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HIGH-LEVEL CONFERENCE ON WORLD FOOD SECURITY: THE CHALLENGES OF CLIMATE CHANGE AND BIOENERGY

Rome, 3 - 5 June 2008

SOARING FOOD PRICES: FACTS, PERSPECTIVES, IMPACTS AND ACTIONS REQUIRED

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FACTS, PERSPECTIVES, IMPACTS AND ACTIONS REQUIRED

I. INTRODUCTION

1. The world is experiencing a dramatic increase in food prices. During the first three months of 2008, international nominal prices of all major food commodities reached their highest levels in nearly 50 years while prices in real terms were the highest in nearly 30 years. Although the food market situation differs from country to country and future evolution remains highly uncertain, best projections suggest that food prices are likely to remain high in the next few years and high prices are expected to affect most developing country markets.

2. Rising food prices are causing severe hardship and suffering. For many of the 800 million people who are already affected by chronic hunger, higher food prices can be devastating. Already their ranks are being swelled by many other millions of poor people who now find themselves unable to buy the food that their families need for a healthy life. It is not surprising that this is provoking social unrest across the developing world. It is also prompting short-term policy responses from governments in both exporting and importing countries that risk exacerbating instability in world markets. In the short run, those food buyers in the cities and in the rural areas (including the poorest rural households that are predominantly net food buyers) who spend a large share of their income on food will be the most adversely affected. In some countries, urgent action is required to maintain and, in some cases, enhance emergency safety nets. On the other hand, high prices will stimulate a supply side response where the market signals are transmitted to food producers who have capacity to increase production and, where existing transport and market infrastructure allow, to supply the market. This may represent an important opportunity for promoting agricultural and rural development in many low-income countries, provided an enabling policy environment and supportive measures are established quickly.

3. The general purpose of this technical background document is to discuss the causes and consequences of the recent increases in food prices. The paper starts from a broad, global perspective, proceeds to national level impacts, and then to household level effects. The concluding section discusses possible actions to deal with rising prices.

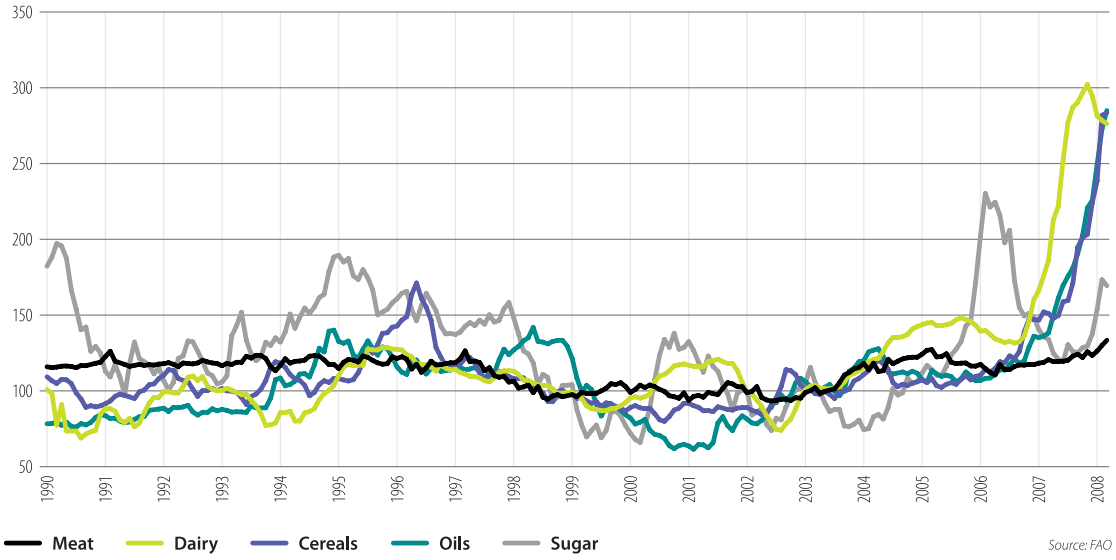
4. The first part of the paper provides an assessment of recent global trends in food prices, a description of the factors underlying the current state of world markets, and finally, a brief look into the future of these markets. The second part of the paper discusses country level macroeconomic impacts in terms of effects on food import bills, current account deficits, the transmission of international prices to domestic prices, and effects on consumer price indices and per capita cereal consumption. The third part of the paper discusses household level impacts, with a special focus on the poorest members of society.

5. The final section of the paper provides some short- and long-term policy options at both national and international levels to help mitigate the negative impacts and take advantage of the emerging opportunities through investment in agriculture with the hope of stimulating discussions at the High-Level Conference.

II. BRIEF ASSESSMENT OF RECENT DEVELOPMENTS

6. Agricultural commodity prices rose sharply in 2006 and 2007 and continued to rise even more sharply in the first three months of 2008. While the FAO food price index rose, on average, 8 percent in 2006 compared with the previous year, it increased by 24 percent in 2007 compared to 2006.[1] Currently, the increase in the average of the index for the first three months of 2008 compared to the same three months in 2007 stands at 53 percent. The continuing surge in prices is led by vegetable oils, which on average increased by more than 97 percent during the same period, followed by grains with 87 percent, dairy products with 58 percent and rice with 46 percent. Sugar and meat product prices also rose, but not to the same extent. Recent large increases in some commodity prices point also to increased volatility and uncertainty in the current market environment.

Figure 1 **Monthly FAO price indices for basic food commodity groups (1998-2000=100)**



7. High-price events, like low price events, are not rare occurrences in agricultural markets, although often high prices tend to be short lived compared with low prices, which persist for longer periods.[2] What distinguishes the current state of agricultural markets is the

[1] The FAO food price index is a trade-weighted Laspeyres index of international quotations expressed in US dollar prices for 55 food commodities (see http://www.fao.org/worldfoodsituation/FoodPricesIndex).

[2] If a price spike is identified as an annual percentage change that is above two standard deviations of the five years preceding the year that the percentage change is calculated from, it is possible to identify the years in which high price events for basic food commodities (using FAO food price index) occurred during the 1961-2008 period. Checking each year's percentage change against twice the standard deviation calculated as:

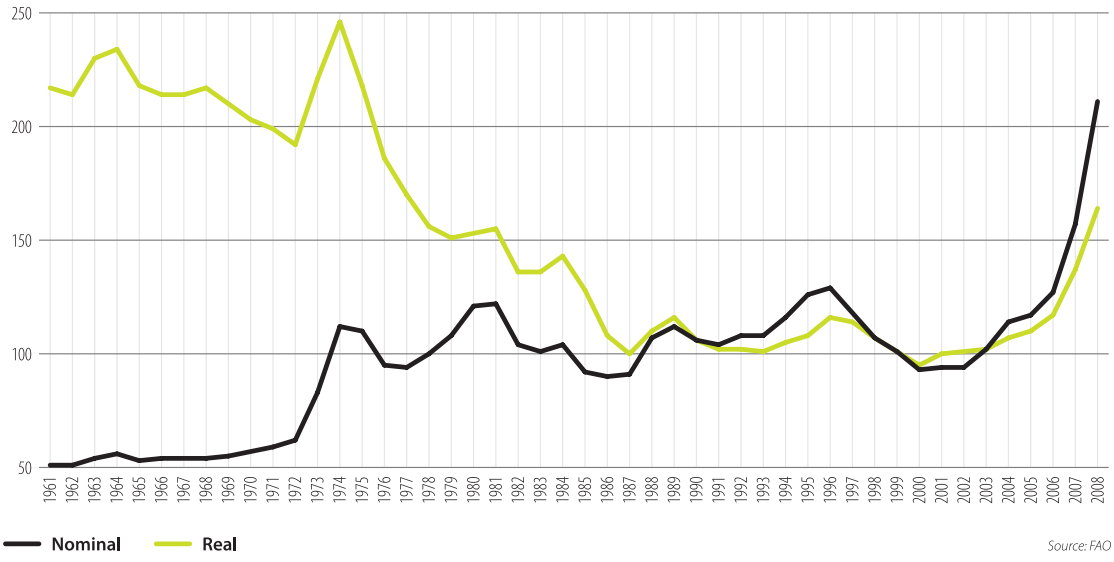
$$\sigma_t^2 = \frac{\sum_{i=t-6}^{t-2}(x_i - \bar{x})^2}{5},$$

four distinct periods can be identified when prices exhibited significant increases: 1972-74, 1988, 1995, and the current period. The only price events in consecutive years are those that occurred in the first and the last period, but three years in a row in the first, 1972, 1973 and 1974 and two years at the moment, 2007 and 2008. When the same methodology is employed to the prices expressed in real terms, however, only four appear to have been significant price event years: 1973 and 1974 and 2007 and 2008.

occurrence of the hike in world prices of not just a selected few but, as noted above, of nearly all major food and feed commodities (Figure 1) and the possibility that the prices may continue to remain high after the effects of short-term shocks dissipate. As will be discussed below, many factors have contributed to these events, though it is difficult to quantify their contributions. Among the most important factors it is possible to list are the strengthening of linkages among different agricultural commodity markets (i.e. grains, oilseeds and livestock products) as a result of rapid economic and population growth in many emerging countries; the strengthening of linkages among agricultural commodity markets and others, such as those of fossil fuels; biofuels and financial instruments that influence not only the costs of production of agricultural commodities but also the demand for them; and the depreciation of the US dollar against many currencies. The price boom has also been accompanied by much higher price volatility than in the past, especially in the cereals and oilseeds sectors, highlighting the prevalence of greater uncertainty in the markets. Yet the current situation differs from the past in that the price volatility has lasted longer, a feature that is as much a result of supply tightness as it is a reflection of changes in the nature of the relationships among agricultural markets of individual commodities, as well as their relationships with others as noted above.

8. These differences compared to the previous periods of agricultural price hikes suggest that the observed long-term decline in real prices could come to a halt, signalling a structural change in agricultural commodity markets. Deflating the extended FAO food price index[3] with the index of unit value of global exports of manufactured goods (MUV)[4] indicates that the downward trend in fact was halted in the late 1980s. There was an important peak in the mid 1990s, an historical low near 1999, followed by a gradual recovery beginning in 2000, and then the sharp increase commencing in 2006. The average growth rate over the 2000-2005 period of 1.3 percent per year jumped to 15 percent since 2006 (see Figure 2).

Figure 2 **Extended Annual FAO Food Price Index 1998-2000=100**



[3] The FAO food price index has been extended on an annual basis from 1961-1989 by splicing it to the index of unit value of imports of the same group of commodities.

[4] The choice of deflator may be important in examining real commodity price movements. Alternatives such as the CPI, the GDP deflator or the personal consumption deflator will yield different estimates. The MUV estimates are from:
http://econ.worldbank.org/WBSITE/EXTERNAL/EXTDEC/EXTDECPROSPECTS/0,,contentMDK:20587651~pagePK:64165401~piPK:64165026~theSitePK:476883,00.html

9. The next section discusses in more detail the changes in the fundamentals underpinning the developments observed over the past two seasons. Almost all commentators agree on the list of these fundamentals, but there are different opinions as regards to which one has dominated the increases. Some recent reports attempt to assign proportionate blame to various causes, both on the demand and supply side. For example, a recent report by Mitchell (2008) of the World Bank has concluded that 65 percent of the rise in prices is due to biofuels and factors related to their rapid increase in demand for feedstocks[5]. IMF assessments have also concluded that rising biofuel production, largely due to biofuel policies, is responsible for a significant part of the jump in commodity prices[6]. Such an assignment of determining factors is not undertaken here, as the situation is very complex and evolving. Rather discussion focuses on the nature of causes and their impacts, attempting to differentiate transitory and permanent factors, and to identify the countries and people who are most affected.

Factors underlying the current state of the food markets

10. It appears that a confluence of different forces has created the unique developments that have been observed over the past two seasons. These can be summarized as follows.

On the supply side

11. *Weather-related production shortfalls:* A critical trigger for the price hikes has been the decline in the production of cereals in major exporting countries, which beginning in 2005[7] and continuing in 2006, declined annually by 4 and 7 percent respectively. Yields in Australia and Canada fell by about one fifth in aggregate, and yields were at or below trend in many countries. There was a significant increase in cereal output in 2007,[8] especially in maize in the US, in response to higher prices. On the other hand, production of all the other major food commodity groups by major exporting countries was not affected in a similar way during the same period. The quick supply response for cereals in 2007 came at the expense of reducing productive resources allocated to oilseeds in some countries (especially soybeans in the United States), resulting in an important decline in oilseed production.

12. *Stock levels:* The gradual reduction in the level of stocks, mainly of cereals, since the mid-1990s is another supply side factor that has had a significant impact on markets recently. Indeed, since the previous high-price event in 1995, global stock levels have declined, on average, by 3.4 percent per year as demand growth has outstripped supply. Production shocks at recent low stock levels helped set the stage for rapid price hikes.

13. A number of changes in the policy environment since the Uruguay Round Agreements have been instrumental in reducing stock levels in major exporting countries, namely: the size

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[5] D. Mitchell (2008)

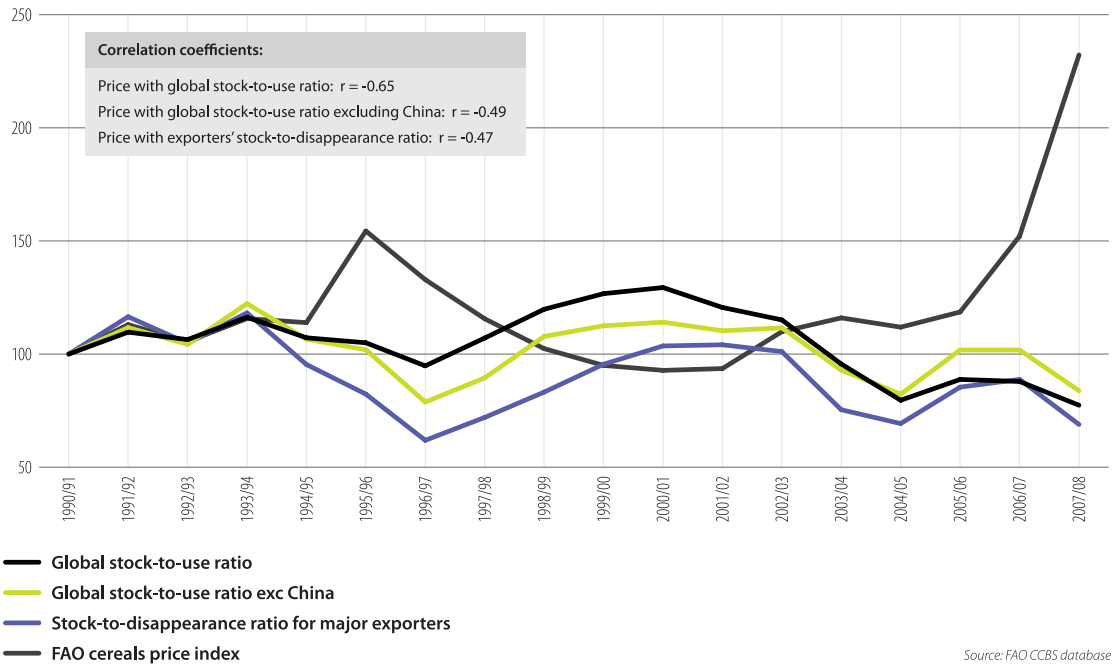
[6] S. Johnston (2007)

[7] Although rice prices, as measured by the FAO rice price index, rose 25 percent in 2004 over 2003 in recovery from very low levels in 2000-2003, the ensuing increases were much subdued until 2007, when it increased by 17 percent. However, in the first few months of 2008 the index rose sharply, by 38 percent compared to the average of 2007, mainly as a short-term reaction to policies applied in some countries that reduced export availabilities. This reaction is expected to subside with the onset of new harvests in 2008.

[8] Current estimates suggest that the production of cereals will increase by nearly 5 percent, reaching a record high.

of reserves held by public institutions; the high cost of storing perishable products; the development of other less costly instruments of risk management; increases in the number of countries able to export; and improvements in information and transportation technologies. When production shortages occur in consecutive years in major exporting countries under such circumstances, international markets tend to become tighter and price volatility and the magnitude of price changes become magnified when unexpected events occur. Indeed, there is a statistically significant negative relationship between the stocks to use ratio (the ratio of stocks at the beginning of the season to utilization during the season) and the average cereal prices during the same season. This means that tight markets at the global level at the beginning of the season tend to put upward pressure on prices (see Figure 3). As stocks reach very low levels, the absence of buffer supplies means that prices may rise precipitously under either a demand or supply shock.

Figure 3 Relationships between cereal stocks ratios and prices



Source: FAO CCBS database

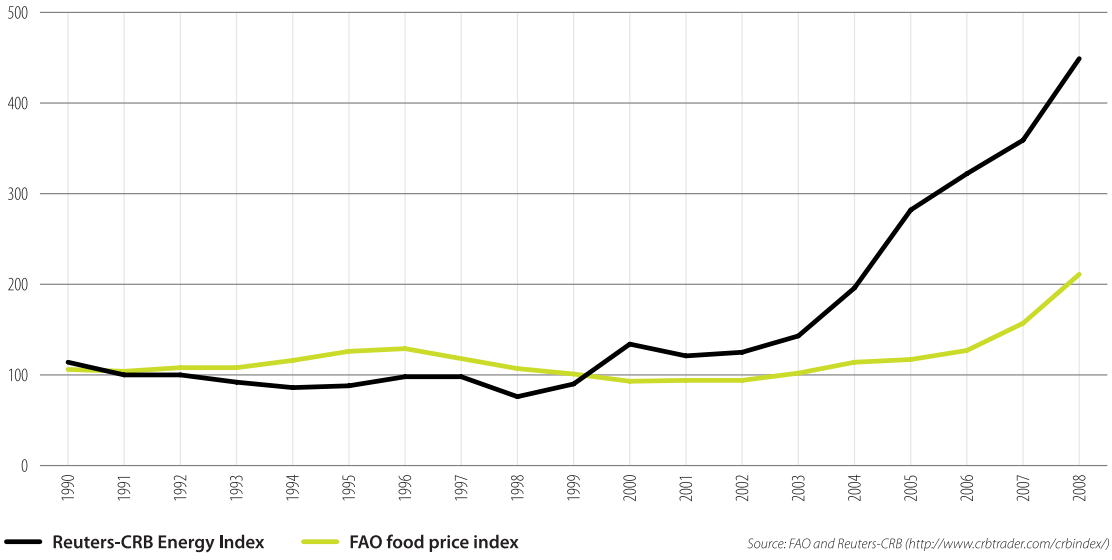
14. This is one of the important reasons that international cereal prices spiked so sharply in 2006 and are expected to remain at high levels for some time. By the close of the 2008 seasons, world cereal stocks are expected to decline a further 5 percent from their already reduced level at the start of the season, reaching their lowest levels in 25 years. The ratio of world cereal stocks to utilization ratio is expected to fall to 18.8 percent, down 6 percent from the previous low in 2006/07.

15. The stock situation for oils/fats and meals/cakes began to deteriorate in mid-2007 because of spillover effects from developments in the cereals markets, especially of wheat and coarse grains, with the stock-to-utilization ratio expected to fall from 13 to 11 percent for oils/fats and from 17 to 11 percent for meals/cakes by the end of the 2007/08 season.

16. *Increasing fuel costs:* The increases in fuel prices have also raised the costs of producing agricultural commodities with, for example, the US dollar prices of some fertilizers

(e.g. triple superphosphate and muriate of potash) increasing by more than 160 percent in the first two months of 2008, compared to the same period in 2007. Indeed, the increase in energy prices has been very rapid and steep, with the Reuters-CRB energy price index more than tripling since 2003[9] (see Figure 4). With freight rates doubling within a one-year period beginning in February 2006,[10] the cost of transporting food to importing countries also has been affected.

Figure 4 Reuters-CRB Energy and FAO Food Price Indices 1998-2000=100



On the demand side

17. *Biofuels and agricultural commodities:* The emerging biofuels market is a new and significant source of demand for some agricultural commodities such as sugar, maize, cassava, oilseeds and palm oil. The increase in demand for these commodities has been one of the leading factors behind the increase in their prices in world markets which, in turn, has led to higher food prices.

[9] Energy prices began increasing in 2003 (up 15 percent compared to 2002). A large spike occurred in 2004 (37 percent), about two years before the hike in grains prices (20 percent in 2006 compared to 2005, and 43 and 60 percent in the following two years).

[10] For both IGC Grain Freight and Baltic Dry indices: see International Grains Council, as quoted in FAO (2007, *ibid.* p. 45).

18. These commodities, which have predominantly been used as food and/or feed, are now being grown as raw material (feedstock) for producing biofuels. Significant increases in the price of crude oil allow them to become viable substitutes in certain important countries that have the capacity to use them.[11] For example, ethanol from various feedstocks and farming production systems becomes competitive with gasoline (petrol) at different crude oil and commodity prices. Brazilian sugar cane is competitive at much lower crude oil prices than other feedstocks and production locations. Schmidhuber (2006) estimated that US maize ethanol was competitive at crude oil prices of around US$58 per barrel, but it is important to note that this breakeven point reflects maize prices as of a fixed point in time and would change along with feedstock prices. Indeed, maize prices have risen sharply since this analysis was conducted, partly due to demand for biofuels. Tyner and Taheripour (2008) estimate that with oil priced at US$100 per barrel, maize would need to cost less than US$4.14 per bushel for US maize-based ethanol to be profitable without ethanol subsidies, or less than US$5.74 with subsidies (Table 1). They include in their calculation of subsidies the combined value of US renewable fuel mandates, tax credits and tariff barriers, representing a total value of about US$1.60 per bushel for maize used in ethanol production.

Table 1. Crude oil – maize price breakeven points for US ethanol production (2007)

Crude oil price (US$/barrel)	Break-even price for maize without subsidies (US$/bushel)	Break-even price for maize with subsidies (US$/bushel)
20	<0	1.50
40	0.96	2.56
60	2.01	3.62
80	3.08	4.68
100	4.14	5.74
120	5.20	6.81

Source: Tyner and Taheripour 2008.

19. This possibility, coupled with expectations that these developments can encourage rural development while reducing dependency has increasingly led to the implementation of

[11] Since the relative contribution of the bioenergy sector to total global energy supplies is small, feedstock prices can be considered as largely endogenous to changes in fossil-fuel prices, with minimal feedback effects. Consequently, shocks from energy markets can be carried into the food markets. On the supply side, when the marginal value product in the biofuel market (net of crop feedstock costs, including by-product revenues) exceeds that in the food market, the crop will be diverted to the production of the biofuel. When larger quantities of the feedstock are absorbed by the energy sector, price determination will tend to mirror that in the energy sector and an 'energy floor price' effect will be created. As energy crops compete for other agricultural resources, greater cultivation intensity of energy crops can lead to reduced supplies of other competing crops, thus pushing up their prices. On the demand side, the degree of substitutability by which biofuels can be blended in large proportions with their fossil-fuel counterparts (e.g. flex-fuel vehicles) determines how much biofuel and petroleum prices may depart from one another. If this substitutability is high, with biofuel competitive at the pump and large quantities of feedstock subsumed by the energy sector, consumers ensure equilibrium between prices of petroleum and biofuel, and producers between prices of biofuel and the feedstock (Schmidhuber, 2007). The implications for price determination in agriculture are considerable.

public policies in support of the biofuels sector, which further encourages the demand for these feedstocks. The support for bioethanol and biodiesel in selected OECD countries totalled US$11-12 billion in 2006 (Table 2). The Total Support Estimates (TSE) represents the total value of all government support to the biofuels industry. This includes the total value of consumption mandates, tax credits, import barriers, investment subsidies and general support to the sector such as public research investment. It does not include support to agricultural feedstock production. US processors and growers received support worth about US$6.7 billion in 2006, and those in the European Union received about US$4.7 billion. The table also indicates that the majority of support varies with the level of production, which suggests that OECD biofuel subsidies are likely to become much larger as mandated consumption increases.

Table 2 - Total support estimates for biofuels in selected OECD countries in 2006

	Ethanol		Biodiesel		Total liquid biofuels	
	TSE (billion US$)	**Variable share (percent)**	**TSE (billion US$)**	**Variable share (percent)**	**TSE (billion US$)**	**Variable share (percent)**
United States	5.4-6.6	60-65	0.5-0.6	85	5.9-7.2	65
EU	1.6	98	3.1	90	4.7	93
Canada	0.15	70	0.013	55	0.11	65
Australia	0.035	70	0.021	70	0.05	70
Switzerland	<0.001	94	0.009	99	0.01	98
Total	7.2-8.4		3.6-3.7		10.8-12.1	

Source: Steenblik 2007.

20. To provide some perspective on the relative importance of these biofuel subsidies, Table 3 shows them on a per litre basis. Ethanol subsidies range from about US$0.30 to US$1.00 per litre, while the range of biodiesel subsidies is somewhat wider. This table reveals that although some countries' total support expenditures are relatively modest, they can be substantial on a per litre basis. Again, the variable portion of support provides an indication of the scope for growth in expenditures with output, although some subsidies are budget limited, especially at the state or provincial level.

Table 3: Approximate average and variable rates of support per litre of biofuels in selected OECD countries (US$/litre)

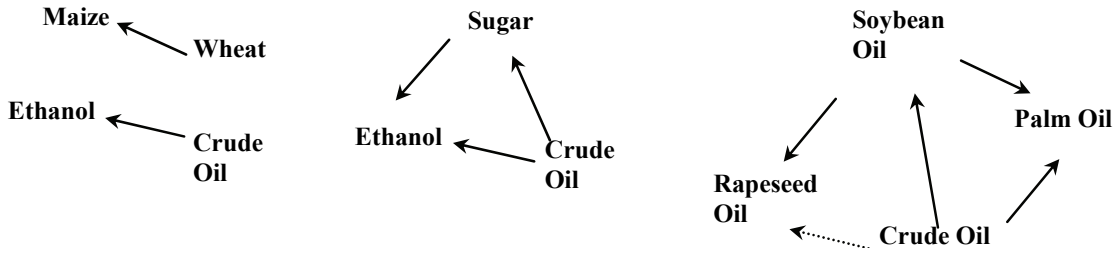
	Ethanol		Biodiesel		Comment
	Average	**Variable**	**Average**	**Variable**	
United States	0.29-0.36	0.15-0.26	0.54-0.67	0.26-0.52	Includes federal and state supports. Varies by state.
EU	1.00	1.00	0.70	0.70	Includes EU and Member State supports. Varies by Member State.
Canada	0.40	0.00-0.20	0.20	0.00-0.40	Includes federal and provincial supports. Varies by province.
Australia	0.40	0.30	0.40	0.30	
Switzerland	0.60	0.60	1.00	0.60-2.00	

Source: Steenblik 2007

21. Among all major food and feed commodities, the additional demand for maize (a feedstock for the production of ethanol) and rapeseed (a feedstock for the production of biodiesel) has had the potential for the strongest impacts on prices. For example, out of the nearly 40 million tonne increase in global maize utilization in 2007, almost 30 million tonnes were absorbed by ethanol plants alone, mostly in the US which is the world's largest producer and exporter of maize. Over 30 percent of that country's 2008 maize harvest is forecast to be diverted to ethanol distilleries, which amounts to over 12 percent of global maize production. In the EU, the biodiesel sector is estimated to have absorbed about 60 percent of member states' 2007 rapeseed oil output, which amounts to about 25 percent of global production and 70 percent of the 2007 global trade in the commodity.

22. The issue is not limited to how much of each crop may be used for biofuels instead of food and feed, but how much planting area could be diverted from producing other crops to those used as feedstock for production of biofuels. To illustrate, high maize prices since mid-2006 encouraged farmers in the US to plant more maize in 2007. Maize plantings increased by nearly 18 percent in 2007. This increase was only possible because of reductions in soybeans and, to a lesser extent, in wheat areas. The expansion in maize plantings combined with favourable weather resulted in a bumper harvest in 2007 which made it possible for the US to meet domestic demand, including that from its growing ethanol sector, as well as exports. However, this apparent success in maize masked another important development – reduced wheat and soybean plantings and therefore their decreased production was one reason for their sharp price increases. This chain reaction may be repeated in 2008, but this time in reverse order. Farmers in the US are reported to be cutting back their maize plantings in favour of soybeans and wheat because of their higher relative prices. However, the demand for maize by the ethanol sector is expected to continue to rise and if production of maize declines in 2008, it is difficult to expect that the United States will be able to meet all demand (food, feed, fuel and exports) without a significant drawdown on its own maize stocks. Such an eventuality will be watched closely because, in these periods of tight markets, they could result in firmer prices for maize again next year. In future years, in view of the new US Energy Independence and Security Act (EISA), feedstock demand for maize is almost assured to grow considerably under mandates.

Price discovery in biofuel markets



*Solid line refers to significance at the 5 percent level, dashed line refers to significance at the 10 percent level. The arrow signifies the direction of causality.

23. Analyses of the links between weekly prices of gasoline, ethanol, maize and sugar, and between crude oil and important vegetable oils such as palm, soybean and rapeseed,[12] suggest that there are statistically significant inter-linkages among the relevant markets. The above schematic summarizes those relationships and contains information about the empirical paths of influence revealed by the analysis. Crude oil prices were found to determine the long-run equlibria of both sugar and ethanol prices in Brazil, as well as to constitute an important driver in EU vegetable oil markets, with soybean oil prices also influencing palm and rapeseed oil markets.

24. The "independence" of maize prices in the US energy nexus is a somewhat surprising result, in that energy prices do not appear to feature in the equilibrium between grain markets and the price of maize does not affect the determination of ethanol prices, despite the price of the feedstock being the dominant component in ethanol's cost schedule. The evidence suggests that over the period, other "fundamentals", including policies and policy changes in grain and biofuel markets in the country, were more important in the evolution of the grain prices. It should be noted that short term deviations can be expected between biofuel and crop feedstock prices which result from adjustments to rapidly evolving situations, both in the energy and crop markets. In the future, as production capacity grows, and as the degree of substitutability between biofuel and fossil fuel grows on the demand side, price relationships can be expected to become tighter.

[12] The analyses were conducted using price data for US grain-ethanol-crude oil, Brazil sugar-ethanol-crude oil and EU vegetable oil-crude oil. A sufficiently long series of biodiesel prices was not available, but it is expected that the crude oil price itself would be a reasonable proxy in capturing energy market impacts. The choice of commodities was governed by their importance in international trade and thus for the prospect of price shocks originating from them to be passed on to importing countries and also for the potential for shocks to be transmitted to other related commodities.

25. *Changing structure of demand:* It is widely accepted that economic development and income growth in developing and emerging countries, as well as population growth and urbanization, have been gradually changing the structure of demand for food commodities. Diversifying diet patterns are moving away from starchy foods towards more meat and dairy products, which is intensifying demand for feed grains and strengthening the linkages among different food commodities.[13] However, these changes were not really the main cause of the sudden spike that began in 2006.[14] This is not to downplay the role that changing consumption patterns might have played in reducing stock levels in cereal and oilseed markets over the past decade and, hence, on the observed price hikes, nor the role they are likely to play in the future.[15] This said, it is noteworthy that food and feed consumption continues to show strength despite dramatic price increases, indicating that either demand is incredibly inelastic to price hikes, has shifted to a higher level, or that prices have not been transmitted to domestic levels. It would appear that a combination of these factors is in play.

Other relevant factors

26. *Operations on financial markets:* Market-oriented policies are gradually making agricultural markets more transparent. Derivatives markets based on agricultural markets offer an expanding range of financial instruments to increase portfolio diversification and reduce risk exposure. The abundance of liquidity in certain parts of the world that reflect favourable economic performances (notably among emerging economies), coupled with low interest rates and high petroleum prices, make such derivative markets a magnet for speculators looking to spread their risk and pursue more lucrative returns. This influx of liquidity, particularly prior to the global credit crunch, and the turmoil it caused in the financial markets, seems to have influenced the underlying spot markets to the extent that they affected the decisions of farmers, traders and processors of agricultural commodities.

27. A recent IMF study analysed the nature of the relationship between this type of financial flow into the futures markets and cash/spot prices of five commodities, including those of sugar, coffee and cotton. The empirical tests employed indicated that the short-run

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[13] Von Braun 2007 notes that real GDP in developing Asia "increased by 9 percent per annum between 2004 and 2006. Sub-Saharan Africa also experienced rapid economic growth of about 6 percent in the same period." He also notes that the "world's urban population has grown more than the rural population; within the next three decades, 61 percent of the world's populace is expected to live in urban areas".

[14] China and India have usually been cited as the main contributors to this sudden change because of the size of their populations and the high rates of economic growth they have achieved. However, since 1980, the imports of cereals in these two countries have been trending down, on average by 4 percent per year, from an average of 14.4 million tonnes in the early 1980s to 6.3 million tonnes over the past three years. Moreover, mainland China has been a net exporter of cereals since the late-1990s, with one exception in the 2004-2005 season. Similarly, India has been a net importer of these commodities only once, in the 2006-07 season, since the beginning of the twenty-first century.

However, the situation for oil crops is different, in that there has been a significant increase in the imports of oilseed, meals and oils of these two countries since 1996. In fact, on average, annual increase in total utilization of oilseeds for these two countries for the period 1996-2008 has been nearly 5 percent, with that for imports more than 17 percent for meals (including the meal equivalent of seeds imported) and 12 percent for oils (including the oil equivalent of seeds imported). Despite this, there is no evidence that there has been a sudden increase in the imports from this source to indicate that they have contributed to the price hike for oilseeds, meals or oils, which began in mid-2007, after the spike in the prices of grains a year earlier.

[15] Indeed a recent study notes: "New government policies will slow, but not avert, the coming end of China's grain self-suffiency" (Trusted Sources).

causality ran, in general, from spot prices to this type of financial flows, implying that higher spot prices are the "cause" rather than the "effect" of increased investor participation (IMF 2006, Box 5.1). The same type of empirical causality was also found where there were long-term equilibrium relationships among the variables concerned.[16] A more recent OECD study (OECD 2008, p. 10) notes that "there have been problems achieving convergence in the corn, wheat and soybeans futures markets at times in recent years, i.e. the link between cash and futures prices may have been broken down occasionally. This could be due to a number of technical issues, such as available storage capacity in the delivery area and the incentives to engage in arbitrage." In particular, the study stated, "Conceivably, it could also be due to the 'inflation' of futures prices being caused by increasingly large long position placed by institutional investors. Could the strong upward pressure on futures prices be putting such stress on cash-futures price link that it breaks from time to time?"

28. The same study also notes that the more or less predictable seasonal differences between cash and futures prices are weakening and adds if "the large long positions of the institutional investors are boosting the futures prices higher than warranted by cash market supply and demand fundamentals, as these investors' growing shares of long side of the market suggest, this could be a cause of the weak basis and the resulting difficulties in pricing the cash corn, wheat and soybeans" (OECD 2008 *ibid.*).

29. *Short-term policy actions and exchange rate swings:* After the start of price hikes, some of the measures to reduce the impact of higher prices on vulnerable consumers, such as export bans and increased export taxes, exacerbated the short-run volatility of international prices. This happened recently in the rice markets, when important exporting countries introduced export bans to protect their own consumers. The section on 'Policies for addressing high food prices" provides further details on these types of policies.

30. Most agricultural commodity prices are quoted in US dollars and the significant decline in its value against many currencies over the recent years has had critical effects on certain developments in the agricultural markets. For those countries that experienced appreciation of their currencies against the US dollar, commodity imports from the United States have become cheaper, thereby boosting demand for products that are exported from the US, and altering trade patterns. Figure 5 provides two examples where the FAO food price index has been adjusted to reflect the changes in the exchange rates between the US dollar and the CFA Franc[17] and International Monetary Fund's (IMF's) special drawing rights (SDRs).[18] Although the adjusted indices are lower than the FAO food price index (expressed in US dollars) since the early 1980s, all three exhibit the recent upward trend. The level to which

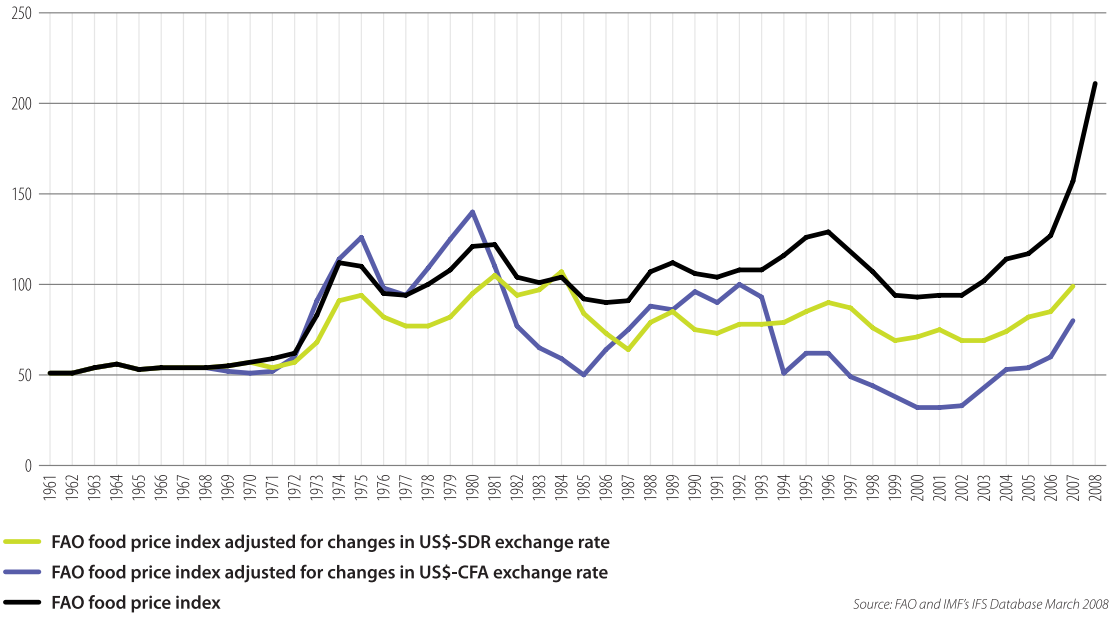
[16] The study concludes: "These findings are consistent with the hypothesis that speculators play a role in providing liquidity to the markets and may benefit from price movements but do not have a systematic causal influence on prices" (IMF *ibid.* p. 18).

[17] CFA Francs are used in 14 Western and Central African countries: Benin, Burkina Faso, Côte d'Ivoire, Guinea-Bissau, Mali, Niger, Sénégal and Togo in Western Africa; and Cameroon, Central African Republic, Chad, Republic of the Congo, Equatorial Guinea and Gabon in Central Africa. Although the West African CFA franc and Central African CFA franc have the same fixed exchange rate against the euro, one currency cannot be used in the countries using the other.

[18] IMF SDRs are international reserve assets created in 1969 to supplement the existing official reserves of member countries. The US dollar value of the SDR is calculated as the weighted sum of four currencies valued in US dollars – the euro, yen, pound sterling and US dollar. The weights of the currencies used in the calculation are revised every five years according to changes in the relative importance of these currencies in the world trading and financial systems.

changes in the international US dollar prices of the individual commodities get transmitted to the domestic markets and the reasons for the extent of the transmission are discussed in more detail in the section on "Impact (pass through) of world price changes on domestic markets". The actual impact of exchange rate variation for given country also depends on its trading patterns including origin and destination of its exports and imports, and the bilateral exchange rates with its trading partners.

Figure 5 **FAO Food Price Index adjusted for changes in the exchange rates between US dollar and SDR and CFA**



Source: FAO and IMF's IFS Database March 2008

III. WHAT NEXT?

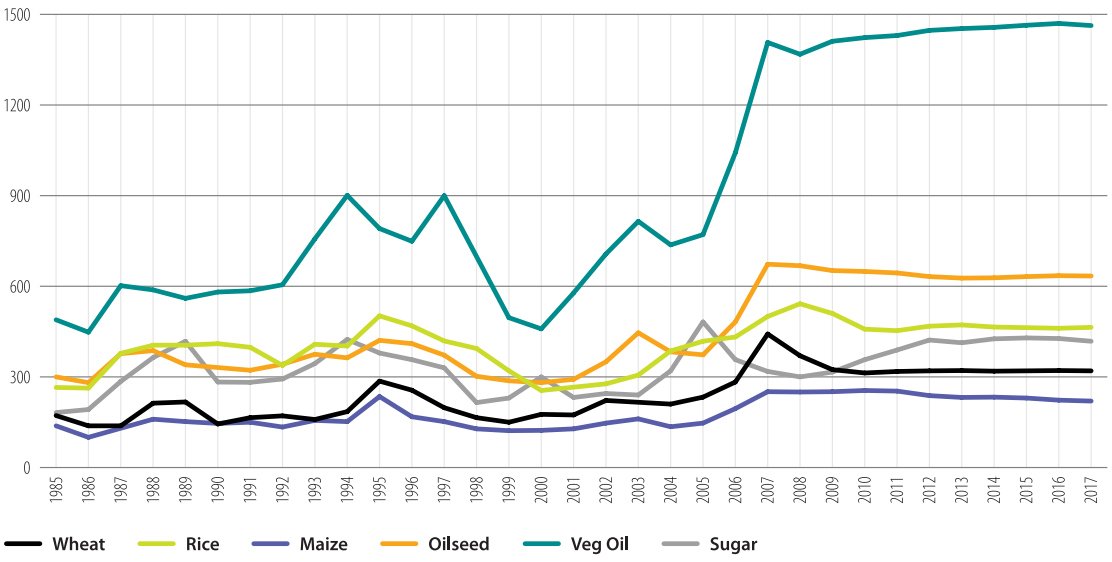
31. The market developments observed since 2006, and briefly described above, seem to have been the result of short-term imbalances in some commodity markets that spilled over to markets with which they had close linkages, as well as of some factors that may continue to influence the markets for longer periods. The fact that the markets can adjust rather rapidly has already been demonstrated by the supply response observed in the maize and sugar markets, where increases in production at the global level led to tempering the price increases in the former and to decreasing the prices in the latter in 2007. Indeed, the early indications are that the world cereal production will increase by 2.6 percent in 2008, reaching a record level of 2 164 million tonnes. With many agricultural commodity markets continuing to be tight despite the positive expectations for some, and with low stock levels that are not likely to be replenished quickly, the possibility of further sharp price hikes and continued volatility as a result of unforeseen events seems to be likely for the next few seasons. As opposed to other instances of sharp increases in agricultural commodity prices that have rapidly dissipated, we could be facing higher prices for some time. Of significance in this respect is the possibility of the persistence of demand for biofuels, which would depend on a number of factors, including:

- whether the price of crude oil continues to increase and policies supporting the biofuels sector are maintained;
- whether the rate at which second generation feedstocks – lignocellulosics that do not compete with agricultural products for land resources – are developed and commercialized speeds up sufficiently to replace first generation feedstocks.

Other important factors that will be influential over the longer term are:

- population and income growth, as well as intensifying urbanization;
- climate change impact on agricultural yields in different parts of the globe;
- land and water resource constraints; and
- the ability to increase yields of agricultural products through more effective use of existing technologies[19] and/or adoption of new technologies.

Figure 6 Historical and projected real prices of selected food and feed commodities



[19] As an illustrative example to indicate that a great deal can be done to increase yields using known technologies in developing countries, the Government of India notes that the actual yields of wheat, rice and sugar cane in selected states are on average 23, 26 and 31 percent, respectively, below the yields obtained by applying the best practices of farmers in those states and 80, 205 and 117 percent, respectively, below the yields obtained by applying improved practices. This indicates that developing countries have potential to increase production, without expanding area planted or using new technologies. Of course, what it would take to achieve this cannot really be disentangled from the difficulties that hinder the process of agricultural development in those countries. It would have already been done, had it been a simple process.

32. OECD and FAO have recently completed their annual exercise of deriving baseline medium-term projections using their AGLINK/COSIMO modelling framework. The framework has been expanded recently to incorporate modules for the sugar and biofuel sectors, enabling it to assess the impact of various policies that are being implemented in the biofuels sector. The baseline estimates indicate that by 2017, when compared to the average of the observed prices during the period 2005-2007, the real price of wheat (deflated by the MUV) is expected to have increased by 2 percent; rice by 1 percent; maize by 15 percent; oilseeds by 33 percent; vegetable oils by 51 percent; and sugar by 11 percent (see Figure 6).[20] Moreover, without exception, the average real prices are likely to remain above those observed during 1985-2007.

IV. LIKELY IMPACTS OF RISING FOOD PRICES

33. Substantial increases in food and fuel prices have important implications for countries and people. The most visible consequences of economic impact are the social unrest and food riots that have taken place on most continents recently, primarily in urban areas where people have felt the brunt of the impact of soaring food prices and rising fuel costs. Long queues at subsidized food stores and higher price tags on almost all food items, not only on staple foods, are an everyday occurrence. Several importing countries are involved in what has been reported as "panic buying" in their efforts to secure adequate supplies and build domestic stocks of major cereals. At the same time, major exporters' efforts to keep domestic cereal prices "in check", and block or impose serious impediments to exports, have further exacerbated the tightness in world markets. Least developed countries with high levels of poverty and food insecurity and large population groups that spend 70-80 percent of their household income on food are particularly vulnerable.

34. Far less visible, but not less important, are the difficult choices that households, especially the poorest ones, have to make because of their rapidly declining purchasing power. The risk of increased food insecurity and malnutrition is high among these population groups, as households have to give up more expensive sources of protein and other nutrient-rich foods and depend on low-cost high-energy foods to maintain a minimum level of productivity. Poor households find themselves having to compromise on health care, education and other non-food household expenditures. At the same time, higher prices present a unique opportunity to re-launch agricultural investment and increase agricultural productivity in the developing countries.

35. Urgent policy measures and practical action need to be taken by governments and development partners around the globe to enhance the positive and alleviate the negative effects of high food prices. FAO recommends the immediate adoption of a twin-track approach aimed at (i) alleviating the impacts of high food and fuel prices on the weakest population groups through direct transfers and safety nets, while (ii) implementing policies and programmes to promote agricultural and rural development both in the short and long run.

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[20] The major assumptions of the baseline projections are:lower but sustained economic and population growth will underpin demand; no major inflation hike, despite continued high oil prices, which will increase slowly over the outlook period from US$90 per barrel in 2008 to US$104 per barrel by 2017; conditions remain favourable for further growth in biofuel production, with the latest policy changes in the EU and US not taken into account; the US dollar will strengthen against most currencies; agricultural and trade policies in place in early 2008 will remain through the rest of the projection period; second generation biofuel technologies will remain economically unavailable in any meaningful scale.

A. COUNTRY-LEVEL IMPACTS

36. Large increases in food and fuel prices threaten macroeconomic stability and overall growth, especially of low-income, net-importing countries. Table 4 lists 22 developing countries that are especially vulnerable due to a combination of high levels of chronic hunger (more than 30 percent undernourishment), while being highly dependent on imports of petroleum products (100 percent in most countries) and, in many cases, on imports of major grains (rice, wheat and maize) for domestic consumption. Countries such as Eritrea, Niger, Comoros, Botswana, Haiti and Liberia are especially vulnerable due to a very high level of all three risk factors.

Table 4: Net importers of petroleum products and major grains as a percent of domestic apparent consumption - ranked by prevalence of undernourishment

Countries	Petroleum % imported[1]	Major grains % imported[2]	% under-nourishment[3]
Eritrea	100	88	75
Burundi	100	12	66
Comoros	100	80	60
Tajikistan	99	43	56
Sierra Leone	100	53	51
Liberia	100	62	50
Zimbabwe	100	2	47
Ethiopia	100	22	46
Haiti	100	72	46
Zambia	100	4	46
Central African Republic	100	25	44
Mozambique	100	20	44
Tanzania	100	14	44
Guinea-Bissau	100	55	39
Madagascar	100	14	38
Malawi	100	7	35
Cambodia	100	5	33
Korea, DPR	98	45	33
Rwanda	100	29	33
Botswana	100	76	32
Niger	100	82	32
Kenya	100	20	31

[1] **Source**: Energy Information Administration *International Energy Annual 2005,* Washington DC ., US. Covers crude and refined petroleum products.

[2] **Source**: FAOSTAT, *Archives Commodity Balance Sheets.* Average 2001-03 for wheat, rice and maize.

[3] **Source:** FAOSTAT, Food Security Statistics, Prevalence of undernourishment in total population (2002-2004 preliminary): www.fao.org/es/ess/faostat/foodsecurity

Impact on food import bills

37. Substantial increases in the global cost of imported foodstuffs have already occurred, with the total import bill estimated at US$812 billion in 2007 (Table 5), 29 percent more than the previous year and the highest level on record. Developing countries as a whole could face an increase of 33 percent in aggregate food import bills, coming on the heels of a 13 percent increase the year before. Similar increases have occurred for the Least Developed Countries (LDCs) and LIFDCs. The sustained rise in imported food expenditures for both of these vulnerable country groups is alarming. Today, their annual food import basket could cost well over twice what it did in 2000. Because cereal prices surged even more in the second half of

2007, the results are more striking when the comparison is done on a marketing year basis. On that basis, the cereal import bill in LIFDCs is expected to increase by as much as 56 percent from 2006/07 to 2007/08.

Table 5: Forecast import bills of total food and major food commodities *(US$ million)*

	World		Developing		LDC[1]		LIFDC[2]	
	2006	**2007**	**2006**	**2007**	**2006**	**2007**	**2006**	**2007**
Total Food	630 135	812 743	190 975	253 626	13 822	17 699	88 577	119 207
Cereals	186 794	268 300	74 615	100 441	6 101	8 031	31 363	41 709
Vegetable Oils	70 822	114 077	34 831	55 658	1 948	3 188	22 919	38 330
Dairy	45 572	86 393	13 593	25 691	824	1 516	5 079	9 586
Meat	78 704	89 712	17 064	20 119	872	1 079	6 295	8 241
Sugar	33 024	22 993	13 892	11 904	1 755	1 320	7 598	4 782

[1]Least developed countries

[2]Low-income food deficit countries

38. Based on the current forecasts, the global share of cereal imports by countries in Africa is about 22 percent, while its share in exports is roughly 3 percent. In spite of the rise in world prices of cereals, imports to Africa in 2007/08 are expected to increase by 2.5 million tonnes to a total of 55 million tonnes, reflecting higher wheat and maize imports, especially in Morocco and Nigeria, which had much smaller harvests in 2007. While this level of imports is higher than in 2006/07, it is below the peaks reached in 2004/05 and 2005/06 when cereal imports exceeded 56 million tonnes. Total wheat imports in Africa are forecast at 29 million tonnes, up 1.2 million tonnes from the previous season. Total imports of coarse grains (comprising mostly maize and barley) are forecast at 16.6 million tonnes, up 1 million tonnes from 2006/07. Rice imports are forecast at 9.6 million tonnes, marginally above the previous season. Africa's total cereal import bill in 2007/08 is forecast at US$2.7 billion, up 23 percent from 2006/07.

Food price increases and current account deficits

39. In some poor countries, increased food import bills might lead to substantial widening of the current account deficit, which in turn could impact other macroeconomic variables such as the exchange rate, the reserve position of the national bank or increased indebtedness.

40. Table 6 shows that, for seven out of a sample of 86 low- and lower-middle-income countries, the predicted *increase* in the cereals import bill in 2007/08 with respect to 2006/07 as a share of their 2007 GDP is greater than 3 percent.[21] This would imply a widening of the current account deficit of those countries as a share of GDP by more than three percentage points.[22] For another seven countries, the anticipated increase is between 2 and 3 percent

[21] The sample includes all low and lower middle income countries with populations in excess of 1 million for which the FAO has predictions on cereal imports. Of the 86, 67 are LIFDCs as classified by the FAO.

[22] This is a rough indicator of the change in the current account. It assumes that the dollar denominated value of exports remains constant, and that the rest of import bill also does not change.

while, for the remaining 72 countries, the anticipated increase in the food import bill is less than 2 percent of GDP.

Table 6. Distribution of Low-Income and Lower-Middle-Income Countries according to their Current Account Position and the Predicted Increase in Cereals Import Bill

	Current account balance (% of GDP) Averages (2004-2007)				
Estimated Change in Cereals Import Bill(% of GDP):	Very Large deficit >10%	Large deficit 5-10%	Moderate Deficit 0-5%	Surplus	Total Number of Countries
	Number of Countries				
<1%	5	6	20	22	53
1-2%	4	8	3	4	19
2-3%	2	1	2	2	7
>3%	2	2	3	0	7
Total Countries	13	17	28	28	86
Average Change in the Cereals Import Bill (% of GDP):	1.5%	2.2%	1.1%	0.4%	1.1%

Sources: GDP in current dollars and current account from IMF (International Financial Statistics and World Economic Outlook estimates). Cereal Bills from FAO estimates for 2006/07 and 2007/08. The table entries can be interpreted as per the following example: The first entry (5) means that in 5 countries where the pre-existing ratio of current account deficit to GDP was larger than 10%, the additional cost of the 2007-2008 cereal imports added less than one percentage point to that ratio.

41. The vulnerable countries from a macroeconomic perspective are counted in the lower-left corner of Table 6. These are the countries that already are experiencing high current account deficits and are predicted to have higher relative increases in their cereals import bill. The table shows that 19 countries already have large deficits (>5 percent of GDP) and will experience a growth of their cereal import bill of more than 1 percent. Of these 19 countries, seven (The Gambia, Jordan, Liberia, Republic of Moldova, Mauritania, Niger, and Zimbabwe) are in the most vulnerable positions, with very high current account deficits and predicted increases of their cereal import bill of more than 2 percent. They could experience severe balance of payments problems as a result of higher food prices. Macroeconomic vulnerability also correlates with food insecurity. Of the 19 countries with large deficits and predicted cereals import bill growth greater than 1 percent, 11 have undernourishment rates greater than 20 percent, meaning that more than one out of every five persons does not consume the minimum caloric requirements necessary to maintain good health under light activity. From a macroeconomic perspective, of the seven most vulnerable countries, four have undernourishment rates of 29 percent or higher.

Impact (pass through) of world price changes on domestic markets

42. The impact of higher prices on the domestic economies of exporters and importers will depend, *inter alia,* on the extent to which changes in world market prices of cereal crops have been transmitted to domestic economies in recent years. Government policies designed to avoid large domestic price shocks[23] and the depreciation of the US dollar against many currencies (e.g. the euro and the CFA franc) tend to reduce transmission of world market prices to domestic markets. Table 7 shows that real exchange rate appreciation in recent years has been quite widespread across different types of countries (categorized according to World Bank income class). Below, price transmission from world to domestic markets is analysed along with the factors that affect transmission.

Table 7: Average real exchange rate appreciation of domestic currencies versus the US dollar, 2003 to 2007, by World Bank income classification.

Income class	**(%)**
Low income	16
Lower middle income	14
Upper middle income	19
High income	12

Source of raw data: USDA (2008). Calculation is a simple average of all countries in a given income class for which data were available.

Rice in Asia[24]

43. A specific analysis of price transmission for rice in seven large Asian countries is revealing. In Table 8, column (1) shows the cumulative price increase in real US dollars from the fourth quarter of 2003 to the fourth quarter of 2007, while column (2) shows the increase in world prices in real domestic currency terms during the same period of time. A comparison of columns (1) and (2) shows that changes in column (2) are substantially lower than column (1) for most countries, although the change is positive for all countries.

44. Column (3) shows cumulative changes in real domestic prices at the consumer level. For several countries, it can be seen that these changes are lower than the changes in column (2). These countries have used various commodity-based policies to insulate the domestic economy from price increases on international markets. For example, India and the Philippines use government storage, procurement and distribution as well as restrictions on international trade. Bangladesh uses variable rice tariffs to stabilize domestic prices. Viet Nam uses export restrictions of various sorts.

45. Other countries, such as Thailand and China, have been content to allow most of the changes in world prices (after taking account of currency appreciation) to pass through to

[23] For more details see last section of this report.

[24] The analysis in this section is based on Dawe (2008).

domestic markets.[25] In yet other countries, there have been domestic price increases unrelated to events on world markets. In Indonesia, for example, domestic prices surged 23 percent due to import restrictions from October 2005 to May 2007, a period when world prices declined by 20 percent in real rupiah terms.

46. A key conclusion that emerges from Table 8 (shown in column 4) is that, for all countries in the sample except China, the percentage change in column (3) is less than 60 percent of that in column (1). The average across these seven countries shows that about one-third of the increase in real US dollar prices has been passed through to domestic markets. This conclusion is consistent with Sharma (2002), who found that during the 1995-96 price spike, transmission elasticities in Asian countries were typically low, especially for rice.

47. However, world rice prices surged further in the first quarter of 2008, from an average of US$378 per tonne in December to more than US$700 per tonne by the end of March in nominal terms and have led to substantial price increases in many domestic markets. In Bangladesh, wholesale prices rose by 38 percent from December 2007 to March 2008, and in the Philippines they increased by more than 30 percent from October 2007 to April 2008. Average retail prices in India increased by 18 percent from October 2007 to March 2008.

[25] Thailand has some government intervention in terms of procurement and storage, but has largely followed a policy of free trade in rice. China, despite restrictions on private traders, was allowing changes in international prices to be reflected more or less fully in domestic prices, at least through the end of 2007.

BOX 1

Defying the resource curse: agricultural commodity price booms can lead to sustainable growth

The current commodity (agricultural and non-agricultural) price boom brings opportunities for increased government revenue and private sector income in exporting countries. At the same time, it presents a challenge as to how governments can best allocate windfall gains between consumption and investment. Thus, decisions made during the price boom are decisive for economic growth during periods of low prices.

Several research efforts have identified a "resource curse", meaning natural resource-abundant countries tend to grow more slowly than resource-scarce countries. However recent research points out that the impact on long-term growth varies with the type of export commodity (Collier and Goderis, 2007; Collier, 2007). Specifically for the African context, the resource curse relates primarily to oil and non-agricultural commodity price booms, while booming prices on agricultural commodities may, in fact, lead to higher economic growth both in the short and long run.

Where the public sector derives a large share of its revenue through taxation of price-volatile non-agricultural commodities, research has shown that such revenues are allocated in an unbalanced way that favours short-term consumption or relatively unproductive investment rather than savings and sound investments that will protect the economy during periods of lower prices. As a result, short-term growth is reversed when prices decline in the long run.

On the other hand, agricultural export commodities compete for land and other input factors with other crops, thus limiting opportunities for rent seeking. Additionally, farmers make expenditure and investment decisions for additional income generated by an agricultural commodity boom that consider long-term consumption paths, investment opportunities, etc. This tends to lead to both short-term economic growth and longer-term economic growth.

The policy implication is that the present agricultural commodity price boom provides an important opportunity for stimulating both short- and long-term growth if it is not, imprudently, taxed away and if the public sector provides the necessary resources in the form of public goods which will increase agricultural productivity.

Table 8: Cumulative percentage changes in real rice prices, Q4 2003 to Q4 2007

Country	(1) World price (US$)	(2) World price (DC)	(3) Domestic price (DC)	(4) Pass through (%) = (3)/(1)
Bangladesh	56	55	24	43
China	48	34	30	64
India	56	25	5	9
Indonesia	56	36	23	41
Philippines	56	10	3	6
Thailand	56	30	30	53
Viet Nam	39	25	3	11

Notes: Data for China compare 2003 and 2007 (annual). Data for Viet Nam compare 2003 and 2006 (annual). DC stands for " Domestic Currency".

48. Table 9 shows that the percentage changes in consumer and producer prices are remarkably similar in all cases for the Asian countries analysed, suggesting that markets are well integrated and that price changes at one level of the marketing system are passed through to other levels.

Table 9: Percentage change in real domestic producer and consumer prices

Q4 2003 to Q4 2007

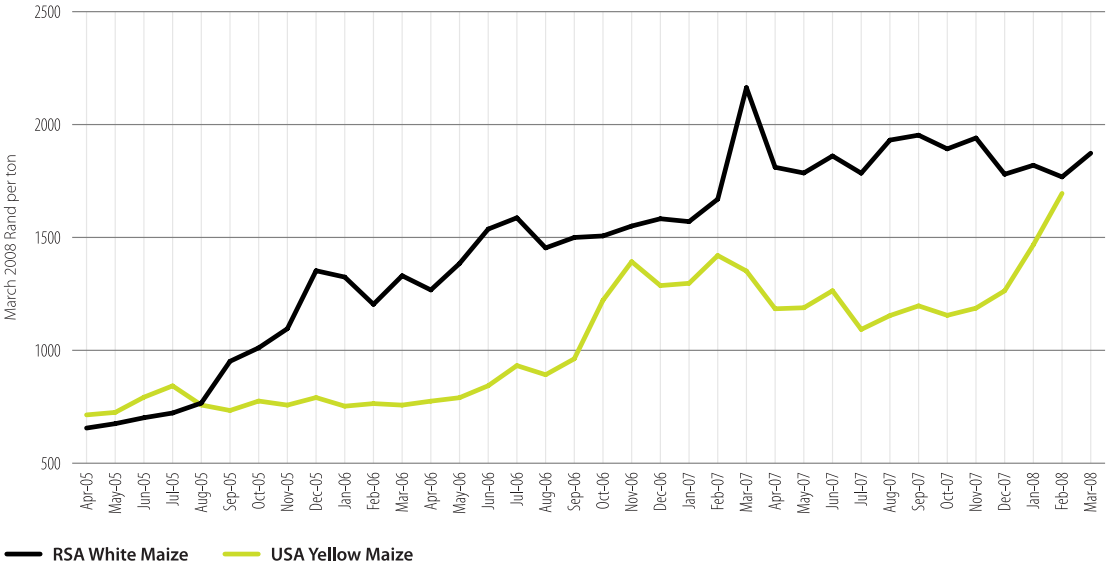
Country	Commodity	Producer	Consumer
Bangladesh	Rice	8	2
Bangladesh	Wheat	42	39
China	Rice	28	30
Indonesia	Rice	28	32
Philippines	Maize	9	5
Philippines	Rice	7	3

Notes: Data for Indonesia compare Q1 2003 and Q1 2007. Data for Bangladesh compare Q4 2003 and Q4 2006. Data for China compare 2003 and 2007 (annual).

White maize in Southern Africa[26]

49. As with rice in Asia, there also has been less than perfect transmission from international yellow maize markets to national or regional white maize markets in southern Africa. At one level, this is not surprising, as white maize is typically used for human consumption while yellow maize is used for animal feed or ethanol. On the other hand, the two commodities are potentially substitutes in production (as happened in Mexico when US maize prices increased) and in consumption (for feed purposes). A graph of yellow maize export prices in the United States (in real Republic of South Africa rand) does not seem to track the changes in South Africa white maize prices well (see Figure 7). There are two possible reasons for this – first, the commodities are different and, second, white maize prices are strongly dependent on supply shocks in South Africa and other countries in the region. For example, from April 2005 to April 2006, white maize prices nearly doubled in South Africa (primarily due to a drought that reduced the maize harvest by some 40 percent), while for US yellow maize, the price increases were very mild. More recently, US maize prices surged from November 2007 to February 2008, partly due to strong demand from the biofuel industry, yet South African maize prices held steady during this time.

Figure 7 **Republic of South Africa wholesale white maize and USA yellow maize export prices (real Republic of South Africa rand per ton), January 2003 to March 2008**



50. Interestingly, white maize prices in the smaller economies of the region (Malawi, Mozambique and Zambia) do not seem to correlate well with prices in South Africa. Further, a close examination of the data seems to indicate that a recent maize price surge in Malawi and Mozambique began just before a similar, but smaller, increase in US prices. Of course, maize markets in southern Africa cannot remain completely disconnected from world markets over the long term but, in the short term, national trade policies, public procurement and distribution of maize and poor infrastructure seem to play an important role in determining domestic prices. Countries with large maize imports relative to their domestic requirements,

[26] The analysis in this section is based on Gunjal and Dawe (2008).

such as Lesotho, Swaziland, Botswana and Zimbabwe, have experienced much stronger price transmission from South African prices, the region's main exporter.

Wheat in Latin America

51. Argentina and Chile present contrasting cases. Both are upper middle-income countries and have relatively good infrastructure. The exchange rate in both countries has appreciated against the US dollar during the past few years. Chile, however, imports a large share of its wheat consumption requirements, while Argentina is a major world wheat exporter. More important for price transmission, Chile pursues a very open trade policy, while Argentina is much more interventionist.

52. Due to exchange rate appreciation, world price equivalents in real domestic currency terms have increased more slowly in both Chile and Argentina than on world markets. Comparing Q4 2007 with Q4 2003, world wheat prices increased by 91 percent in real US dollars. However, in real Chilean pesos, the increase was just 50 percent, while in real Argentine pesos, the increase was 68 percent.

53. Domestic wheat prices in Chile follow international prices quite closely, as can be seen in Figure 8, while Argentina places export taxes on wheat to keep domestic prices lower and also uses export registrations to influence trade. Thus, Figure 9 shows that domestic wheat prices are consistently lower than benchmark international prices. Further, as international wheat prices have climbed, Argentina has increased its use of such instruments to control trade, with the result that the gap between domestic prices and the world price has increased during the past few years.

Figure 8 **Chile domestic wholesale and world wheat prices (real Chilean pesos per kg), January 2003 to February 2008**

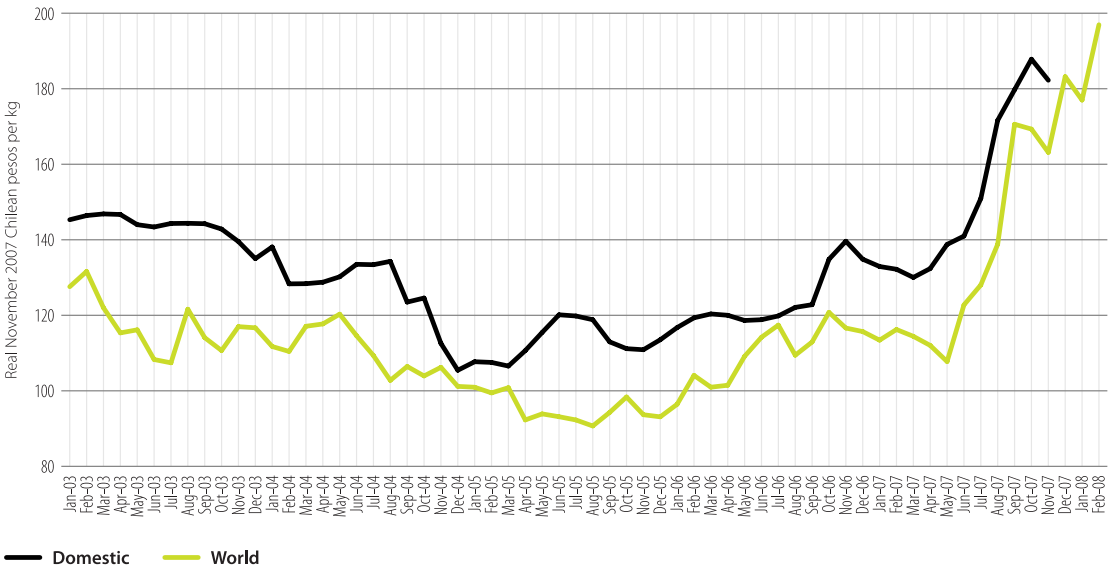
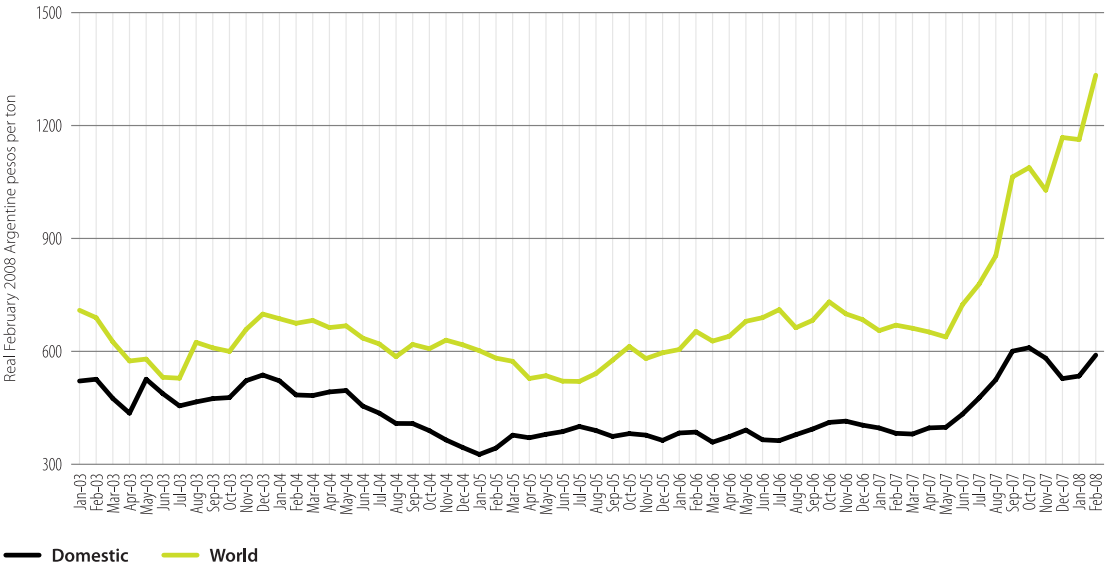


Figure 9 **Argentina domestic wholesale and world wheat prices (real Argentine pesos per ton), January 2003 to February 2008**



Impact of rising food prices on consumer price indices

54. One way to measure the price changes that have occurred on domestic markets is to examine data on food price inflation. One disadvantage of this approach is that the food basket consumed by the poor can be quite different from the food basket used in the calculation of the consumer price index (CPI). Nevertheless, data from the CPI can be used to estimate the aggregate impact of price increases for a wide range of food commodities, and they are available for a number of countries on a timely basis. This approach is helpful because prices have increased for a very large number of different commodities (see Table 10).

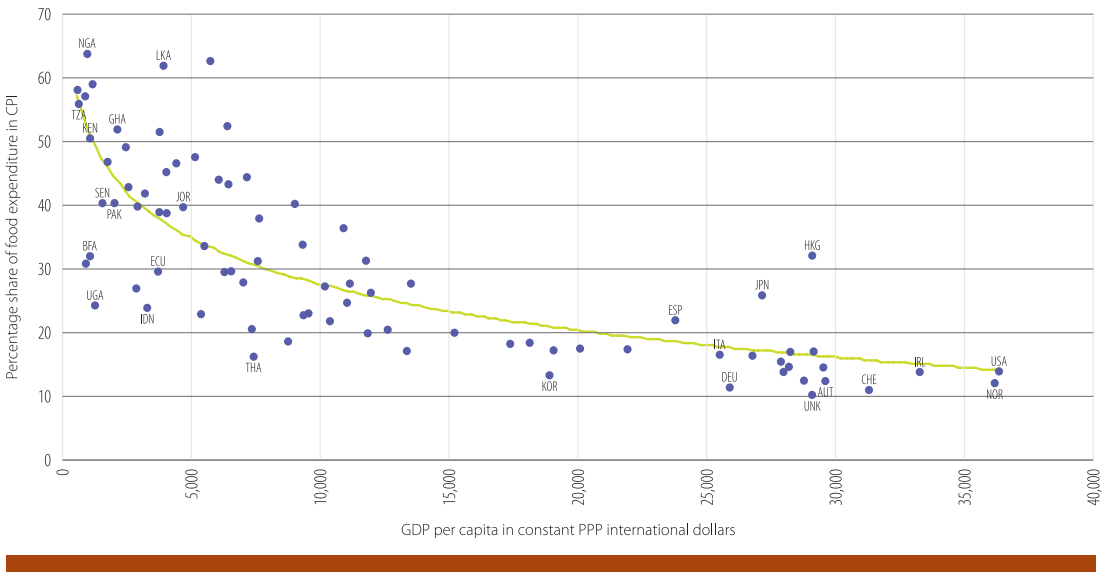
Table 10: Summary of changes in domestic prices of main basic food commodities observed in 45 developing countries

Commodities	Percentage of consumer price quotations from 45 reporting countries indicating *increases* of 0-75%			Percentage of consumer price quotations from 45 countries indicating *decreases*		
	01/2006 to 01/2007	01/2007 to 01/2008	01/2008 to 03/2008	01/2006 to 01/2007	01/2007 to 01/2008	01/2008 to 03/2008
Rice	67	72	65	27	15	29
Wheat	57	69	57	36	18	40
Maize	60	71	52	26	16	37
Root crops	43	65	52	39	28	42
Vegetable oils	72	75	63	23	2	24
Pulses	67	59	70	20	32	23
Milk	70	90	49	26	3	46
Meat	69	76	49	29	17	46
Eggs	58	70	49	33	25	43
Fish	62	62	43	26	28	51

Source: Survey of countries where FAO has a representative

55. Figure 10 highlights the importance of food expenditures for poor countries. It plots GDP per capita expressed in purchasing power parity (PPP) international dollars of 86 countries for which data are available, against the weight of food expenditures in the calculation of consumer price indices (CPIs) in each. For example, at the lower end, the average weight of food expenditures in total CPI is around 45 percent for the 20 countries with the lowest per capita income (i.e. less than PPP dollars 3 700), while the share of the richest top 20 countries (i.e. greater than PPP dollars 22 000) averages only 16 percent.

Figure 10 **Share of food expenditure in consumer price index and consumer price index and GDP per capita for selected countries**



56. Table 11 presents the percentage changes in the CPI, as well as the changes in its food component as a result of the changes in food prices in selected countries or group of countries from 2007 to 2008 for the months of January and February. As can be seen, in all cases for both months, the changes in the food component of the CPI have been larger than the changes in the value of the index itself, though there have been differences in the magnitude of changes, reflecting many of the factors described in the previous section. The average increase in the food component for the developing countries was about 12 percent in January, rising to 13.5 percent in February. For the developed countries/regions it was 5.4 percent for both months. The larger increases for the developing countries are probably due to the fact that foods consumed in those countries undergo less processing relative to that in developed countries. Thus, increases in the price of the basic food contribute relatively more to price increases for the final product in developing countries.

57. While the average figure for developing countries of 13.5 percent inflation in food prices is certainly cause for concern, especially for the poor, this increase is much less than what one might expect based on a reading of press reports. Further, some of this increase is just general inflation due to growth of the money supply. Nevertheless, the overall average may also hide many very serious increases in staple food prices, which are the most important for the poor. For example, as noted earlier, from October 2007 to March 2008, rice prices increased by 38 percent in Bangladesh, 18 percent in India, and more than 30 percent in the Philippines.[27] This is a very large increase for poor people who depend on a single staple food for the bulk of their caloric intake, and typically spend 20 to 40 percent of their income on this one commodity alone.

Trends in per capita consumption

58. One would expect that higher cereal prices would reduce cereal consumption, and countries with high levels of undernourishment that are highly dependent on cereals for their daily caloric intake would be of particular concern (see the top two panels of Table 12). However, in spite of the soaring prices in global commodity markets documented above, in particular of tradable cereals such as wheat, rice and maize, the most recent data on the food use of these key cereals have not shown a decline on a per capita basis. This trend is the same for most low- income countries, including those with high levels of undernourishment (see Figure 11). While this may change with the persistence of high cereal prices in the future, current trends suggest that given the importance of cereals as a major source of energy in the household diet, cereal consumption is highly inelastic to price changes.

59. These trends must be interpreted cautiously, however. First, the data on consumption are estimated using the supply-disposition method, and do not come from consumption surveys. There are major sources of uncertainty in the data used to make these calculations. Second, the average trends for a country obscure the fact that poor consumers respond more to price changes than do wealthy consumers; thus, average consumption may change little for the country in total, but for the poorest the changes could be quite substantial. Third, even if cereal consumption of the poor does not change, this does not imply that there are no important welfare effects. The poor may defend their intake of cereals, but only at the expense of reduced consumption of more nutritious foods and reduced expenditures on education and health (see the section on “Household level impact of high food prices”).

[27] For the Philippines, the calculation refers to October 2007 to April 2008.

Table 11: Monthly percent changes in the CPI and share of food expenditures in CPI for selected countries/groups

Country	Jan 2007 to Jan 2008		Feb 2007 to Feb 2008	
	%change		%change	
	Total CPI	FOOD	Total CPI	FOOD
Guatemala	7.7	18.3	8.0	11.6
Sri Lanka	4.6	5.8	19.4	25.5
Malawi	6.8	11.4		
Botswana	10.6	18.2	7.7	18.3
India[1]	8.6	13.6	4.6	5.8
Indonesia	5.4	9.1	6.8	11.4
Pakistan[1]	4.0	6.4	10.6	18.2
South Africa	5.8	10.9	8.6	13.6
Jordan	9.5	13.5	5.4	9.1
Peru	9.9	11.8	4.0	6.4
Senegal	3.6	7.3	5.8	10.9
Egypt	15.4	24.6	9.5	13.5
Haiti	10.3	14.2	9.9	11.8
UEMOA[2]	6.9	14.6	3.6	7.3
Kenya	4.6	12.6	15.4	24.6
Bangladesh	3.4	5.1	10.3	14.2
Chile	4.1	5.8	6.9	14.6
China	6.6	18.2	8.0	23.3
OECD	3.4	5.1	3.4	5.1
USA	4.1	5.8	4.1	5.8

[1] Food beverages and tobacco

[2] Includes: Benin, Burkina Faso, Cote d'Ivoire, Guinee-Bissau, Mali, Niger, Senegal, Togo

Figure 11 **Per capita consumption of all cereals**

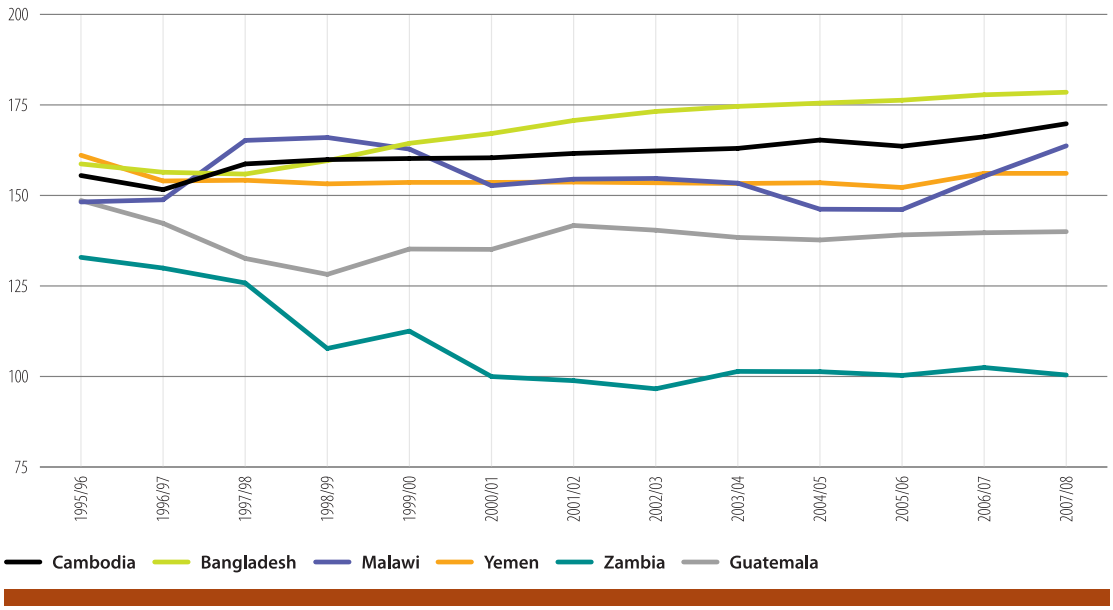


Table 12: Countries with high levels of undernourishment (>20%); high and low shares of Dietary Energy Supply (DES) from rice, wheat, maize

Country	Undernourishment		% DES from rice, wheat, maize	2001-03 daily DES (kcal)
	Prevalence 2001-03 %	Number of People 2001-03 millions		
>55 % DES from tradable cereals				
Bangladesh	30	43	81	2200
Cambodia	33	5	77	2060
Zambia	47	5	63	1930
Korea, DPR	35	8	62	2470
Malawi	34	4	59	2140
Yemen	37	7	59	2020
50-55 % DES from tradable cereals				
Zimbabwe	45	6	54	2010
Sri Lanka	22	4	54	2390
Madagascar	38	7	53	2040
Guatemala	23	3	53	2210
India	20	212	53	2440
Sierra Leone	50	2	52	1930
<20 % DES from tradable cereals				
Dem. Republic of Congo (DRC)	72	37	18	1610
Central African Republic	45	2	17	1940
Burundi	67	5	15	1640
Chad	33	3	11	2160
Sudan	27	9	11	2260
Rwanda	36	3	9	2070
Niger	32	4	9	2160

Impact of high food prices at country level: some concluding remarks

60. There are several conclusions that can be derived from the analysis of the country-level impacts of high food prices. First, from the point of view of country-level impacts, assessment must be done on a case-by-case basis, because different countries have experienced different exchange rate movements and employ different commodity policies. International price movements are not fully reflected in domestic prices and changes in domestic prices are not necessarily due to events on international markets. Nevertheless, it should be emphasized that many countries have experienced sharp increases in domestic prices, even if these increases are less than price changes on world markets. Furthermore, even if these prices subsequently decline, it still remains difficult for the poor to cope with such changes, because it is not possible to forego staple food consumption for several months waiting for prices to fall.

61. These increases will be more easily tolerated if wages are increasing at sufficiently rapid rates, but the limited evidence available suggests that there is a lag of several years before wage increases are adequate to compensate the poor (Ravallion 1990; Rashid 2002).

62. Second, in the short run, most countries seem to have managed to maintain a non-declining per capita cereal consumption. The data on apparent consumption show no dramatic changes in the historical patterns. Again, however, these national average data hide changes that may be occurring in poor households, and they also ignore changes in consumption of

more nutritious food such as meat and dairy products, and changes in expenditures on health care and education. Large import bills have had large macroeconomic effects only in a limited number of countries, but these effects could be severe in many cases, especially if world prices remain high or continue to increase. If high prices remain in place for an extended period of time, some of the government interventions that have so far helped to moderate price increases will not be fiscally sustainable.

63. Most importantly, "moderating" the impact of movements in world prices on domestic prices does not mean that the food security impacts are negligible: increases in domestic prices even by moderate rates (10 or 20 percent) may be disastrous for very poor households that spend a large part of their income on food staples. For example, Senauer and Sur (2001) estimated that if there is a 20% increase in food prices in 2025 relative to the baseline, the number of under-nourished people in the world would increase by 440 million people. These considerations point to the importance of household-level food security analysis, which is discussed in the next section.

B. HOUSEHOLD-LEVEL IMPACTS OF HIGH FOOD PRICES

64. It is clear from media reports that soaring food prices have had a wide and substantial impact on the food security situations of households and individuals around the globe. While empirical data are limited, the following sections review the heterogeneous nature of this impact across households and individuals depending on existing consumption patterns and household market position as net buyers or net sellers of food.

65. Urban populations are more exposed to rising food prices for two reasons. First, urban populations are more likely to consume staple foods derived from tradable commodities (wheat, rice), while rural populations (particularly in Africa and Latin America) tend to consume more traditional staples, such as roots and tubers. Second, urban populations are less likely to produce a significant share of their own food or produce for sale.

66. In the very short term, the impact of soaring food prices on households depends crucially on their position in agricultural output food markets as producers and consumers. Low-income households that spend a large proportion of their income on tradable staples whose prices increase substantially are likely to be the ones whose overall welfare is worst affected. Households that derive a large proportion of their income from the production and sale of those goods will, on the contrary, be positively affected if producer prices are remunerative relative to production costs some of which, such as fuels, seeds and fertilizers, have also increased substantially. The effect on households that are both producers and consumers of different commodities is ambiguous and will depend on their net position in the specific markets and the relative price changes for different commodities.

67. Clearly these effects can be mitigated by the extent to which consumers are able to shift consumption towards less expensive food. In the medium term, production patterns will also reflect the movement in relative prices with households shifting to more profitable crops. If this supply side response is large enough, some households may move from being net buyers to net sellers, but that will depend on the movement in relative prices and the access to land and other resources needed to effect that response.

68. A reasonable picture of the likely short-term impact of high food prices on different types of households can be obtained by looking at the evidence from existing survey data on the production and consumption patterns of both urban and rural households. While price

changes affect all income groups, the focus of the analysis will be on households in the poorest strata of the population, which are those households that development policy is (or should be) most concerned with.

69. The first step is to identify the proportion of net seller or net buyer households and their characteristics. Table 13 reports on the share of net seller households in a sample of countries from the three main developing regions. The upper part of the table is based on RIGA[28] data, and defines net food sellers as those households with a value of production of a given country's main food staple larger than the value of their consumption of the same staple. The lower part uses results from Aksoy and Isik-Dikmelik (2008), which is based on two to three staples per country.

[28] The Rural Income Generating Activities (RIGA) programme is a joint effort by FAO, the World Bank and American University. More information may be found at http://www.fao.org/es/ESA/riga/index_en.htm.

Table 13: Share of Net Staple Food Seller Households [a] (percent)

	Share of Households [b]		
	Urban	**Rural**	**All**
Bangladesh, 2000	3.3	18.9	15.7
Pakistan 2001	2.8	27.5	20.3
Viet Nam, 1998	7.1	50.6	40.1
Guatemala, 2000	3.5	15.2	10.1
Ghana, 1998	13.8	43.5	32.6
Malawi, 2004	7.8	12.4	11.8
Madagascar, 1993	14.4	59.2	50.8
Ethiopia, 2000 [c]	6.3	27.3	23.1
Zambia, 1998 [c]	2.8	29.6	19.1
Cambodia, 1999 [c]	15.1	43.8	39.6
Bolivia, 2002 [c]	1.2	24.6	10.0
Peru, 2003 [c]	2.9	15.5	6.7
Max	15.1	59.2	50.8
Min.	1.2	12.4	6.7
Unweighted average	6.8	30.7	23.3

*

Sources: Figures shown are from the RIGA dataset, unless otherwise indicated in the notes below.

Notes: (a) In the RIGA[29] data one staple crop per country is used, as opposed to 2-3 in Aksoy and Isik-Dikmelik (2008).

(b) Share of Urban, Rural, and National Households respectively.

(c) Figures drawn from Aksoy and Isik-Dikmelik (2008).

70. The overall range of net seller households varies between 7 and 51 percent in this sample of countries. The same range in rural areas is between 12 and 59 percent. Taking an unweighted average across countries, only 23 percent of all households and 31 percent of rural households are net food sellers, indicating that, in this sample, a majority of households are net buyers of staple foods.

[29] Rural Income Generating Activities. The database is part of a joint FAO-WB-American University project http://www.fao.org/es/ESA/riga/index_en.htm

71. Taking a further look into this, to understand how the poor are represented within the group of net sellers, Table 14 reports the proportion of the poor that are net sellers, using the dollar-a-day international PPP poverty line. The bottom line is that even in rural areas, where agriculture and staple food production are important occupations for the majority of the poor, a vast share of the poor are net food buyers and stand to lose (or at least not gain) from an increase in the price of tradable staple food. At the same time, in two of the countries analysed, about half of the poor are net food sellers and, therefore, might benefit from the higher prices. Even among the rural poor, the impact of recent price trends can be heterogeneous.

Table 14. Share of dollar-day poor households that are net sellers

	Share of dollar-day poor households		
	Urban	***Rural***	***All***
Bangladesh, 2000	0.0	9.2	8.6
Pakistan 2001	5.0	22.0	18.8
Viet Nam, 1998	0.0	25.3	25.0
Guatemala 2000	7.9	11.9	11.7
Ghana 1998	29.2	46.5	43.6
Malawi 2004	2.6	7.8	7.6
Madagascar, 1993	15.4	59.6	54.4

Source: RIGA

72. Having characterized households in terms of their market position for main food staples, the next step is to gauge the likely welfare impact of a price change across different household types. The net impact of price changes on household welfare can be disaggregated into the impact on the household as a consumer of the good and the impact on the household as a producer of the good.

73. Given the same change in producer and consumer staple price, the net effect on household welfare depends on the household's condition as net seller or net buyer[30]. To quantify this change in welfare in an intuitive manner, we use the concept of compensating variation, which is the income/monetary transfer that is needed to restore the household to the initial position before the (price) shock occurred, expressed as a percentage of the initial level of total consumption expenditure.

74. In its simplest form, which is the one being computed here, substitution effects and household responses in production and consumption decisions are not accounted for. Therefore, the results are to be interpreted as the upper bound of the likely impact.[31] For simplicity, this exercise also assumes that price changes are transmitted to the same degree to

[30] Consumption and production are valued at the time of the survey and may not necessarily capture seasonal patterns.

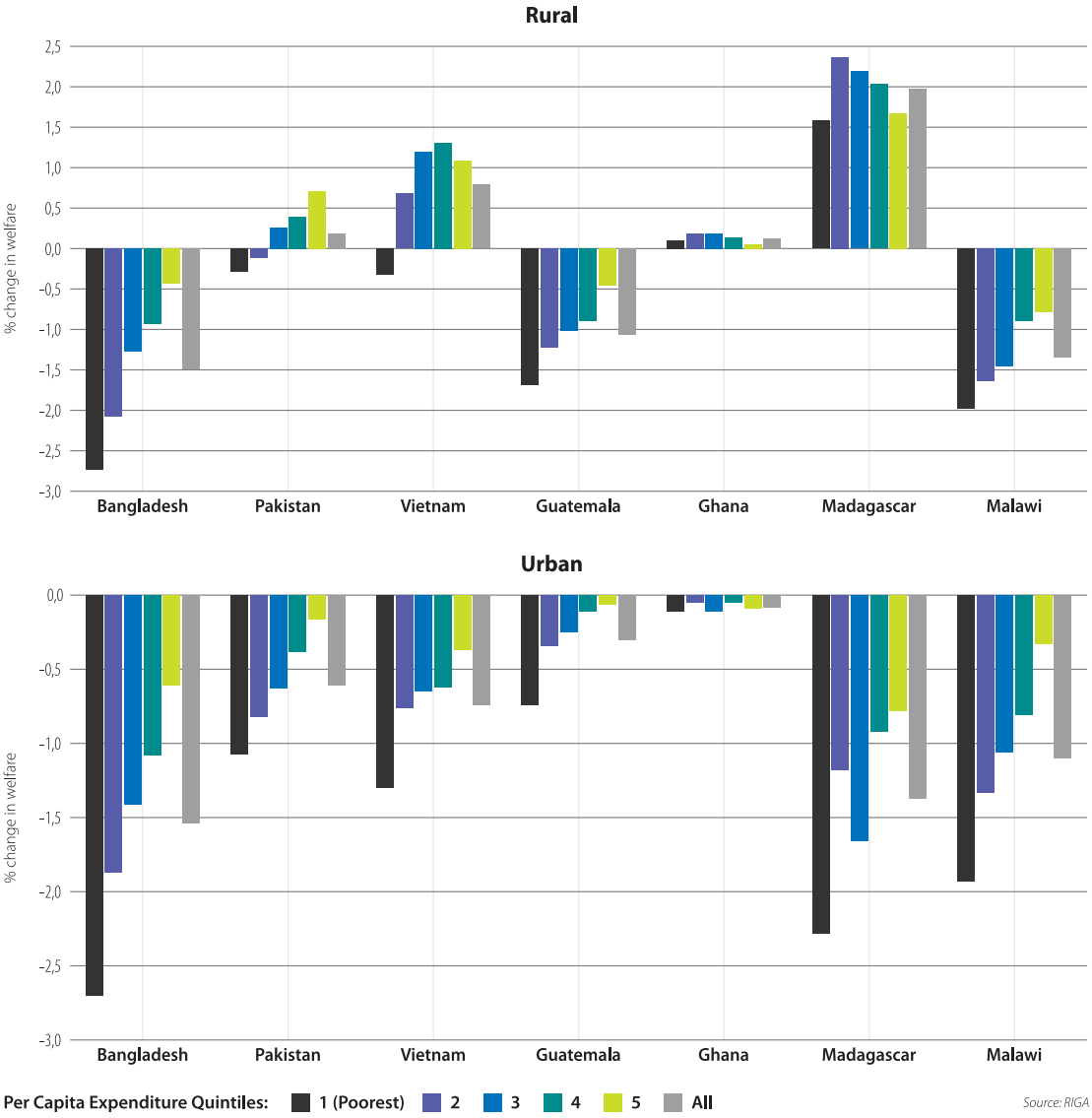
[31] It is also worth noting that adjustments in crop production are not possible in the very short term (they will take at least a cropping season to materialize), and that on the consumption side, the very poor are likely to have already exhausted most possibilities of substitution towards cheaper calories.

different types of households, be they urban consumers or smallholder farmers in a remote area with limited access to larger markets and, therefore, relatively insulated from international price movements.

75. On the other hand, the results presented below simulate the impact of a 10 percent increase in the price of the staple good, which is lower than the actual price increase currently being faced by households in many, but not all, countries. Also, these estimates refer to the increase in the price of one commodity only (the main staple), while as it has been shown above that the increase in prices is often generalized, affecting the price of non-tradable staples as well as some essential non-food items such as energy. In this respect, the results may underestimate the overall welfare impact.

76. Using the RIGA dataset, it is possible to examine the welfare impact of food price changes on different types of households. Given that the magnitude of the effects may represent an over or underestimate of the actual impacts, what matters in the analysis below is the relative effects among groups of households classified across different characteristics (net market position, income quintile, sources of household income). Several interesting observations can be drawn from these data. First, and as expected from both intuition and the discussion of Table 13 above, urban consumers are expected to lose in all countries. In rural areas, the situation is more mixed. But what is perhaps more important to note from the results reported in Figure 12, is that it is the poorest expenditure quintiles that are the worst affected in both urban and rural areas across the board. Even in some countries where rural households gain on average, such as Viet Nam and Pakistan, the poorest of the poor face a negative change in welfare following the staple price increase.

Figure 12 **Percentage welfare gain/loss from a 10 percent increase in the price of the main staple, by income (expenditure) quintile**



Source: RIGA

Note: The dark bars represent income (expenditure) quintile averages, from the poorest to the richest quintile (from left to right).

77. In Bangladesh, for instance, both rural and urban households are adversely affected by the increase in the price of rice, and the impact is, on average, of similar magnitude at 1.5 percent of their initial total expenditure level. In both rural and urban areas, however, it is the poorest of the poor (the bottom 20 percent) that are hit the hardest, facing a net loss of 2.7 percent following a 10 percent price increase, with the second poorest quintile losing around 2.0 percent. Among the African countries, losses of a comparable order of magnitude are found for Malawi and urban Madagascar. Only in rural Madagascar do the poorest households seem to stand a chance to gain from the increase in rice prices.

78. Viet Nam is another case in point. Here, rural households are expected to see their average welfare increase by 0.8 percent following a 10 percent increase in rice prices. However, these gains are not evenly distributed and the poorest quintile is still expected to face a small 0.3 percent net loss. The larger gains (1.1 to 1.3 percent) accrue to the three wealthier quintiles. Poor urban consumers are the group whose estimated welfare loss is greatest in Viet Nam.

79. As this analysis shows, it is extremely important to unpack the average impact estimates in order to understand how specific population subgroups stand to be affected, depending on their access to key assets and livelihood strategies. For instance, the outlook is systematically worse for the poor landless (Table 15) whose losses, with the exception of Guatemala, are far greater than those of the average rural dwellers. Taking once again the example of Bangladesh, the welfare loss for the landless is as high as 3.5 percent in the bottom quintile. Even in rural Viet Nam, where gains are estimated to accrue to a large share of the rural population, the one group that is expected to lose according to these estimates is the landless, whose average loss is estimated at 1.8 percent, with a 2.7 percent loss for the bottom 40 percent of the expenditure distribution. However, this group represents only about one tenth of the rural sample in Viet Nam (as opposed to one half in Bangladesh).

Table 15. Average welfare gain/loss from a 10% increase in the price of the main staple, by income (expenditure) quintile and land-ownership category

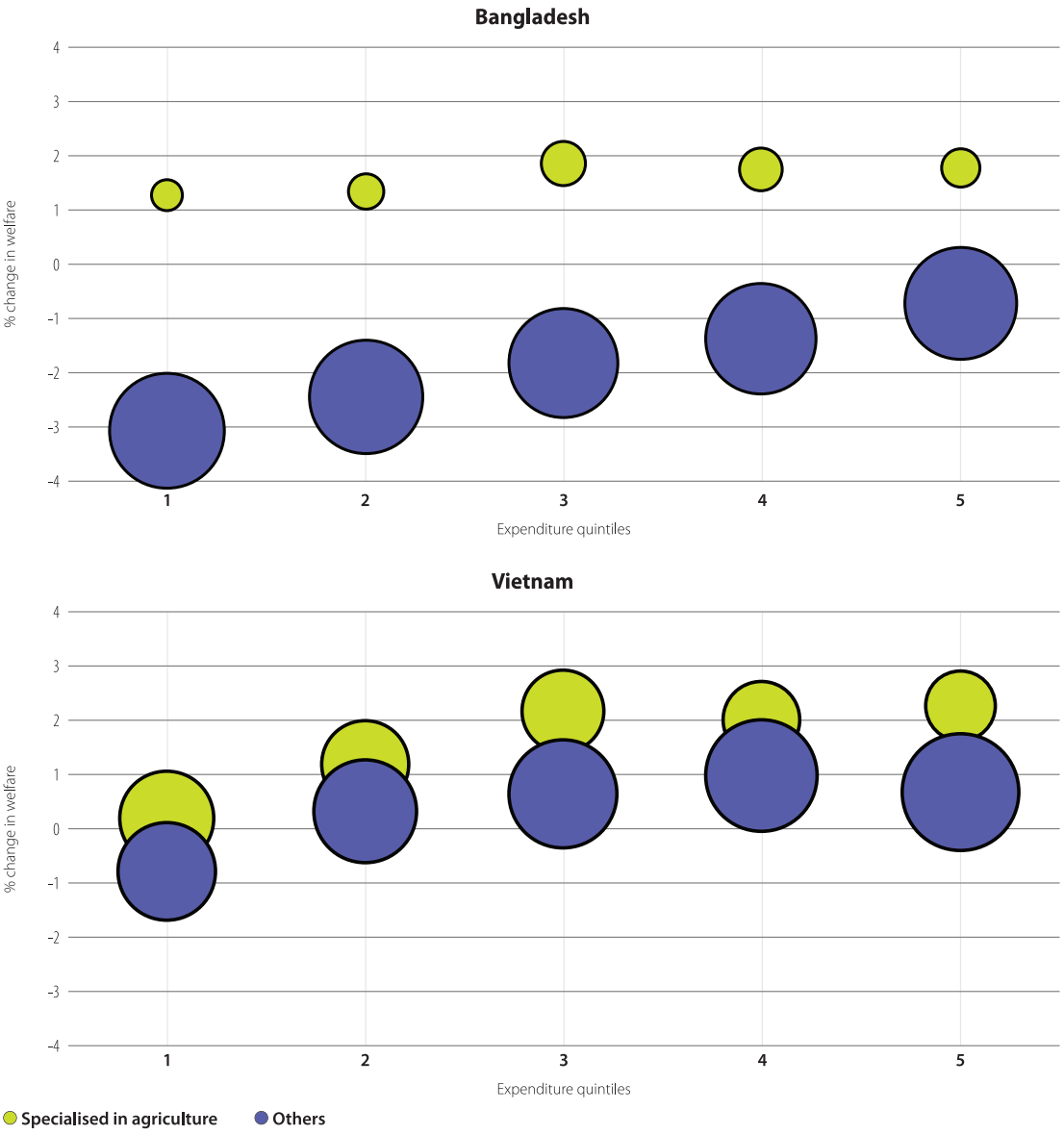
		Per Capita Expenditure Quintiles					
		1	**2**	**3**	**4**	**5**	**All**
Bangladesh	Landowners	-1.22	-0.86	-0.29	-0.06	0.15	-0.34
	Non-landowners	-3.48	-2.92	-2.36	-2.04	-1.45	-2.60
Pakistan	Landowners	1.16	1.20	1.65	1.65	1.91	1.58
	Non-landowners	-0.66	-0.63	-0.49	-0.39	-0.15	-0.48
Viet Nam	Landowners	-0.16	0.88	1.43	1.51	1.38	1.00
	Non-landowners	-2.71	-2.69	-1.85	-1.75	-0.96	-1.81
Guatemala	Landowners	-1.91	-1.27	-1.00	-1.23	-0.62	-1.27
	Non-landowners	-1.32	-1.22	-1.02	-0.89	-0.36	-0.83
Ghana	Landowners	0.5	0.31	0.32	0.19	0.15	0.29
	Non-landowners	-0.08	0.13	0.11	0.1	-0.01	0.05
Malawi	Landowners	-1.95	-1.62	-1.43	-0.85	-0.76	-1.34
	Non-landowners	-2.54	-2.05	-1.69	-1.39	-0.89	-1.45
Madagascar	Landowners	1.26	2.16	2.19	2.03	1.78	1.89
	Non-landowners	0.67	1.46	0.17	0.59	0.86	0.72

Source: RIGA

Note: This table refers to rural households only.

80. The one subgroup that, on the contrary, stands to systematically gain from the increase in prices, is the agricultural “specializers”, those households that derive more than 75 percent of their income from farming. Figure 13 compares the impact on agricultural specializers versus all other households for Bangladesh and Viet Nam – the size of the bubbles is proportional to the share of the rural households in each subgroup. In Bangladesh, agricultural specializers, who form about one tenth of the rural sample, see their welfare improve by 1.7 percent on average (1.3 percent in the bottom quintile, 1.8 in the top). Also in Viet Nam, it is the richer agricultural specializers who gain the most, at around 2.2 - 2.3 percent. But in this case, agricultural specializers represent a larger share of the rural population, likely due to the more equitable distribution of land.

Figure 13 **Percentage welfare gain/loss from a 10 percent increase in the price of the main staple, by expenditure quintile and income typology. Rural sample.**



Note: The size of the bubble is proportional to the share of rural households in each group.

Source: RIGA

81. Other sources that use more or less complex modelling techniques obtain results that are qualitatively the same as the ones presented here. For instance, this is the case of Taylor, *et al.* (2006) who simulate, in a general equilibrium framework the effect of a 10 percent change in the price of the main staple in four countries in Central America. Ivanic and Martin (2008) simulate the percentage point change in the dollar-a-day poverty rate resulting from a 10 percent increase in a number of food products and obtain results that are very close to those presented here, even when they account for some possible labour market effects (via the wage rate).

High food prices and undernourishment: the case of Peru

82. The effects of an increase of food prices on nutrition will depend on a variety of underlying factors that vary from country to country. In this section, we analyze the case of Peru as an illustration of the mechanisms through which food price increases transmit into the overall nutrition status of a population. We simulate an increase in the price of wheat which is both a staple and tradable cereal.

83. The effect of the price increase on consumption will vary if the household produces wheat or is only a consumer of wheat products. For wheat farmers, nominal income increases which has a positive effect on consumption of all goods, but the price increase has a negative impact on real income and provides incentives for the household to substitute towards less expensive items. The net effect, positive or negative, will depend on the price and income elasticities of demand, the relative importance of the value of wheat production in total income, and how the household substitutes away from wheat goods into other foods. For the non-wheat producers, which includes all urban consumers, the net effect is most likely negative.

84. Wheat is not widely produced in Peru and, therefore, the positive pure income effects are likely to be minimal. However, the distribution of the producers across income categories is also important because it is regularly observed that poorer household have higher food income elasticity. The substitution possibilities will determine the final fall in both wheat and non-wheat goods. With high substitution possible, the fall in wheat consumption will be higher, but the net fall in food consumption will be lower as consumers move away from wheat products to other cereals and tubers. Further, the net caloric effect of these trade-offs will depend on the different caloric contents of wheat and its substitutes. In the case of Peru, with its traditional diet rich in non-tradable tubers and grains such as quinoa, a high degree of substitution[32] is expected, though increased demand may eventually lead to higher prices for these commodities as well.

85. The experiment of a 10 percent increase in the real price of wheat, using as a base the nutritional status of the population as calculated from the 2003-2004 national household survey, is presented in Table 16. The table shows, by population groups, average daily caloric intake and the prevalence of food deprivation, the latter of which is the share of individuals within a given population group that consumes fewer calories per day than the age- and gender-adjusted minimum necessary to maintain good health under light physical activity. A 10 percent hike in the price of wheat results in a national increase of food deprivation from 21 percent to 22 percent. However, the increase in undernourishment is higher in the capital Lima, where a fourth of the population lives, and in the coastal region, but lower in the poorer highlands region. Although the highlands region consumes a higher share of wheat and wheat products, it is also where most of the farms that benefit from a price increase are located. Similarly, when the results of the experiment are examined by income quintile, Table 16 reveals that, for the poorest quintile, the prevalence of undernourishment and the average caloric intake do not change.

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[32] The Agricultural Information Agency of Peru recently informed that potato consumption in the capital Lima increased by 17 percent in March of this year compared to the previous year, suggesting as expected, that consumers are substituting into tubers. Further, public information campaigns that promote the use of alternative foodstuffs can have an important effect in promoting substitution and mitigating the nutritional impact of soaring food prices.

Table 16: Mean Caloric Intake and Food Deprivation in Peru (2003/04). Measured and predicted levels following a 10% real price increase in wheat and wheat goods.

	Initial Condition		Final After 10% Increase in Wheat Price			Initial Condition		Final After 10% Increase in Wheat Price	
Region	Mean Caloric Intake	Proportion of Food Deprived %	Mean Caloric Intake	Proportion of Food Deprived %	Income Quintile	Mean Caloric Intake	Proportion of Food Deprived %	Mean Caloric Intake	Proportion of Food Deprived %
Coast	2320	12	2310	13	Poorest	1490	80	1490	80
Highland	1950	36	1940	36	2nd Quintile	1880	36	1880	37
Amazon	2100	23	2100	23	3rd Quintile	2090	19	2080	20
Lima City	2280	14	2270	15	4th Quintile	2240	11	2230	12
National	2150	21	2140	22	5th Quintile	2450	5	2440	5

86. Even if the impact of higher food prices on cereal consumption is small, this does not imply that the impact of higher food prices is unimportant. Indeed, many poor people must protect their calorie intake in order to survive, so reductions in cereal consumption are not a realistic option. Instead of reducing cereal consumption, their response will be to reduce expenditures on other items such as more expensive and nutritious food (e.g. meat and dairy products), education and health care. As one example, Block et al (2004) found that when rice prices increased in Indonesia in the late 1990s, purchases of more nutritious foods were reduced in order to afford the more expensive rice. This led to a measurable decline in blood haemoglobin levels in young children (and in their mothers), increasing the probability of developmental damage. A negative correlation between rice prices and nutritional status has also been observed in Bangladesh (Torlesse et al 2003). Reductions in expenditures on education and health care can also obviously have adverse long-term consequences on their efforts to escape poverty. Households under distress may liquidate assets (distress sales) and deplete savings with uncertain prospects for re-building them.

High food price impacts: the gender dimension

87. An important question regarding the welfare effects of rising food prices is whether there are observable differences between male-headed and female-headed households. Table 17 illustrates how female-headed households in some countries are over-represented among the poor or, equivalently, are more likely to be poor, while in other countries the opposite is true. The welfare losses or gains due to staple food price increases, however, do not seem to be equally distributed among female- and male-headed households. As a matter of fact, with a few exceptions in which no differences could be established, in most urban, rural and national samples, female-headed households have greater proportional welfare losses (or smaller proportional welfare gains) than male-headed households. This effect is true for the population as a whole as well as for the poorest segments of the population.

88. These rather strong results can be explained. In the case of urban samples, the welfare effect is because of the share of the staple food in consumption: poorer households spend a greater percentage of their income on food than richer ones. Therefore, where female-headed

households are poorer, such as in Madagascar, it is expected that their welfare losses would be higher. However, even when in urban areas there is no poverty bias, such as Viet Nam, or male-headed households are over-represented among the poor, such as Nicaragua, it is still possible for female-headed households to have greater welfare losses. It has been observed in different contexts that all other things being equal, female-headed households tend to spend a greater share of their income on food. In the case of rural samples, the results in Table 17 mirror what has also been shown in different rural contexts, which is that female-headed households have less access to land and participate less in agricultural income generating activities. When this is the case, female-headed households cannot participate in the benefits of food price increases, which is what probably drives the gender bias displayed in the "Rural welfare losses" column of Table 17.

89. Although the sample of countries included in Table 17 is small, the strength of the results suggests that special attention should be paid to female-headed households within the safety-net programmes that are implemented in the context of rising food prices.

Table 17. Gender Bias in Poverty and Welfare Effects of Staple Food Price Increases

	Urban			Rural			National		
Country / Year	Share FHH (%)	Over-represented among Poor†	Welfare losses higher§	Share FHH (%)	Over-represented among Poor†	Welfare losses higher§	Share FHH (%)	Over-represented among Poor†	Welfare losses higher§
Ghana 1998	32.8	FHH	--	24.9	MHH	FHH	27.5	MHH	FHH
Madagascar 1993	20.8	FHH	FHH	13.2	FHH	--	14.6	FHH	FHH
Guatemala 2000	18.8	MHH	--	11.9	MHH	--	14.5	MHH	--
Nicaragua 2001	33.3	MHH	FHH	18.1	--	FHH	27	MHH	FHH
Bangladesh 2000	7.7	--	--	5.9	MHH	FHH	7.6	MHH	FHH
Pakistan 2001	6.3	MHH	--	6.7	MHH	FHH	6.6	MHH	FHH
Viet Nam 1998	37.8	--	FHH	16.9	MHH	FHH	21.6	MHH	FHH

Notes: FHH stands for female-headed households, and MHH stands for male-headed households. "--" Indicates that there is no statistical difference between MHH and FHH at the 95% confidence level.

† Poor households identified as those with per-capita expenditures below 2 Purchasing Power Parity dollars in 2000 prices.

§ Or welfare gains lower.

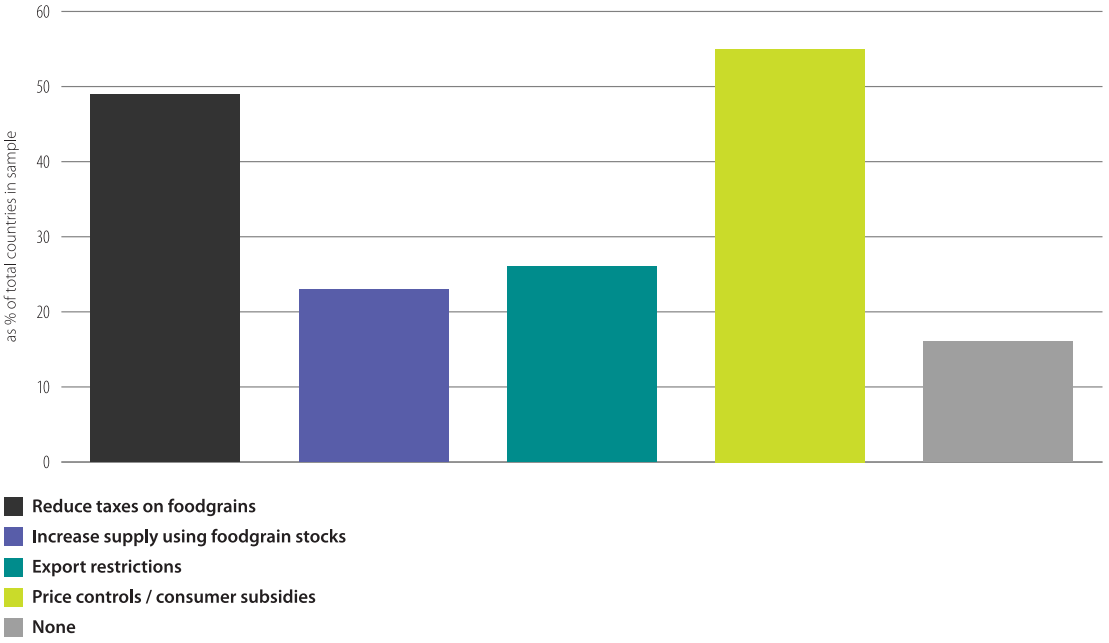
V. POLICIES FOR ADDRESSING HIGH FOOD PRICES: RESPONSES TO DATE AND POLICY OPTIONS

90. So far, national policy responses to soaring food prices have varied in nature and effectiveness. In general, the focus has been on guaranteeing an adequate and affordable food supply for the majority of consumers, providing safety nets for the most food insecure and vulnerable and, to a much lesser degree, fostering agricultural supply response.

91. As seen in Figure 14, approximately half of the governments in the 77 countries surveyed reduced grain import taxes, reflecting both the ease of use and political expediency of this measure. The table shows that 55 percent of the countries used price controls or consumer subsidies in an attempt to reduce the transmission of price increases to the consumer. One-quarter of the governments imposed some type of export restriction, and

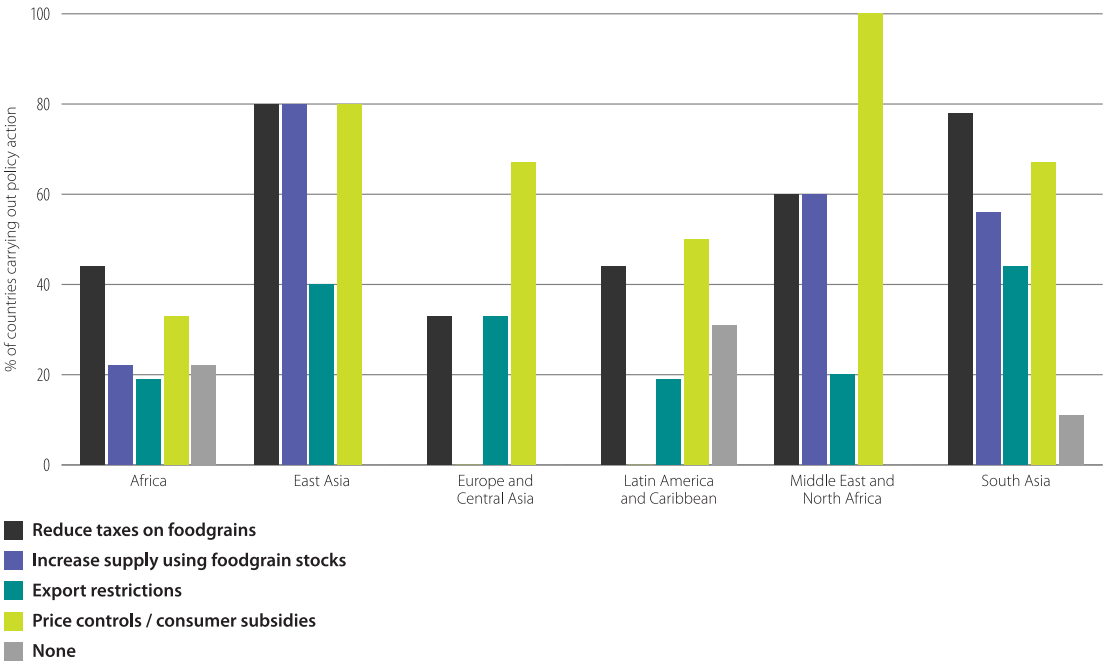
roughly the same proportion took action to increase supply, drawing on foodgrain stocks. Only 16 percent of countries surveyed showed no policy activities whatsoever.

Figure 14 Policy actions to address high food prices



92. Policy actions vary considerably by region. The governments sampled in East Asia, South Asia and the Middle East and North Africa have undertaken significant activities in all four areas of intervention. In every geographical region except sub-Saharan Africa, 50 percent or more of the countries reported using price controls or consumer subsidies. Sub-Saharan Africa and Latin America and the Caribbean regions showed the lowest policy activity, with roughly 20 percent and 30 percent of their countries, respectively, reporting no activity in any of the policy categories listed (see Figure 15).

Figure 15 Policy actions to address high food prices by region



High food prices: assessing policy options

93. The current situation serves as a reminder of the fragility of the balance between global food supplies and the needs of the world's inhabitants, and of the fact that earlier commitments to accelerate progress towards the eradication of hunger (especially through agricultural and rural development) have not been met. The immediate need is to prevent human suffering due to hunger and malnutrition and to induce a rapid supply response to restore a better balance between food supply and demand, especially in developing countries. But, if these immediate measures are to have a sustained impact, they must be followed up by actions in the medium term that will result in an accelerated and permanent reduction in the number of people suffering from hunger and malnutrition. These actions must take place not only at the national but also the global level, in relation to public goods, trade policies, markets, and responses to the impact of climate change. The focus for the longer term must be on generating and enabling farmers to apply sustainable technologies for agricultural intensification that will continue to meet the food needs of future generations in the face of rising population and effective demand, tightening availability of land and water resources, and increased risks associated with climate change processes.

94. This concluding section of the paper examines the policy options that are facing developing countries, especially those hit most hard by the price rise. It closes with a brief review of issues related to the maintenance of global food security.

National Responses

95. High food prices are associated with both threats and opportunities. The analysis in previous sections has shown that for the poorest net buyer households, high food prices of principal staple foods are associated with potentially serious welfare losses, at least in the short run. At the same time, high food prices increase the value of agricultural assets and have the potential of stimulating private sector investment in agriculture if the necessary public goods are present. In order to prevent the potential negative effects of high food prices on the extremely poor and a further increase in undernourishment, and to simultaneously take advantage of the potentially positive effects on agricultural investment, productivity and food production, a twin track approach will be essential.

96. The **twin track approach**, proposed by FAO, IFAD and WFP on the occasion of the Monterrey Conference on Financing for Development and the World Food Summit-*five years later*, addresses the dichotomy between needed actions to protect the welfare of the most poor and hungry by providing direct support on an emergency basis and beyond, while at the same time providing public resources and designing policies to re-launch agriculture and revitalize rural economies over the medium term. In the case of high food prices, emergency measures also include those intended to boost short-term supply response by facilitating smallholder access to essential production inputs.

97. Policy measures available in the short run include the provision of safety nets and social protection to the most vulnerable consumers in both rural and urban areas, as well as the enhancement of short-term supply response by smallholder farmers. Improved trade policies can also yield important gains. In the longer run, it will be important to address the fundamentals that increase investment in agriculture, both public and private, and improve the functioning of markets. Implementation of these policies offers the best option for putting the world on track to reach the World Food Summit target despite price increases.

Safety nets, social protection and rapid recovery of agriculture

98. Those most vulnerable to food price shocks need to be protected from nutritional deprivation, asset shedding and reductions in their real purchasing power. Such protection not only saves lives, it can also strengthen livelihoods and promote longer-term development. Safety nets and social protection can reduce malnutrition that has lifelong consequences, prevent distress sales of assets, and allow investments in education and health that high food prices make more difficult, all of which help keep households from falling into poverty traps.

99. In the very short run, protecting the most vulnerable may require direct food distribution, targeted food subsidies and cash transfers, and nutritional programmes including school feeding. The precise choice will depend on the extent to which some form of safety net or social protection mechanisms are already in place and can be mobilized.

100. In the short to medium run, social protection programmes must be set up or expanded and strengthened, allowing countries to phase out more generalised subsidies while making sure that all their people are able to meet their essential food needs. In order to become part of national development priorities, they must be integrated into national development plans such as national food security strategies and poverty reduction programmes. Successful implementation will generate beneficial impacts on the overall diet and nutritional status, an outcome which would not arise with input subsidies aimed at a single staple food crop. Well organized and targeted social protection systems are potentially capable of providing direct support to the neediest at a cost that is substantially lower than more broad-based actions which, in turn, makes them more sustainable.

101. Because cash economies are more prevalent and social networks are generally weaker in urban areas, strengthening of safety nets is especially important for the urban poor. Safety nets will also be especially important for nutritionally vulnerable groups, including children, pregnant women and the elderly.

102. For rural households, an integrated approach to social protection should be taken that combines traditional transfers (social safety nets) and policies that enable smallholders to respond quickly to the market opportunities created by higher prices. In the very short run, however, the supply response to higher price incentives, especially by smallholders, may be limited by their lack of access to essential inputs such as seeds and fertilizers. In these cases, social protection measures, including the distribution of seeds and fertilizers, directly or through a system of vouchers and "smart subsidies", may be an appropriate short-term response. If implemented effectively, such a programme will increase the income of small producers and may reduce price increases in local markets, thereby contributing to improvements in the nutritional status of net food-buying families.[33]

103. However, safety net programmes must be carefully designed. They may place large demands on institutional capacity, especially in countries where such programmes are most needed. Indeed, the implementation of various forms of transfer programmes has proven to be a major challenge. Particular risks include leakage of benefits to non-target groups, resale of vouchers by the target group and rent seeking by officials. It is also crucial that safety net

[33] One of the risks of subsidies on purchased farm inputs is that they draw farmers' attention away from making better use of the resources already available to them, such as the use of manure, compost and rotations involving nitrogen fixing legumes or cover crops to improve soil fertility and structure.

programmes do not impede the formation of a private marketing sector by driving out nascent, indigenous, private sector input suppliers.

Improving trade policies

104. As was elaborated above, many countries have restricted exports in attempts to ensure domestic food security. While such barriers sometimes help to contain pressures on domestic prices, they can also signal problems and lead to panic buying on domestic markets. On the other hand, in some countries where the barriers are effective, farmers have reduced planting of cereals in the face of low domestic prices for their products coupled with high prices for inputs such as fuel, seeds and fertilizers.[34]

105. Export restrictions also exacerbate price instability on world markets, especially when they are implemented in an ad hoc and uncoordinated manner. Increased world market volatility in turn will then often worsen food security in other countries. Fortunately for world food markets, some countries have started to relax those restrictions. Ukraine has recently increased the quantities of wheat exports that will be allowed, and, so far, Thailand has avoided government restrictions on rice exports.

106. Export restrictions have been given substantially less attention in the WTO than import barriers, but the current situation argues strongly that trade negotiations give more serious attention to export barriers. Indeed, many countries resort to import barriers out of fear that exporting nations may be unreliable suppliers. Thus, legal restraints on the use of export barriers may provide some spur to the reduction of import tariffs, which will lead to longer term welfare gains. Given that many of the poorest countries will have difficulties in implementing safety net programs (as noted above), export barriers may have a role to play in providing food security, but the use of such instruments should be restricted to the poorest countries.

107. Subsidies to and tariff protection of biofuel production may also need to be re-examined in light of their effects on food security. China and South Africa have already restricted the use of grains for ethanol production based on food security concerns, and some observers have called for other countries to also include food security considerations in the policymaking process.

108. While actions to free import restrictions and release foodgrain stocks into the market have had mostly immediate and favourable effects on consumers and on economic efficiency in general, these measures do have some shortcomings. First, they provide only one-time relief. Once the tariff or tax has been reduced to zero, no further reductions in price can take place through this measure. Second, they entail revenue losses for the government, which in some countries could be substantial. On the positive side, tariff reductions may make good policy sense in any case, especially if the original tariffs unduly distorted the trade regime. But if tariff reductions are to be sustainable, the government would need to undertake complementary reforms in the medium term, e.g. tax reform measures to help recoup at least part of the revenue loss. In addition, since tariff reductions imply a loss of protection for domestic producers, complementary measures (with credible exit strategies) may be needed to support and ease their transition to a liberalized environment. Such measures could include

[34] Financial Times, 18 April 2008

strengthening safety nets, public investment in rural infrastructure, improved extension services or other policies that facilitate response to the new market signals.

Stimulating agricultural investment and supply response as fundamental priorities

109. In the medium-term, there is a need for renewed attention to the agricultural sector. High food prices constitute an important element in the effort to re-launch agriculture since they provide incentives to the private sector to invest and produce. There is ample scope for substantial increases in agricultural production and productivity. Productivity increases will require significant and sustained improvements in long neglected areas such as research, extension, agricultural and general infrastructure along with credit and risk management instruments, all of which will complement increased price incentives. These initiatives will need to consider the challenges from possible long-term impact of climate change as well as more short-term effects of increased demand for biofuel feedstock.

110. Support needs to focus particularly on enabling poor rural producers – those least able to respond to changing market signals – to expand their production and marketed supply. The main areas of support include fostering agricultural research focused on the needs of poor rural producers, many of whom farm in increasingly marginal areas; enhancing access to agriculture services, including research, extension and financial services, and strengthening their capacity to take advantage of these; securing their access to natural resources such as land and water; and fostering their participation in non-agricultural sources of income including payments for environmental services. It is also important to assist poor rural households in strengthening their livelihoods in conditions of ever greater climatic uncertainty and their awareness of ways to benefit from new approaches to managing weather and other risks, including new forms of insurance.

The way ahead: creating a global enabling environment for carrying out policies

111. The risks to food security posed by the present regime of low worldwide food stocks and high food prices are substantial. The challenges of "managing" this crisis over the coming years are daunting. However, the costs of failure will be measured in terms of increased poverty and hunger, reversals in hard-earned gains in nutrition, health, education and social protection and, more broadly, social unrest and insecurity. The world community must ensure that governments have the human, financial, technical and material resources they need to implement the priority reforms listed above. These include avenues for – and access to – increased budgetary and technical support, strong policy guidance, heightened advocacy in international negotiations to reduce international trade barriers and market distortions, and the creation of new international protocols and agreements surrounding biofuels. Good governance and the support of the private sector are essential for improving effectiveness and for any measures to succeed domestically.

112. A fundamental economic incentive for stimulating the agricultural sector (higher prices) is in place for the first time in 25 years. Global attention is also now focused on the plight of the poor and hungry. At the national level, governments, supported by their international partners, must now undertake the necessary public investment and provide a suitable environment for private investments, while at the same time ensuring that the most vulnerable are protected from hunger. They must initiate actions to ensure accelerated progress towards the permanent eradication of chronic hunger and malnutrition in the world, making this a fundamental element of their development policies and poverty reduction strategies. For as long as a large number of people remain hungry, the threat of a repetition of the current crisis will remain.

113. The international community must take immediate steps to increase its capacity to respond in a coordinated and expeditious way to requests from countries for professional assistance and financial support to enable them to meet the costs of emergency interventions without unduly compromising their economic and growth potential. The immediate and medium term funding needs are estimated below. It should be noted that these funding needs for agricultural investment (not for FAO) are already in need of updating as the cost of investment has risen and food prices have increased. Further, the time period in which the WFS target needs to be achieved is substantially shorter and therefore the effort needs to be stepped up. A mere inflation adjustment will bring the required amount to more than US$30 billion.

114. At the same time, it is necessary to set in motion steps towards ensuring long-term global food security, taking into account the probable risks to global food supplies posed by climate change. Amongst the big issues to be addressed are how to develop a new generation of technologies for agricultural intensification that is sustainable from financial, environmental and social perspectives and is resilient to climate change and how to prevent further reductions in the availability of fresh water and land resources for future food production. These and other major issues affecting mankind’s continuing ability to feed itself will be the focus of a High-Level Meeting on How to Feed the World in 2050, being convened by FAO in December 2008.

BOX 2

Mobilizing resources to meet the WFS goal in the context of the twin-track approach: FAO's Anti-Hunger Programme*

The FAO Anti-Hunger Programme was initially proposed in June 2002 on the eve of the **World Food Summit:** ***five years later***, which convened Heads of State and Government, international agencies and nongovernmental organizations in Rome to discuss progress towards reducing hunger. The programme calls for an additional public investment of US$24 billion annually (in 2002 constant prices) with the objective to halve the number of hungry people by 2015 from their number in 1990-92. It also proposes combined investment in agriculture and rural development with measures to enhance direct and immediate access to food for the most seriously undernourished. It focuses mainly on small farmers and aims to create more opportunities for rural people, representing 75 percent of the poor, to improve their livelihoods on a sustainable basis. In particular, the FAO Anti-Hunger investment package includes the following:

- Programmes for enhancing access to food for the most needy through school meals, feeding of pregnant and nursing mothers and children under five, and food-for-work programmes. These activities would target the 200 million neediest people in the world. The cost would be US$5.2 billion per year, of which US$1.2 billion is needed for a school feeding programme.

- Start a process of on-farm innovation in poor rural communities. This would mobilize capital for raising farm productivity through investments in seeds, fertilizers, small irrigation pumps, school gardens and legal services to broaden access to land. A plausible target is to benefit 60 million households worldwide by 2015 with start-up capital of US$500 per family, on average. The total cost would be US$2.3 billion per year.

- Development and conservation of natural resources. Additional investment should be made in irrigation systems and in the conservation and use of plant genetic resources and aquatic ecosystems. More funding is also needed to ensure that the world's fisheries and forests are used in a sustainable way. Estimated costs are US$7.4 billion per year.

- Expansion of rural infrastructure. High priority should be given to upgrading basic infrastructure, such as rural roads, to stimulate private sector investment. Investment is also needed to assure food quality and safety, to prevent the spread of transboundary livestock diseases and to develop food handling, processing, distribution and marketing enterprises by promoting small farmers' cooperatives and associations. The additional public investment is estimated at US$7.8 billion annually.

- Improvements in international and national agricultural research, extension, education and communication, estimated to cost US$1.1 billion per year.

FAO proposed that additional public investments for agriculture and rural development should, on average, be equally shared between donor and recipient countries.

* The investment requirements need to be updated to account for increased investment costs and higher food prices (see main text).

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