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# Rising Food Prices in Sub-Saharan Africa: Poverty Impact and Policy Responses

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## Abstract

The increase in food prices represents a major crisis for the world's poor. This paper aims to review the evidence on the potential impact of higher food prices on poverty in sub-Saharan Africa, and examines the extent to which policy responses will benefit the poor. The paper shows that rising food prices are likely to lead to higher poverty in sub-Saharan Africa as the negative impact on net poor consumers outweighs the benefits to poor producers. A recent survey shows that the most common policy response in sub-Saharan African countries is reducing taxes on food while outside the region price controls or targeted consumer subsidies are the most popular

measure. Sub-Saharan African countries also have a higher prevalence of food-based safety net programs which are being scaled up to respond to rising prices. The review suggests that the benefits from reducing import tariffs on staples may accrue largely to the non-poor. Social protection programs show more promise, but geographic targeting is likely to be crucial in ensuring that benefits reach the neediest. The paper also argues that anti-poverty interventions ought to retain their focus on rural areas where poverty remains highest even after taking into account the adverse impact on the urban poor due to the rise in food prices.

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# **Rising Food Prices in Sub-Saharan Africa: Poverty Impact and Policy Responses<sup>1</sup>**

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## 1. Introduction

From 1974 to 2005 food prices on world markets fell by three quarters in real terms. Recent price increases have reversed this trend. Since April 2007, wheat prices have doubled and almost every crop (maize, milk, oilseeds, etc.) is at or near a peak in nominal terms. Rice prices tripled between January and April 2008. There are differing views on the relative importance of the main factors which have driven prices up. However there is a general consensus that a combination of policy decisions (export bans by key wheat and rice producers and the use of foodgrains to produce biofuels) and global market trends (higher energy prices, a depreciating dollar and increased foodgrain demand) have been the main causes (Mitchell 2008).

Rising world prices have different pass-through effects on domestic prices depending on import trade regimes, price controls and domestic market structures. While these pass-through effects vary considerably, it is clear that higher inflation has become a major socio-political issue and has led to social unrest across all continents (examples include Uzbekistan, Mexico, Pakistan and Cameroon). There have been significant increases in food price inflation in 2007/08 ranging from the Kyrgyz Republic (32%) to Vietnam (26%) and Chile (16%). In countries from the West African Economic and Monetary Union where inflation has traditionally been low, several countries have experienced double digit inflation, with significantly higher increases in food prices. This higher inflation has led to concerns that poverty might increase substantially and rapidly in many countries (FAO 2007; World Bank 2008a). Recent analysis of the potential impact on the poor of higher food prices has confirmed these fears (e.g. Ivanic and Martin 2007)<sup>2</sup>. Beyond the immediate impact of higher food prices on the cost of the food purchased by households, there is evidence that higher overall inflation hurts the poor the most (Easterly and Fischer 2001; Ravallion and Datt 2002).

The current crisis could have long-term negative effects. If higher food prices lead to lower caloric intake and an increase in child malnutrition, this could have additional negative effects (e.g. Del Rosso 1999; Alderman et al. 2006). There is also evidence that when households are faced with large negative shocks, they may sell their productive assets such as seeds and livestock, thereby jeopardizing their future earnings prospects (Carter et al. 2004; Fafchamps et al. 1998; Jalan and Ravallion 2002; Lokshin and Ravallion 2000; see also World Bank 2008b for a discussion).

The policy responses which countries have used to address the current crisis are essentially three fold (Zaman et al. 2008). The first are “economy-wide” policies to stabilize domestic food prices that are clearly important since the ability of households to shift consumption patterns is especially limited for staple foods (Tyers and Anderson 1992). The second are social protection and human development

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<sup>2</sup> On the issue of the impact of changes in prices on the poor, there is a related literature focusing on the impact of trade reforms (see among others Chen and Ravallion, 2004; Hertel and Winters, 2006; Hertel et al., 2004).

programs which are meant to cushion the impact of higher prices on the poor (World Bank 2008b). The third are programs and policies to boost domestic food production both over the immediate and medium run.

The present paper seeks to provide evidence on a few questions arising from the rise in global prices with a focus on sub-Saharan Africa. First to what extent have the poor in Africa been affected by these price rises? Second what types of policies have been put in place and how do responses in Africa differ from the rest of the world? Third, to what extent are the policies implemented in Africa targeted to the poor and how can they be improved?

The paper is divided into two main sections – poverty impacts and policy response. It starts by discussing a standard methodological approach to estimating the poverty impact of rising food prices. It then moves to presenting estimated changes in poverty due to higher prices, focusing on recent work in several African countries. This ‘poverty impact’ section concludes by illustrating the relevance of using poverty maps to show how the impact of these price rises varies within a country. The policy response section begins by comparing the way sub-Saharan African countries are responding to rising food prices with other countries. It also discusses the merits of possible policy responses by examining the extent to which three common responses – reducing import tariffs and expanding feeding and public works programs – benefit the poor.

## **2. Assessing the Distributional and Poverty Impact of Price Rises**

### **2.1. Methodological Issues**

The analysis of the distributional impact of price rises follows a simple methodology outlined by Singh et al. (1987) and Deaton (1989, 1997). Deaton (1989) defines a ‘net consumption ratio’ as the elasticity of the cost of living with respect to changes in prices. For net producers this elasticity is negative and for net consumers it is positive. In his work in Thailand Deaton showed that middle class farmers benefited most from a price rise relative to either the poorest or wealthy rural households. These methods were subsequently applied among others by Barret and Dorosh (1996) using data from Madagascar, Budd (1993) in Cote d’Ivoire and Klytchnikova and Diop (2006) in Bangladesh. The argument made is that the non-parametric techniques implicit in Deaton’s methodology do not impose any structure on the data and hence make full use of the information available. Analyses of the recent food price rises also use this method as well as simple summary statistics (Ivanic and Martin 2008 and Wodon et al. 2008a).

Deaton’s framework can be summarized as follows. The change in welfare following a change in prices for a household is:

$$\Delta w_i = \Delta p [(PR_i - CR_i) + \eta L_i]$$

where  $\Delta w$  is the welfare effect expressed in percentage terms of the baseline income or consumption level of household  $i$ ,  $\Delta p$  is the percentage change in food prices (this can be estimated for one or more food consumption items),  $PR$  is the food production ratio (at the aggregate level for a household, this can be proxied by the household's agricultural sales divided by its total income or consumption, but it is also feasible to analyze this variable for various food items one by one),  $CR$  is the food expenditure ratio (which at the aggregate household level is captured by the household's food consumption divided its total income or consumption, but again this can also be examined for each specific food item separately), and finally  $\eta$  is the wage rate elasticity with respect to food price changes and  $L$  is the labor share in total household income or consumption.

The interpretation of the above equation is straightforward. If a household is a net seller of food (in the aggregate or for any specific food item)  $PR$  will be larger than  $CR$  and the household will benefit from the price increase. By contrast, if the household is a net purchaser of food, the first term in the above equation will be negative. As to the second term, it captures the potential compensating effect of higher wages, for example for those households who have some of their members providing wage labor in food-producing farms. While the framework is very simple, there are a number of implicit assumptions embedded in it that we will need to carefully consider. There may also be issues with estimating the variables in that equation. For example, depending on data availability we can estimate the wage elasticity directly or use a range of plausible estimates from other work and carry out sensitivity analysis. In the absence of good estimates of these wage elasticities (especially in sub-Saharan Africa), researchers may also decide to compute short-term effects by not including the potential gains through wages. Following Deaton's methodology, beyond statistical point estimates of the impact of higher food prices, one may also estimate non-parametric kernel regressions by location, by net market position, by occupation etc.

The distinction between the short and long run impact of price rises is also important. Ravallion (1990 and 2000) uses data from Bangladesh and India to argue that while in the short run the rural poor are adversely affected when the relative price of food rises, the impact in the long run can be neutral after adjusting for changes in wage rates. This result is due to the increased price elasticity of the wage rate to the price of foodgrains in the long run. However, the extent to which wages do in fact respond to changes in food prices has been called into question by Rashid (2002). Using time series data the author argues that since the mid-eighties changes in rice prices have had a negligible impact on agricultural wages in Bangladesh. Using data from a number of African countries, Christaensen and Demery (2006) extend this analysis of second-round effects by including an additional effect of increased farm productivity arising from the increase in price of food staples. Their main conclusion is that policies leading to higher food prices are likely to increase poverty, even after factoring in countervailing wage and productivity effects.

A limitation with using partial equilibrium analysis to assess the impact of price rises is that it does not take into account the economy-wide impacts of changes in relative prices. There are different ways to look at the issue, starting from simple simulations using Social Accounting Matrices (SAMs) to more complex Computable General Equilibrium (CGE) models. SAMs have for example been used to trace the multiplier effects of the recent price shocks in Africa (e.g. Nganou et al. 2008; Parra and Wodon 2008), but before reaching any firmer conclusions it would be better to have the results of more complex CGE models that can accommodate induced impacts such as changes in labor markets, the knock-on impacts on other industries from changes in wages in selected sectors, and the effects on outputs and prices of these industries. It is because only limited work on the impact of the recent food price crisis has been done to date with CGEs in sub-Saharan Africa that we focus the following discussion of the African experience on simple partial equilibrium analysis.

By contrast, much more CGE work is available for Asian countries. For example, a CGE model was used in Indonesia to assess the impact of changing rice tariffs (SMERU 2003). The results suggested that the overall welfare impact from the proposed change in rice tariffs was small in relation to average household income, but that this effect varied significantly across household groups. Specifically the increase in real wages for unskilled workers was insufficient to make up for the increased living costs for the poor. Imports of rice were actually banned in Indonesia after 2004. Warr (2005) found that the ban raised the price of domestically produced rice which led to an increase in poverty (see also Timmer and Dawe 2007 on the Asian experience with rice policies). Another paper on Indonesia by Sumarto et al. (2005) suggests rice subsidies helped to reduce household vulnerability (see also previous research on Indonesia by Ravallion and van de Walle 1991). In Vietnam, Niimi et al. (2004) and Minot and Goletti (2000) found that liberalizing rice exports helped reduce poverty due to higher production and despite an increase in domestic prices.

## **2.2. *Global Estimates***

Clearly, an increase in food prices will have uneven impacts across countries and population groups. At the macroeconomic level, countries that are net food exporters will experience improved terms of trade, while net food importers will face increased costs in meeting domestic demand. There are about four times more net cereal-importing countries in the world than net exporters (IFPRI 2007). Almost all countries in sub-Saharan Africa are net importers of cereals, and therefore likely to be affected negatively. The vulnerability of poor households is also related to the extent that locally consumed staples are traded on international markets. This varies from 24% in Ethiopia to 64% in Vietnam (World Bank 2007).

Price rises hurt net consumers of food and the 2007 World Development Report provides estimates on the share of households who are net sellers or buyers of staple food. The data suggest that in four out of

seven surveyed countries (Bolivia, Ethiopia, Bangladesh and Zambia) the poor are net consumers, while in three others (Cambodia, Madagascar and Vietnam) they are net producers. Most other empirical analyses suggest that the poor are net consumers (e.g., Poulten et al. 2006; Christiansen and Demery 2007) and therefore would be hurt from an increase in food prices. The urban poor are clearly in most cases net consumers and are likely to be adversely affected by an increase in food prices. Urban wage rates are also unlikely to adjust to increases in food prices, at least in the short run. Effects on the rural poor are likely to be more country-specific but on average they are worse off when prices rise. This is due to the fact that the poor in rural areas are often constrained by small landholdings, input costs and distance to markets, and hence are generally unable to produce the marketable surplus required to exceed their food expenditures.

Ivanic and Martin (2007) use household survey data for several countries and apply the Deaton framework to estimate the poverty impact of global price changes for seven key staples between 2005 and 2007. They also use a CGE model to simulate the increase in wages for unskilled agricultural labor that would follow from the food price increase under various assumptions. Their results show that the effects of rising commodity prices on poverty differ considerably between countries and commodities, but that poverty increases are considerably more frequent and larger than poverty reductions. Urban households are typically hit harder than rural households, though many in rural areas are also net consumers of food and therefore adversely affected by price rises. The average impact of a 10% increase for seven key food items is to raise the poverty headcount ratio by 0.4 percentage point.

In addition to the simulated 10% price shock, the authors also produce rough estimates of the poverty impact of the global food price increases between 2005 and 2007. The variations across countries are clear – with large poverty increases in Nicaragua, Zambia, Pakistan, and Madagascar and poverty reduction in Peru and Vietnam (where a significant number of poor households are net rice producers). Moreover they show that the effect of a relatively small 10% change in prices can be a first order approximation for the impact of a larger change but some results vary significantly depending on the extent of clustering of households around the poverty line. In rural Peru, for instance, the impact of a 20% price rise on the poverty headcount is five times greater than that of a 10% rise. If one were to derive global estimates of the poverty impact of rising food prices by generalizing the results from these eight countries the results would depend significantly on assumptions of the extent to which global prices are passed through to domestic consumers. A pass-through rate of 0.66, for example, translates into a 4.5 percentage point increase in the \$1/day poverty headcount ratio, or an additional 105 million people in poverty. On the other hand, if we assume the pass-through rate is only 0.33 there would be an additional 45 million poor people. Clearly, there are caveats to this analysis. Aside from price pass-through rates which generate vastly different estimates global estimates are based on the somewhat heroic assumption that these eight countries are representative of the world population.



The impact on the poverty headcount only conveys part of the story of the impact of these price rises. A recent paper shows that 88% of the increase in urban poverty depth due to the global increase in food prices is from poor households becoming poorer and only 12% from households falling into poverty (Dessus et al., 2008). This is consistent with evidence from the Indonesian financial crisis in the late 1990s where the impact on poverty depth was higher than on the headcount (Skoufias et al., 2000), as well as with the evidence provided for West and Central Africa by Wodon et al. (2008). Hence, policy responses ought to focus less on identifying the ‘new poor’ and more on scaling up anti-poverty interventions for the existing poor. Moreover the strains caused by higher food prices may lead to distress sales of assets which will aggravate chronic poverty. There is evidence that, over the medium run, households adjust their production and consumption in the face of higher prices (Deaton 1997, Porto 2005). In the short run, households smooth their consumption by increasing their labor supply and drawing down their savings. However, when families have to disinvest in their livelihoods—eating their seed grain, selling their animals — they will be challenged to rebuild their earning capacities and increase the risk of chronic poverty. Inadequate credit markets can exacerbate these constraints<sup>3</sup> as the poor are often forced to borrow from moneylenders at high rates of interest.

The costs to human development outcomes particularly for poor children may be irreversible. As households face shocks to their real income, they eat less and switch from more expensive sources of protein such as fish, meat, and eggs to cheaper coarse cereals. This switch will cause micro-nutrient deficiencies (in iron, iodine and essential vitamins). The poor, moreover, will be forced to cut back on calorie intake, leading to weight loss and acute malnutrition. Evidence from economic crises in the past has shown that the most susceptible are children under 24 months of age, pregnant and lactating women, and those already suffering from malnourishment (Alderman et al 2006, Pongou et al 2005). The adverse impact of shocks on schooling is also well documented (Escobal et al 2005, Duryea 2006). Evidence from a recent survey in Bangladesh suggests that about half the households surveyed reduced spending on education to cope with rising food prices. Policy responses to minimize the potential effects of higher food and fuel prices on schooling are thus essential as even a temporary gap in attendance can impose serious costs in a child’s educational attainment.

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<sup>3</sup> Adequate access to credit can help families avoid negative coping strategies, but the poor often lack access to credit or have access only on particularly onerous terms (for example, from moneylenders). Where credit is available, it can lead to large indebtedness, which can have repercussions on family welfare for years to come.

### 2.3. *Estimates from Sub-Saharan Africa*

A review of the poverty impact work carried out in sub-Saharan Africa suggests that we currently have more evidence for West and Central Africa than other parts of the region. The Deaton framework was applied to more than a dozen West and Central African countries to simulate the poverty impact of a range of price increases of key imported staples by Wodon et al. (2008a). The authors consider only the short term impact on poverty of higher food prices, as estimated by looking at the consumption and production of food by households, without taking wage effects into account. For comparability purposes, all the simulations are based on the same price increases – 25% and 50% - for all countries and food items (the detailed country studies consider many other intermediate price changes and are based on country-specific poverty lines). In order to provide poverty estimates, as for other work, a number of assumptions are made in the analysis. For example, the authors assume that the cost of an increase in food prices for a household translates into an equivalent reduction of its consumption in real terms. This means that they do not take into account the price elasticity of demand which may lead to substitution effects thereby helping offset part of the negative effect of higher prices for certain food items.

Importantly, the authors present estimates using both the standard Deaton methodology where both consumers and producers face the same price increases, as well as a variant of this where only consumers are assumed to face this price increase. In Africa, at least two factors may dilute the impact of rising global prices on the domestic prices which local farmers face. First, market intermediaries may be able in some cases to keep a large share of the increase in consumer prices for themselves without paying farmers much more for their crops. Second, poor physical connectivity in many countries also contributes to the sluggish transmission of global price changes to local producers (Benson 2008). Since this price transmission factor is difficult to assess the authors present estimates obtained when considering only the impact on consumers as an upper bound of the impact of the rise in prices on poverty, and interpret the results obtained when factoring in a proportional increase in incomes for net sellers as a lower bound of the impact.

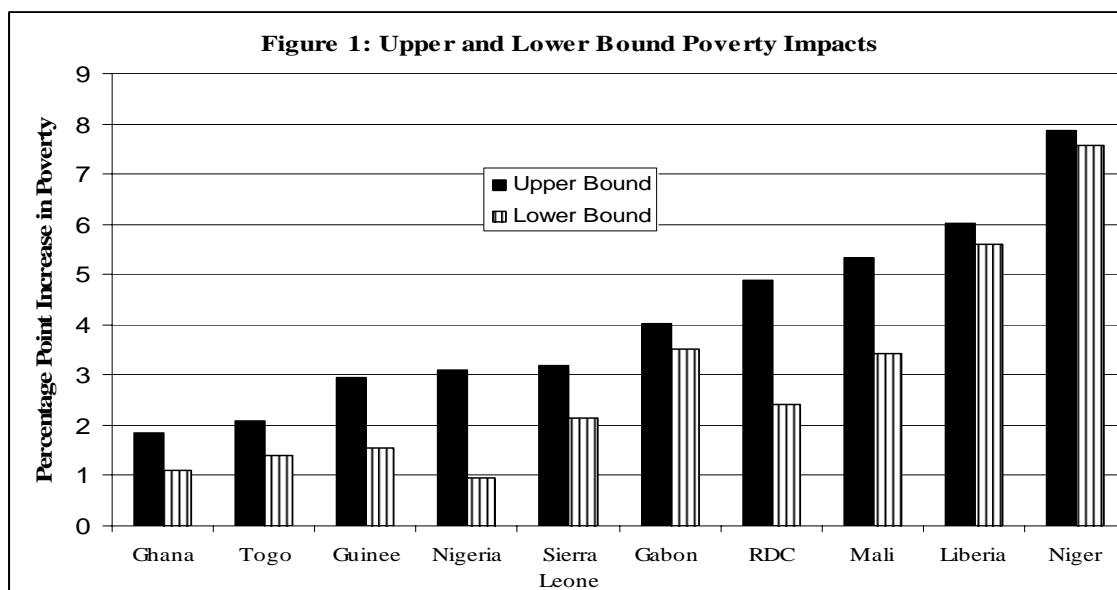
Another factor that may limit the benefits of higher food prices for farmers is the fact that the cost of inputs such as fertilizers is rising as well in part due to higher oil prices. Even if the increase in input costs for farmers does not affect the prices paid to them, it does affect their profit, which is ultimately what matters for welfare and poverty analysis. This increase in input costs is another reason why when simulating the potential impacts of changing economic conditions on poverty, impacts obtained by considering food price changes for both consumers and producers should be considered as a lower bound, with the consumer side effects only taken as an upper bound.

At the national level, upper bound estimates obtained by Wodon et al. (2008a) suggest that the increase in the headcount index of poverty following from a 50% increase in selected food prices varies from 1.8 percentage point in Ghana to 9.6 points in Senegal. The differences in impacts are due in part to

the fact that the sets of goods considered for the simulations in various countries represent different shares of total consumption. In Ghana the staples included in the analysis account for 8% of total consumption versus 21% in Senegal. Another factor that affects the magnitude of the impacts is the degree to which the diet of the population is diversified. This is important because the increase in food prices has been concentrated (or at least has been steeper) in a few internationally traded commodities such as rice. In a country such as Liberia, where much of the diet is based on rice, the impact of the increase in food prices on poverty is greater than a country like Uganda where there are multiple staple food items (Benson 2008).

As discussed in more detail below, impacts vary not only between countries, but also between urban and rural areas within countries. In many countries, poverty impacts are larger in percentage points in urban than in rural areas, but this is not always the case. In Ghana, Senegal, and Liberia, the poverty impact is actually larger in rural areas than in urban areas. In Ghana, this is essentially because poverty is low in urban areas in comparison to other countries. As Ghana's urban population is better off, only a small percentage of urban dwellers fall into poverty with the price shock. In Senegal and Liberia, this is in part because a large share of food consumption in the country is imported, so that rural households are not protected to the same extent from the price shock through production for auto-consumption. Moreover, the authors find typically that poverty impacts are largest in urban areas outside of the capital again because in the capital, households tend to have higher consumption levels so that they can better cope with the shock.

With a 50% increase in prices the average increase in the poverty headcount is 4.4 percentage points when only the impact on the consumer side is taken into account. This falls to 2.5 percentage points when the positive impact on producer incomes is accounted for. Figure 1 provides a comparison of the upper and lower bound estimates at the national level (Senegal is not included in the Figure because the survey does not include data on producers, so that the lower bound impact cannot be estimated). The differences are smallest for Niger, Liberia, and Gabon. These are three countries with substantial net imports of food. In addition, in Liberia and Niger, while local food production is important, much of this local production is auto-consumed, and thereby is not taken into account either in the upper or in the lower bound poverty estimates. In urban areas, the average upper bound impact across all countries is 5.2 percentage points, and this falls to 3.7 points with producer gains. This drop may appear to be large, but many urban households are net producers of food, especially outside of the capital cities. In rural areas, the average upper bound impact is 4.1 points, falling to 2.2 points when factoring in producer gains. These impacts are large. For example, an average 3.5 percentage point impact at the national level for all of sub-Saharan Africa, which has a total population of more than 800 million, would imply that the food crisis could lead to an increase in poverty of close to 30 million persons. In addition, all households who are already in poverty would be even poorer.



Source: Wodon et al. (2008a). Impacts are estimated for a 50% increase in food prices.

There is also some evidence of the food price impact in East Africa. Loening and Oseni (2007) focus on the extent to which various groups in Ethiopia are affected by the increase in food prices between 2000 and 2007. This is again carried out by assessing whether households are net producers or consumers and estimating a labor wage response to these changed prices. The analysis shows that the poorest households, even in rural areas, will be adversely affected by rise in prices. However the average rural household will benefit with an increase in welfare of about 4% due to the food price rises between 2000 and 2007. By contrast the real income of urban households will fall by 8%. The interface between conflict, rising food prices and droughts is particularly dangerous. It is estimated that approximately 15% of the Ethiopian population require emergency food aid particularly those in the Eastern part of the country where a mix of drought and civil conflict have led to widespread food insecurity. In Somalia, between one-third and a half of the population are facing serious food shortages. Due to rising food prices many are now either skipping meals or switching to cheaper cereals (World Bank 2008a).

In contrast, analysis carried out in June 2008 in Uganda suggests that the country has remained relatively insulated from the global food price rises although staple prices are showing a gradual upward trend (Benson 2008). A diversified staple diet, with a large share of staples derived from local products (matooke, tubers and potatoes) is a key factor behind the moderate trend in local food prices. The author assesses which types of households are most at risk and argues that those for whom maize constitutes a large share of calorie intake are potentially vulnerable. Maize is the one staple crop which is affected by international price changes, and constitutes 16% of the average Ugandan calorie intake. However for the

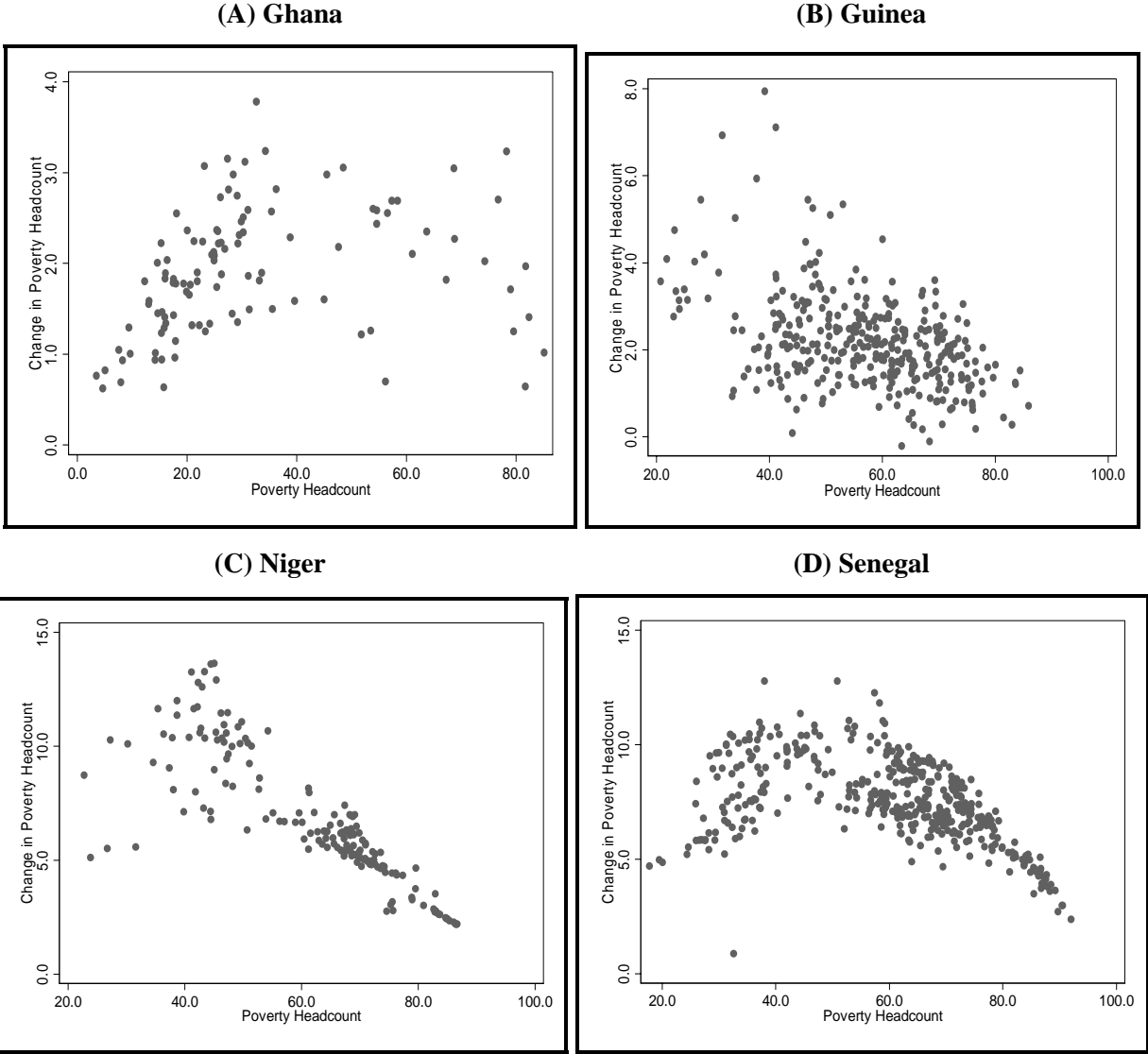
urban poor maize is 26% of the diet and for Internally Displaced People in World Food Program camps it is 41% of their calorie intake.

#### **2.4. *Using Poverty Mapping Techniques to Assess Local Impacts***

The above analysis considers likely poverty impacts of higher food prices at the aggregate national, urban, or rural level. In some cases a distinction is made for the capital city. Yet it is also feasible to look at disaggregated impacts using poverty mapping techniques to assess which geographical areas are most affected by rising prices. As discussed by Elbers et al. (2003), the idea behind poverty maps is straightforward, but its actual implementation is complex. Essentially, a regression is estimated using household survey data and its key parameters used to predict the level of consumption of all households listed in a census. These predicted household expenditures are then used to construct poverty indicators for small geographic population subgroups. To assess how the increase in food prices is likely to affect households living in various areas of a country, Coulombe and Wodon (2008) complement existing poverty maps with new maps relying on a revised consumption aggregate that takes into account the impact of the price increase. By comparing the initial poverty map with the revised poverty map based on the new consumption aggregate, one obtains estimates at a disaggregated geographic level of the impact on poverty of the price shock.

The relationship between initial poverty and the change in poverty by area is visualized in Figure 3 for four countries: Ghana, Guinea, Niger, and Senegal. The scatter plots provide the initial level of poverty (measured through the headcount) on the horizontal axis and the change in poverty due to the increase in food prices on the vertical axis. Only upper bound impacts are provided here (the lower bound impact results are in most cases similar). In Ghana and Senegal, the authors find evidence of an inverted-U relationship between the change in poverty and the initial level of poverty. For areas with very low poverty measures, the impact of the food crisis is not very large, as most households are not poor and able to cope with the shock. For the very poor districts, the impact is also not very large, because many households are protected from the increase in prices because they are net sellers of food or rely in large part on auto-consumption in order to meet their basic food needs. The areas most affected are those who are in the middle-ground with initial poverty levels in the 30% to 60% range (many of these areas are urban). In the other two countries, there is however a clear negative relationship between initial poverty and the change in poverty suggesting that the hardest hit areas are not the poorest.

**Figure 2: Change in Poverty and Initial Poverty in four West African Countries**



Source: Coulombe and Wodon (2008).

Impacts differ substantially between areas, which poses a dilemma for policy-makers. On the one hand, the desire to help households cope with the increase in food prices may lead policy-makers to implement safety net interventions in the hardest hit areas. On the other hand, these hard hit areas are not among the poorest in the country. Hence the effectiveness of the country’s overall poverty reduction strategy may be jeopardized if public resources are diverted from the poorest areas to less poor areas to address the food crisis. We turn in more details to the issue of policy responses to the food crisis in the next section.

### **3. Policy Responses to Rising Food Prices in Sub-Saharan Africa**

#### **3.1 *Typology of Policies***

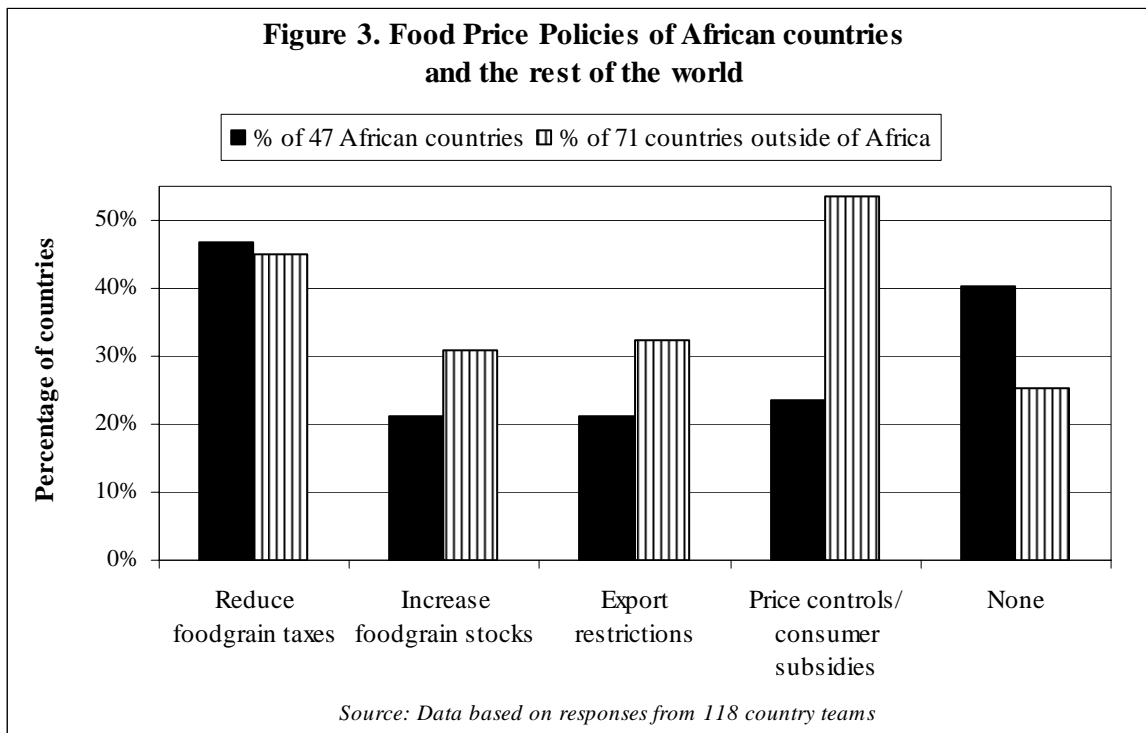
Countries vary widely in the type of policies or programs they are able to introduce to respond to rising commodity prices. A recent paper based on a survey of 118 country teams and country economists carried out by the World Bank in March 2008 shows that in sub-Saharan Africa, the most common policy response was to reduce foodgrain taxes - either tariffs, VAT, other sales tax or a combination of these measures (Revinga et al. 2008). On the other hand, the most common response outside sub-Saharan Africa was some form of consumer subsidy or price control which over half of countries outside of sub-Saharan Africa used to stabilize domestic prices (see Figure 3). These price controls have a long history in several countries. For instance formal or tacit agreements between producers and the Government on either actual prices or profit margins are common for basic staples in Eastern Europe. In the Middle East and North Africa, subsidies on key items are an important part of the social compact between the State and citizens. In contrast, only 22% of sub-Saharan African countries used some form of price control. This lower share is likely due to the greater fiscal and administrative constraints in Africa relative to non-African countries.

Close to a third of countries outside sub-Saharan Africa used foodgrain stocks to increase domestic supply and curb prices compared with around 20% of African countries. Export restrictions were also slightly more common outside sub-Saharan Africa (28% of countries) compared with countries within Africa (21%). A significantly larger share of sub-Saharan African countries (42%) did not use any of the 'economy-wide' policies discussed above, compared with non-African countries. The likely reasons are (i) the greater diversity of diets and import dependence across sub-Saharan Africa has meant that certain countries have insulated themselves from higher global prices than outside Africa and (ii) the smaller and resource-poor countries in Africa have fewer administrative and fiscal means to implement these measures. For instance the reduction in import tariffs and taxes on foodgrains in Benin is equivalent to 9% of its 2008 Budget.

The second broad type of policy response revolves around using existing safety net instruments to either increase benefit levels or increase beneficiary coverage. The authors show that sub-Saharan African countries have a significantly larger share of food based safety net programs relative to non-African countries – school feeding, food for work and food ration programs. However, while many countries in sub-Saharan Africa have food-based transfer programs, the coverage of these programs tends to be very limited (in part due to lack of financing), so that the programs also have a limited impact.

The third type of policy measure involves supporting domestic food production. Free or subsidized input distribution or subsidized agricultural credit schemes are common responses. The use of new technology has contributed to an 8% increase in rice production in sub-Saharan Africa in 2007/08 relative to the previous year. Over the medium run African countries, through the NEPAD mechanism, have

committed to increasing their investments in agricultural research and extension as well as on irrigation and new technology. However, it will take some time for these policies to have a significant impact.



Country examples are illustrative of the mix of immediate policy responses. Liberia’s response revolved around reducing import taxes on foodgrains and scaling up targeted feeding programs. Kenya is building its food stocks by raising domestic maize procurement prices by 30% and importing three million metric tones of maize. Kenya is also subsidizing fertilizers and is facilitating access through Government imports and a credit scheme. Guinea is considering a targeted consumer subsidy for rice and expansion of an existing school feeding program to urban areas. Cameroon has sharply reduced VAT and customs duties on basic food staples as well as on imports of agricultural inputs while its government has also raised civil service wages. We turn next to assessing the extent to which the poor benefit from three types of policy choices.

### 3.2. *Economy-Wide Policies: The Case of Indirect Tax Cuts*

In this section and the next, we provide a preliminary assessment of the targeting performance of some of the policies implemented by governments to cope with the food price crisis. Forty percent of sub-Saharan Africa governments have reduced taxes levied on food items, such as import taxes and value added taxes in order to deal with the increase in food prices. The implicit assumption is that a reduction in these



taxes would be passed on by intermediaries to consumers. Even if there were such a pass-through or trickle down, it is not clear that a reduction in indirect taxes is a good policy for helping the poor. For a start, reductions in indirect taxes rates can have significant fiscal costs and lead to cuts in pro-poor spending (IMF 2008). Furthermore, if a large share of targeted food items is consumed by the non-poor, other policy instruments to help the poor cope with the crisis may have a stronger impact on poverty reduction at a lower cost.

Wodon et al. (2008b) estimate to what extent the poor are likely to benefit from a reduction in indirect taxes. The authors provide data on the consumption of various imported foods for the same set of West and Central African countries discussed earlier. The analysis is focused on rice, flour and bread, maize, vegetable oil, sugar, and milk, because these are food items that tend to be imported to a large extent. Table 1 provides results for rice. The most important variable in the table is the share of a staple's consumption that is accounted for by the poor. Indeed, the higher this share is, the more likely it is that a reduction in the price of the good following a reduction in indirect taxes will help in reducing poverty (on the impact of indirect tax reforms on poverty, see Makdissi and Wodon 2002, and Duclos et al. 2008). The share of the population that is poor varies between countries (from 28.5% in Ghana to 71.3% in the Democratic Republic of Congo according to recent poverty assessments completed at the World Bank), so that for cross-country comparisons, it is easier to consider the share of total consumption accounted for by the bottom 40% or 60% of the population (these two proportions were chosen because for most countries, the poverty rate falls between these two values).

Consider the share of rice consumption in the bottom 40% of the population. This share varies from 11% in Mali to 32% in Sierra Leone. This means that if one considers the bottom 40% as the poor, out of every dollar spent by a government for reducing indirect taxes on rice, and assuming that the indirect tax cuts results in a proportionate reduction in consumer prices, only about 20 cents will benefit the poor on average. In Guinea for example, the share of rice that is consumed by the bottom 40% of the population is only 23%. In Liberia, the share is at 22%. If the bottom 60% of the population is considered as poor, the share of subsidies or tax reductions that would reach the poor would be higher, at 25%-54%, but this still does not suggest good targeting. For most of the other imported foods for which indirect tax cuts have been implemented or considered by governments, the proportions of those foods consumed by the poor tend to be even lower than what is observed in Table 2 for rice.

**Table 1: Basic Statistics on the consumption of rice in selected West and Central African countries**

Food item	Share in Total consumption	Proportion Consumers	Share consumed by bottom 40%	Share consumed by bottom 60%
Burkina Faso (2003; poverty at 46.4%)	3.6	60.2	13.4	25.6
D. R. Congo (2005; poverty at 71.3%)	3.2	57.3	15.5	31.7
Gabon (2005, poverty at 32.7%)	3.0	91.4	31.7	51.1
Ghana (2006, poverty at 28.5%)	3.1	74.6	16.4	33.0
Guinea (2003, poverty at 49.1%)	13.0	90.7	23.1	42.8
Liberia (2007, poverty at 63.8%)*	13.2	84.9	22.3	41.2
Mali (2006, poverty at 47.5%)	7.2	95.1	11.1	25.1
Niger (2005, poverty at 62.1%)*	4.4	54.7	14.8	31.4
Nigeria (2004, poverty at 54.7%)	4.1	73.4	14.0	30.2
Senegal (2006, poverty at 50.8%)	6.8	96.3	28.0	47.9
Sierra Leone (2003, poverty at 66.4%)	11.7	96.4	32.0	53.9
Togo (2006, poverty at 61.6%)	3.5	92.2	23.0	40.4

Source: Wodon et al. (2008b). The date in parenthesis for each country refers to the household survey year.

Thus, while reducing taxes is one of the first actions that governments are considering to reduce the impact on the poor of rising food prices in sub-Saharan Africa, this measure suffers from several weaknesses. First, it is costly in budgetary terms. For instance the reduction in import tariffs on rice imports in Guinea-Bissau is estimated to cost about 7% of tax revenues worsening an already tight fiscal balance. Second, there is no guarantee that the tax cuts will end up reducing the market prices of the goods targeted, particularly in markets dominated by a few traders. Third, for many food items, even if there is a one-to-one relationship between taxes and market prices, much of the benefit of the tax cuts will accrue to the non-poor. Fourth, compared to reducing VAT or a sales tax, lowering import tariffs may well hurt domestic producers in the short run, and in some circumstances reducing import tariffs may increase poverty (Makdissi and Wodon 2008a). Hence the decision to reduce tariffs should balance the benefits which the poor are likely to accrue and political economy gains, with the costs outlined here.

### 3.3. *Safety Net Programs – Food Aid and School Feeding*

Alternatives to economy-wide policies such as indirect tax cuts consists in implementing new social protection programs and safety nets, or expanding existing ones. In their comprehensive review of the targeting performance of a wide range of safety nets, Coady et al. (2003) suggest that food subsidies tend to be less well targeted than other programs. As discussed in World Bank (2008b), direct transfers in cash or in kind, whether through proxy-means testing programs or public works for example, tend to have better outcomes. It is unclear however whether broad assessments of the targeting performance of alternative mechanisms of social protection are necessarily valid for sub-Saharan Africa since few of the case studies analyzed in existing reviews of social protection programs tend belong to the region.

In this section and the next, three types of food-based safety nets are considered: food aid as typically distributed by the World Food Program (WFP), school feeding programs, and labor intensive public works which often are based in part on food for work systems (but may also provide benefits in cash

through wages). There has been some debate on the targeting performance and especially the impact of food aid in East and Southern Africa<sup>4</sup>. In the case of food aid and school feeding programs, we provide summary results from studies looking at who benefits from these programs in two countries. Unfortunately while data on food consumption are available in household surveys for most African countries, and while many countries have food distribution programs (albeit of small scale in many instances), very few household survey questionnaires include questions on who benefits from existing food distribution programs. In West and Central Africa, two exceptions are Burundi and Liberia. The analysis of the surveys for these two countries suggests that while in principle, food aid should be well targeted, in practice it is often difficult to achieve good targeting, especially in post-conflict countries with weak governance. In the case of public works, the results provided are based on simulations rather than existing programs.

Consider Burundi, a country that is suffering from a high level of food insecurity. Zoyem et al. (2008) show that in 2006 more than half of the population had a caloric intake of less than 1,900 kcal per day per equivalent adult, insufficient to meet basic nutritional needs. In the northern region of the country, almost half of the population had a daily caloric intake below 1,400 kcal. In 2005, the WFP distributed food to 1.8 million people. The donations represented 3.4 % of the food consumption value of households. The question is whether such food aid distributions are well targeted to the poor. The analysis of Diang'a et al. (2008) suggests that there are actually few differences in the likelihood of receiving food aid between various groups of households. The share of total food distribution obtained by the poor was actually slightly lower than the share of the poor in the total population. However, the WFP targeting performance was similar to that of health services, falling between the performances of primary and secondary education, and was much better targeted than subsidies for basic infrastructure services such as water and electricity or subsidies for tertiary education. Still, one key reason for the limited targeting performance of the WFP seems to have been that in 2006 the program did not specifically target areas in the North where food insecurity was most severe – which it now does.

Food security also remains a major issue in Liberia. Malnutrition affects a third of the children, and the recent increase in food prices is expected to have a significant impact on the population. Analysis from a 2007 survey shows that almost a fourth of the population (22%) received some form of food aid. School feeding (meals or take home food) was the most common (74% of recipients of food aid), followed

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<sup>4</sup> As noted by Tsimpo and Wodon (2008), Little (2008) suggests that food aid in Ethiopia is limited and poorly timed, so that it does not lead to aid dependency among farmers who benefit from the aid. By contrast Gelan (2006, 2007) reaches a different conclusion using a CGE model for Ethiopia (on the debate between cash and kind, see also Abdulai et al., 2005). Different types of emergency food aid have been found to have different targeting performance as well as different impacts on poverty and household income growth by Gilligan and Hoddinott (2007), still using Ethiopian data. Del Ninno et al. (2007) review the experience with food aid in two South Asian countries (India and Bangladesh) and two East African countries (Ethiopia and Zambia). Their results suggest that while food aid can be beneficial under certain conditions, it is not in many cases the most efficient tool for addressing food insecurity (for other reviews of the literature on food aid, including in Africa, see Kirwan and McMillan, 2007 and Barrett and Maxwell, 2005).

by public works projects and nutritional supplementation. Similar to Burundi, estimates of the targeting performance of these programs suggest that non-poor households are essentially as likely to benefit from food aid as poor households. There are differences in targeting estimates between programs (school feeding programs are slightly pro-poor, while other programs are slightly in favor of the non-poor), but these differences are not large for most programs (Tsimpo and Wodon 2008).

These two examples suggest that while food aid programs are likely to have a significant impact on their beneficiaries in post-conflict and very poor countries, it is not clear that the poorest and most vulnerable members of the population benefit more from these programs than the rest of the population. Given that emergency food needs will not disappear overnight in post-conflict countries, and that the recent food price crisis is likely to increase the need for aid, government and donors should not only focus on the need to increase food aid but also on the need to target it better. In many countries, given large differences in consumption and nutrition levels between regions, geographic targeting could be used to improve the likely impact that the aid will have. It is also important to ensure that distribution of rations take place during the lean seasons to relieve hunger until the next harvest, thereby avoiding households having to consume their seeds and preventing acts of survival with negative long-term consequences, such as the sale of family assets and production goods. Beyond food distributions, other potential interventions include nutritional programs to reach children under five suffering from malnutrition and pregnant mothers (World Bank 2008b). Finally, especially in post conflict countries, food aid probably needs to continue to target especially vulnerable groups such as refugees and returnees.

### **3.3. *Safety Net Programs: Labor Intensive Public Works***

Implementing or expanding labor intensive public works programs are another alternative being considered by governments confronted with rapidly rising food prices. There is an extensive literature on the advantages and limitations of labor intensive public works for social protection and poverty reduction (for reviews, see among others Ravallion 1991 and 1999, von Braun et al. 1992, Subbarao, 1997 and 2003, Coady et al. 2003). The implicit assumption is that such programs are relatively well self-targeted to the poor because they typically provide low wages so that only the poor are interested in participating in them, and that they provide direct cash or kind benefits for program participants which may help in reducing the negative impact of higher food prices. In addition, public works may help in reducing youth unemployment and underemployment, which is high in many countries. However, in the African context where a large share of the population is employed at very low wages or without pay, it is not certain a priori that public works are well targeted. In addition, public works often suffer from substitution effects whereby program participants have to give up other employment in order to participate in public works,

which may lead to only part of the wage outlays being effective in reducing poverty. Finally, public works may entail substantial costs both in terms of administration and materials.

The experience with public works in Africa is mixed, and much of the published research deals with middle income countries such as Botswana and South Africa. Haddad and Adato (2002) find that among a sample of public works projects in South Africa, about 90% outperformed an untargeted transfer scheme, but among community-based programs, performance was lower (Adato and Haddad 2002). Teklu and Asefa (1997, 1999) find that in rural Botswana and Kenya, public works have had a substantial positive impact on the income of the poor, and that the poor are more likely to participate in the schemes than the non-poor. Nevertheless, a substantial number of non-poor individuals also participate in the schemes, so that targeting performance could be improved.

Using data from Chad, Ghana, Liberia, and Rwanda and simple simulation techniques, Wodon et al (2008c) provide some further empirical evidence on these issues and on the importance to complement self-targeting with geographic targeting. The authors first assess who may be potentially interested in participating in a public works program by identifying working individuals in the household survey without pay, as well as for every level of proposed wage in the public works program, those individuals who work but now earn less than the public works wage. The assumption is that all these individuals may be interested in participating in the program to increase their earnings. They also consider as potential beneficiaries the unemployed whose reservation wage (the wage that they would like to get in order to work) is below the proposed public works wage. Next, they randomly select a number of participants from among the pool of potential beneficiaries of the public works program so as to match a certain number of program participants. Finally, they estimate for the assumed participants to the program two key parameters which affect the potential impact of the program on the poor: the targeting performance of the program, and the substitution effect of the program, whereby only part of the wages paid to beneficiaries generate additional income, because at least some of the beneficiaries would probably have done other work if they had not participated in the program.

The authors define the overall leakage rate as the share of program outlays that are likely not to raise the incomes of the poor, either because program participants are not poor, or because there is a substitution effect whereby some of the wages earned in labor intensive public works program are lost due to the fact that program participants must give up other work to participate in the programs. When national public works programs are implemented, the leakage rates are very high, varying from 50% to close to 75% in all four countries. Reducing the public works wage helps in reducing leakage rates, though by a small amount only. By contrast, if the programs are geographically targeted, targeting performance can improve substantially. In Ghana for example, while at the national level, the leakage rate is very high, at 73.2%, it could be as low as 17.9% in the Upper West region of the country.

Given that labor intensive public works program also entail substantial non-wage costs (either in the form of materials or in the form of administrative costs), it is very likely that only a small amount of the funds allocated to these programs would help in reducing poverty. However, one clear possibility to improve targeting performance is to implement labor intensive public works primarily in the poorest areas of a country. In that case, targeting performance could be increased very substantially. In Ghana for example, while at the national level, the leakage rate is very high, at 73%, it could be as low as 18% in the Upper West region of the country.

#### **4. Conclusion**

In this paper, we had two main objectives. The first was to review the evidence regarding the potential impact of the recent increase in food prices on poverty in sub-Saharan African countries. The second was to document the policy responses adopted by governments to cope with this crisis, and assess the likely targeting performance of these policies in terms of reaching the poor. Two main findings stand out from our review.

First, the poor are likely to be significantly affected by the food price increases. In West and Central Africa for example, the evidence suggests that an increase in the price of cereals of 50% could increase the share of the population in poverty by 4.4 percentage points if only the impact on consumers is taken into account. Even when factoring in potential gains for producers, the headcount index of poverty would still increase by 2.5 percentage points. In some countries, the impact should be limited, but in other countries that are highly dependent on food imports such as Liberia, the share of the population in poverty could potentially increase by eight percentage points with a 50% increase in rice prices. If one considers an increase in the headcount index of 3.5 percentage point as a mid point, for sub-Saharan Africa as a whole this would imply that close to 30 million persons would fall into poverty.

Second, governments have various tools at their disposal to deal with the immediate impact of the increase in food prices, with important differences in the effectiveness of these tools. In sub-Saharan Africa, some of the most commonly used policies to help populations cope are to reduce import taxes, and to expand food distribution programs and public works. Tariff reductions on food are however likely to be relatively poorly targeted in many countries, although there are some exceptions. Indirect tax cuts are likely to have larger beneficial impacts for urban than for rural dwellers. The desire of governments to protect urban dwellers from the increase in prices is understandable, since these are the population groups that tend to be affected by the largest shocks and are the most vocal about the crisis. At the same time, many rural households are also likely to be hurt by the crisis. Given that rural households are much poorer than their urban counterparts, the consequences of higher food prices for them may be more dramatic.

Social protection programs tend to be better targeted than indirect tax cuts which benefit better-off households the most, but even for such safety nets the available information suggests that they can suffer from significant leakages to the non-poor. The limited evidence available on feeding programs suggests that their targeting performance can be improved considerably. As for public works, simulations suggest that even if wages are set at low levels, because so many individuals are unemployed or underemployed in sub-Saharan African countries, there is no guarantee that self-selection into these programs will lead to most of the benefits accruing. However, when using geographic targeting, social protection programs have the potential of being well targeted so that scarce public funds end up providing relief to those in highest need.

The above diagnostic underscores the gravity of the food crisis in sub-Saharan Africa, and the difficulties ahead in responding to this crisis. Given the absence of well targeted safety nets in many countries, it could be that some of the measures now being adopted by governments, will have only a limited impact in protecting the poor from the shock induced by the crisis. At the same time, the data and the experience in some countries suggest that there are ways to ensure that social protection programs better reach the poor. In addition, although medium to long term initiatives to boost food production have not been discussed here, these initiatives are clearly necessary in most of the affected countries both to stimulate growth and to exert downward pressure on prices.

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