 2002/03 | FRA Purchases 2006 |
|---|---|---|---|
| Eastern | | | |
| Chadiza | 1,391 | 1,586 | 28,257 |
| Nyimba | 1,133 | 486 | 10,088 |
| Northern | | | |
| Mbala | 5,962 | 6,406 | 20,386 |
| Nakonde | 1,545 | 4,521 | 11,704 |
| Total | 10,031 | 12,999 | 70,435 |

* Farm household estimates of total volumes of maize sold, including all sales to households, traders and to the FRA.

Source: FSRP (2007).

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