

Global Food Crisis: Causes and Effects at Global Level

Abstract

Global food crisis experienced during the latter part of 2007 and early 2008 came as a shock by way of a sharp drop in food availability and increase in prices, mainly of grains, and to a lesser degree of other food commodities. Although many attributed this to sharp increase in oil prices, production of bio-fuels and crop loss due to adverse weather conditions in countries such as Australia, analysis show that there were signals for an upcoming food crisis over a longer period due to reasons such as global warming, reduced investment in agriculture research and development, drop in productivity, increase in the global population and changes in consumption pattern in several large economies.

The present global food crisis would last at least for two years before coming to an equilibrium. The impacts of the present crisis show slowing down of economic growth, increase in poverty and malnutrition and increase in income inequalities. Here the impacts are larger for net food importing countries and on urban populations who are non-food producers.

Although many countries took short-term measures such as price controls, restriction of exports, extending food and input subsidies, these in turn had large fiscal impacts and even acted as a disincentive to increase food production.

Several studies show that in the medium term, there can be gains through increasing production with financial assistance to induce farmers to practise existing best technologies. However, in the long term, impacts could be mitigated only through increase in productivity through investment in research and development, infrastructure development, provision of market information, making available affordable inputs and reducing distortions in pricing and trade policies.

1. Introduction

Global food crisis experienced during the latter part of 2007 and early 2008 came by way of a

sharp drop in food availability and increase in prices, mainly of grains, and to a lesser degree of other food commodities. This came to many as a quite a surprise, since this was at global level, compared to localised problems that we hear due to specific situations such as droughts and floods.

The common understanding was, at a global level there was adequate food and the problem was distribution and affordability. The bad news is, this observed increase in food prices would persist in the medium term, and only after 2009, they may stabilise to some extent, as supply and demand respond to high prices. (World Bank, 2008). The good news however, is "2006-2008 food price increases do not appear to be a sign that earth has reached its productive capacity limits or that we are on the brink of a massive Malthusian global shortage" (Pinstrup-Anderson, Per Herforth, Anna, 2008). Hence, it is important to understand, the current situation in the context of changing circumstances, and why the world was slow at responding, if things were changing. Also it is important to analyse in terms of exporting and importing countries, the consumption levels and the steps taken by various governments to combat escalating prices.

2. Past Situation

At the turn of the new millennium, the concern was very much on adequacy of food available or hunger. The Food and Agriculture Organisation (FAO) published a document 'The State of the Food Insecurity' in the year 2000, and introduced a measure to determine the severity of want; the depth of hunger (FAO, 2000). This is a measure of the per person food deficit of the under nourished population within each country, measured in kilocalories. Accordingly, 792 million people in 98 developing countries were not getting enough food to lead normal, healthy and active lives. More importantly this was due to causes such as war, lack of investment for sustainable longer term productivity growth and poverty reduction, and lack of agricultural research towards improvement of agricultural production in the developing countries. However, on the positive side, the situation was seem to be under control, since, although production was lopsided, there was always excess production globally reflected by the declining food prices over decades (Asian Development Bank (ADB), 2008). Hence, mechanisms like food aid and subsidised food

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assisted in distribution and to make it affordable avoiding catastrophes to a great extent. Adding more complacency, the famous Bruntland Commission back in 1987, noted that the world was producing more food per head of population today than ever before in human history, indicating the potential was there to feed the ever increasing population. Although, there was complacency, there were signals of stagnation of growth in productivity relative to population growth, resulting in a reversal of this long term trend. In fact, according to a United States Department of Agriculture (USDA) Report (2008), rice and wheat stocks have dwindled to around 200 million tonnes in 2008 compared to 350 million tonnes in 2000 (a 43% decline). Although most of the causes cited above by FAO still remained, as discussed below, there is a new set of reasons for the present crisis, exacerbating the severity of hunger.

3. Present Situation

Although the present situation seems to have happened instantly, as indicated above, there were signals of declining productivity/production, and it is ironical that world as a whole failed to see this. ADB (2008), recently analysed the status with regard to escalation of global food prices and the underlying causes. This study notes that, over the period from 2002 to 2007, the global prices of rice and wheat have been steadily rising and spiked by end of 2007, doubling the prices compared to 2002, fuelling inflationary pressures. According to the World Bank (2008), wheat prices have increased by 181% and global food prices by 83% over the past 36 months leading up to February 2008. It is reported that domestic rice price doubled in Bangladesh and Cambodia, and increased in Afghanistan by 70%, in Sri Lanka by 55% and 40% in the Philippines. Domestic wheat price has increased by 36-100% in Bangladesh, Mongolia, Pakistan, Kyrgyz Republic, Tajikistan and Sri Lanka (ADB (2) 2008). Seven countries in the Asian region reported double digit food price inflation following five years of

relatively subdued inflationary pressures. (World Bank (2), April 2008). Along with the cereal prices, there was escalation of prices of vegetable oils, soy beans, meat products and fish.

However, fortunately the total impact of price escalations have not been passed on to the consumers, due to interventions by governments, such as price controls, additional imports, and even grow more campaigns through subsidised inputs as in the case of Sri Lanka. Also, fortunately the percentage of grain imports for domestic consumption is relatively low, since many of the developing countries have a significant production base (ADB, 2008) Although, one would envisage importing countries to face more the brunt of food inflation, it shows that exporting countries experience price escalations even more.

3. Causes for Global Food Crisis

Though no one reason can be attributable to the sudden escalation of global prices, there are number of causes identified, some of which have been, having a long-term impact. The following causes have been identified in the ADB (2008) study. Some of the important ones are discussed in detail:

- i. Shortfalls in production over time and attempts to rebuild stocks.
- ii. Stagnation of petroleum oil production, resulting in increase of oil prices and related products (transport costs, fertiliser prices, etc).
- iii. Climatic change and adverse weather conditions in 2007.
- iv. Growing world population.
- v. Strong economic growth of certain countries with large populations and changes in dietary habits.
- vi. Use of food grain to produce ethanol as a substitute for petroleum, and conversion of land to produce grain for ethanol production.
- vii. Inadequate investments on agriculture technology development, infrastructure and extension services.
- viii. Short term measures by governments in the face of escalation of prices, such as restriction of exports.
- ix. Agitation against genetically modified foods, discouraging farmers in developing countries of planting genetically modified varieties (Aiyer, 2008).

As noted above, some of the contributory factors have been sudden in nature, such as restrictions on exports and adverse weather conditions. However, most of the other factors were apparent for a longer periods where corrective action should have been taken. Some of these causes are described and analysed below for clarity:

3.1 Growing World Population

The world population stood at 6.6 billion people in 2007 growing at a rate of 1.1% according to a recent publication by United Nations Fund for Population Activities (UNFPA, 2007). While growth itself adds more mouths to be fed, more importantly, the shift of concentration of the population from rural to urban had major implications. According to present estimates, over 50% (3.3 billion), of the population live in urban areas, and it is likely to increase up to 5 billion by 2030. By 2030, 80% of urban humanity will be from developing countries (UNFPA, 2007). This change in the demographics has several implications. Firstly, given that majority of the rural population is engaged in agriculture, city migration has negative impacts on number of people engaged in agriculture and producing food. This means a larger percentage is dependent on fewer people who are now producing food. This is not a problem if labour and land productivity has been growing. However, the information available does not show long-term trends in growth in productivity of food crops. Hence, growth in population, mainly with rapid urbanisation, had an influence on decreasing crop production and increasing demand for food with price escalations.

3.2 Stagnation of Petroleum Oil Production

Stagnation of petroleum oil production by Oil Producing and Exporting Countries (OPEC), and reduction in oil production by Non-OPEC countries has had a severe impact not only on the fuel prices, but also on all petroleum-based agricultural inputs and materials. In 2008, the prices almost went up to US\$140 per barrel of crude oil, which was under US\$ 100, over a year ago. During the first quarter of 2008, World Bank's oil price index grew by 66.5% (ADB, 2008). Correspondingly, World Bank's food price index climbed by 57%. In Sri Lanka since April 2006, the retail price of petroleum and diesel have increased by about 60%. (World Bank (3), 2008). The oil price increase had a direct impact on fertiliser prices, increasing cost of production.

3.3 Climate Change Over Time and Short-Term Adverse Weather Conditions in 2007

Climate change has long-term impacts as well as short-term impacts. With reference to the short-term effects, some of the reported cases include drastic reduction of wheat production in Australia due to droughts, incidence of flooding, especially in South Asia, and outbreak of plant hoper infestation in Indonesia, and poor crops in European Union (EU) and Ukraine in 2006 and 2007. Although this was a very short-term cause, it has been reported long-term impacts on production due to climate change. Global warming that we are experiencing today is overloading the carrying capacity of the Earth's atmosphere. Green gas emissions trap heat in the earth's atmosphere at an alarming rate having implications on agricultural production. For example, in Africa, crops tend to fail, storms and floods in the great river deltas of the Ganges, the Mekong and the Nile have made these areas vulnerable, affecting crop production (Human Development Report, (HDR), 2007/2008). This is a long-term trend which has serious implications on food production and food security.

3.4 Strong Economic Growth and Changes in Dietary Habits

This is an important factor which has been becoming significant during the last two decades. Especially, India and China have been recording continuous economic growth of around 10% over a period of a decade or so. This economic growth had marked changes in the consumption patterns (ADB, 2008). It is observed this economic growth, has resulted in high demand for foods such as dairy products and meat. This is at the expense of grain available for direct human consumption since, grain is increasingly used as a livestock feed, which has a poor conversion rate of around 7 kilograms of grain to produce a kilogram of meat. For poultry production, large quantities of grain such as corn and soy bean are needed. With restrictions of grain exports, cost of poultry production has increased significantly, fuelling food price increases even more.

3.5 Use of Food Grain to Produce Bio-fuels

Conversion of grain to ethanol production as a substitute for petroleum has created a lot of debate during the past months. Concerns over global oil prices as well as impacts on the environment due to heavy use of petroleum products prompted

many countries to start producing bio-fuels. In the United States of America (USA), as an incentive to produce ethanol as a fuel, the current ethanol subsidy given is 51 US cents per gallon of blended ethanol with gasoline (Cooke, 2007). While most of the ethanol production is taking place in North America and Europe, even in countries such as Sri Lanka, there are attempts to grow fast-growing crops as an input to produce dendro power. This too will have the same impact of diverting land away from production of food crops. It is reported that almost all the additional production of corn during period 2004-2007, went for ethanol production in USA (World Bank, 2008). It is also ironical to note that real cost, (including social costs) of producing a gallon of corn ethanol at 85% blend is US\$ 6.89, (the direct cost is US\$ 3.37) which is much higher than a gallon of pure gasoline (Cooke, 2007).

3.6 Inadequate Investments on Agriculture Technology Development, Infrastructure and Extension Services

With fixed global physical resources such as land, irrigation water, non-renewable energy sources, investments in agriculture research is fundamental to increase productivity. Way back in 1960's, Green Revolution technologies made great strides in increasing grain yield by many fold. Recent times research in genetic engineering in the developed countries has contributed to a great extent developing high-yielding/pest resistant and high nutrient food crops such as soy bean and corn. However, many developing countries have not been able to gain much from this technology due to agitations against genetically modified food. In addition, developing countries have been lagging behind with respect to agriculture research though it offers tremendous potential for productivity improvements. For example, while developed industrialised countries reinvested US\$ 2.68 for every US\$ 100 agricultural gross domestic product (GDP), in developing countries, it was only US\$ 0.62 (HDR, 2001). This report also concludes that both national governments and the international community have neglected agriculture research.

This negligence for investment on agriculture research was due to the perception that there was a world food surplus. Also with declining world food prices, many industrialised countries had a food dumping policy, undermining local markets. In addition, due to heavy investment by the private sector in agricultural research in the industrial countries, the need to maintain

public investment has been obscured for the development of crops and needs of developing countries (HDR, 2001). Ironically, although private agricultural research has exceeded US\$ 10 billion per annum, the Consultative Group for International for Agriculture Research (CGIAR), have found it difficult to raise even US\$ 400 million required to meet their annual needs (HDR, 2001). Although back in 1980, 30% of annual World bank lending went to agricultural projects, by 2007 this has declined to 12%, and the overall Official Development Assistance going to agriculture is only 4%. (World Bank, 2008)

4. Effects/Impacts of Global Food Crisis

The likely impacts of global food crisis have to be analysed in terms of effects on the macro-economy on the one hand and as well as on the households. In this regard, due consideration needs to be given for interventions taken by governments to neutralise these impacts.

4.1 Impact on the Macro Economy

Although this paper will not attempt to analyse the macro-impacts at length, the results of a modelling exercise done by the ADB (2008), gives some indications. It estimates the impacts using two scenarios; one is the World Bank's Food Index growth. (57.5% increase), as well as adding the World Bank's Oil Price Index' growth (66.5%). With the assumption that food and oil prices would return to baseline rates by 2009, under the first scenario, it predicts that developing Asia would have an inflation rising by 1.65 percentage points in 2008, consumer prices climbing by 0.53 percentage points, private consumption to drop by 0.94 percentage points, interest rates to rise by 0.87 percentage points and overall GDP growth rate to decline by 1.05 percentage points. Under the second scenario, situation is worse with GDP growth declining by 1.41 percentage points. It further says, this drop will continue in 2009 and will have an impact since global growth and demand for industrial goods such as garments, which are exported by Asian developing countries to the industrialised countries, would decline. Hence, one can see a chain reaction where the whole economy is affected. ADB (2008) warns "the explosion of food prices across the region is a threat to macroeconomic stability through inflation, rising fiscal costs of food subsidies and the possible exchange rate depreciation in food importing countries".

4.2 Impacts on Fertiliser Prices and Government Expenditure

The impact of global fuel prices on fertilisers can be explained by considering the Sri Lanka case. In 2005 when the import price of urea was around Rs. 1500 per tonne, the state was subsidising prices up to around 75%. Since then prices have escalated to well above Rs. 6000 per tonne, resulting the subsidy to go up to around 95%. Hence, the fiscal impact on the government is tremendous to protect farmers from escalating global prices of fertilisers. In the Philippines, where most of the subsidised rice is imported, ADB (2008) estimated that with a 50% price increase results in a 329% increase in the total subsidy cost. Hence, although consumers and producers are some what guarded against escalating prices, the fiscal impacts are very large.

4.3 Impacts on Household Food Consumption

The impact on household consumption level has to be considered in the context of percentage of the population who produces a net surplus and who does not, the percentage of non-producers (especially urban consumers), and the expenditure percentage on food by different income deciles.

Although, some may argue that increase in domestic prices would increase the income of surplus producers and would act as an incentive for more production, as indicated earlier, the urban population which has been increasing over time, is the worst affected. Despite, various short measures taken by governments to curtail the impact of global prices escalations, there has been a rise in food prices inflation in countries such as Sri Lanka (34%), Costa Rica (21%), and Egypt (13.5%) over the past year (Word Bank, 2008), reducing food consumption.

Also, data reveal that in many developing countries, the poorest 20% of the population spend more than 60% of their income to purchase food and over 70% is for grain purchases. In terms of total expenditure, grain purchase accounts to 20-35 % the bottom quintile group (ADB, 2008). Hence, this is the group which is most affected, and likely to have a negative impact based on the FAO index of severity of hunger (FAO, 2000).

Though Latin America as a region, is a net food exporter, food price inflation, still had negative impacts on income, nutrition and health of poor

consumers. It is reported that during the period 1990 and 2005, the share of children under five with moderate and severe stunting fell from 33.5% to 24.1% worldwide (World Bank, 2008). Hence, food price increases is likely to derail these gains by reducing the real incomes and households' purchasing power.

4.4 Impact on Income Inequality

Gini Coefficient, measures income inequality. Studies show that, a 10% increase in food price, results in increase of inequality by 0.55% and 0.39% in countries such as Philippines and Pakistan respectively. This translates to a reduction in the standard of living by 4.16% and 4.84% respectively (ADB, 2008). Hence, it is likely that present food price inflation would have resulted in increasing inequality, and living standards of many people living in developing countries.

4.5 Impact on Poverty

Millennium Development Goal (MDG) of halving the proportion of hungry people, presents two challenges: ensuring access to food and increasing the productivity of farmers. The discussion we had so far clearly shows that lack of productivity growth has been a major reason for the present status, having negative impacts on achieving the MDG goal of halving the proportion of hungry people by 2015 (HDR, 2003). In Yemen, it is reported all gains in poverty reduction achieved between 1998 and 2005, has wiped off due to wheat prices doubling (World Bank, 2008). The ADB (2008) study shows a 30% increase in food prices would drive 8.85 million in the Philippines (middle income country) and 21.96 million in Pakistan (low income country) into poverty relative to country specific poverty lines. A recent study done by Ivanic and Martin (2008), quoted by World Bank (2008), shows that out of the eight countries studied, in six countries, increased food prices between 2005 and 2007 is estimated to have increased poverty by 3%.

Although no specific studies have been carried out in Sri Lanka, with regard to impact on poverty, studies show that if the cost of living increases by 10%, the poverty headcount would increase by 6% nationally and by 10% in the estates where more households are clustered near the poverty line (World Bank, 2007). Hence, it is likely that poverty levels may have increased mainly in urban areas, in the estate sector, as well as in the war-torn areas, due to the present crisis.

As indicated earlier, there is likely to be slowing down of economic growth (ADB, 2008), which can have implications on increasing poverty. For example, according to the World Development Report (World Bank 2007), a 1% GDP growth originating in agriculture increases the expenditure of the 3 poorest deciles by at least 2.5 times as much growth originating in the rest of the economy. Hence, any drop in GDP due to negative impacts on agriculture will reduce expenditure of the lowest deciles resulting in increasing of poverty.

4.6 Medium-term Impacts on Poverty.

Some efforts have gone to analyse the medium-term effects of escalation of prices, using simulation techniques. One would expect re-allocation of resources to increase food production due to the present shock of price escalations. For example in China, which is a net exporter of grains, although there would be a 20% expansion in grain production, in the medium term, it is unlikely the gains will be distributed evenly and especially real incomes of the urban population would erode. This would result in reduction of poverty of rural population at the expense of urban population (ADB, 2008). On the other hand for countries such as Indonesia which is a net food importer would face a decline in real GDP by 0.4% and increase in the total poverty measure by 0.03%. The worst hit are the urban low-income, rural low income and landless farmers. Those that benefit are households of medium and large farmers. Hence, this analysis clearly shows the impacts on poverty can be different based on the production base. In Sri Lanka, though no analysis has been done so far, the rice price escalations have positively affected the extent that came under the plough, during 2008 yala season. Official estimates of the Department of Census and Statistics show that the 2008 yala paddy production to be 1.57 million tonnes. This large increase compared to the 2007 yala harvest, which was 1.15 million tonnes, is mainly due to land abandoned hitherto being cultivated as a supply response to increased prices. This clearly should increase the real income of rice farmers. However, the impact on the non-farming community, specially the urban consumers, cannot be that favourable.

4.7 Impact on Food Aid

As mentioned earlier, the problem a decade ago was one of distribution, rather than global food supply, and mechanisms such as food aid helped to reduce the non-food availability in some parts of the world. However, reduced global food supply is likely to have impacts on food aid as well. According to an Oxfam Report (Oxfam, 2008), with the cost of food rising, aid groups are also

concerned about how they are going to meet global demands. The UN World Food Program estimates it needs a US\$500 million injection just to maintain its operations at last year's levels. And the US Agency for International Development predicts it will have a shortfall of US\$ 260 million by the end of this year.

5. Policy Recommendations and Way Forward

Although several countries have used price controls as a measure to cushion consumers against escalating prices as a very short-term intervention, this is criticised on the grounds of distorting domestic incentives to produce more (World bank, 2008). A more appropriate measure suggested is to give targeted cash transfers as a safety net programme. However, with weak administrative capacities, this is a difficult thing to implement.

Given the above scenario, several analysis, especially by multi-lateral lending agencies give some directions one needs to consider. It suggests measures in the medium term as well for the long term.

In the medium term, to realise positive supply response suggested earlier, promotion of existing new technology and new seed varieties is suggested through favourable financial services. In fact, analysis of 50 countries between 1980 and 2003 shows a 1% increase in private credit would reduce the prevalence of under nourishment by 0.22% -2.45%, as a result of increased production and consumption (Claessens and Feijein, 2006).

It is acknowledged that many developing countries may not have a clear roadmap and analytical work to better understand the economic, poverty and social implications of rising food prices, and capacity to design flexible country specific strategies (World Bank 2008). It suggests the need for expanding assistance for diagnostics, and support in critical areas, including: agricultural constraints; distributional analysis of food price increases and safety net programmes; rural investment climate assessments; and for public expenditure reviews.

In the long term, one has to increase productivity through expansion of the technology frontier. In this context, the public sector can play a major role in partnership with the private sector.

Contd. on page 19

Towards this end investment is needed in 5 areas; Infrastructure (such as irrigation and connectivity to markets), input availability (easy, reliable and affordable access to seed, fertiliser, pesticides and credit), institutions (agricultural research and development and extension), information (market information) and incentives (reduced distortions in pricing policies and trade policies) (ADB 2008).

6. Conclusion

Global food prices, though alarmingly went up to crisis proportions in late 2007 and early 2008, was not necessarily due to short-term reasons, but due to several causes which were building up. They include: a trend of reducing productivity, climatic changes, reduction of investment in research and development, and growing population to name a few. There is evidence to show that price increases to have increased poverty and malnutrition, as well as increased inequality, while slowing down economic growth. This global price escalations were cushioned to some extent by short-term interventions, such as price controls, input subsidies and export controls. However, these short-term interventions have impacted negatively on, macro-economic indicators. It also has acted as a disincentive to increase food supply.

In the medium term, however, there can be gains through increasing production with financial assistance, to induce farmers to practice existing best technologies, the long-term impacts could be mitigated only through increase in productivity through investment in research and development, infrastructure development, provision of market information, making available affordable inputs and reducing distortions in pricing and trade policies.

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Footnotes

¹ Crude Oil (petroleum), Price index, 2005 = 100, simple average of three spot prices; Dated Brent, West Texas Intermediate, and the Dubai Fateh