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FOOD SECURITY AND AGRICULTURAL DEVELOPMENT IN TIMES OF HIGH COMMODITY PRICES

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Comments on this paper are invited and may be addressed to the author, c/o the Publications Assistant, Macroeconomic and Development Policies Branch (MDPB), Division on Globalization and Development Strategies (DGDS), United Nations Conference on Trade and Development (UNCTAD), Palais des Nations, CH-1211 Geneva 10, Switzerland (Telefax no: (4122) 9170274/Telephone no: (4122) 9175896). Copies of Discussion Papers may also be obtained from this address.

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FOOD SECURITY AND AGRICULTURAL DEVELOPMENT IN TIMES OF HIGH COMMODITY PRICES

Michael Herrmann
(UNCTAD)

Abstract

Efforts to promote food security must distinguish between short-term and medium-term measures, but also between countries with agricultural potential and without such potential, argues this paper. Furthermore, while high international food prices provide appropriate incentives for agricultural development, it would be misguided to expect that they will automatically result in an increase of agricultural output.

Globally, food security is both a demand-side and the supply-side challenge. High food prices make it more difficult to address food security on the demand-side, as more and more low-income households become unable to afford sufficient food, but at the same time, higher food prices can provide impetus to address food security on the supply-side, as more and more farmers may find it lucrative to increase agricultural production. However, not all countries can address both challenges simultaneously.

In principle, a higher rate of food self-sufficiency can help to increase the food security of the local population. But efforts to boost food production are viable only in countries that have agricultural potential; in others such efforts bear great opportunity cost. Viable approaches to promote food security must recognize, this paper argues, that food security is not per se dependent on a country's food trade balance. At the country level, food security does not depend on whether countries are able to cover domestic food consumption through domestic food production, but whether they are able to generate sufficient financial resources to finance necessary food imports. The same holds true at the household level.

Hunger must be addressed through social policies, including food aid, in the short run, but it can sustainably be addressed only through higher household incomes in the medium run. Countries that do not have potential in agriculture will need to address food insecurity through the development of non-agricultural sectors, which generate more, and more productive and remunerative jobs, particularly for low-income households. By contrast, countries that have potential in agriculture would most suitably address food insecurity through economic development that includes the agricultural sector.

Although higher international food prices can provide appropriate incentives for agricultural development, it should not be expected, the paper argues, that higher international food prices will automatically result in an increase of agricultural output. While desirable, this reaction is crucially dependent on two factors, namely: (i) the pass-through of international commodity price changes to the farm gate; and (ii) the farmers' capacity to raise production in response. In many developing countries, especially low-income countries, the pass-through to farm gates and the productive capacities of farmers, is insufficient, and therefore requires appropriate policies.

A. INTRODUCTION

During the early years of their independence developing countries were exporting commodities; many developed countries specialized in manufactures. As commodity exporters, developing countries suffered from relatively volatile commodity prices in the short run and declining commodity prices over the long run. On the other hand, manufactured prices tended to increase. These developments were a major concern for developing countries and subsequently became an important focus of UNCTAD's work. UNCTAD's first Secretary-General, Raul Prebisch, as well as Hans Singer, have highlighted the negative implications of volatile and declining terms of trade for developing countries (Prebisch, 1960; Singer, 1950).

Since the turn of the millennium however many commodity prices, including the prices of many agricultural produce, have increased substantially, while at the same time many manufactured prices, especially the prices of low-tech and low value added manufactures, have declined, effectively improving the terms of trade for the developing countries that continue to depend on commodity exports.[1] This development prompted the *Trade and Development Report 2005* (UNCTAD, 2005) to examine the question whether the reversal in barter terms of trade is likely to be a lasting phenomenon, which provides a historical opportunity for developing countries and encourages a rethinking of the classical development strategies that focused on promoting a gradual graduation from a commodity-dependent economy and an increasing specialization in manufactures.

However, as the group of developing countries has become increasingly diverse during the past decades, there is no simple and uniform answer to this question. On the one side of the spectrum are relatively successful developing countries, especially in East and South-East Asia, which have increased their specialization in basic manufactures; on the other are many low-income countries, especially in Africa, which have maintained a strong specialization in primary commodities. Contrary to the latter, the former are negatively affected by the improving barter terms of trade. However, as highlighted by the *Trade and Development Report 2005*, countries in East and South-East Asia have more than compensated for declining unit values of their exports through a more than proportionate increase of their export volumes, resulting in a significant increase of their income terms of trade. By contrast, many countries in Africa have not been able to significantly increase their export volumes, despite increasing unit values of their exports, and have therefore seen only a small improvement of their purchasing power of exports. How economies react to changing barter terms of trade depends on whether the change of international commodity prices translates into a change of local producer prices, and whether economies have the productive capacities to react to such price changes.

Although the global financial crisis and economic slowdown have led to a marked decline of commodity prices since their peak in mid-2008, commodity prices are expected to remain elevated compared with historical trends, and especially compared with the late 1990s. And indeed many commodity prices have begun to rise again in recent months. Against this backdrop, this paper examines whether international commodity price hikes are a threat or an opportunity for developing countries. Such price hikes can, on the one hand, lead to rising food prices and undermine food security; but they can, on the other hand, also lead to rising farm gate prices and stimulate agricultural production. To evaluate the threats and opportunities that arise from higher levels of international food prices, this paper examines the pass-through of international food prices to both consumers and producers. Section B of this paper describes the recent increase of commodity prices; section C focuses on effects of commodity price hikes on consumers and producers; section D outlines the challenge of agricultural development in developing countries; and section E derives implications for policymakers.

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[1] The international commodity price hike is most pronounced when compared with the late 1990s, but it is also apparent when compared with other periods (see chart 1 below).

The paper concludes that the prospect of high and sustained commodity prices provides indeed a historical opportunity for some of the poorest developing countries, many of which continue to be characterized by a strong dependence on commodities, to develop and benefit from the commodity economy. Yet, to minimize associated threats and size upon this opportunity is not an automatic process. To minimize threats, requires active social policies; to size opportunities demands active economic policies. The successful development of the agricultural sector ultimately necessitates that higher commodity prices are passed through to the farm gate (a question of appropriate incentives) and that farmers are capable of reacting to higher commodity prices (a question of productive capacities). To raise agricultural production and productivity, demands that available factors of production be more effectively and fully utilized, and that the linkages between the different economic sectors be strengthened. This critically depends on entrepreneurial capabilities, but also appropriate business support institutions and a functioning banking sector, which supplies credit that is suitable for investments in the real economy (Gore and Herrmann, 2008; UNCTAD, 2008a). Furthermore, developing countries must find ways to cope with short-term adjustment costs, including rising food prices which can undermine food security.

B. THE DEVELOPMENT OF COMMODITY PRICES

Despite a sharp fall of commodity prices since the onset of the global economic crisis, a comparison between the long-term trend and current level of commodity prices shows that many current commodity prices remain comparatively high. The average annual price of most commodities and commodity groups during 2000–2008 were higher than during previous decades, and the average monthly price of these commodities and commodity groups in May 2009 was in many cases still higher than during the previous years (chart 1). Furthermore, just as many commodity prices have been overshooting by mid-2008 many have fallen excessively since, compared with fundamentals. The notorious instability of commodity prices makes commodity price forecasts a difficult undertaking (Deaton and Miller, 1996), however it is very likely that commodity prices increase as the world economy recovers (FAO, 2008a; IFPRI, 2008a; World Bank, 2008a and 2008b). Indeed, today the fall in many commodity prices has come to a halt or has seen a revival.

The rise of international commodity prices, which are denominated in United States dollars, is partially attributable to the dollar's depreciation, and less pronounced if expressed in special drawing rights (UNCTAD, 2008a). While the international commodity price hike has been dampened in some cases by a relative appreciation of national currencies against the dollar, it has been exacerbated in others by depreciations of national currencies against the dollar.

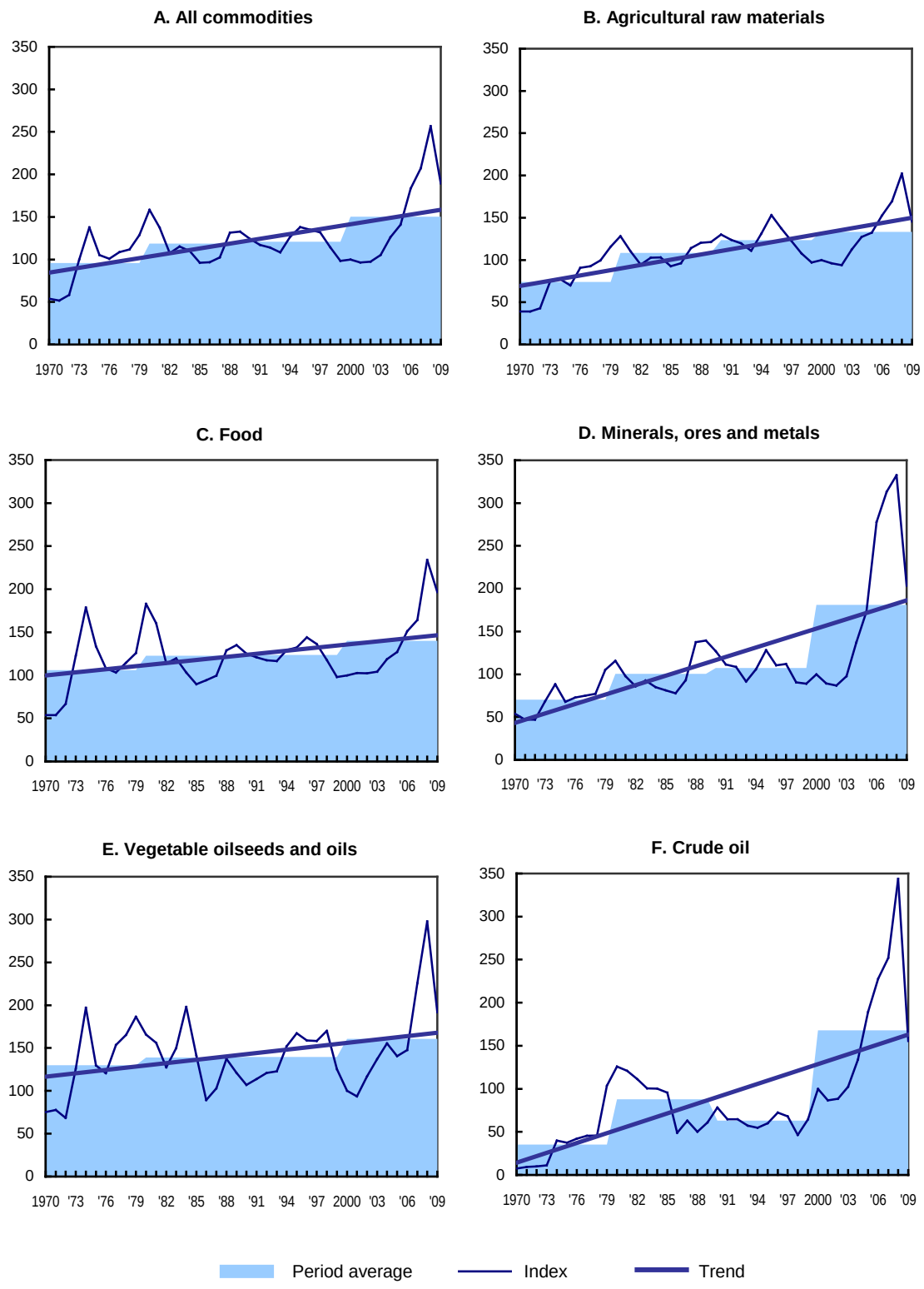
The commodity price hikes have several interrelated causes. Principal amongst these causes is a tightening of fundamentals in commodity markets and an associated increase of speculative activities (Flassbeck and Boffa, 2009; UNCTAD, 2009a and 2009b). The combination of a rapidly expanding industrial production in the developing world, which is strongest in East and South-East Asia, as well as a rapidly expanding population in the developing world, which is highest in Africa, has led to an increasing demand for commodities. Food prices however have not only increased because of a relatively high growth of the population but also because of a changing diet characterized by an increasing consumption of meats. The rise in meat consumption has important implications for both food security and for environmental sustainability (see box 1).

While demand for many commodities was rising rapidly, supply remained lagging. Although higher prices encourage producers to step up supply, most producers are unable to do so in the short run. The supply lag is particularly long in extractive industries where an increase of supply depends on the exploration and exploitation of new mines or oil fields, but the supply lag is also considerable in the agricultural sector, where an increase of supply depends more and more on the intensification rather than a mere expansion

Chart 1

LONG-TERM DEVELOPMENT OF COMMODITY PRICES, SELECTED COMMODITY GROUPS, 1970–JANUARY 2009

(Index numbers, 2000 = 100)



Source: Calculations based on UNCTAD, *GlobStat* online, extracted 2 March 2009.
Note: Food includes vegetable oilseeds and oils.

Box 1

IMPLICATIONS OF MEAT CONSUMPTION FOR FOOD SECURITY AND ENVIRONMENTAL SUSTAINABILITY

As incomes rise, the consumption of staple foods which is relatively income inelastic will further fall whereas the consumption of meat which is relatively income elastic will rise. By 2050, it is expected that the global meat consumption will double, which is attributable especially to rising incomes in the developing countries (FAO, 2006). Between 1980 and 2007, the Chinese consumption of meat alone has increased from 20 to 50 kg per capita.[a]

Yet, meat has a considerably lower nutritious value than cereals, and its production consumes considerably more natural resources than vegetarian foods. To produce one kilogram of meat requires between 10000–13000 liters of water, compared with 1000–2000 liters of water for one kilogram of wheat, and in some cases meat production also accelerates the rate of deforestation and thereby contributes to soil erosion and desertification. Today, virtually all deforested land in the Amazonas and about 78 per cent of total agricultural land is used as pastures or for feed crop production (FAO, 2006), and 80 per cent of the global soybean production is already used as fodder (Nierenberg, 2005). This share will further increase with an increasing preference of consumers for meat, putting additional upward pressure on commodity prices. Furthermore, FAO (2006) estimates that about 18 per cent of greenhouse gas emissions, measured in carbon dioxide equivalents, are attributable to livestock, including 9 per cent of anthropogenic carbon dioxide emissions, 37 per cent of methane (which has 23 times the global warming potential of carbon dioxide), and 65 per cent of nitrous oxide (which has 296 times the global warming potential of carbon dioxide). Globally, livestock accounts for more emissions of greenhouse gases than the transport sector.

[a] Calculation based on FAO, *FAOSTAT* online.

of agricultural production. And to intensify agricultural production, or increase agricultural productivity, requires considerable upfront investment in the agricultural sector.

A limited food supply is also frequently attributed to adverse climatic conditions which have depressed output in the agricultural sector, as well as a high oil price which has encouraged an increasing demand for biofuels.[2] The link between oil prices and agricultural prices has become much stronger in recent years. In the past, oil prices have influenced agricultural prices mostly by raising the cost of production, shipping and fertilizers, today however oil prices are also affecting agricultural prices because of the increasing demand for biofuels, which either encourages the use of staple foods for the production of ethanol or diverts the use of scarce agricultural land which was so far been used for food production. Despite the recent emphasis on biofuels, it has already led to considerable land use changes. Between 2001–2007, maize has begun to replace soybeans in the United States, and oilseeds are increasingly

[2] Although adverse climatic conditions are typically treated as an exogenous shock, several adverse climatic conditions are endogenous to agricultural production itself. This is because agricultural production and associated land use changes can lead to erosion and droughts (see box 1). Other adverse climatic conditions may not be directly attributable to agricultural production but they are nonetheless attributable to anthropogenic forcing (IPCC, 2007). As such they may be exogenous to the agricultural sector, but they are not exogenous to economic activities more generally.

displacing wheat in the European Union and other exporting countries (Mitchell, 2008). Although global maize production rose by 6.6 per cent between the 2005–2007 average and 2008, it actually fell by 5.1 per cent if maize for ethanol is being subtracted. Canada, China, the European Union and the United States used about 11 per cent of the global maize supplies for ethanol production, and the United States used at least 25 per cent of its corn supply for this purpose last year.[3] In accordance, several studies find that the increasing demand for biofuels, especially from the European Union and the United States, have been a major driver for the recent increase of cereal prices (Mitchell, 2008; Collins, 2008; Rosegrant, 2008). In a first round this has triggered a price increase of corn and vegetable oil, which has in turn encouraged an increase of other cereal prices, especially rice. Carter, Rausser and Smith (2008) find that the correlation between crude oil prices and corn prices increased considerably. Between 2003 and 2007, this correlation jumped from a negligible 0.05 to 0.33. The decision of the United States and the European Union, as well as several developing countries, to further increase the consumption of biofuels is likely to keep upward pressure on many commodity prices, which can be expected to ease only with future generations of biofuel technologies that rely on organic waste rather than prime agricultural produce.

The tightening of fundamentals is at the core of the recent commodity price hikes, but these price increases have been exaggerated by speculation and misguided policies.[4] While it is common for a tightening of market fundamentals to encourage an increase of speculative activities, the speculation in commodity markets last year was particularly pronounced because of the almost simultaneous collapse of the real estate and stock markets which has encouraged a large number of financial firms to seek returns in the commodity market instead. While informed guesstimation about future prices can help to make markets more efficient, outright speculation, which is disassociated from market fundamentals, tends to make markets unstable and unpredictable. In recent months, the large swings of commodity prices, well in excess of changes of market fundamentals, is attributable to the second type of speculation, as was highlighted, for example, by the *Trade and Development Report*s of 2008 and 2009 (UNCTAD, 2008a; and UNCTAD, 2009a).

Increasing prices and speculative activities however have also been prompted by country policies and vice versa. Country policies that have helped to further push up international commodity prices include restrictions of oil supplies and food exports, on the part of exporting countries, and hoarding of oil and food on behalf of importing countries. While such policies may be rational from the perspective of the individual countries, they have negative implications for other countries, as they further exacerbate commodity price increases. Furthermore, while restrictions on food exports may help to lower food prices in the exporting country, and thereby contribute to food security in the short run, a decrease of food prices may also discourage food production in the exporting country with negative implications for food security in the medium run. The suitability of different policy instruments to promote food security will be discussed in more detail below.

In conclusion, while the recent hike of commodity prices was principally encouraged by a tightening of fundamentals in commodity markets, the significant price swings in excess of market fundamentals were encouraged by speculation and misguided policies, which were mutually reinforcing. As fundamentals are likely to remain tight and markets unstable, it is desirable to consider a regulatory system that discourages speculation in commodity markets, as well as shortsighted policies in response to commodity price hikes (von Braun and Torero, 2008; UNCTAD, 2009a; UNCTAD, 2009b).

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[3] Estimates based on Mitchell (2008), as well as FAO, *FAOSTAT* online, accessed 10 March 2009. Others estimate that the United States used even 30 per cent of its corn supply in 2008 for ethanol production, which is up from 14 per cent in 2005 (Carter, Rausser and Smith, 2008).

[4] Flassbeck and Boffa (2009) for example show very strong correlation between selected commodity prices and currencies, which are best explained by increasing speculative activities.

C. EFFECTS OF COMMODITY PRICE HIKES

Out of 222 countries and territories, there were 154 net food importers and 68 net food exporters in 2003–2006. The largest number of the net food importers is not affected by spells of food insecurity, but a relatively large number of net food exporters are. Out of the net food importers 59 countries (38 per cent) were food insecure, whereas out of the net food exporters 16 countries (24 per cent) suffered food insecurity.[5] The data shows no significant correlation between the food trade balance of countries and their food security. Rather than being related to the food trade balance, food insecurity of countries is related to their income levels. Out of the 75 countries that suffer food insecurity 61 (81 per cent) were low-income and/or least developed countries (Herrmann, 2007). Paradoxically, many of the countries that are affected by food insecurity have a relatively strong specialization in agricultural sector, as indicated by a high share of agricultural value added in total value added, a high share of the agricultural labour force in the total labour force, and in many cases a relatively high share of agricultural land in total land area. Furthermore, most food insecure countries are suffering from perpetual food insecurity. This cannot adequately be explained by temporary shocks and hints at more persistent structural causes (Herrmann, 2007). However, temporary shocks may serve as triggers for outright food crisis. The recent food price hikes is but an example. They have exacerbated the underlying food insecurity of many countries and have even led to food riots.

1. Effects on consumers

How food price inflation affects different countries and consumers is strongly dependent on income levels. Since the demand for food is relatively inelastic, a rise of food prices will have negative effects on real disposable income. The effects are worse for low-income countries, where food accounts for a larger share of consumer baskets than for medium- or high-income countries, and they are worst for low-income households, where food consumption makes up the lion's share of total consumption (Ligon, 2008). Rising food prices will thus also increase income inequality. According to IMF (2008) estimates, the rural population in developing countries spends 66.1 per cent of their income on food; the ratio is 60.4 per cent for the urban population in developing countries (for similar estimates see Dessus, Herrera and Hoyos, 2008). Depending on the assumed rate at which the international food price increases pass through to domestic markets, studies derive at different estimates of the poverty impact of higher commodity prices.

The pass-through to consumers would best be estimated by a comparison between international price changes and local retail prices; the pass-through to producers would best be gauged by a comparison between international price changes and farm gate prices. However, data on retail prices and farm gate prices are either unavailable or unreliable, as highlighted by the statistical background work for this paper. As a consequence, most studies, this one included, estimate the pass-through rate using changes in

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[5] Food insecure countries include those that receive emergency aid by WFP (online information March, 2009) and are classified as emergencies by the FAO (2009), as well as those that are considered to be particularly vulnerable to food price hikes (FAO, 2008a) or highly exposed to the food and financial crisis (World Bank online information March, 2009).

Table 1

IMPORTERS OF MAIZE, RICE, SOYBEANS AND WHEAT WITH NOMINAL DEPRECIATION OF NATIONAL CURRENCY AGAINST US$, 2004–2008

	All economies	*Developed economies*	*Transition economies*	*Developing economies*	***Memo item:*** *Food insecure economies*
Importing economies (number)	168	37	14	117	63
with currency depreciation (number)	39	1	2	36	24
with currency depreciation (share)	23	3	14	31	38

Source: IMF, *International Financial Statistics* online, March 2009.
Note: For explanation of food insecure countries, see note to annex table. Iceland is the only developed economy; and Tajikistan and Uzbekistan are the only transition economies in the sample of countries that have seen a nominal depreciation of their national currency in excess of the depreciation of the US$.

exchange rates.[6] With a pass-through rate of 0.33 poverty is expected to increase by 45 million, whereas a pass-through rate of 1 would increase headcount poverty by 174 million (World Bank, 2008b).[7]

The estimates of the pass-through presented in the annex table are based on market-based exchange rates. Furthermore, unlike other studies, the estimates presented here also take into consideration import restrictions. The results summarized in table 1 show that the hike of international commodity prices was aggravated in 39 out of a sample of 168 economies that saw a depreciation of their currencies against the United States dollar over the 2004–2008 period. Most of these countries were developing countries. The only developed country where exchange rate changes have added to the increase of international commodity prices was Iceland; the only two transition economies where this has been the case where Tajikistan and Uzbekistan. A relatively large number of the countries that are considered to suffer from food insecurity, or are highly expose to food insecurity, have also seen an exchange rate change that increases the domestic price of imported commodities. The pass-through rate in many countries is further exacerbated by tariff barriers on food items. However, several estimates do not yet take into consideration that a number of food importing countries have eased import restrictions on food items in response to the recent price hikes. Although tariff reductions can make an important difference in some countries, most countries already have rather low levels of applied tariff rates.

Taking into consideration both exchange rate changes and estimates of trade barriers over the period 2004–2008 the average pass-through rate of the increase of international maize, soybean, rice and wheat prices to the markets of the developing countries over the period 2004–2008 was 1.0, 1.0, 0.9 and 0.9 respectively, compared with an average pass-through rate of 0.5, 0.4, 0.6 and 0.5 for developed countries, and an average pass-through rate of 0.8, 0.8, 0.6 and 0.8 for transition economies (see annex table). These averages however mask considerable differences between countries. Countries, especially in the Americas and Asia, which maintain an explicit or implicit dollar peg, tend to import the inflation

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[6] Gomez (2008) uses nominal exchange rates to estimate pass-through effects; the IMF (2008) and Dawe (2008) however use exchange rates adjusted for inflation.

[7] Ivanic and Martin (2009) estimate an increase by 105 million. The World Bank (2008b) provides a bound between 73 and 105 million; the IMF (2008) suggests between 130 and 150 million; and the United Nations (2008) estimate between 109 and 126 million. According to the United Nations, the food price rise since 2006 may have increased poverty incidents in sub-Saharan Africa by 8 percentage points, effectively offsetting the progress in poverty reduction between 1990 and 2004.

of dollar-denominated international commodity prices. However, the share of African countries where the pass-through rate exceeds one is higher than the share of countries in the other regions. For rice, a pass-through rate in excess of one could be observed in 20 out of 46 African economies (43 per cent), in 9 out of 36 Latin American and Caribbean economies (25 per cent), and in 10 out of 38 Asian and Pacific economies (26 per cent). It is noteworthy that the pass-through rate was not systematically higher in countries that are exposed to food insecurity, reinforcing the point that food insecurity is not only affected by food prices, but also income levels.

At the household level, the effects of food price rises also differ with income levels. While some households may be able to sustain food consumption by cutting other expenditures, the poorest households will most likely need to reduce food consumption itself. As a result, many households that live just above the poverty line will fall below the poverty line, and many that already live in poverty will slip even further into poverty. The effects are particularly dramatic for the world's least developed countries, where extreme poverty is particularly high and widespread. According to latest UNCTAD estimates, about 40 per cent of their population lived between $1 and 2 per day, and about 36 per cent of their population lived below $1 per day. Furthermore, the depth of poverty, measured by actual consumption of the poor, tends to be higher in least developed countries than in other developing countries. On average, the 581 million people that lived with less than $2 per day in the least developed countries in 2005 had a real average private consumption of only 76 cents per day. The average consumption of those living with $1 per day or less tends to be correspondingly lower (UNCTAD, 2008b and 2002).

In a recent article, Josette Sheeran, Executive Director of the World Food Programme, wrote: "People living on less than US$ 2 a day have cut out health and education and sold or eaten their livestock. Those living on less than US$ 1 a day have cut protein and vegetables from their diet. Those living on less than US$ 0.50 cents a day have cut out whole meals. Phase three is characterized by a nutritional crisis, which requires critical action for groups such as children under two year old, who will suffer the effects of deprivation for life" (Sheeran, 2008; see also Ligon, 2008). In accordance, FAO (2008a) estimates that the increase of food prices between 2003–2005 and 2008 will increase the number of people that go hungry by 75 million to 963 million. Compared with more advanced developing countries, low-income countries are particularly exposed to food insecurity and will find it particularly difficult to address this challenge. On the one side, these countries are confronted by widespread poverty and food insecurity, and on the other, these countries have very limited resources to provide for necessary safety nets.

The domestic prices denominated in national currencies provide a rough estimate of national wholesale prices. However, in countries where rural and urban markets are not well integrated, these price estimates are more applicable to urban than rural areas. The pass-through of prices to consumers, as well as the pass-through effect to producers, is thus strongly dependent on the integration of markets.

2. Pass-through to producers

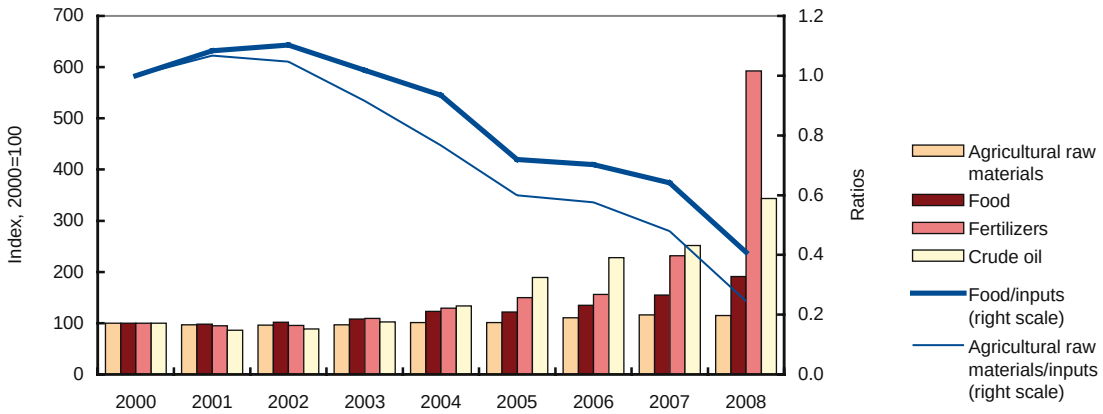
Between the 1990s and 2003–2008, world agricultural prices grew by about 21 per cent cumulatively. Using elasticities provided by Anderson, Martin and van der Mensbrugghe (2006), such a price shock would lead in developing countries to an annual increase of agricultural output by 6.3 per cent and an annual increase of agricultural employment of 4.2 per cent above the counterfactual over the period 2005–2015. The gains however are unevenly distributed between countries. Like developed countries, countries in East Asia and the Pacific are expected to lose on both grounds, whereas countries in Latin America and the Caribbean are expected to derive the greatest benefits. The actual supply and employment response in developing countries however critically depends on the pass-through of international commodity prices to local producers, and also on the capacity of local producers to respond to these price changes. Finally, the rate of pass-through to local producers, as well as the productive capacities of local producers, differs considerably between countries.

Contrary to an increase of consumer prices which will inevitably and immediately follow from an increase of world market prices, an increase of producer prices is neither immediate nor inevitable. The recent price hikes have helped to boost incomes of large agribusinesses (Oxfam, 2008), and according to some estimates they have also benefited farmers. Evidence from the United States (Sumner, 2008) shows that gross farm incomes have increased, and evidence for Bangladesh, China, Indonesia and the Philippines (Dawe, 2008) shows that local producer prices have also increased. However, the pass-through from world market prices to producer prices critically depends on the integration of local markets with world markets. Despite relatively open trade regimes many low-income countries are only weakly integrated in world markets, owing to weak infrastructures as well as weak productive capacities more generally. In accordance, it is likely that an increase of world market prices has had comparatively small, if any, benefits for producers in most low-income countries (FAO, 2008b; Conforti, 2004; Baffes and Gardner, 2003).

Although a lack of reliable and comparable data prevents a systematic comparison between producer and world prices over time, some studies of individual value chains highlight differences between producer and retail prices over a few years. A recent study of the maize chain in Mexico shows that while consumer prices have considerably increased between 2004–2008 producer prices have increased only marginally, effectively raising profits of intermediaries (Oxfam, 2008). The relatively small increase of producer prices, compared with the increase of consumer prices, is partially explained by a rising cost of transport, but it is also encouraged by a relatively weak bargaining power of producers. An unbalanced bargaining power between producers and intermediaries is attributable to the fact that there tend to be many highly fragmented and unorganized producers, on the one side, and a few large intermediaries on the other, which farmers must necessarily use in order to get their produce to markets. Case study evidence suggests that the bargaining power of producers weakens with the distance to markets. In Madagascar, for example, only 29 per cent of rice farmers have access to more than one buyer, and in remote areas of Madagascar this figure drops to 6 per cent (Barret and Dorosh, 1996).

While it is not clear that increasing world prices of agricultural outputs will necessarily and proportionally lift the revenues of producers, especially in the low-income countries, increasing world market prices of agricultural inputs will inevitably and at least proportionally increase the expenditures of producers across countries. Since 2000, the price of essential agricultural inputs, namely fertilizer and oil, has risen in excess of the prices of agricultural outputs, including food and raw materials (chart 2).

Chart 2
AGRICULTURAL OUTPUT AND INPUT PRICES, 2000–2008



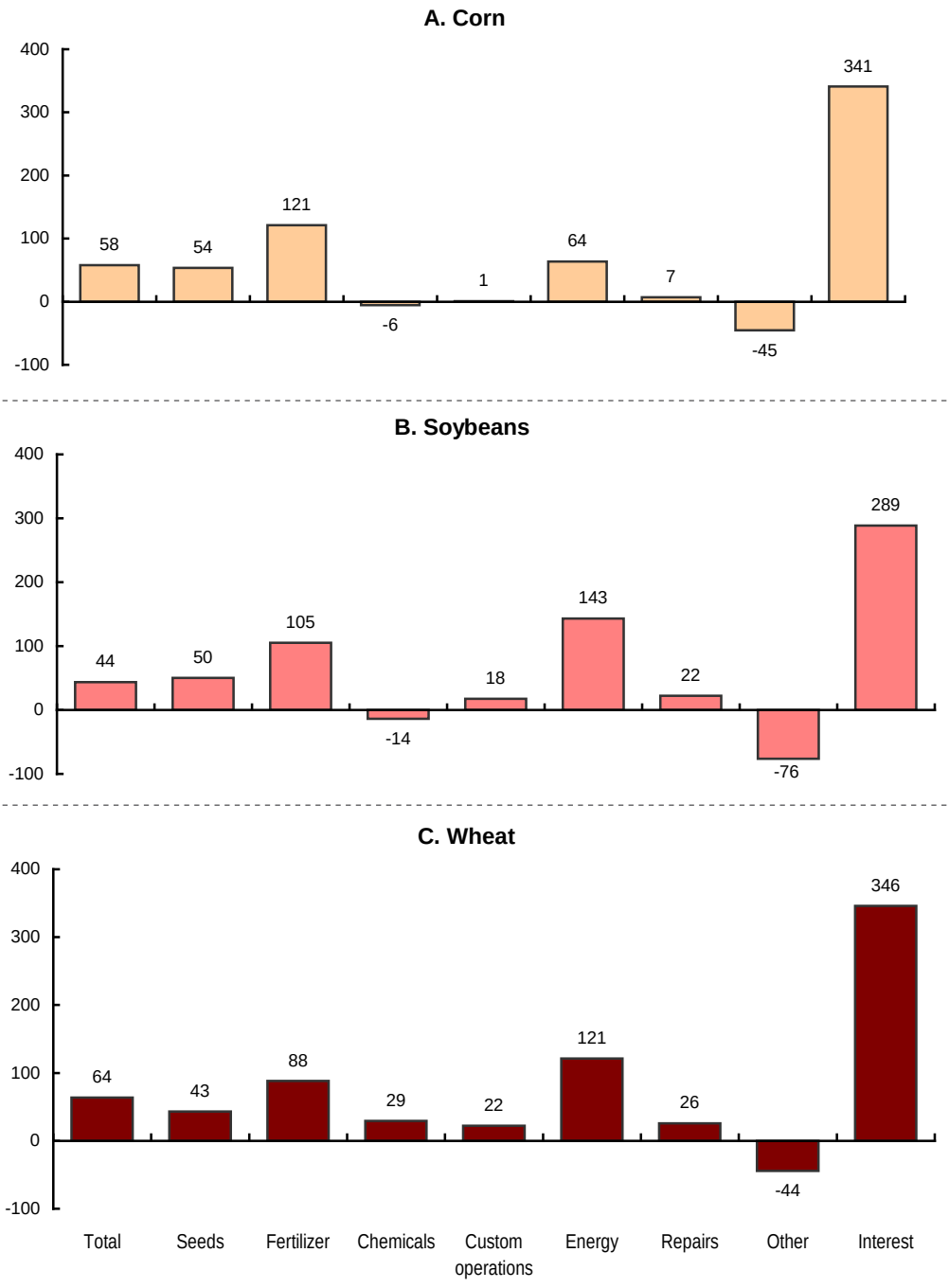
Source: Calculations based on IMF, *International Financial Statistics* online, extracted 2 March 2009.
Note: Based on world market prices in US$. The price trend of fertilizers is based on a simple average of diammonium phosphate and superphosphate (US Gulf), phosphate rock (Morocco, Casablanca), potash (Canada, Vancouver) and urea (Ukraine). The price trend of crude oil is based on the unweighted average of UK Brent (light), Dubai (medium) and West Texas. Trends of input prices are the unweighted average of trends in fertilizer prices and crude oil prices.

A more detailed study of operating costs in the United States corn, soybean and wheat production between 2002 and 2007 paints a similar picture. The lion's share of the increase in operating costs in corn, soybean and wheat production – 75, 58 and 72 per cent respectively – were attributable to an increase of the price of fertilizers and energy (chart 3). The cost of credit has increased by even more than the price of

Chart 3

CHANGES IN OPERATING COSTS IN THE UNITED STATES CORN, SOYBEANS AND WHEAT PRODUCTION BETWEEN 2002 AND 2007

(Per cent)



Source: Mitchell (2008), based on USDA, *Cost of Production Surveys and Forecasts*, July 2008.
Note: Energy includes lubricants and electricity.

essential inputs, but it accounts for a smaller share of total operating costs. Although gross farm incomes in the United States have increased between 2004 and 2008, net farm incomes, adjusted for production expenses, have remained almost unchanged (Sumner, 2008).

Whereas in the United States, an increase of overall production costs was balanced by an increase of producer prices, it can be expected that in many developing countries producer prices have increased by relatively little compared with production costs, owing to a weaker integration of farmers into global markets, and also a weaker bargaining power of farmers vis-à-vis their intermediaries. The subsequent squeeze of profit margins encourages further disinvestment in agriculture with possible negative effects on future food security. Farmers involved in organic production are less dependent on imported fertilizers and therefore less affected by these trends.

In conclusion, to evaluate the net effects of food price rises on households and economies at large, it is important to consider both the effects of these price hikes in the short run and the long run – to balance the current decline of real household incomes that is attributable to a food-price driven rise of consumer prices against a possible future rise of household income that could result from a boost for agricultural production and employment.

In the short run, all economies that are net importers of food, even if they have domestic food production, and all households that are net consumers of food, even if they are themselves involved in food production, will suffer from rising food prices. The share of rural households that is involved in the production of food but at the same time a net buyer of food is particularly high in the least developed countries (Oxfam, 2008; de Janvry and Sadoulet, 2008). Because of this phenomenon a dichotomy that classifies urban households as net food buyers and rural households as net food suppliers to estimate effects of food prices changes is too simplistic.

However, even where short run effects of high food price rises are negative, the medium run effects may be positive. Provided that higher world food prices are sustained, which is probable, and that higher world food prices are passed on to producers, which is less certain, it may well encourage some economies to expand agricultural production with direct positive effects on agricultural employment. An increase of wages and incomes of agricultural workers should also provide stimulus for higher wages and incomes in the non-agricultural sectors.

An increase of food production in response to an increase of food prices critically depends on two factors: Firstly, the pass-through of prices to producers and, secondly, the capacity of producers to respond to price changes. To strengthen both should be a key concern of policy. The former requires that the bargaining power of many producers in developing countries be strengthened vis-à-vis intermediaries and retail chains; the latter requires a large increase of investment in agriculture of the developing countries.

D. THE CHALLENGE OF AGRICULTURAL DEVELOPMENT

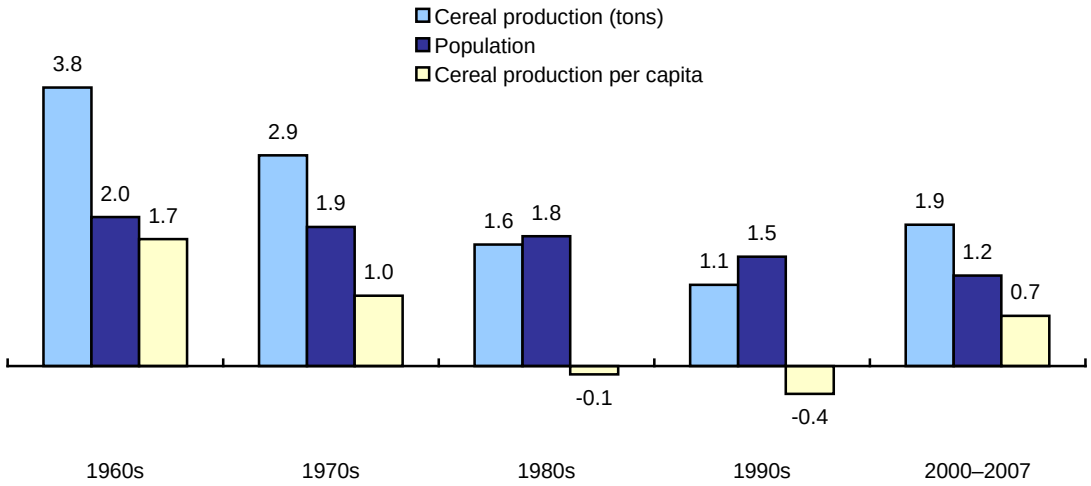
According to latest estimates of the United Nations Population Division, the world population will cross the 7 billion threshold by 2010 and top 9 billion by 2050, with the biggest increases occurring in developing countries of Africa and Asia. To prevent a further tightening of food markets, the growth of the world population must be matched by a concomitant growth of world food supplies, and world food supplies must grow at an over-proportionate rate if an increasing share of stable foods is used for the production of ethanol and/or used as fodder for livestock (Wright, 2008).

While the growth of world cereal production outpaced that of the world population in the 1960s and 1970s, the growth of the world population began to exceed that of cereal production in the 1980s and 1990s. Even though yield growth in maize, rice, soybeans and wheat has continued to decelerate in the

Chart 4

WORLD CEREAL PRODUCTION AND POPULATION GROWTH, 1960s, 1970s, 1980s, 1990s AND 2000–2007

(Average annual growth in period)



Source: Calculations based on FAO, *FAOSTAT* online, extracted 27 February 2009.
Note: Cereal production in quantities; growth rate is based on log estimate.

most recent years (IMF, 2008), between 2000–2007 cereal production per capita has begun to increase once again (chart 4).

The recovery of cereal production in per capita terms is mostly attributable to an increase of output by developed countries. According to FAO (2008c) between 2007–2008 cereal output increased by 11 per cent in developed countries and only by 0.9 per cent in developing countries; it even decreased by 1.6 per cent in developing countries if China and India are excluded. Just before the crisis struck, cereal stocks were at their lowest level since the early 1980s and to bring back the stocks of the 1980s is estimated to require productivity growth of 40 per cent, which is unprecedented so far (FAO, 2008c).

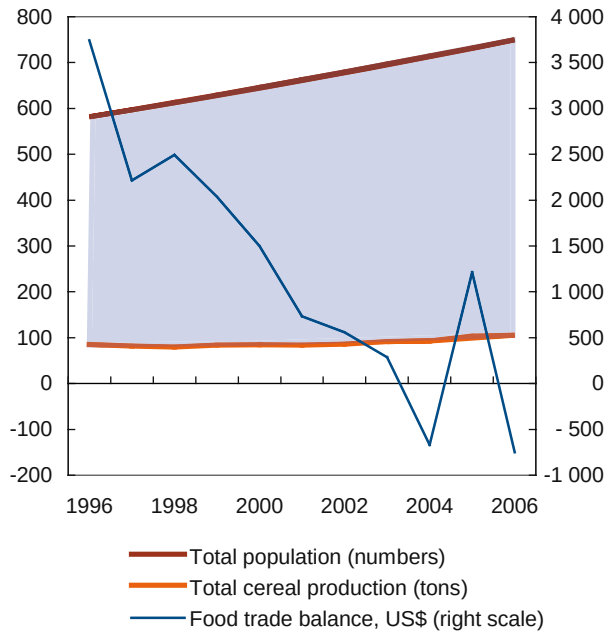
Contrary to developed countries which have for some time now maintained very high support measures for their agricultural sector, many developing countries have during the past two decades reduced their support to agriculture. The underinvestment in agriculture in developing countries, especially the low-income developing countries, in the 1980s and 1990s was exacerbated by the implementation of structural adjustment programmes, which encouraged the dismantling of publicly backed agricultural banks, marketing boards and extension schemes, as well as a decrease of publicly supported agricultural research and education. But structural adjustment programmes not only encouraged countries to decrease public support to agriculture, they also encouraged countries to decrease trade barriers, effectively leaving their domestic farmers unsupported and exposed to foreign competitors, many of which received themselves support from their governments (IFPRI, 2008b). Subsequently, several developing countries have been adversely affected by food import surges (FAO, 2003; Oxfam, 2008) which reinforced a premature deagrarianization, especially in the low-income countries (Gayi, 2007; Herrmann, 2007).

A weak agricultural development, paired with a rapid population growth, made many countries increasingly vulnerable to food insecurity and dependent on food imports. African countries in particular saw a persistent deterioration of their food trade balances. Africa as a whole became a net food importer in 1988, and sub-Saharan Africa has just become a net food importer (see chart 5).

Chart 5

FOOD TRADE BALANCE OF SUB-SAHARAN AFRICA, 1996–2006

(Millions)



Source: Calculations based on *UN COMTRADE* database, online, extracted 12 March 2009.

The void that was created through the retrieval of the State from the agricultural sector was in most cases not filled by a stronger engagement of the private sector in agriculture. The *Trade and Development Report 1998* (UNCTAD, 1998) has provided an in-depth discussion of the effects of agricultural liberalization in Africa, and most recently the *Trade and Development Report 2008* (UNCTAD, 2008a: 108) has discussed bank lending to agriculture in selected African countries. Although in Africa agriculture continues to employ about 3/4 of the labour force and accounts for about 1/3 of total value added, the agricultural sector receives less than 1/10 of commercial bank loans in the countries for which comparable data were available.

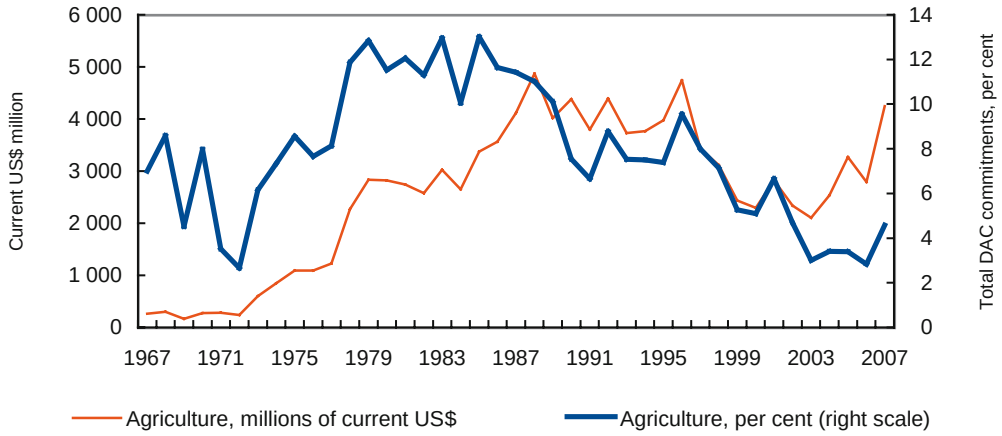
The decreasing public investment in agriculture is reflected by both a declining share of government spending that is committed to agricultural development (United Nations, 2008), as well as a low or declining share of government spending in total agricultural value added (UNCTAD, 2007). The United Nations has estimated that governments of developing countries have halved their spending on agricultural development since 1980 (United Nations, 2008). On average, in 2004, public expenditures on agriculture, as a share of agricultural value added, amounted to only 10.7 per cent in developing countries; in least developed countries it was only 4.2 per cent (Fan, 2008). Paradoxically, countries and regions that most strongly depend on agriculture have most significantly reduced support to agriculture. Notable exceptions to this general trend are China and India (United Nations, 2008), as well as Brazil (Oxfam, 2008), which have increased public funding for agricultural research and development. According to estimates of the International Food Policy Research Institute (2008a), public spending on agriculture and social protection has increased in China by US$ 23.2 billion and India by US$ 6.0 billion in 2008, amounting to an increase of 27 per cent and 24 per cent respectively.

Although the decreasing engagement of developing countries in agriculture was somewhat compensated by an increase of development assistance to agriculture, development aid to agriculture has remained low, considering the overall importance of the sector within the economy of many developing countries. Measured as a share of total aid, aid to agriculture has been on a downward trend since the early 1980s, however measured in value terms, aid to agriculture has actually increased until the late 1980s. Between the late 1980s and late 1990s aid to agriculture was at its highest level, in value terms, but aid to agriculture declined considerably between 1996 and 2003 (chart 6). The fall of bilateral aid was paralleled by a decline of multilateral assistance. Between 1991 and 2000, World Bank lending to agriculture declined from US$ 419 million to US$ 123 million (World Bank, 2008a). Both bilateral and multilateral aid has increased since but remains below their respective peaks. Furthermore, donors have committed particularly little aid for agricultural development in the least developed countries. In 2007, aid commitments to

Chart 6

TOTAL BILATERAL ODA TO AGRICULTURE, 1967–2007

(DAC commitments)



Source: Calculations based on OECD, *International Development Statistics* online, extracted 2 March 2009.

these countries amounted to only 5.9 per cent of total bilateral aid commitments and 4.7 per cent of their agricultural value added (Herrmann, 2006).[8]

Owing to the underinvestment in the agricultural sector, agricultural productivity growth was low in many developing countries (chart 7). In 1980–1985, it took 27 workers in an average developing country and 52 workers in a least developed country to achieve the agricultural output of one worker in a developed country. By 2000–2005, however 46 workers in the average developing country and 106 workers in an average least developed country were needed to match the productivity of an agricultural worker in a developed country.[9]

Over the same period, agricultural output per agricultural worker grew by US$ 15,508 in developed countries, compared with US$ 188 in developing countries, and US$ 44 in least developed countries. Furthermore, in many least developed countries agricultural labour productivity has often declined. Today, the group of least developed countries has lower labour productivity in the agricultural sector than half a century ago (UNCTAD, 2008b). Between 1983 and 2003, agricultural labour productivity declined in two-thirds of the least developed countries for which data were available (UNCTAD, 2006). As a result of these developments, there has been an increasing productivity gap, which also explains an increasing income gap, between developing countries and developed countries (Herrmann, 2007).

Contrary to the classical theories of the dual economy, which see increasing rural-urban migration largely as a result of rising productivity in the agricultural sector (Lewis, 1954; Fei and Ranis, 1964), evidence for low-income countries suggests that accelerated rural-urban migration is rather due to a negative development in the agricultural sector, characterized by low and often falling productivity and high and

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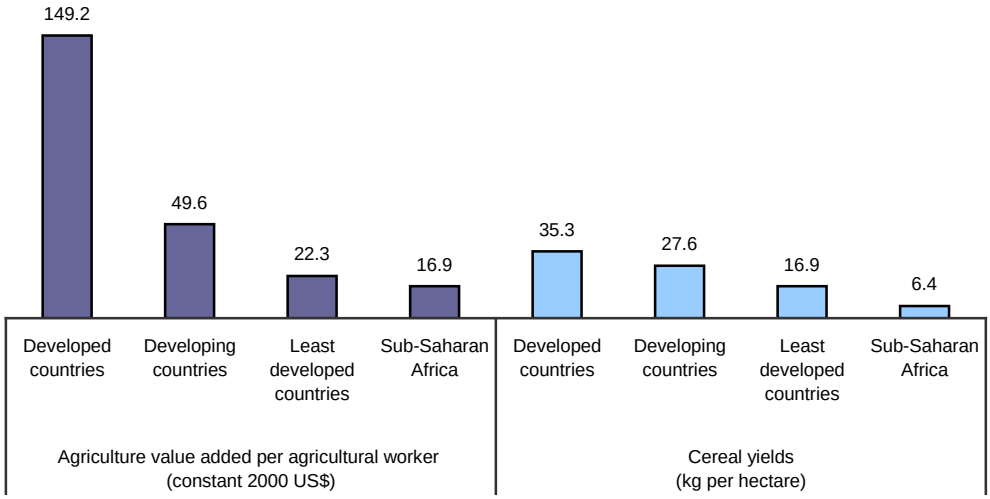
[8] Based on OECD-IDS online (aid data) and World Bank WDI online (agriculture value added), extracted 2 March 2009. For a critical assessment of development assistance to agriculture, see also UNCTAD (2007).

[9] This gap increased despite a decelerating productivity growth in some developed countries. In the case of the United States, Alston, Beddow and Pardey (2008) attribute the deceleration of agricultural productivity growth mostly to an underinvestment in agricultural research and development.

Chart 7

CHANGE OF AGRICULTURAL LABOUR AND LAND PRODUCTIVITY BETWEEN 1980–1985 AND 2000–2005

(Per cent)



Source: Calculations based on World Bank, *World Development Indicators 2008*, CD-ROM.
Note: Developed countries are high-income OECD countries, developing countries include only low and middle-income countries.

often rising poverty (Herrmann, 2006). Many who leave the agricultural sector and rural areas to search for better employment in the non-agricultural sectors and urban centres, will be disappointed however, as the weak development of the agricultural sectors is often paralleled by a weak development of non-agricultural sectors. Low wages in the agricultural sector frequently also set wage ceilings for non-agricultural sectors. Instead of finding a more productive and remunerative job in the formal economy of urban centres, many will need to accept relatively unproductive and sometimes hazardous jobs in the informal economy of the cities. They will end up working as shoes shiners on street corners, rather than formally employed workers in textile factories, for example. As a result, many people will effectively trade rural poverty for urban poverty rather than escaping poverty altogether (Herrmann and Khan, 2008).

E. IMPLICATIONS FOR POLICY

While impossible to provide uniform policy recommendations that are equally applicable to all developing countries, it is nonetheless possible to derive at broad policy recommendations for two distinct country groups, namely those countries that have an actual or potential comparative advantage in food production and those that have neither.

Here, comparative advantage is understood as a dynamic process: Some countries may already have it (actual); others may seek to build it (potential). The assessment of comparative advantage is complicated by significant distortions in the agricultural markets. As a consequence, the price of, and trade in, an agricultural produce is often not a reflection of comparative advantage but rather the outcome of highly price- and trade-distorting support. While the provision of well targeted and temporary support can help to build comparative advantage, the need to sustain support should raise serious questions. It either

suggests that the provided support is inappropriate to promote a sustainable agricultural sector, or that the countries simply do not have a comparative advantage in agriculture.[10]

In countries that have neither an actual nor a potential comparative advantage in agriculture, food security ultimately depends on food imports at minimal costs. It is therefore important that these countries reduce and indeed eliminate associated import restrictions. To do otherwise and seek to promote the development of an agricultural sector that does not have potential would amount to an irresponsible use of scarce national resources that will only further worsen food insecurity. After all, food insecurity is not per se related to whether countries are net food exporters or net food importers but to their income levels; the capacity to purchase food when needed.

By contrast, in countries that have an actual or potential comparative advantage in agriculture, food security depends on domestic agricultural development. Efforts to promote the domestic agricultural sector in many countries however are complicated by the fact that many advanced countries provide price- and trade distorting agricultural support. In this situation, the elimination of tariff barriers on food imports may help to reduce domestic prices of food and contribute to food security in the short run. But the elimination of tariff barriers on food would also discourage the domestic production of food which negatively affects food security in the medium run. This group of countries therefore needs to carefully balance measures that help to counteract food insecurity in the short run with measures that promote food security in the medium run through the development of their own agricultural potential. In accordance, the heads of State and government, ministers and representatives of 181 countries and the European Union have stressed in the Declaration of the High-Level Conference on World Food Security: The Challenge of Climate Change and Bioenergy, held in Rome from 3–5 June 2008, that "all efforts by governments and non-governmental organizations to strengthen immediate humanitarian and development assistance should be synergized with those of multilateral organizations, and made coherent, to deal with the continuum from urgent to long-term assistance".

1. Short-term measures

To ensure food security on a sustainable basis, amid a considerable rate of population growth and a tightening of market fundaments, especially in the poorest countries of the world, it is imperative for developing countries and their development partners not only to pursue stop-gap measures aimed at lessening human suffering today but also step up measures aimed at developing the agricultural sector, where feasible. Investment in agriculture must be significantly increased to ensure the necessary increase of agricultural output. In some cases this may be based on more expansive agricultural production, which requires that underutilized factors of production be more fully utilized, but in many cases it will need to be based also on more intensive agricultural production, which requires that the total factor productivity be increased.

In recent months countries have taken an array of stop-gap measures to address the challenge of food insecurity, including specific measures that directly address poor households, and general measures that have economy–wide effects (see chart 8). In principle, specific measures that address challenges in the most direct manner are preferable over general measures that have broader effects on the economy. Many of the policy instruments that are fashioned to address the challenge of food insecurity are inappropriate.

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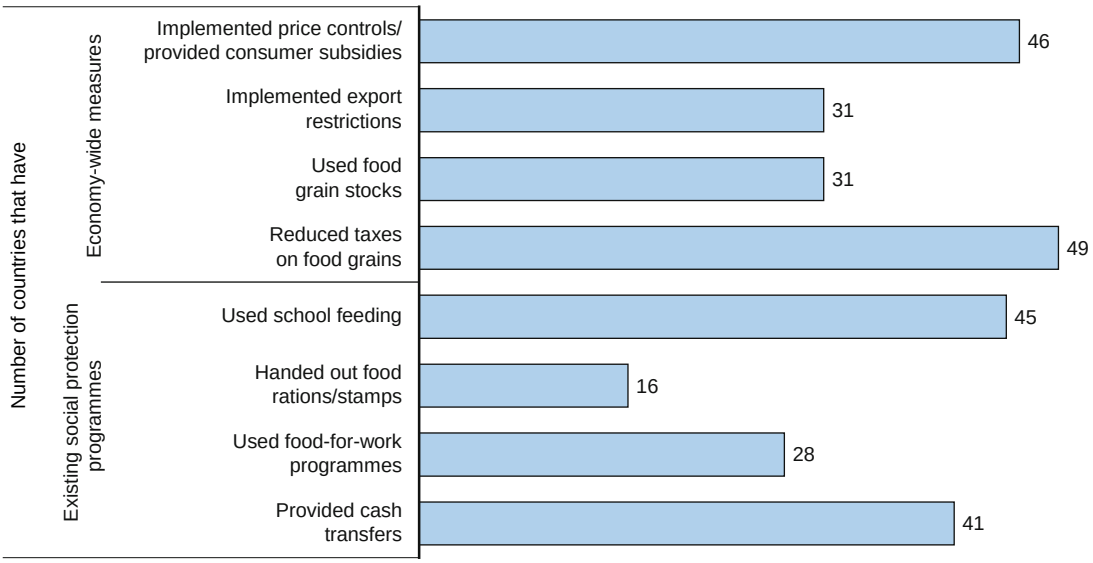
[10] It should also be noted that the subsidization of products that do not benefit from network externalities, and where production processes provide for little learning opportunities, promises relatively little overall payoff. This however should not suggest that the subsidization of agricultural sectors is generally undesirable, as agricultural production becomes more and more complex and dependent on sophisticated technologies, and agricultural products begin to look more and more like industrial products.

Chart 8

RECENT NATIONAL RESPONSES TO FOOD PRICE HIKES AND FOOD INSECURITY



Source: Compilation based on World Bank online information, extracted 17 March 2009. http://siteresources.worldbank.org/NEWS/Resources/risingfoodprices_chart_apr08.pdf.

Note: Not all countries that are considered food insecurity by the FAO and/or the WFP have taken measures. There are 91 countries that are reported to have taken measures. These include 37 in Africa, 11 in East Asia and the Pacific, 17 in Eastern Europe and Central Asia, 9 in the Middle East and North Africa, 8 in South Asia and 9 in Latin America and the Caribbean.

Responses to food insecurity undoubtedly require measures that help the poorest households which suffer most from a rise of food prices. It is in the interest of countries however to ensure that these measures are associated with minimal transaction costs, which is an argument for cash transfers, but it is also in the interest of countries that the money is being used for the intended purpose, which is often advanced as an argument for non-cash programmes. Household studies show that income from cash transfers tend to be administered by the heads of households, mostly men, and that a share of this income tends to be used for the consumption of adult goods, including alcohol and cigarettes. Accordingly, conditional cash transfers, non-cash programmes, or a combination of both may be most appropriate to reach all household members, including women and children. (Haddad et al., 1996; Haddad, Hoddinott and Alderman, 1997; UNU, 1983).

For analytical purposes, economy-wide measures to address food insecurity may be distinguished into two groups: Those that affect revenues of food producers and those that do not. Food producing countries should seek to avoid measures that decrease revenues of food producers, for example by depressing the prices at farm gates, which could subsequently discourage food production. Amongst the implemented economy-wide measures only the reduction of domestic food taxes and the provision of consumer subsidies do not have negative effects on the revenues of local farmers. By contrast, the implementation of price ceilings as well as restrictions on exports negatively affects farm income.

Food prices and crises have also encouraged many countries to rethink their trade strategies and policies. Several countries have begun to build up food stocks which put further upward pressure on several food prices. Furthermore, several food producing countries have imposed export restrictions on agricultural goods to combat food insecurity in the short run; others have advocated import restrictions on agricultural goods to boost their own agricultural production in the medium run. Some countries that depend on food

imports have also decreased their pressure on developed countries to reduce agricultural support measures, as they fear that such a policy change would result in a further increase of world food prices.[11] But are the different trade policies in fact reasonable instruments to ensure food security?

The current crisis has shown that when food prices are high, even large producers of food items may face food insecurity. This normally happens when the local population cannot afford to purchase food at higher prices and when the domestic producers therefore export food to foreign markets. To prevent economies which have an abundance of food from slipping into a food crisis, governments may impose restrictions on food exports. This would either depress the domestic price of food items, making it easier for the local population to purchase food, or it would increase public revenues, making it easier for the government to provide special support to low-income households. Such export restrictions may therefore help to ensure food security in countries that are major food producers. But while a rare and temporary use of export restrictions can be effective in ensuring food security, an excessive and prolonged use of export restrictions can have the opposite effect, as it reduces returns to local farmers and may therefore discourage future investment in the farming sector.[12]

In response to far-reaching support to the agricultural sector in developed countries, several developing countries advocate import restrictions on agricultural goods. In order to protect their domestic farmers from unfair foreign competition and ensure a sustained food production in the domestic market, they seek to preserve their right to implement special safeguards and to exempt special products from tariff reduction commitments. Both measures would enable countries to raise trade barriers above bound tariff rates, and maintain relatively higher trade barriers compared with the counterfactual, namely full formula cuts as provided by the tiered formula.

The utility of such restrictions on agricultural imports is codependent on two other factors: Firstly, they are negatively correlated with agricultural prices in world markets (if prices are high, the utility of the proposed import restrictions is low); and, secondly, they are positively correlated with the level of support provided by advanced countries (if support is high, the utility of the proposed import restrictions is high as well). Selected import restrictions by developing countries may thus be justifiable as long as developed countries maintain large market-distorting support measures (Gayi, 2007). But such import restrictions are not a panacea. They will not be effective in helping countries to increase their agricultural production if the countries have a weak agricultural potential in the first place. Among the countries that have agricultural potential, the proposed import restrictions on agricultural goods are most useful for those countries that have low bound tariff rates close to applied tariff rates and therefore little leeway to protect their farmers. Furthermore, while import restrictions may in some cases stimulate agricultural

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[11] The provision of agricultural support in food exporting countries ultimately amounts to a transfer of income to food importing countries. Accordingly, it appears understandable why countries that depend on food imports are not eager for other countries to phase out agricultural support. This case however is not as clear cut as it may appear. From a global perspective, agricultural support is only useful if it helps to increase aggregate food supply; it is meaningless and wasteful if it merely reallocates food production; and it is outright harmful if it reduces aggregate food supplies, as it squeezes out farmers. In the latter instance, agricultural support would ultimately lead to a decline in agricultural output, and a rise of agricultural prices, with concomitant negative effects on all countries, including the food importing countries. For this reason, even countries that depend on food imports may carefully reconsider their position on agricultural support.

[12] Another difficulty associated with the use of export restrictions is that they effectively undermine the very idea of the multilateral trading system. Free trade enables countries to specialize in accordance with comparative advantage, increase imports and exports and ultimately maximize the wealth of their nation. Yet, this system works only if countries can rely on being able to import necessary goods from other countries at all times. Export restrictions undermine this implicit contractual agreement. To ensure the functioning of the multilateral trading system, it is therefore necessary that export restrictions become part of trade agreements and, like safeguard measures, be limited to exceptional circumstances (Herrmann and Peters, 2009).

production, they are unlikely to effectively address concerns of food security, if not complemented by other support to agriculture.

In conclusion, whereas import restrictions may help food-importing countries to increase food output and address the challenge of food insecurity in the medium term, export restrictions may help food-exporting countries to decrease domestic food prices and address the challenge of food security in the short term. However, import restrictions alone are unlikely to bring about a very large increase of food production, and export restrictions are only a short-term and partial solution to food insecurity, which can temporarily help countries that are net food exporters, but will inevitably hurt countries that are net food importers. Hence, neither import nor export restrictions offer standalone comprehensive solutions to the challenge of food insecurity and food crisis.

2. Medium-term measures

In some countries a considerable increase of agricultural output may be achieved bringing forestless lands under cultivation (IMF, 2008), in others however an increase of agricultural output must be achieved by raising the level of agricultural productivity. Although on the face value it may appear as though some developing countries, particularly in Africa, are land abundant, many are in fact land scarce, as indicated by a small and decreasing plot size of agricultural workers, and a high and increasing share of people working on and living of marginal lands. Already in the mid-1990s there were 16 least developed countries in Africa where 30–50 per cent of the population depended on marginal lands, and 7 where more than 50 per cent of the population lived on such lands, out of a sample of 30 countries (UNCTAD, 2006).

According to FAO (2008b) as much as 80 per cent of the required increase of food production by the year 2050 must come from an increase in yields. A large increase of agricultural productivity must take place in the developing countries where levels of agricultural productivity remain relatively low. And while an increase of agricultural productivity in many African region is challenged by the tropical climate (e.g. Sachs and Warner, 1997; Bloom and Sachs, 1998), soil erosion (Gabre-Medhin and Haggblade, 2004) and climate change (IPCC, 2007), it appears that the right policies can nonetheless boost agricultural productivity (von Braun et al., 2008; Sachs, 2000).[13] Despite or indeed because of the underdevelopment of the agricultural sector in the poorest countries, there is considerable scope to increase agricultural production in these countries. Furthermore, in most countries a considerable increase of agricultural production can be achieved through rather conventional means, namely better access to credit, insurance, seeds, fertilizers and utilities; necessary improvements of irrigation systems, storage facilities and transport networks; a more widespread utilization of tractors and other agricultural machinery; higher investments in agricultural research and development, extension services and training; a stronger cooperation between agricultural producers; as well as a reform of land tenures, property rights and governance structures.[14] There are, in short, manifold unutilized or underutilized opportunities for developing countries and especially the low-income countries to increase their agricultural production and productivity. Countries should make

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[13] Easterly and Levine (2002) come to the conclusion that development is less dependent on geographic and climatic specificities than on institutions.

[14] Although least developed countries have a relatively strong specialization in agriculture, they make little use of modern agricultural production methods. There are however important differences amongst the least developed countries themselves. On average, least developed countries in Asia have a considerably more modern agricultural sector than the least developed countries in Africa, where the Green Revolution did not take off (UNCTAD, 2006). Although Africa has a larger agricultural land area per capita than other regions, only a small share of its agricultural land is irrigated (3.7 per cent), and only little use is made of fertilizers (12.6 kilograms per hectare of agricultural land). This is considerably below the average of developing economies (22.7 per cent and 109.0 kilograms per hectare, respectively) (see FAO, 2008a; Gayi, 2007).

use of these conventional means to raise agricultural output before hastily invoking a stronger reliance on advanced biotechnologies, including genetically modified organisms. Furthermore, UNCTAD research has shown that a focus on organic agriculture does not only enable producers to increase agricultural output in a more sustainable manner but also makes them less dependent on costly inputs to agricultural production (UNCTAD, 2009c).

According to several studies by International Food Policy Research Institute, the propensity to increase agricultural productivity tends to be higher in poorer countries, and higher yet in the poorest regions of these countries, which are characterized by a considerably underdevelopment of the agricultural sector. These studies estimate that even relatively small investment in agriculture – particularly promising are investments in agricultural research and extension, as well as the construction of rural roads – can generate considerable private and social returns to agriculture, and can make an important contribution to employment and the reduction of poverty. Accordingly, a doubling of agricultural research and development expenditures by 2013 is expected to reduce the total number of poor by 282.1 million and increase global agricultural output by 1.1 percentage points by the year 2020. The impact would be particularly strong in the low-income regions of sub-Saharan Africa and South Asia where 95 per cent of the poverty reduction is expected to take place and regional agricultural output is expected to grow by 2.75 and 2.40 percentage points respectively (IFPRI, 2008a; von Braun et al., 2008).

The focus on poverty reduction that has been reaffirmed by the United Nations Millennium Declaration, as well as the challenge of food security that has been brought to the fore by the current food price hikes, have encouraged a renewed focus on agricultural development. The increasing focus on agriculture is for example reflected in the Comprehensive Africa Agriculture Development Programme (CAADP) put forward by the secretariat of the New Partnership for Africa's Development (NEPAD). Accordingly, it is necessary to invest US$ 354.7 billion in total, and US$ 26.4 billion annually in African agriculture between 2002 and the target year 2015 (NEPAD, 2006). In support of this programme the Maputo Declaration of African Leaders calls for 10 per cent of government budgets to be allocated to the development of the agricultural sector by 2008. Although many African countries have increased spending on agriculture in recent years, in 2005 most of them were still falling considerably short of their commitments. At the time only 3 out of 38 African countries, for which data were available, reached their spending target (Fan and Saurkar, 2008), which amounted to about half of what the CAADP envisaged as average annual expenditures in support of agriculture.

The increased investment of many developing countries in agriculture is backed by a renewed interest of many donors in agriculture, including official donors as well as private foundations such as the Rockefeller Foundation and the Gates Foundation which jointly sponsor the newly established Alliance for the Green Revolution in Africa. While it is necessary to step up investment in the agricultural sector and to encourage an increase of agricultural productivity, it is equally necessary to carefully consider the means to this end and to ensure that efforts to increase agricultural productivity do not negatively affect the long-term development of the agricultural sector. The past experiences with the Green Revolution, as well as the imperative of climate change mitigation, require that the very concept of the Green Revolution be redefined and that a greening of the Green Revolution be pursued.

The efforts of developing countries to raise agricultural output must be backed by development partners. This requires that donors significantly increase aid to the agricultural sector, where it makes sense, and that they live up to their pledges in this regard. The United Nations High Level Task Force on the Global Food Crisis has estimated that comprehensive actions to address short and medium-term food insecurity requires between US$ 25 billion to US$ 40 billion. In comparison, the pledges of world leaders continue to fall dramatically short (Oxfam, 2008). While more advanced developing countries may themselves raise resources for agricultural investment, the poorest countries are unable to do so without cutting other necessary expenditures. Finally, aid for agricultural development in developing countries must be complemented by comprehensive agricultural reforms in developed countries; otherwise the aid money

disbursed to developing countries will be rendered ineffective by the agricultural support policies pursued in the developed countries.

F. CONCLUSION

Falling commodity prices have had negative effects on trade balances and economic growth in many developing countries, particularly in the least developed countries that are heavily dependent on commodity exports (e.g. David and Herrmann, 2001). If sustained, the current boom of commodity prices, and the associated improvement of terms of trade for many countries, provides indeed a historical opportunity that encourages a rethinking of classical development strategies which focus on promoting a decreasing specialization in the commodity sectors. However, even if an increase of commodity prices sets the right incentives, countries will not automatically benefit from this change of the policy environment.

Many developing countries are set to suffer from higher commodity prices in the short run, and whether they will be able to benefit from higher commodity prices in the medium run will strongly depend on complementary policies. In order for developing countries which have a potential in agriculture to reinvigorate the development of their agricultural sectors it is essential to eliminate persisting distortions in agricultural markets. Coherent policies require that developed countries not only provide more aid to agriculture in developing countries but that they also do away with trade-distorting support to their own agricultural sectors. Furthermore, short-term strategies that are designed to help developing countries ensure food security must be made coherent with medium-term strategies that seek to promote the agricultural development in developing countries.

But the development of agriculture also requires that producers benefit from higher prices and that the producers have the necessary productive capacities to increase their production in response. To strengthen the pass-through of commodity prices, it is necessary that the bargaining power of producers be strengthened vis-à-vis intermediaries and retail chains; to strengthen the productive capacities of producers, it is necessary that they be provided with appropriate national support and foreign aid. At the same time however it is important that the urban bias that has arguable characterized public policy in the past years (Lipton, 1977) is not replaced by a rural bias in the years to come. To create viable economic structures and sufficient employment opportunities for a rapidly growing labour force in many developing countries, it is necessary that the development of the agricultural sector and rural areas is complemented and indeed reinforced by the development of non-agricultural sectors (Herrmann and Khan, 2008).

In conclusion, food security is both a demand-side and the supply-side challenge. Globally, it is necessary to significantly increase the production of food to feed a rapidly growing population, but at the same time, it is necessary to raise incomes of poor households to ensure necessary food purchases. Addressing only one of these challenges will only be a partial and insufficient approach to address food insecurity. Incidents of food insecurity in food abundant and exporting countries underline the need to raise incomes of poor households.

Although food security is both a demand- and a supply-side challenge, not all countries can effectively address both of these challenges simultaneously. Countries that have a potential in agriculture will need to significantly step up support for the agricultural sector, but countries that do not have a potential in agriculture should instead focus on the development of non-agricultural sectors, which generate jobs and incomes, and hence enable a growing number of households to satisfy their consumption needs and escape hunger.

This is not to say that a higher rate of food self-sufficiency cannot help to increase the food security of the local population. But efforts to boost food production are viable only in countries that have agricultural potential; in other countries such efforts bear great opportunity cost. Viable approaches to promote food

security must recognize that food security is not per se dependent on a country's food trade balance. At the country level, food security does not depend on whether countries are able to cover domestic food consumption through domestic food production, but whether they are able to generate sufficient financial resources to finance necessary food imports. Similarly, at the household level, food security is determined by household income more than anything else.[15]

The way in which trade can best contribute to food security and poverty reduction is not through its direct impact on food prices, but its contribution to economic development. The ultimate objective of trade policy should be the contribution of trade to capital accumulation, technological progress and economic growth, which are prerequisites for rising employment, household incomes and food security. Hence, rather than focusing on trade policies that contribute to food security, countries may want to focus on trade policies that promote economic development. In particular, countries may want to abstain from trade policy changes that could undermine necessary investments in their agricultural sectors, as an increase of such investments, where feasible, is vital for future food security. In the short run, food insecurity of low income economies is best addressed through unconditional emergency assistance in form of balance of payments support, grants and/or food aid, and food insecurity of low income households is best addressed through social transfers, including cash transfers and/or in-kind transfers.

[15] Herrmann (2003) has argued that for any provision of special and differential treatment in the context of the multilateral trading system to be more effective, it is necessary that the provision has a stronger focus on specific problems and better targets the countries in need. This also holds true for the provisions related to food insecurity of net food-importing countries. The current situation shows that food crises may happen in both low-income countries that are net importers and low-income countries that are net exporters of food. Hence, rather than focusing per se on net food importing countries, the provisions on food security may more appropriately focus primarily on low-income countries. In particular, it is desirable that the provisions on food security clearly identify the types and terms of the emergency assistance required to help low-income countries cope with acute food crisis, as well as the types and terms of development-oriented assistance that these countries need to develop their agricultural sector and thereby decrease their vulnerability to future food insecurity.

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ANNEX TABLE

PERCENTAGE INCREASE OF INTERNATIONAL MAIZE, RICE, SOYBEANS AND WHEAT PRICES AND PASS-THROUGH TO DOMESTIC MARKETS OF IMPORTING COUNTRIES, 2004–2008

	Vulnerability			*Maize*				*Rice*				*Soybeans*				*Wheat*				***Memo item:*** *Rank by imports*			
	Low income	*Least dev.*	*Food insec.*	*International price in dollars (a)*	*International price in national currency (b)*	*Domestic price in national currency (c)*	*Pass-through rate =(c)/(a)*	*International price in dollars (a)*	*International price in national currency (b)*	*Domestic price in national currency (c)*	*Pass-through rate =(c)/(a)*	*International price in dollars (a)*	*International price in national currency (b)*	*Domestic price in national currency (c)*	*Pass-through rate =(c)/(a)*	*International price in dollars (a)*	*International price in national currency (b)*	*Domestic price in national currency (c)*	*Pass-through rate =(c)/(a)*	*Maize*	*Rice*	*Soybeans*	*Wheat*
Developed economies				**99.7**	**73.7**	**48.2**	**0.5**	**153.9**	**120.8**	**63.3**	**0.4**	**61.6**	**40.0**	**38.3**	**0.6**	**128.8**	**98.1**	**58.5**	**0.5**	**..**	**..**	**..**	**..**
Australia				99.7	75.1	75.1	0.8	153.9	122.6	122.6	0.8	61.6	41.7	41.7	0.7	128.8	100.6	100.6	0.8	131	43	82	174
Austria				99.7	69.3	37.5	0.4	153.9	115.2	38.4	0.2	61.6	37.0	37.0	0.6	128.8	93.9	42.2	0.3	45	68	42	72
Belgium				99.7	69.3	37.5	0.4	153.9	115.2	38.4	0.2	61.6	37.0	37.0	0.6	128.8	93.9	42.2	0.3	24	23	8	12
Bermuda				99.7	99.7	99.7	1.0	153.9	153.9	153.9	1.0	..	..	..	..	..	..	..	..	162	191		
Bulgaria				99.7	69.5	60.4	0.6	153.9	115.6	115.6	0.8	61.6	37.2	37.2	0.6	128.8	94.2	96.9	0.8	90	109	116	144
Canada				99.7	63.8	63.8	0.6	153.9	108.3	108.3	0.7	61.6	32.5	32.5	0.5	128.8	87.6	136.5	1.1	16	18	25	130
Cyprus				99.7	69.3	37.5	0.4	153.9	115.2	38.4	0.2	61.6	37.0	37.0	0.6	128.8	93.9	42.2	0.3	63	137	85	86
Czech Republic				99.7	69.3	37.5	0.4	153.9	115.2	38.4	0.2	61.6	37.0	37.0	0.6	128.8	93.9	42.2	0.3	75	61	44	118
Denmark				99.7	69.3	37.5	0.4	153.9	115.2	38.4	0.2	61.6	37.0	37.0	0.6	128.8	93.9	42.2	0.3	47	66	33	67
Estonia				99.7	69.3	37.5	0.4	153.9	115.2	38.4	0.2	61.6	37.0	37.0	0.6	128.8	93.9	42.2	0.3	120	152	91	149
Finland				99.7	69.3	37.5	0.4	153.9	115.2	38.4	0.2	61.6	37.0	37.0	0.6	128.8	93.9	42.2	0.3	139	87	46	121
France				99.7	69.3	37.5	0.4	153.9	115.2	38.4	0.2	61.6	37.0	37.0	0.6	128.8	93.9	42.2	0.3	25	11	22	78
Germany				99.7	69.3	37.5	0.4	153.9	115.2	38.4	0.2	61.6	37.0	37.0	0.6	128.8	93.9	42.2	0.3	9	15	4	15
Greece				99.7	69.3	37.5	0.4	153.9	115.2	38.4	0.2	61.6	37.0	37.0	0.6	128.8	93.9	42.2	0.3	28	86	24	31
Hungary				99.7	69.3	37.5	0.4	153.9	115.2	38.4	0.2	61.6	37.0	37.0	0.6	128.8	93.9	42.2	0.3	67	78	88	136
Iceland				99.7	151.7	151.7	1.5	153.9	220.0	220.0	1.4	61.6	103.7	103.7	1.7	128.8	188.3	188.3	1.5	105	160	118	120
Ireland				99.7	69.3	37.5	0.4	153.9	115.2	38.4	0.2	61.6	37.0	37.0	0.6	128.8	93.9	42.2	0.3	49	90	39	53
Israel				99.7	59.9	59.9	0.6	153.9	103.3	103.3	0.7	61.6	29.4	29.4	0.5	128.8	83.1	83.1	0.6	23	50	18	28
Italy				99.7	69.3	37.5	0.4	153.9	115.2	38.4	0.2	61.6	37.0	37.0	0.6	128.8	93.9	42.2	0.3	12	40	9	1
Japan				99.7	90.8	71.1	0.7	153.9	142.6	-22.2	-0.1	61.6	54.4	54.4	0.9	128.8	118.5	13.6	0.1	1	7	2	3
Latvia				99.7	69.3	37.5	0.4	153.9	115.2	38.4	0.2	61.6	37.0	37.0	0.6	128.8	93.9	42.2	0.3	118	148	58	135
Lithuania				99.7	69.3	37.5	0.4	153.9	115.2	38.4	0.2	61.6	37.0	37.0	0.6	128.8	93.9	42.2	0.3	94	116	95	103
Luxembourg				99.7	69.3	37.5	0.4	153.9	115.2	38.4	0.2	61.6	37.0	37.0	0.6	128.8	93.9	42.2	0.3	101	143	110	115
Malta				99.7	69.3	37.5	0.4	153.9	115.2	38.4	0.2	61.6	37.0	37.0	0.6	128.8	93.9	42.2	0.3	92	155	122	131
Netherlands				99.7	69.3	37.5	0.4	153.9	115.2	38.4	0.2	61.6	37.0	37.0	0.6	128.8	93.9	42.2	0.3	7	31	3	10
New Zealand				99.7	88.3	88.3	0.9	153.9	139.5	139.5	0.9	61.6	52.4	52.4	0.9	128.8	115.7	115.7	0.9	117	71	79	57
Norway				99.7	67.1	-9.2	-0.1	153.9	112.5	79.9	0.5	61.6	35.2	-11.6	-0.2	128.8	91.4	89.8	0.7	108	92	20	71
Poland				99.7	69.3	37.5	0.4	153.9	115.2	38.4	0.2	61.6	37.0	37.0	0.6	128.8	93.9	42.2	0.3	40	51	60	47
Portugal				99.7	69.3	37.5	0.4	153.9	115.2	38.4	0.2	61.6	37.0	37.0	0.6	128.8	93.9	42.2	0.3	17	62	13	23
Romania				99.7	54.1	36.0	0.4	153.9	96.0	100.4	0.7	61.6	24.7	24.7	0.4	128.8	76.6	76.7	0.6	83	74	55	105
Slovakia				99.7	69.3	37.5	0.4	153.9	115.2	38.4	0.2	61.6	37.0	37.0	0.6	128.8	93.9	42.2	0.3	58	89	51	104
Slovenia				99.7	69.3	37.5	0.4	153.9	115.2	38.4	0.2	61.6	37.0	37.0	0.6	128.8	93.9	42.2	0.3	54	127	53	93
Spain				99.7	69.3	37.5	0.4	153.9	115.2	38.4	0.2	61.6	37.0	37.0	0.6	128.8	93.9	42.2	0.3	5	48	7	7

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	Vulnerability			Maize				Rice				Soybeans				Wheat				Memo item: Rank by imports			
	Low income	Least dev.	Food insec.	International price in dollars (a)	International price in national currency (b)	Domestic price in national currency (c)	Pass-through rate =(c)/(a)	International price in dollars (a)	International price in national currency (b)	Domestic price in national currency (c)	Pass-through rate =(c)/(a)	International price in dollars (a)	International price in national currency (b)	Domestic price in national currency (c)	Pass-through rate =(c)/(a)	International price in dollars (a)	International price in national currency (b)	Domestic price in national currency (c)	Pass-through rate =(c)/(a)	Maize	Rice	Soybeans	Wheat
Sweden				99.7	69.3	37.5	0.4	153.9	115.2	38.4	0.2	61.6	37.0	37.0	0.6	128.8	93.9	42.2	0.3	99	55	72	101
Switzerland				99.7	74.0	49.4	0.5	153.9	121.2	95.9	0.6	61.6	40.8	26.3	0.4	128.8	99.2	21.7	0.2	72	47	38	62
United Kingdom				99.7	69.3	37.5	0.4	153.9	115.2	38.4	0.2	61.6	37.0	37.0	0.6	128.8	93.9	42.2	0.3	15	5	15	25
United States				99.7	99.7	99.3	1.0	153.9	153.9	164.7	1.1	61.6	61.6	61.6	1.0	128.8	128.8	127.7	1.0	21	4	29	17
Transition economies				**99.7**	**72.8**	**75.6**	**0.8**	**153.9**	**125.0**	**124.7**	**0.8**	**61.6**	**37.9**	**37.6**	**0.6**	**128.8**	**102.7**	**101.3**	**0.8**	**..**	**..**	**..**	**..**
Albania				99.7	63.6	63.6	0.6	153.9	108.0	108.0	0.7	61.6	32.4	32.4	0.5	128.8	87.4	87.4	0.7	91	101	111	64
Armenia				99.7	14.6	14.6	0.1	153.9	45.6	45.6	0.3	..	..	..	..	128.8	31.2	31.2	0.2	130	119		65
Azerbaijan				99.7	67.0	67.1	0.7	153.9	112.3	112.5	0.7	61.6	35.1	35.1	0.6	128.8	91.3	91.3	0.7	112	135	65	39
Bosnia and Herzegovina				99.7	69.3	82.1	0.8	153.9	115.2	115.2	0.7	61.6	37.0	37.0	0.6	128.8	93.9	93.9	0.7	57	139	62	63
Croatia				99.7	63.3	62.2	0.6	153.9	107.7	107.7	0.7	61.6	32.2	32.2	0.5	128.8	87.1	86.2	0.7	98	111	36	152
Georgia			X	99.7	55.3	55.3	0.6	153.9	97.5	79.2	0.5	61.6	25.7	23.2	0.4	128.8	77.9	58.9	0.5	96	146	120	48
Kazakhstan				99.7	76.6	76.6	0.8	153.9	124.6	114.0	0.7	61.6	42.9	42.9	0.7	128.8	102.3	102.3	0.8	142	140	66	138
Kyrgyzstan	X		X	99.7	71.3	71.3	0.7	153.9	117.8	117.9	0.8	61.6	38.6	38.6	0.6	128.8	96.2	96.2	0.7	154	107	121	90
Moldova			X	99.7	68.3	76.8	0.8	153.9	114.0	114.0	0.7	61.6	36.2	36.2	0.6	128.8	92.8	92.8	0.7	148	151	126	151
Russian Federation				99.7	72.3	75.3	0.8	153.9	119.0	100.0	0.6	61.6	39.4	39.4	0.6	128.8	97.3	97.3	0.8	38	30	74	37
Tajikistan	X		X	..	..	..	..	153.9	193.3	207.9	1.4	..	..	..	..	128.8	164.2	164.2	1.3		165		87
FYR of Macedonia				99.7	69.2	69.2	0.7	153.9	115.2	116.0	0.8	61.6	36.9	36.9	0.6	128.8	93.8	94.5	0.7	89	196	104	128
Ukraine				99.7	97.8	98.1	1.0	153.9	151.4	164.0	1.1	61.6	60.0	60.0	1.0	128.8	126.5	126.5	1.0	59	77	78	150
Uzbekistan	X		X	99.7	157.8	170.7	1.7	153.9	227.7	244.1	1.6	..	..	..	..	128.8	195.3	195.3	1.5	137	150	..	114
Developing economies				**99.7**	**93.5**	**96.3**	**1.0**	**153.9**	**146.6**	**152.8**	**1.0**	**61.6**	**57.1**	**58.0**	**0.9**	**128.8**	**121.8**	**120.8**	**0.9**	**..**	**..**	**..**	**..**
Africa				99.7	100.0	100.6	1.0	153.9	151.7	159.0	1.0	61.6	66.2	67.8	1.1	128.8	127.5	129.8	1.0	..	..	..	..
Algeria				99.7	79.0	79.0	0.8	153.9	127.6	127.6	0.8	61.6	44.8	44.8	0.7	128.8	105.0	105.0	0.8	11	73	123	4
Angola		X	X	99.7	79.4	79.4	0.8	153.9	128.1	128.1	0.8				..	128.8	105.5	105.5	0.8	109	105	..	175
Benin	X	X	X	99.7	69.3	69.3	0.7	153.9	115.2	115.2	0.7				..	128.8	93.9	93.9	0.7	155	35	..	157
Botswana				99.7	190.5	190.5	1.9	153.9	269.4	269.4	1.8	61.6	135.1	135.1	2.2	128.8	232.8	239.4	1.9	62	88	89	102
Burkina Faso	X	X	X	99.7	69.3	69.3	0.7	153.9	115.2	112.6	0.7				..	128.8	93.9	93.9	0.7	149	124	..	122
Burundi	X	X	X	99.7	115.1	73.7	0.7	153.9	173.5	120.9	0.8				..	128.8	146.4	146.4	1.1	161	149	..	146
Cameroon			X	99.7	69.3	68.4	0.7	153.9	115.2	88.3	0.6	61.6	37.0	37.0	0.6	128.8	93.9	93.9	0.7	119	25	96	49
Cape Verde				99.7	69.3	69.3	0.7	153.9	115.2	115.2	0.7	61.6	37.0	37.0	0.6	128.8	93.9	93.9	0.7	102	99	113	126
Central African Republic	X	X	X	..	..	..	..	153.9	115.2	126.0	0.8	..	..	..	..	..	..	..	..	..	174	..	..
Chad	X	X	X	..	..	..	..	153.9	115.2	88.3	0.6	..	..	..	..	128.8	93.9	93.9	0.7	..	176	..	123
Congo			X	99.7	69.3	69.5	0.7	153.9	115.2	88.6	0.6	..	..	..	..	128.8	93.9	93.9	0.7	150	84	..	111
Côte d'Ivoire	X		X	99.7	69.3	69.3	0.7	153.9	115.2	115.2	0.7	61.6	37.0	37.0	0.6	128.8	93.9	93.9	0.7	124	8	133	60
Dem. Republic of the Congo	X	X	X	99.7	177.7	178.1	1.8	153.9	253.1	252.9	1.6	..	..	..	..	128.8	218.1	218.1	1.7	97	145	..	58

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	Vulnerability			Maize				Rice				Soybeans				Wheat				Memo item: Rank by imports			
	Low income	Least dev.	Food insec.	International price in dollars (a)	International price in national currency (b)	Domestic price in national currency (c)	Pass-through rate =(c)/(a)	International price in dollars (a)	International price in national currency (b)	Domestic price in national currency (c)	Pass-through rate =(c)/(a)	International price in dollars (a)	International price in national currency (b)	Domestic price in national currency (c)	Pass-through rate =(c)/(a)	International price in dollars (a)	International price in national currency (b)	Domestic price in national currency (c)	Pass-through rate =(c)/(a)	Maize	Rice	Soybeans	Wheat
Djibouti		X	X	99.7	99.9	109.9	1.1	153.9	154.2	166.9	1.1	..	..	..	..	128.8	129.0	129.0	1.0	177	162	..	137
Egypt				99.7	75.1	75.1	0.8	153.9	122.7	122.7	0.8	61.6	41.7	38.9	0.6	128.8	100.6	100.6	0.8	6	144	17	6
Equatorial Guinea		X	X	..	..	..	..	153.9	115.2	88.3	0.6	..	..	..	..	128.8	93.9	93.9	0.7	..	184	..	159
Eritrea	X	X	X	99.7	122.7	127.2	1.3	153.9	183.2	188.8	1.2	..	..	..	..	128.8	155.1	155.1	1.2	107	177	..	107
Ethiopia	X	X	X	99.7	115.6	126.3	1.3	153.9	174.0	187.7	1.2	61.6	74.4	83.1	1.3	128.8	146.9	146.9	1.1	147	97	68	52
Gabon				99.7	69.3	69.3	0.7	153.9	115.2	88.3	0.6	61.6	37.0	37.0	0.6	128.8	93.9	93.9	0.7	164	79	70	99
Gambia	X	X	X	99.7	52.8	52.8	0.5	153.9	94.3	94.3	0.6	..	..	..	..	128.8	75.0	75.0	0.6	151	103	..	154
Ghana	X		X	99.7	119.9	113.7	1.1	153.9	179.5	205.0	1.3	61.6	77.9	77.9	1.3	128.8	151.8	151.8	1.2	126	29	124	51
Guinea-Bissau	X	X	X	99.7	69.3	69.3	0.7	153.9	115.2	115.2	0.7	..	..	..	..	128.8	93.9	93.9	0.7	198	136	..	178
Kenya	X		X	99.7	74.5	80.5	0.8	153.9	121.9	187.6	1.2	61.6	41.2	47.9	0.8	128.8	99.9	80.0	0.6	69	42	63	43
Lesotho		X	X	99.7	155.4	155.4	1.6	153.9	224.7	224.7	1.5	..	..	..	..	128.8	192.6	192.6	1.5	76	138	..	113
Libyan Arab Jamahiriya				99.7	87.3	87.3	0.9	153.9	138.1	138.1	0.9	..	..	..	..	128.8	114.5	114.5	0.9	42	57	..	56
Madagascar	X	X	X	99.7	82.6	60.9	0.6	153.9	132.1	97.5	0.6	61.6	47.7	47.7	0.8	128.8	109.1	109.1	0.8	178	58	108	117
Malawi				99.7	157.7	157.7	1.6	153.9	227.7	260.4	1.7	61.6	108.5	108.5	1.8	128.8	195.2	195.2	1.5	85	168	90	82
Mali	X	X	X	99.7	69.3	69.3	0.7	153.9	115.2	105.6	0.7	..	..	..	..	128.8	93.9	93.9	0.7	140	54	..	89
Mauritania	X	X	X	99.7	87.7	97.1	1.0	153.9	138.7	166.8	1.1	..	..	..	..	128.8	115.0	125.8	1.0	192	198	..	73
Mauritius				99.7	106.1	106.1	1.1	153.9	162.1	162.1	1.1	61.6	66.8	66.8	1.1	128.8	136.1	136.1	1.1	80	65	107	88
Morocco				99.7	75.0	3.1	0.0	153.9	122.5	186.1	1.2	61.6	41.6	47.0	0.8	128.8	100.5	88.0	0.7	18	163	21	16
Mozambique	X	X	X	99.7	113.7	113.7	1.1	153.9	171.7	170.7	1.1	61.6	72.9	69.1	1.1	128.8	144.8	144.8	1.1	71	34	86	59
Namibia			X	99.7	155.4	155.4	1.6	153.9	224.7	224.7	1.5	61.6	106.7	106.7	1.7	128.8	192.6	198.4	1.5	87	128	87	106
Niger	X	X	X	99.7	69.3	69.3	0.7	153.9	115.2	115.2	0.7	61.6	37.0	37.0	0.6	128.8	93.9	93.9	0.7	93	37	92	134
Nigeria	X		X	99.7	77.1	77.1	0.8	153.9	125.2	125.2	0.8	61.6	43.3	43.3	0.7	128.8	102.9	102.9	0.8	128	12	69	14
Rwanda	X	X	X	99.7	89.1	89.1	0.9	153.9	140.5	197.4	1.3	61.6	53.0	53.0	0.9	128.8	116.6	116.6	0.9	116	125	117	183
Senegal				99.7	69.3	69.3	0.7	153.9	115.2	115.2	0.7	..	..	..	..	128.8	93.9	93.9	0.7	77	14	..	54
Seychelles				99.7	243.4	243.4	2.4	153.9	336.6	336.6	2.2	61.6	177.9	177.9	2.9	128.8	293.3	293.3	2.3	115	133	76	165
South Africa			X	99.7	155.4	155.4	1.6	153.9	224.7	224.7	1.5	61.6	106.7	106.7	1.7	128.8	192.6	198.3	1.5	29	13	64	38
Sudan		X	X	99.7	60.8	77.5	0.8	153.9	104.5	104.5	0.7	61.6	30.2	62.7	1.0	128.8	84.2	84.2	0.7	136	93	57	18
Swaziland			X	99.7	155.4	155.4	1.6	153.9	224.7	224.7	1.5	61.6	106.7	106.7	1.7	128.8	192.6	192.6	1.5	68	104	94	108
Togo	X	X	X	99.7	69.3	69.3	0.7	153.9	115.2	115.2	0.7	..	..	..	..	128.8	93.9	93.9	0.7	163	129	..	96
Tunisia				99.7	97.6	97.6	1.0	153.9	151.2	151.3	1.0	..	..	..	..	128.8	126.3	128.5	1.0	27	126	..	30
Uganda	X	X	X	99.7	89.8	150.5	1.5	153.9	141.4	267.3	1.7	61.6	53.6	57.9	0.9	128.8	117.4	168.2	1.3	104	96	101	44
United Rep. of Tanzania	X	X	X	99.7	119.3	153.8	1.5	153.9	178.9	290.5	1.9	61.6	77.5	56.2	0.9	128.8	151.2	195.1	1.5	46	80	80	40
Zambia	X	X	X	99.7	56.5	70.5	0.7	153.9	99.0	118.0	0.8	61.6	26.7	38.7	0.6	128.8	79.3	87.8	0.7	55	118	97	97
Americas				99.7	94.4	95.2	1.0	153.9	147.1	148.7	1.0	61.6	57.7	60.4	1.0	128.8	122.5	120.8	0.9	..	..	..	..
Antigua and Barbuda				99.7	99.7	99.7	1.0	153.9	153.9	153.9	1.0	61.6	61.6	61.6	1.0	128.8	128.8	128.8	1.0	171	166	130	190
Argentina				99.7	114.8	114.4	1.1	153.9	173.1	169.7	1.1	61.6	73.8	72.6	1.2	128.8	146.0	144.3	1.1	95	157	19	168
Bahamas				99.7	99.7	99.7	1.0	153.9	153.9	153.9	1.0	61.6	61.6	110.1	1.8	128.8	128.8	128.8	1.0	143	115	134	180

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	Vulnerability			Maize				Rice				Soybeans				Wheat				Memo item: Rank by imports			
	Low income	Least dev.	Food insec.	International price in dollars (a)	International price in national currency (b)	Domestic price in national currency (c)	Pass-through rate =(c)/(a)	International price in dollars (a)	International price in national currency (b)	Domestic price in national currency (c)	Pass-through rate =(c)/(a)	International price in dollars (a)	International price in national currency (b)	Domestic price in national currency (c)	Pass-through rate =(c)/(a)	International price in dollars (a)	International price in national currency (b)	Domestic price in national currency (c)	Pass-through rate =(c)/(a)	Maize	Rice	Soybeans	Wheat
Barbados				99.7	99.7	99.7	1.0	153.9	153.9	153.9	1.0	61.6	61.6	57.8	0.9	128.8	128.8	128.8	1.0	100	147	49	124
Belize				99.7	99.7	91.5	0.9	153.9	153.9	158.9	1.0	61.6	61.6	61.6	1.0	128.8	128.8	128.8	1.0	138	192	112	132
Bolivia			X	99.7	82.2	82.2	0.8	153.9	131.6	131.6	0.9	61.6	47.4	47.4	0.8	128.8	108.6	108.6	0.8	111	180	32	95
Brazil				99.7	25.2	24.4	0.2	153.9	59.2	56.7	0.4	61.6	1.3	0.6	0.0	128.8	43.4	43.4	0.3	35	17	45	5
Chile				99.7	71.2	71.2	0.7	153.9	117.7	117.7	0.8	61.6	38.5	38.5	0.6	128.8	96.1	96.1	0.7	14	64	30	34
Colombia			X	99.7	49.5	52.8	0.5	153.9	90.1	61.7	0.4	61.6	21.0	21.0	0.3	128.8	71.2	71.3	0.6	8	38	23	21
Costa Rica				99.7	140.0	140.0	1.4	153.9	205.1	206.9	1.3	61.6	94.2	94.2	1.5	128.8	174.9	174.9	1.4	34	60	28	70
Cuba			X	99.7	99.7	99.7	1.0	153.9	153.9	153.0	1.0	61.6	61.6	61.6	1.0	128.8	128.8	127.2	1.0	26	6	34	36
Dominica				99.7	99.7	99.7	1.0	153.9	153.9	154.0	1.0	61.6	61.6	61.6	1.0	128.8	128.8	128.8	1.0	176	182	132	184
Dominican Republic			X	99.7	64.2	64.2	0.6	153.9	108.7	108.7	0.7	..	..	..	..	128.8	88.0	88.0	0.7	32	108	..	68
Ecuador			X	99.7	99.7	100.1	1.0	153.9	153.9	182.4	1.2	61.6	61.6	57.9	0.9	128.8	128.8	126.7	1.0	36	195	93	41
El Salvador				99.7	99.7	99.2	1.0	153.9	153.9	161.1	1.0	61.6	61.6	61.6	1.0	128.8	128.8	128.8	1.0	33	75	105	66
Grenada				99.7	99.7	99.7	1.0	153.9	153.9	165.1	1.1	61.6	61.6	61.6	1.0	128.8	128.8	128.8	1.0	158	175	127	156
Guatemala				99.7	90.0	82.1	0.8	153.9	141.6	141.6	0.9	61.6	53.8	53.8	0.9	128.8	117.6	117.6	0.9	30	69	52	50
Guyana				99.7	105.1	117.2	1.2	153.9	160.7	159.0	1.0	61.6	66.0	66.0	1.1	128.8	134.9	134.9	1.0	122	209	142	116
Haiti	X	X	X	99.7	103.4	133.9	1.3	153.9	158.6	166.3	1.1	..	..	..	..	128.8	132.9	132.9	1.0	181	24	..	76
Honduras			X	99.7	107.3	106.7	1.1	153.9	163.5	234.1	1.5	61.6	67.7	67.7	1.1	128.8	137.4	137.4	1.1	44	56	84	69
Jamaica				99.7	136.5	136.5	1.4	153.9	200.7	194.6	1.3	61.6	91.4	91.4	1.5	128.8	170.9	170.9	1.3	56	63	102	79
Mexico				99.7	97.0	97.8	1.0	153.9	150.4	148.9	1.0	61.6	59.4	59.4	1.0	128.8	125.6	95.5	0.7	3	16	5	9
Nicaragua			X	99.7	142.8	144.6	1.4	153.9	208.6	148.0	1.0	61.6	96.4	96.4	1.6	128.8	178.1	178.1	1.4	88	70	109	84
Panama			X	99.7	99.7	90.4	0.9	153.9	153.9	145.2	0.9	61.6	61.6	61.6	1.0	128.8	128.8	128.8	1.0	53	102	73	94
Paraguay				99.7	45.9	43.7	0.4	153.9	85.4	83.4	0.5	61.6	18.0	16.3	0.3	128.8	67.1	64.7	0.5	81	185	54	162
Peru				99.7	71.1	66.4	0.7	153.9	117.6	97.6	0.6	61.6	38.5	28.2	0.5	128.8	96.0	74.1	0.6	19	91	43	22
St Kitts and Nevis				99.7	99.7	100.2	1.0	153.9	153.9	153.9	1.0	61.6	61.6	61.6	1.0	..	..	..	..	169	178	140	..
St Lucia				99.7	99.7	99.7	1.0	153.9	153.9	154.6	1.0	61.6	61.6	61.6	1.0	128.8	128.8	128.8	1.0	160	158	128	185
St Vincent and Grenadines				99.7	99.7	99.7	1.0	153.9	153.9	153.9	1.0	..	..	..	..	128.8	128.8	128.8	1.0	180	169		129
Suriname				99.7	100.6	110.6	1.1	153.9	155.0	218.7	1.4	61.6	62.3	66.3	1.1	128.8	129.7	129.7	1.0	106	201	100	147
Trinidad and Tobago				99.7	99.3	99.3	1.0	153.9	153.3	153.3	1.0	61.6	61.2	61.2	1.0	128.8	128.2	128.2	1.0	73	100	67	85
Uruguay				99.7	45.8	45.0	0.5	153.9	85.3	81.4	0.5	61.6	18.0	17.1	0.3	128.8	67.0	75.1	0.6	64	197	56	160
Venezuela				99.7	126.7	130.5	1.3	153.9	188.3	182.4	1.2	61.6	83.5	133.5	2.2	128.8	159.7	159.6	1.2	66	183	37	19
Asia				99.7	94.8	101.0	1.0	153.9	147.7	154.8	1.0	61.6	58.0	57.3	0.9	128.8	123.1	118.4	0.9	..	..	..	..
Afghanistan	X	X	X	99.7	109.4	109.4	1.1	153.9	166.3	166.3	1.1	..	..	..	..	128.8	139.9	139.9	1.1	135	44	..	100
Bahrain				99.7	99.7	99.7	1.0	153.9	153.9	153.9	1.0	61.6	61.6	53.9	0.9	128.8	128.8	128.8	1.0	157	82	77	133
Bangladesh	X	X	X	99.7	130.2	130.2	1.3	153.9	192.7	186.4	1.2	61.6	86.3	79.6	1.3	128.8	163.7	157.5	1.2	39	19	31	24
Bhutan		X	X	99.7	91.7	91.7	0.9	153.9	143.8	143.8	0.9	..	..	..	..	128.8	119.6	119.6	0.9	167	112	..	166
Brunei Darussalam				99.7	67.2	67.2	0.7	153.9	112.6	112.6	0.7	61.6	35.3	35.3	0.6	128.8	91.5	91.5	0.7	173	76	103	171
Cambodia				99.7	101.6	101.4	1.0	153.9	156.3	156.3	1.0	..	..	..	..	128.8	130.9	114.9	0.9	141	154	..	143
China				99.7	67.7	75.5	0.8	153.9	113.2	109.4	0.7	61.6	35.7	35.7	0.6	128.8	92.0	88.6	0.7	84	9	1	45

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	Vulnerability			Maize				Rice				Soybeans				Wheat				Memo item: Rank by imports			
	Low income	Least dev.	Food insec.	International price in dollars (a)	International price in national currency (b)	Domestic price in national currency (c)	Pass-through rate =(c)/(a)	International price in dollars (a)	International price in national currency (b)	Domestic price in national currency (c)	Pass-through rate =(c)/(a)	International price in dollars (a)	International price in national currency (b)	Domestic price in national currency (c)	Pass-through rate =(c)/(a)	International price in dollars (a)	International price in national currency (b)	Domestic price in national currency (c)	Pass-through rate =(c)/(a)	Maize	Rice	Soybeans	Wheat
China, Hong Kong				99.7	99.7	99.7	1.0	153.9	153.9	153.9	1.0	61.6	61.6	61.6	1.0	128.8	128.7	128.7	1.0	78	20	41	141
China, Macao				99.7	99.7	99.7	1.0	153.9	153.9	153.9	1.0	61.6	61.6	61.6	1.0	128.8	128.7	128.7	1.0	188	132	98	182
China, Taiwan Province of				99.7	88.4	88.4	0.9	153.9	139.6	112.0	0.7	..	..	..	..	128.8	115.8	114.8	0.9	4	49	..	27
India			X	99.7	91.7	20.1	0.2	153.9	143.8	149.7	1.0	61.6	55.2	55.2	0.9	128.8	119.6	37.3	0.3	134	203	106	2
Indonesia			X	99.7	116.7	127.3	1.3	153.9	175.5	175.5	1.1	61.6	75.4	84.1	1.4	128.8	148.2	148.4	1.2	13	26	12	8
Iran			X	99.7	118.6	128.1	1.3	153.9	177.9	357.1	2.3	61.6	76.9	95.6	1.6	128.8	150.4	176.9	1.4	52	21	27	55
Jordan				99.7	99.9	99.9	1.0	153.9	154.1	154.1	1.0	61.6	61.7	61.7	1.0	128.8	128.9	128.9	1.0	37	41	115	61
Kuwait				99.7	82.2	82.2	0.8	153.9	131.6	131.6	0.9	..	..	..	..	128.8	108.7	108.7	0.8	79	32	..	163
Lao People's Democratic Rep.	X	X	X	99.7	68.3	68.3	0.7	153.9	114.0	114.0	0.7	..	..	..	..	128.8	92.8	92.8	0.7	133	164	..	187
Lebanon				99.7	99.7	99.7	1.0	153.9	153.9	153.9	1.0	..	..	..	..	128.8	128.8	128.8	1.0	65	94	..	92
Malaysia				99.7	75.3	75.3	0.8	153.9	122.9	212.1	1.4	61.6	41.9	41.9	0.7	128.8	100.8	100.8	0.8	10	10	16	20
Maldives				99.7	99.7	99.7	1.0	153.9	153.9	153.9	1.0	61.6	61.6	40.5	0.7	128.8	128.8	128.8	1.0	175	114	139	179
Mongolia			X	99.7	96.4	96.4	1.0	153.9	149.7	149.7	1.0	61.6	58.9	58.9	1.0	128.8	125.0	125.0	1.0	189	134	129	98
Myanmar	X	X	X	99.7	87.6	87.6	0.9	153.9	138.5	138.5	0.9	..	..	..	..	128.8	114.9	114.9	0.9	129	156	..	109
Nepal	X	X	X	99.7	89.1	89.1	0.9	153.9	140.4	140.4	0.9	..	..	..	..	128.8	116.6	116.6	0.9	113	46	..	127
Pakistan	X		X	99.7	141.4	141.4	1.4	153.9	206.9	206.9	1.3	61.6	95.3	86.4	1.4	128.8	176.5	143.3	1.1	70	161	40	46
Philippines			X	99.7	58.5	76.2	0.8	153.9	101.5	101.5	0.7	61.6	28.3	28.3	0.5	128.8	81.5	81.5	0.6	43	2	35	13
Qatar				99.7	99.7	99.7	1.0	153.9	153.9	153.9	1.0	61.6	61.6	53.9	0.9	128.8	128.8	128.8	1.0	114	59	81	125
Republic of Korea				99.7	92.2	92.2	0.9	153.9	144.3	144.3	0.9	61.6	55.5	55.5	0.9	128.8	120.1	119.3	0.9	2	28	11	11
Saudi Arabia				99.7	99.7	99.7	1.0	153.9	153.9	153.9	1.0	61.6	61.6	53.9	0.9	128.8	128.8	83.0	0.6	20	1	83	148
Singapore				99.7	67.2	67.2	0.7	153.9	112.6	112.6	0.7	61.6	35.3	35.3	0.6	128.8	91.5	91.5	0.7	123	27	47	83
Sri Lanka			X	99.7	113.8	112.8	1.1	153.9	171.8	168.4	1.1	..	..	..	..	128.8	144.9	143.7	1.1	61	53	..	33
Thailand				99.7	65.4	124.0	1.2	153.9	110.3	105.0	0.7	61.6	33.9	33.9	0.5	128.8	89.5	36.3	0.3	74	173	10	29
Turkey				99.7	82.4	245.1	2.5	153.9	131.8	141.0	0.9	61.6	47.6	54.9	0.9	128.8	108.9	164.1	1.3	103	36	14	77
United Arab Emirates				99.7	99.7	99.7	1.0	153.9	153.9	153.9	1.0	..	..	..	..	128.8	128.8	128.8	1.0	50	3		32
Viet Nam	X		X	99.7	106.8	113.9	1.1	153.9	162.9	167.6	1.1	61.6	67.3	67.3	1.1	128.8	136.8	136.6	1.1	31	72	48	26
Yemen	X	X	X	99.7	115.9	126.7	1.3	153.9	174.5	174.5	1.1	61.6	74.7	83.4	1.4	128.8	147.3	147.3	1.1	48	85	59	42
Oceania				99.7	84.9	88.4	0.9	153.9	139.8	148.8	1.0	61.6	46.5	46.5	0.8	128.8	114.0	114.0	0.9	178	150	136	125
Palau				..	..	..	..	153.9	153.9	153.9	1.0	..	..	..	..	..	..	..	..	..	167	..	..
Papua New Guinea				99.7	67.3	67.3	0.7	153.9	112.8	112.8	0.7	..	..	..	..	128.8	91.7	91.7	0.7	146	67	..	110
Solomon Islands				99.7	106.4	116.7	1.2	153.9	162.4	175.5	1.1	..	..	..	..	128.8	136.4	136.4	1.1	186	159	..	139
Vanuatu				99.7	81.0	81.0	0.8	153.9	130.2	153.2	1.0	61.6	46.5	46.5	0.8	..	..	..	..	201	205	136	..

Source: IMF, *International Financial Statistics* online (commodity prices and exchange rates); and UNCTAD, *TRAINS* (tariff data).

Note: Domestic market prices are international market prices in domestic currency plus import tariffs. Country group averages are unweighted. Countries are classified by income according to the World Bank's WDI, and identified as least developed by the United Nations' CDP. Food insecure countries are identified based FAO, *Crop Prospects and Food Situation*, No. 1, February 2009; WFP online information, 3 March 2009; World Bank online information, 3 March 2009. Between 2004 and 2008 the international prices, denominated in US$, for maize increased by 99.72 per cent (from US$ 111.78 to US$ 223.25); rice by 153.93 per cent (from US$ 257.88 to US$ 654.81); soybeans 61.61 per cent (from US$ 278.56 to US$ 450.19); and wheat by 128.76 per cent (from US$ 153.60 to US$ 351.38).

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