

**How Can We Avoid Another Food Crisis in Niger?**

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By Jenny C. Aker

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**ABSTRACT**

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With increasing concerns over the impact of higher global food prices on poor countries, lessons learned from previous food crises can be instructive. This research analyzes grain market performance in Niger during its 2005 food crisis. The research provides evidence that local grain markets are highly responsive to national and sub-regional production and price shocks. This suggests local early-warning systems should monitor the spatial impact of drought and prices in key national and sub-regional markets. In addition, policies regarding the impact of local purchases and regional trade need to be carefully examined and discussed.

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## **HOW CAN WE AVOID ANOTHER FOOD CRISIS IN NIGER? \***

Jenny C. Aker  
Post-Doctoral Fellow  
Center for Global Development.

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\*1776 Massachusetts Avenue, NW Suite301 Washington, DC 20036. Tel: (510) 219-1663. Email: [jaker@cgdev.org](mailto:jaker@cgdev.org). This research was partially funded by the Rocca Dissertation Fellowship, Catholic Relief Services, CARE, World Vision, the Ford Foundation, UC-Berkeley's CIDER, the World Bank and USAID. I am grateful to Ali Abdoulaye, Erin Baldrige, Ousseini Sountalma, Lisa Washington-Sow and the data collection team for their support and patience in Niger. I would like to thank Maximilian Auffhammer, Geert Beekhuis, Carlo del Ninno and Paul Dorosh for comments on theoretical and empirical issues. All errors are my own.

Since early 2008, a variety of international actors have expressed concern over higher global and regional food prices. The average world price for rice has risen by 217 percent since 2006, with wheat and maize prices increasing by 136 percent and 125 percent, respectively. The marked increase in global food prices can be attributed to a variety of factors, including a decline in global food reserves, increased demand in Asia, the production of biofuels, increases in fuel prices, and climatic shocks in several parts of the world. Food price increases have also been associated with violence: since January 2008, riots and demonstrations protesting higher food prices have taken place in numerous countries in West Africa, including Benin, Burkina Faso, Guinea, Ivory Coast, Niger, Senegal, and Sierra Leone.

Will higher global food prices translate into a regional food crisis in West Africa in 2008? This depends upon a variety of factors, including national and regional agricultural production, relative demand for imported and local goods, elasticities of demand and integration with global markets. As governments and international organizations reconsider how to manage future food crises in low-income countries, it is important to review the lessons learned from previous food crises. This research focuses on the case of Niger, a landlocked country in West Africa that was affected by a severe food crisis in 2005. Since Niger's rainfall patterns, agro-pastoral systems, and history of food crises are similar to those of other Sahelian countries in West Africa, the Niger case study is instructive for donors, international organizations, and host country governments who are preparing for potential food crises in 2008 and beyond.<sup>1</sup>

## **Drought and food crises in Niger**

With a per capita GNP of USD230 and an estimated 62 percent of the population living below the poverty line, Niger is one of the lowest-ranked countries on the United Nations' Human Development Index (INS 2005; UNDP 2008). Grains represent approximately 75 percent of per capita caloric consumption (INS 2005).<sup>2</sup> Annual rainfall ranges from 200-800 mm, with strong inter-annual fluctuations. While drought often coincides with lower levels of production and higher grain prices, drought does not always result in famine.

In 2004, Niger experienced a drought, followed by a reduction of its per capita staple grain (millet and sorghum) production of 12 percent as compared to the ten-year average. Millet prices were 25 percent higher than the ten-year average.



**Mother and child near Tanout, Niger. Photo credit: Frank de Ruiter for CRS**

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<sup>1</sup> The Sahel includes the countries of Burkina Faso, Cape Verde, Chad, The Gambia, Guinea Bissau, Mali, Mauritania, Niger, Senegal, and those countries in the Horn of Africa (Ethiopia, Sudan).

<sup>2</sup> Over 80 percent of caloric consumption in Niger comes from cereals, including millet, sorghum, fonio, rice and maize. Of these, rice accounts for less than 15 percent of total caloric consumption (INS 2005).

By June 2005, an estimated 2.4 million Nigeriens were affected by severe food shortages, with more than 800,000 of these classified as critically food insecure.<sup>3</sup> In 2000, a drought also occurred, with per capita grain production 21 percent lower than the ten-year average. Yet, according to the local early-warning systems, a severe food crisis did not occur in 2001.

Several sources blamed grain traders for the 2005 crisis. The *Washington Post*, for example, stated that “In (Niger) . . . the suffering caused by a poor harvest has been dramatically compounded by a surge in food prices and . . . profiteering by a burgeoning community of traders.”<sup>4</sup> Similarly, the Oakland Institute stated that the 2005 food crisis was a “free-market famine,” blaming higher prices on trader hoarding and lower national reserves. While these factors can contribute to higher prices, they do not explain why a food crisis occurred in 2005 and not in 2001. In addition, these claims could lead to well-intentioned but potentially harmful policies for responding to food crises in 2008.

## **Facts about grain markets in Niger**

***Fact #1. Grain prices in Niger fluctuate on an intra- and inter-annual basis.*** Grain prices in Niger are subject to a high degree of inter- and intra-annual variation. Figure 1 shows deflated average monthly grain prices in Niger and Nigeria between 1996 and 2006. High-production years in Niger are followed by relatively lower prices, and low-production years are followed by relatively higher prices. In addition, grain prices in Niger closely follow those in Benin and northern Nigeria, but not those in Burkina Faso or Chad. The seasonal variation of prices is also important. While the average intra-seasonal price difference for millet is 44 percent, millet prices increased by 89 percent between October 2004 and August 2005, and by 75 percent between October 2000 and August 2001. One of the key reasons for high price instability in Niger is the fairly inelastic regional supply of food, as climatic shocks in the sub-region are not easily offset by extra-regional imports.

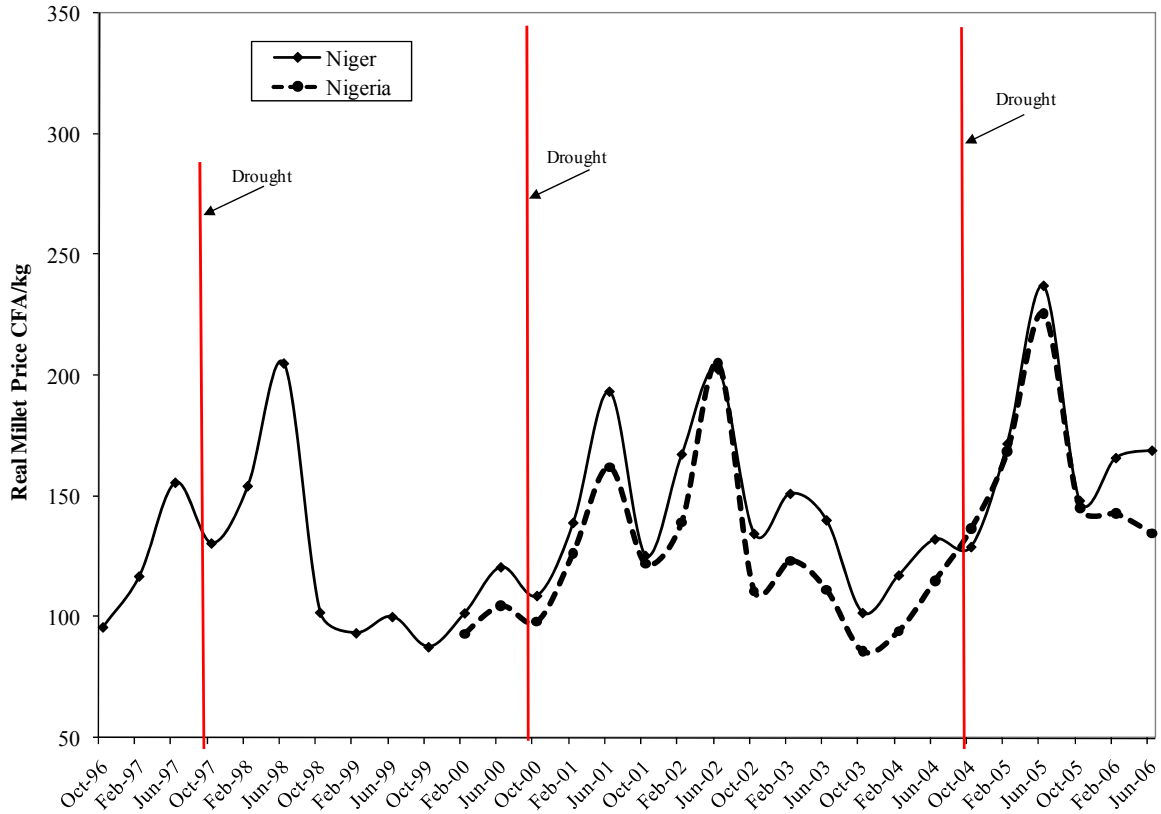
***Fact #2: Grain markets in Niger are well-integrated with markets in northern Nigeria and Benin.*** Staple food crop markets in Niger are relatively well-integrated, with an average correlation coefficient of .55 (Aker 2008b). On average, grain markets in Niger are more integrated during low production years, as traders, farmers and consumers buy and sell from more markets. The degree of integration between markets in Niger and border countries follows a similar pattern: markets in Niger are highly integrated with those in Benin and Nigeria, and are more integrated during drought years. This suggests that grain markets in Benin and Nigeria have important implications for grain market performance in Niger.

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<sup>3</sup> The gross mortality rate reached 1.5 deaths per 10,000 per day in targeted regions, whereas the mortality rate for children under 5 reached 4.1 deaths per 10,000 per day (Médecins sans Frontières 2005).

<sup>4</sup>“The Rise of a Market Mentality Means Many go Hungry in Niger”, *Washington Post*, April 11, 2005. Despite the implication that market liberalization occurred recently in Niger, the grain market was liberalized in the mid-1990s. In addition, trader census data between 2000 and 2005 suggests that grain markets are highly competitive.

**Figure 1. Average monthly grain prices in Niger and Nigeria, 1996–2006**



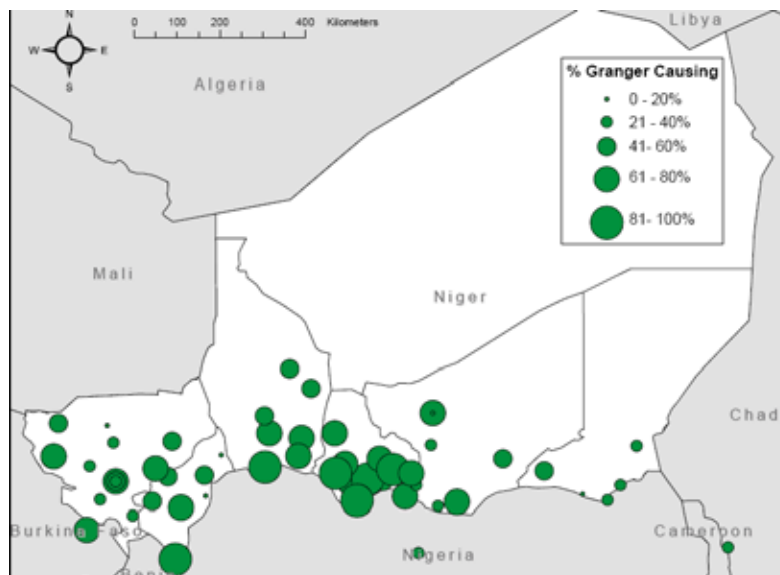
Note: Prices are deflated monthly grain prices in CFA/kg over a ten-year period. The red vertical lines represent the timing of drought.

**Fact #3: Grain prices in Niger respond to supply shocks in the Niger-Nigeria production basin.** Price movements within Niger follow well-defined paths: they start in production centers (the southeast) and spread across the country. This implies that grain prices in Niger respond to supply shocks, rather than demand shocks. Figure 2 shows the percentage of times that a market is useful for forecasting price changes.<sup>5</sup> Markets located in surplus regions of the country are useful for predicting price changes in a high number of markets in the country (Aker 2008b). In addition, markets in Benin and northern Nigeria forecast price changes in over 75 percent of the markets in Niger.<sup>6</sup>

<sup>5</sup> This forecasting technique used to generate Figure 2 is Granger causality. Granger causality tests use the following error correction model:  $\Delta P_{i,t} = \lambda_0 + \sum_{m=1}^3 \lambda_m \Delta P_{i,t-m} + \sum_{m=1}^3 \bar{\lambda}_m \Delta P_{j,t-m}$ . If price movements in market  $j$  precede price movements in location  $i$ , then the  $\Delta P_{j,t-m}$  terms should have a significant effect on  $\Delta P_{i,t}$ . The test is repeated for all pairs of markets, both ways. Figure 2 shows the results of those markets that Granger-cause other markets in Niger.

<sup>6</sup> Kano, an important grain market located in northern Nigeria, does not appear to be useful in forecasting millet prices in a significant number of markets in Niger. However, Kano plays an impact role in the sorghum and maize trade.

**Figure 2. Markets that forecast price movements in Niger**



**Fact #4. Niger needs to import, yet marketable surpluses depend heavily upon Nigeria.** In light of the strong intra-annual variation in staple food crop production, total food supply in Niger depends upon commercial imports, imported food aid and public stocks.<sup>7</sup> While Niger imports grains from its neighboring countries, Nigeria plays a dominant role: on average, Nigeria supplies 75 percent of Niger’s millet and sorghum imports and 35 percent of total maize imports. Consequently, potential and actual imports from Nigeria play an important role in grain market performance in Niger.<sup>8</sup>

**Fact #5. Storage is necessary . . . and apparently not excessive.** Since Niger’s agricultural system relies upon one agricultural season, storage is crucial for stabilizing domestic grain supply. Twenty percent of farmers sell their staple grain production after the harvest; consequently, traders either sell the product immediately or engage in storage (Aker 2008b). Nevertheless, traders store for a relatively short period in Niger, an average of 45 days during normal years and 30 days during the 2005 food crisis. This suggests that excessive hoarding was not a primary factor contributing to food price increases in 2005.



**Outdoor storage in Bakin Birgi, Niger. Photo credit: Frank de Ruiter**

<sup>7</sup> Millet is the dominant staple food crop in Niger, accounting for 76 percent of total grain production and 72 percent of net supply between 2000 and 2005 (World Bank 2008). Sorghum is grown primarily in the southern regions of Niger, accounting for 22 percent of cereal production and 20 percent of net availability during the same period. Rice production accounts for only 2 percent of total net availability of cereals, and is grown primarily in the Niger River basin.

<sup>8</sup> Unlike other countries in Sub-Saharan Africa, imported food aid has not played an important role in Niger’s total food availability since the mid-1990s. Between 1997 and 2007, Niger programmed both imported food aid and food aid from local or triangular purchases. Approximately 29,000 MT of food aid are imported annually (WFP 2005).

## Why a food crisis in 2005?

While droughts are often associated with production shocks in Niger, the relationship between drought and food crises is not well-understood. During the previous drought year (2000), staple food crop production was lower than in 2004, yet a severe food crisis did not occur. Consequently, understanding the factors that contributed to the 2005 food crisis is important for preparing for and responding to future food crises in Niger and the Sahel.

**Factor #1: A higher percentage of regions were affected by drought in 2004.** Most early-warning systems in Niger rely upon climatic indicators to predict potential food crises. Nevertheless, relying primarily upon national-level production indicators may not accurately indicate a potential food crisis. In 2000, only 15 percent of the departments in Niger experienced a per capita decrease of more than 50 percent. By contrast, in 2004, over 25 percent of departments suffered a per capita decrease in grain production of more than 50 percent.<sup>9</sup> This suggests that the percentage of departments affected by production shocks—as opposed to national-level production—is more relevant for grain market performance in Niger (Aker 2008b).

**Factor #2. Key production areas in Niger and Nigeria were affected by drought in 2004.** Since prices in Niger respond to supply shocks, drought in forecasting markets will have a larger impact on price levels. In 2004, the markets affected by drought were key forecasting markets in Niger and the sub-region. For example, average deflated millet prices in these markets were 17 percent higher in October 2004 as compared to October 2000.<sup>10</sup> This suggests that monitoring prices on these markets during the harvest period could have served as an indication of a potential food crisis.

**Factor #3. Prices were higher in northern Nigeria, making it unprofitable to import.** On average, domestic millet prices in Niger are lower than prices in Nigeria from October until May. This pattern changes between June and August, when prices in Niger are higher than those in northern Nigeria, thereby making imports profitable.<sup>11</sup> The situation in 2005, however, was markedly different. Figure 3 shows millet prices between Jibia (Nigeria) and Maradi (Niger) for several years (Aker 2008b). Millet prices in Nigeria were higher than domestic millet prices in Niger for the entire 2004–2005 marketing season, implying that it was unprofitable to import grains from Nigeria. While prices in Benin and Burkina Faso were lower than those in Niger during 2005, it is unclear whether sufficient quantities of grains could have been imported from these countries.<sup>12</sup>

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<sup>9</sup> During non-drought years, less than 3 percent of all departments experience a per capita decrease in grain production greater than 50 percent.

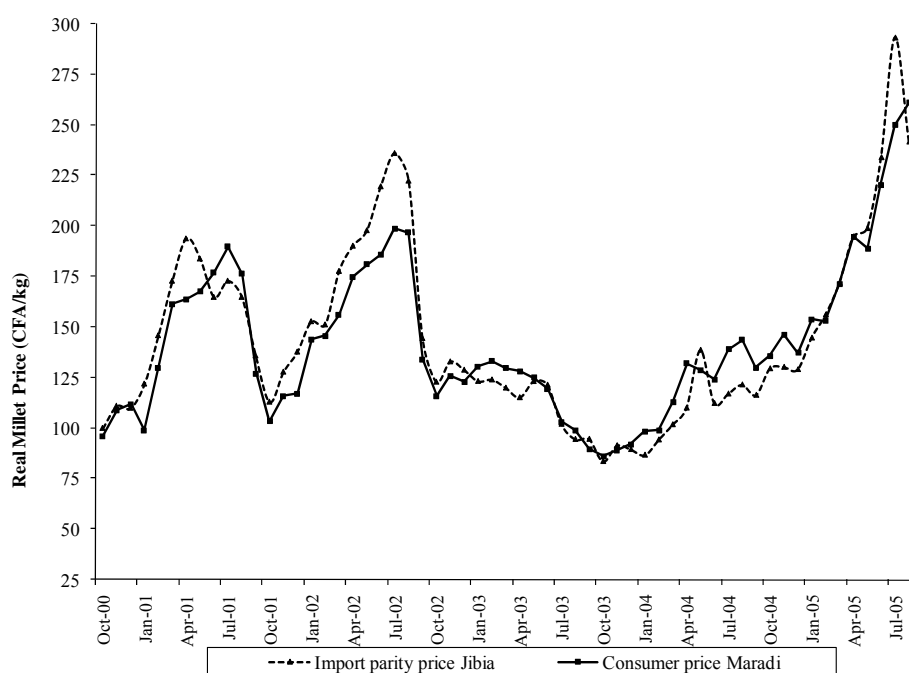
<sup>10</sup> The forecasting markets are those markets that Granger-cause more than 75 percent of markets in Niger: Gaya, Maradi, Guidan Roundji, Tessaoua, Tounfafi and Zinder (Niger); Jibia, Illela and Mai Adua (Nigeria); and Malanville (Benin).

<sup>11</sup> When looking at trade with Burkina Faso and Benin, net marketing margins are consistently positive, and there are fewer intra- and inter-annual fluctuations.

<sup>12</sup> Higher imports from Burkina Faso were unlikely, as the Government of Burkina Faso implemented a temporary ban on exports of cereals towards Niger in 2005.

**Factor #4: Grain Prices Reached Record Levels during the Hungry Season.** Average grain prices in 2004–2005 were 25 percent higher than the 10-year average, with grain prices representing more than 27 percent of per capita income by July 2005. This period also coincided with the height of the food crisis. Although grain prices in 2004–2005 followed a similar pattern to that of other drought years, prices increased significantly between June and August 2005. While there are several potential explanations for this price spike, the magnitude of the price increase during this period remains a puzzle (Dorosh 2008). As markets in Niger were very thinly supplied during this period, it is likely that the expectations of local purchases of food aid in surplus markets of Niger and Nigeria may have exacerbated the situation.

**Figure 3. Comparison of deflated millet prices in Niger and Nigeria, 2000-2005**



### What does this mean for 2008?

Based upon the lessons learned during the 2005 crisis, donors, international organizations, and host country governments should consider several factors when preparing for and responding to a potential food crisis in 2008. This section provides some recommendations in the short- and long-term.

**Recommendation #1: Local early-warning systems should look beyond national-level production indicators to analyze climatic shocks at the sub-national and sub-regional levels.**

In early 2008, a mission to Benin, Niger, and Nigeria noted that lower sorghum production and reduced stocks in Nigeria, combined with high global food prices, were factors of concern in the Sahel.<sup>13</sup> Since that time, local early-warning systems have been monitoring the situation for a

<sup>13</sup> CILSS/FAO/FEWSNET/SIMA/WFP. “Special Report: Markets, Prices, Food Situation and Prospects for Benin, Niger and Nigeria.” April 2008. Local millet and sorghum prices primarily follow regional fluctuations in supply and demand, rather than



potential food crisis. In addition to assessing national-level production, these early-warning systems should assess the spatial distribution of production shocks in Niger and northern Nigeria, with a particular focus on forecasting markets. Deflated prices on several forecasting markets in Niger and northern Nigeria in October 2007 were similar to the price levels of the 2004 harvest. These price data suggest that key markets were affected by shocks in 2007, as was the case in 2004.

***Recommendation #2: Local early-warning systems should monitor prices in the sub-region between June and September of each year in order to determine whether imports will be profitable.*** In 2005, grain prices in northern Nigeria were above those in Niger for the entire marketing season. In order to determine whether imports from Nigeria will be profitable in 2008, local early-warning systems should monitor grain prices on cross-border markets.<sup>14</sup> If prices in northern Nigeria are higher than those in Niger, this suggests that Niger would need to import from other countries. Between October 2007 and May 2008, grain prices in Nigeria were relatively higher than those in Niger, but they fell in June 2008.

***Recommendation #3: Host country governments, international organizations and bilateral donors should carefully consider whether local or triangular purchases are appropriate in 2008.***

In an effort to respond to a potential crisis in 2008, the government of Niger and international organizations have proposed a variety of interventions, including the subsidized sale of grains, free food distributions, cereal banks and Cash for Work (CFW). Many of these interventions involve the use of food aid, either via local purchases or imports. While local purchases have been strongly supported by the international community, it is not clear that they are always a first-best option. If local food supplies are thin, then such purchases can increase prices. Although the magnitude of these effects depends on the country-specific situation and the nature of the local purchase, in light of relatively higher food prices in the sub-region, governmental and international organizations using food aid should strongly prioritize imported food aid in the short-term. If this is not feasible, then such organizations should consider purchases from Benin, Mali, or Burkina Faso. If local purchases are required, then they should only occur in areas where production is significantly above average and should be limited in quantity (ie, less than



**Farmer in Dogondoutchi, Niger. Photo credit: Frank de Ruiter for CRS**

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international prices. While international price fluctuations are relevant for wheat, rice and maize, these are primarily consumed by urban populations in Niger.

<sup>14</sup> Prices should be compared between the following markets: Malanville (Benin)-Gaya, Illela (Nigeria)-Konni, Jibia (Nigeria)-Maradi, Mai Adua (Nigeria)-Zinder, and Kantchari (Burkina Faso)-Torodi.

5,000 MT). In all cases, grain prices should be monitored before and after the local purchase takes place.

***Recommendation #4. Donors, international organizations and host country governments should develop guidelines for local and regional purchases.*** Despite the increasing frequency of and interest in local and regional purchases, their effects on local markets are multiple, diverse and not well-understood. In addition, current guidelines on local procurement do not provide concrete recommendations on whether and how to conduct local purchases. In order to inform policy decisions and minimize potential negative impacts of local and regional purchases, a comprehensive “how to” guide is necessary. In the short term, this would require that all agencies involved in local purchases conduct impact evaluations of these interventions on local market performance, collecting pre- and post-data on price levels, market structures and quantities traded in purchase and recipient markets. In the medium to long term, these results should be used to develop comprehensive guidelines that provide (1) best practices and lessons learned; (2) specific criteria and/or conditions to assist international agencies, donors and host country governments in determining whether local purchases are appropriate during a particular year; (3) criteria for determining the appropriate quantity, geographic location and purchase prices if local purchases are appropriate. These guidelines should be adopted by governmental, international, and non-governmental actors engaging in food aid procurement and distribution in a particular country.

***Recommendation #5: Host country governments, donors, and international organizations should carefully consider the relative merits of food versus cash interventions.*** In recent years, cash-based interventions (cash transfers, cash vouchers, CFW) have been used with increasing frequency by international organizations in Niger and in other countries (WFP 2008). While cash-based interventions have advantages over food-based interventions, they can exacerbate an inflationary problem if sufficient goods are unavailable. In general, cash-based interventions are preferred if food is available on the local markets, distribution channels and marketing systems are functioning well, and there is little inflationary pressure (Jaspers 2006, WFP 2008).

***Recommendation #6: Donors, in collaboration with host country governments and development partners, should support initiatives that protect productive assets in the short term, while encouraging sustainable strategies for improved food production and marketing in the Sahel in the long term.*** Natural disasters, production shocks, and low agricultural productivity are not new concerns in the Sahel. In response to the global food crisis, donors and international organizations have supported initiatives to increase agricultural production in the Sahel (such as subsidized fertilizers). While short-term responses might be required to support food insecure populations in West Africa, they should not disrupt agricultural and marketing systems in the longer term. In addition, a focus on production—to the exclusion of marketing—will not resolve the Sahel’s food security problem. Increasing local and regional grain production will not necessarily transfer into higher incomes unless farmers receive higher prices for their products. This requires that the local, regional and international commodity value chains for these crops are competitive and efficient.

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