

## Executive Summary

The impact of rising food prices in the context of high oil prices raises challenges for both developed and developing countries, but these “twin shocks’ have a particularly sharp impact on developing countries with large numbers of people on or below the poverty line. The impact on South Asia, home to half of the world’s poor, is naturally of great interest. Despite being the second fastest growing region in the world over the last decade, South Asia is widely considered to be one of the most severely affected regions of the world from rising food prices. There have been sharp food price rises in Bangladesh, Pakistan, Nepal and Sri Lanka though price increases have been more muted in India. These price rises have threatened political stability with street protests in Bangladesh, Pakistan and Sri Lanka.

Several studies have been undertaken recently by both international organisations and individual analysts analysing the implications of rising global food prices for South Asia in terms of food security, poverty, socio-political stability and long term growth in the region. This study presents a critical survey of this literature and the evidence of seriousness of the problem in South Asia. The study also examines the immediate responses by the main countries in the region.

The main findings of this critical survey are summarised below:

- Among the main countries in South Asia, food price rises have been moderate in India but in Bangladesh, Pakistan and Sri Lanka food prices have increased significantly in recent years. These increases can be partly attributed to the imposition of the restrictive policies of the major food exporting countries in the region.
- Although food price increases were moderate in India, its policies aggravated food price situation in global markets and had a direct impact on neighbouring countries such as Bangladesh and Nepal.
- While the macroeconomic effects of rising food prices vary with a country’s position as a net food importer or exporter, recent studies demonstrate that rising food prices has threatened macroeconomic stability in countries such as Bangladesh, Nepal, Pakistan and Sri Lanka with high level of inflation, slow growth and external and internal imbalances.
- While the impact on the poor from rising food prices obviously depends on whether they are net food sellers or buyers, recent empirical studies demonstrate that the poor in countries such as Bangladesh, Pakistan and Nepal have been affected by the global food crisis.

- In comparison with other countries in the region, a recent empirical study demonstrates that the poorest households would gain from food prices rises (these are clearly very controversial results).
- As governments elsewhere, South Asian governments also responded to the immediate food price crisis by implementing a range of interventionist measures including export bans and export restrictions, temporary removal of restrictions on food imports, introduction of price ceilings and higher consumer and producer subsidies. These short-run government responses may result in serious long term problems. In particular, a sharp swing away from trade liberalisation and efficient policy instruments have aggravated the crisis and undermined international cooperation. But to shift governments away from these types of interventionism is not an easy task.

All in all, irrespective of whether higher food prices are overall good or bad for the poor, there are compelling political imperatives that drive governments to attempt to minimise the likelihood of sharp (though temporary) increases in food prices. After all, poor urban consumers are directly affected with political implications that are clear and obvious. Long term solutions to the upward shift in food prices, however, require a combination of policies and instruments that can deliver short term goals of food price stability and food security without undermining the longer term goal of liberalising agricultural trade. This is a formidable challenge.

# Impact of Rising Global Food Prices and Policy Responses in South Asia

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## 1. Introduction

The impact of rising food prices in the context of high oil prices raises challenges for both developed and developing countries, but these “twin shocks’ have a particularly sharp impact on developing countries with large numbers of people on or below the poverty line. The impact on South Asia, home to half of the world’s poor, is naturally of great interest.

These twin shocks have come during a period of rapid economic growth in South Asia. It has been the second fastest growing region in the world over the last decade despite major social and political conflicts and widespread poverty. In recent years the biggest economy in the region, India, has grown at 8-9 percent, while Pakistan, Bangladesh and Sri Lanka have also registered growth of around 6 percent or more. Smaller economies such as Bhutan and Maldives have also performed well with growth rates around 7-8 percent. These high growth rates have helped reduce poverty in the region. But now there is much concern that these poverty reduction achievements may be reversed as a result of rising food prices.

South Asia is widely considered to be one of the most severely affected regions of the world from rising food prices. The UNESCAP in a recently released report has noted that “food inflation hit the poor in South Asia” and that many countries are suffering from the twin shocks of rising oil and food prices (UNESCAP, 2008, p.82). Bangladesh, Nepal and Sri Lanka have been identified among 34 countries in crisis requiring external assistance by the FAO. There have been sharp food price increases in Bangladesh, Pakistan and Sri Lanka, though price increases have been more muted in India; in Bangladesh, for example, the price of rice rose by around 70 percent over the past 12 months. These price increases have generated political instability, with street protests in Bangladesh, Pakistan and Sri Lanka.

Both demand and supply factors in South Asia are expected to maintain pressure on food prices in the period ahead. Rapid economic growth - South Asia is projected to grow at 5.5 percent over

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the next 25 years - is expected to increase overall demand for cereal grains even though direct demand for cereals is likely to fall with changes in consumption habits leading to a shift away from staple cereals to higher value foods such as dairy products, meat and fish. Thus per capita consumption of rice is projected to decline by 4 percent during the next 25 years but consumption of milk and vegetables is expected to rise by 70 percent, and meat, eggs, and fish by 100 percent (Kumar and Birthal, 2007). Such changes in food consumption patterns will generate upward pressure on cereal grain prices because the derived demand for cereal grains will increase even more as cereals are an input into many of these high value food items, particularly meat and poultry.

On the supply side, South Asia is also projected to be severely affected by climate change. Food production in South Asia may decline from its 1990 level by 22 percent by 2080 (Fisher, et al, 2005). South Asia is also vulnerable to potential social conflicts as a result of continuing degradation of natural resources and widening income gap between the rural and urban population (Rosegrant, et al, 2007). This region is considered to be one of the worst in terms of food insecurity (Smith and Wiesemann, 2007), having a very high proportion of malnourished children and a wide gender gap.

In this context, several studies have been undertaken by both international organisations and individual analysts analysing the implications of rising global food prices for South Asia for food security, poverty, socio-political stability and long term growth in the region. The aim of this paper is to critically survey this literature and the evidence of seriousness of the problem in South Asia. The paper also attempts to undertake an econometrics analysis to the impact of food prices on South Asian countries. In order to meet these objectives the rest of the paper is structured as follows. Section 2 examines the background and the nature of rising food prices in leading South Asian countries. The vulnerability of South Asian countries to rising global food prices is highlighted in Section 3. In Section 4, the impact of high food prices on inflation, growth, internal and external balances is examined while the impact of food crisis on poverty and inequality is examined in Section 5. In section 6, an econometric analysis is carried out using time-series data related to a number of South Asian countries. The immediate responses to the crisis across the region and necessary long-term measures are discussed in Section 7 and the final section summarises the key messages emerging from this survey.

## **2. Rising Food Prices in South Asia: The Nature of the Problem**

Falling real prices of staple cereal grains such as rice and wheat observed since the spread of the green revolution in the 1970s and 1980s in Asia appear to be over. By mid-2008, food prices had increased by more than 200 percent since 2006 and more than 60 percent of this rise occurred after January 2008 (World Bank, 2008a, p.1). Between March 2007 and March 2008, prices of corn, rice, soya bean and wheat increased by 31, 74, 87 and 130 percent, respectively. Rice price passed US\$1000 in April 2008 as panic buyers from countries like the Philippines and Bangladesh attempted to secure orders in the already tight international rice market that had been impacted by the introduction of export restrictions first by India and followed by several other grain exporters such as Vietnam, China and others (Blas and Minder, 2008 and World Bank, 2008a, 2008b). In this paper, we do not intend to go onto detailed analysis of the reasons for the food price increase at the global level as there are several studies now available that have analysed the trends, projections and reasons for rising food prices (see for example, von Braun, 2007; World Bank, 2008a and 2008b; IMF, 2008; OECD, 2008; and FAO, 2008). The price increases have been attributed to the increase in food demand due to economic growth in both Asia and Africa, decline in supply due to a variety of reasons including subsidies for biofuels and climate change, high oil prices and the related increase in the price of fertilizer. Figure 1 presents the export prices of rice and wheat, and various government policy interventions during 2005-2008. The sharp spike in food prices was, at least in part, a direct consequence of decisions by key exporting countries to impose restrictions on exports.

Our focus here is on developments in the South Asian region, in particular on developments in India, Pakistan, Bangladesh, Nepal and Sri Lanka. The biggest country in the region and one of the rising economic giants in the world, India, experienced significantly lower price increases when compared with price increases in world markets and in other neighbouring countries. This was primarily due to government policy interventions that were designed to insulate domestic markets from international market movements. When food prices started to increase in global markets from late 2005 onwards, at first, Indian prices also started to move up. Between December 2005 and December 2006, Indian wheat prices increased by 20 percent while international prices rose 24 percent. But between December 2006 and December 2007, when international wheat price moved up by 80 percent, Indian prices only increased by a mere 1.3 percent. In the first four months of 2008, when international prices of both wheat and rice continued to increase rapidly, Indian wheat prices actually declined while rice price rose by less

than 6 percent (Chand, 2008). Between 2004 and 2007, at a time of near doubling of international fertilizer prices, Indian domestic prices remained almost unchanged (Chand and Pandey, 2008). Although food price increases were moderate in India, its policies aggravated the food price situation in global markets and had a direct adverse impact on neighbouring countries such as Bangladesh and Nepal.

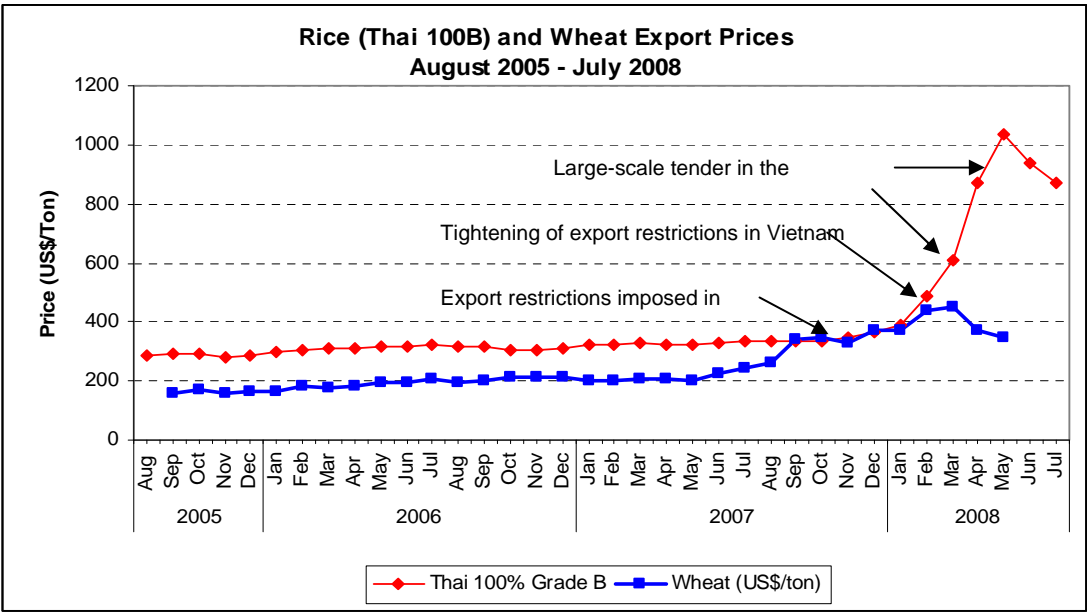
Bangladesh, a country highly vulnerable to natural disasters, was impacted by the food price shock following a number of natural disasters, two major floods in July and August and a cyclone in November 2007, which destroyed some 1.23 million tonnes of rice (World Bank, 2008b). The adverse effects of natural disasters were compounded by India's (its main supplier of imported rice) decision to curtail its rice exports by increasing its minimum export price. Figure 2 shows that price rises in Bangladesh were impacted by changes in Indian minimum export prices of rice. Due to these events, overall, domestic rice price in Bangladesh rose by nearly 70 percent rise from late 2007 to mid-2008.

Food prices in Nepal, one of the least developed countries of the world, have historically tended to follow Indian food prices. Until the 1980s it was largely self-sufficient in food but had then become a net food importer, with food grain imports sourced mainly from India. In 2008, it was just starting to recover from a decade-long armed conflict (1996-2006) and a series of natural disasters in 2006 and 2007. However, due to India's ban on exports of non-*basmati* rice, wheat and lentils to Nepal in October 2007, food prices in Nepal have increased significantly, though by less than world prices, despite the existence of significant informal trade between two countries and very good harvest of paddy (which increased by 17 percent) and wheat (which increased by 4 percent) (World Food Programme, WFP, and Nepal Development Research Institute, NDRI, 2008). The recent closure of border with China has also created a food shortage in remote mountain areas of Nepal along the border with Tibet. Nepal has been declared to be one of seventeen most severely affected countries in the world by rising food prices.

Pakistan too has been severely affected by high food prices. Its problems have been compounded by political instability and "the worst ever wheat crisis in the country's history" (Government of Pakistan, Ministry of Finance, 2008, p.7). Wheat is Pakistan's staple food. The price increases came in the wake of a fall in domestic wheat price in April 2007 following news of a bumper wheat crop of 23.3 million tons. The government allowed export of 0.5 million tonnes of wheat to halt the falling wheat price at a time that global wheat prices had started to rise sharply, also encouraging hoarding and smuggling (particularly to Afghanistan and Iran). Secondly, *basmati*

rice exports increased in response to rising international prices at a time of more or less constant domestic production and increasing domestic demand, leading to price increases of over 56 percent during the period of July 2007 to March 2008. Higher world prices of other food items such as palm oil also contributed to Pakistan’s high food inflation.

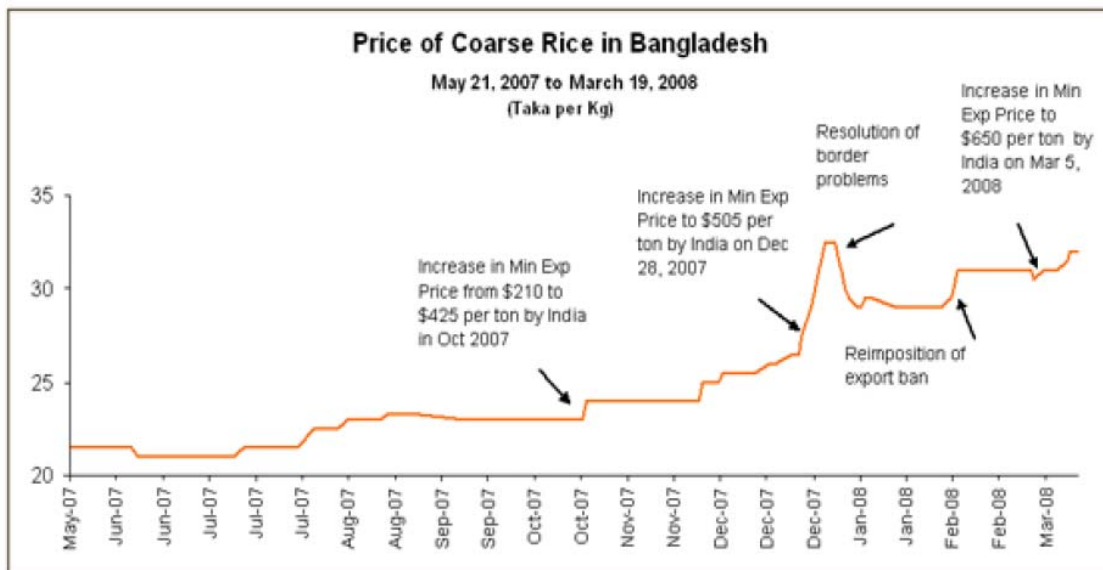
Sri Lanka, a significant net importer experienced the worst food price inflation in the region, with price hikes of 30 to 40 percent during the early months of 2008 (Figure 3). Prices of different varieties of rice increased around 60-70 percent from January 2007 to January 2008. As in the case of Bangladesh, Sri Lanka’s rice production was affected by floods in 2007 when supply fell by 6.4 percent (Central Bank of Sri Lanka, 2008). However, the government policy on rice protection and severe restrictions on wheat imports in 2007 certainly contributed to an aggravation of the food price inflation. Strict restrictions on imported wheat (the main substitute for rice) led to higher demand for rice and created a shortage of rice though the government has placed most of the blame temporary hoarding by paddy farmers and middlemen. The sharp rise in rice prices created a political crisis and some panic in Sri Lanka which led to a Sri Lankan Government Minister visiting Myanmar and ordering 100,000 metric tons of rice and the imposition of a price ceiling to protect the consumers in April 2008.<sup>1</sup>



**Figure 1: Export prices of rice and wheat, and government intervention policies, August 2005- July 2008**

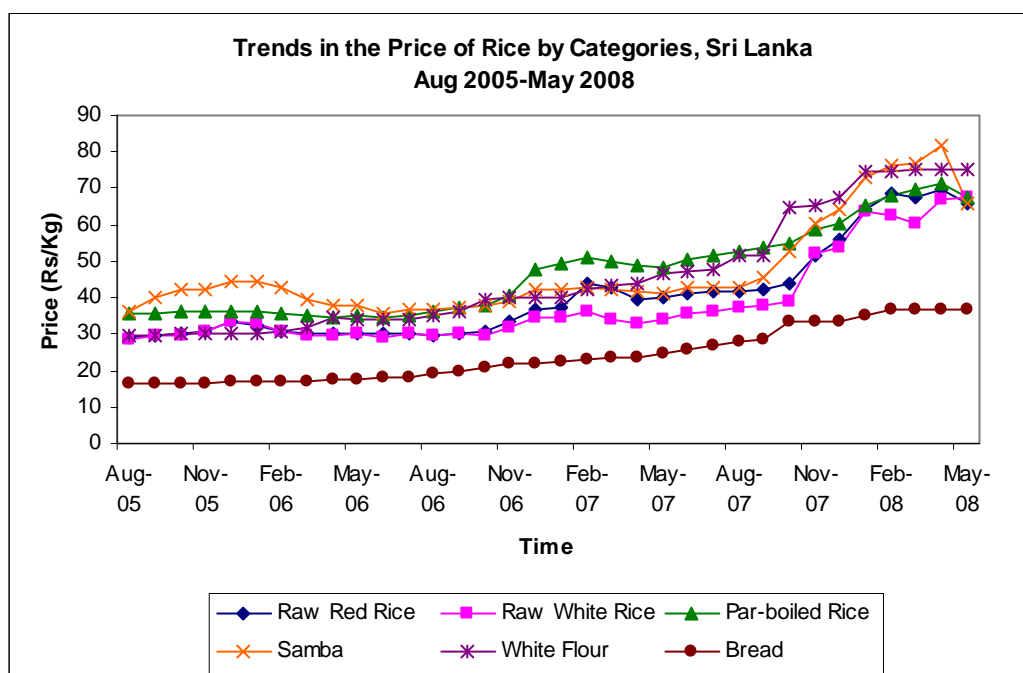
[Source: FAO, <http://www.fao.org/giews/english/fo/index.htm>.]

<sup>1</sup> Some observers have claimed that “Sri Lanka has never experienced this kind of rapid rise of rice prices over last few decades” (Dayaratna-Banda, et al, 2008).



**Figure 2: Price of Coarse Rice in Bangladesh**

[Source: Adapted form World Bank (2008d)]



**Figure 3: Prices of Various Categories of Rice (Rs/Kg), 2005-2008, Sri Lanka**

[Source: Department of Census and Statistics of Sri Lanka, Various issues of Retails Prices.]

### 3. South Asian Vulnerability to Rising Food Prices

As described above, despite the relative price stability in India, the South Asian region overall has been severely affected by food price inflation and is considered to be the second worst affected region in the world. It is highly vulnerable to the impact of high food prices for several reasons.

Table 1 provides a number of key internal and external socio-economic indicators of the region. South Asia has the largest number of poor people in the world with a large proportion of its population continuing to depend on agriculture. Most of the energy intake of people is derived from staples while the proportion of calories obtained from cereals is very high. Indicators of food insecurity (compiled by Smith and Wiesmann, 2007) presented in Table 1 show that more than half of the South Asian population suffer food energy deficiency and around one-third of the population are at high risk food insecurity. Food insecurity in the region has been a serious and persistent problem over the years and it is considered the world's second most vulnerable region, after Sub-Saharan Arica, in terms of food insecurity.

**Table 1: Socio-Economic Profile of South Asia with a Focus on Food Security (2006)**

	Afghanistan	Bangladesh	Bhutan	India	Maldives	Nepal	Pakistan	Sri Lanka
GDP growth rate (%)	5.3	6.6	7.8	9.2	23.5	1.9	6.9	7.4
GDP per capita (US\$, Atlas method)		490	1410	820	2680	290	800	1320
GDP per capita growth rate (%)	1.7	4.5	6.1	7.7	20.7	-0.1	4.7	6.6
Share of agriculture in GDP (%)	36.1	19.0	25.2	17.5		39.5	19.4	165
Per capita food production growth % (1996-2005)		1.6	-3.3	0.4	-1.1	0.6	0.1	-0.3
Share of agricultural employment in total agriculture (%)		52.0		66.7		78.5	48.4	41.6
Total population (millions)		144.3	0.65	1109.8	0.34	27.7	159.0	19.8
Population growth (%)		1.9	2.4	1.5	2.5	2.1	2.4	0.4
Rural population (% of total population) -2004		75	91	71	71	84	66	79
Agricultural population (% of total population)-2004		52	94	52	23	93	49	44
Poverty Headcount ratio – National (%)		35.3 (2005)	23.2 (2007)	36.6	6 (2005)	30.8 (2004)	23.94 (2005)	15.2 (06/07)
Poverty Headcount – Rural (%)			30.9 (2007)	40.2 (2005)		34.0(2004)	28.13 (2005)	15.7 (06/07)
Poverty Headcount – Urban (%)			1.7 (2007)	19.6 (2005)		10 (2004)	14.94 (2005)	6.7 (06/07)
Gini index		31.8		32.5	0.41	36.7	33.0	34.4
Agricultural imports as a % of total imports (2002-04)		16.8	7.9	6.2	19.7	15.4	13.1	12.4
Net food imports (2002-04), US\$ Millions		1,250.5	11.2	-3836.6	91.9	56.9	-509.5	-178.3
Foreign reserves (number of months of imports)-2008		3.2		12.1		5.4	4.4	3.0
Proportion of undernourished in total population %		30		20		47 (2007)	23	22
Child malnutrition (% of children under 5)	39	48		48		45	35	29
Food energy deficiency index (1999)		53.7(2000)		52.4			44.1 (1998)	56.7
Severe food energy deficiency (1999)		29.4 (2000)		34.2			31.2 (1998)	42.1
Percent of energy from staples (1999)		82.4 (2000)		66.5			56.2 (1998)	59.9
Proportion of calories obtain from cereals % (2002-04)		82		59		73	50	54
Global Hunger Index		28		25		24	23	
Fiscal Vulnerability Index		3		3	1	2	3	2

Source: IMF (2008), World Bank (2007) and Smith and Wiesmann (2007)

Countries in the region (except in Sri Lanka) experience high population growth and though most have experienced rapid economic growth in recent years, poverty remains a major problem, with the region being home to the largest numbers of poor in the world. Though there has been a steady decline in the proportion of poor in South Asia in recent years, the number of people living on less than US\$1 a day is fairly constant (Chen and Ravallion, 2007). For example, the number of poor people in the region fell by only about 9 million between 1981 and 2004, while the number of poor people in the world fell sharply from around 1470 million to 970 million during the same period. In terms of the \$2 per day poverty line, more than 75 percent of the people in South Asia live in poverty; in fact the number of poor below US\$2 a day is increasing in South Asia. The most striking fact is that the highest proportion of the world poor is living in South Asia and this proportion has increased from 31% in 1981 to 46% in 2004. In contrast, this proportion has fallen from 54% to 17% in East Asia during the same period.

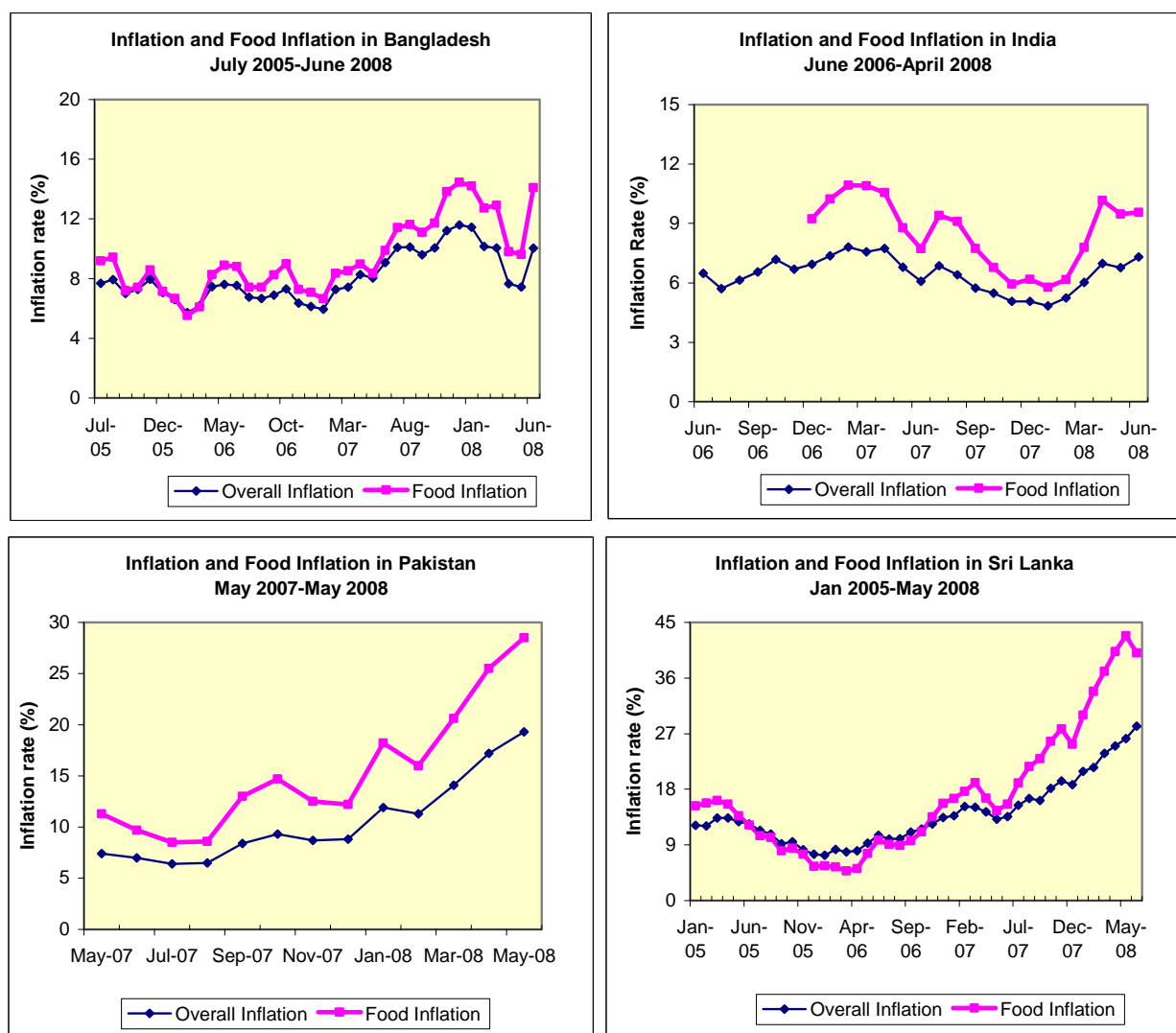
#### **4. Macroeconomic Impact of Soaring Food Prices in South Asia**

Rising food prices are not only a serious humanitarian concern but it also threatens macroeconomic and political stability across the South Asian region through the budgetary cost of food subsidies, inflation, slow growth, and external imbalances. The overall macroeconomic situations of countries like Bangladesh, Pakistan and Sri Lanka are also not strong; they not only experience high food price inflation but also have higher overall inflation (see Figure 4). Though they depend on food imports, their foreign reserve positions are not very strong. Some observers believe that the food crisis is a bigger problem for Asia than the global credit crunch (Blas and Minder, 2008).

The link between global food price rises and domestic prices is weakened in most South Asian countries by extensive interventions in food markets including trade restrictions, price interventions, public food distribution systems, and so on. However, given the high share of food in the consumer expenditure baskets (column 4, Table 2), it is clear that the sharp rise in food prices has contributed to a higher overall inflation across the South Asian region (see Figure 4 and columns 2 and 3 of Table 2). In fact, food price inflation has exceeded overall inflation in all these countries including India. Overall, the impact of food price increases, together with that of oil price increases, is expected to have a significant negative impact on economic growth in the region.

In a recent report covering a large number of low income countries, the IMF has identified the macroeconomic effects of rising food prices and oil prices separately. Table 3 summarises these

macroeconomic effects and the fiscal burden on some of the South Asian countries, taking into account the cost of various consumer and producer subsidies and various transfers designed to insulate the impact on the poor and maintain food-based safety nets (IMF, 2008).



**Figure 4: Overall Inflation and Food Inflation, Sri Lanka, India, Pakistan and Bangladesh**

**Table 2: Food price contribution to consumer price inflation in South Asian countries, 2008**

Country	Overall inflation	Food price inflation <sup>(a)</sup>	Expenditure share of food (in %)	Contribution of food prices to overall inflation <sup>(b)</sup>
(1)	(2)	(3)	(4)	(5)
Bangladesh (April 2008)	9.94	11.84	64.5	6.41
India (February 2008)	4.60	5.80	33.4	1.54
Nepal (April/May 2008)	7.50	10.00	53.2	3.99
Pakistan (May 2008)	19.30	28.50	41.5	8.01
Sri Lanka (June 2008)	28.20	40.06	46.7	13.17

Source: Statistical Departments and Bureaus of different countries, 2008.

<sup>(a)</sup> Includes beverages and tobacco.

<sup>(b)</sup> Column (5) entries are calculated as (5) = (2)×(4)/100.

**Table 3: Macroeconomic Impact of Rising Food Prices**

Macroeconomic Impact	Afghanistan	Bangladesh	India	Maldives	Nepal	Pakistan	Sri Lanka
Change in food price subsidies as a % GDP:2006-2008	na	0.3%	-0.3%	2.7%	Na	0.5%	na
Change in transfer program outlays as a % of GDP: 2006-2008	0.25%	1.0%	0.7%	na	Na	1.0%	0.15%
Current account deficit as % GDP							
Before the food price shock	-3.1	-0.7	-3.4	-19.2	0.2	-6.1	-4.9
After the food price shock (projected 2009 position)	-3.9	-1.1	-3.3	-17.4	0.0	-6.5	-5.4
Foreign reserves available for imports (in terms of months)							
Before the food price shock	9.0	2.4	10.1	-2.3	6.0	2.8	2.6
After the food price shock (projected 2009 position)	8.4	2.2	10.2	-1.8	5.9	2.5	2.3

Source: IMF (2008)

These estimates demonstrate that food price subsidies as a percentage of GDP are expected to rise in the range of 0.3 percent in Bangladesh to 2.7 percent in Maldives. According to another study, India's food subsidy is expected increase by 4, 9 and 13 percent, respectively under three scenarios of food price rises, 10, 20 and 30 percent (ADB, 2008b). Outlays of transfers to protect the poor under safety net programs are expected to increase in the range of 0.7 percent to 1.0 percent of GDP in Bangladesh and Pakistan. Rising food prices are also expected to exert pressure on the external balances in these countries. As shown in Table 3, the current account deficit as a percentage of GDP in South Asian countries is expected to increase as a result of rising food prices except in India and Maldives.

A number of computable general equilibrium (CGE) studies have also been conducted to examine the macroeconomic effects of rising food prices in South Asian countries. For example, Polaski, et al, (2008) have examined an increase in rice and wheat prices on macroeconomic variables, income distribution and poverty in India. They report that a rise in the world price of rice (in which India is a small net exporter) will have a positive impact on all macroeconomic variables of the Indian economy, while an increase in the world price of wheat (in which it tends to be a marginal importer) will have some negative effect (Table 4).

**Table 4: Impact of an Increase in Rice and Wheat Prices on Macroeconomic Variables in the Indian Economy**

Macroeconomic Variable	Percentage change in response to increase in world price of rice		Percentage change in response to increase in world price of wheat	
	25% increase	50% increase	25% increase	50% increase
Private consumption	0.30	0.84	-0.02	-0.03
Government consumption	0.17	0.52	0.00	0.00
Investment	0.39	1.20	0.00	0.00
Import demand	1.82	5.62	-0.12	-0.19
Export demand	0.60	1.08	-0.07	-0.13
Total domestic production	0.23	0.70	0.00	0.00

Source: Polaski, et al, (2008), A summary of Tables 4 and 7.

In contrast, a recent CGE study on Bangladesh, a net food importing country, finds that the macroeconomic effects of rising food prices on Bangladesh are negative, with declines in real household income, real GDP and household welfare (Table 5). In contrast to the case of India, as expected, the general price level is projected to rise.

Overall, standard economic theory would predict that net importers of food are obviously likely to experience net losses from higher global food prices.

**Table 5: The Impact of Rising Food Prices: Bangladesh (CGE Estimates 60% Rise)**

Macroeconomic Variables	The effect of increase in food prices
General price level	2.16%
Real household income	-1.61%
Welfare (equivalent variation)	-0.905
Real GDP	-0.787

Source: Adapted from ADB (2008a).

## 5. Impacts of Rising Food Prices on Poverty and Inequality in South Asia: Evidence so far

While the overall macroeconomic effects of rising food prices vary with a country's position as a net food importer or exporter, the impact on the poor has given rise to considerable controversy and debate. The World Bank has stated that up to 105 million people in the world could fall below the poverty line as a result of rising food prices alone (World Bank, 2008b, p.4). On the other hand, some analysts have argued that – at least in some cases – higher food prices will favour the poor, given that most poor live in rural areas where agriculture is the main source of income. Thus Polaski, et al, (2008), for example, have asserted that, according to their CGE modelling, Indian poor will gain overall from higher food prices.

The impacts of rising food prices on poverty depend on a number of factors such as whether households are net food sellers or net food buyers, whether household purchasing power is increasing or decreasing, the share of food expenditure in total household budget, the food distribution system, infrastructure and government policies. As pointed out in *The Economist*, “high food prices do help poor farmers, but they also hurt the more numerous category of people (poor city-dwellers as landless rural folk) who must buy food to survive” (*The Economist*, 27 March, 2008).

It is clear that, as consumers, the poor are likely to lose most from higher food prices. As can be seen from Tables 6 and 7, the total expenditure share of food, of which the bulk is cereals, of the bottom two quintiles is more than 50 percent in all South Asian countries. This share in the rural sector is even higher than that in the urban sector. But these figures are not adequate in themselves to conclude that rising food prices will have an adverse impact on people living below the poverty line and push more people into poverty because higher food prices can alter the incomes of the poor, if food production is a major source of income. This is clearly the case where farm households are net sellers of food.

**Table 6: Share of Food expenditure in Total Household Expenditure**

Country	Overall	Urban	Rural
Bangladesh (2000)			
Total expenditure share of food	61.31	53.13	63.39
Total expenditure share of cereals	42.22	32.96	44.58
India (2004-2005)			
Total expenditure share of food	53.2	42.0	55.0
Total expenditure share of cereals	18.0	10.0	18.0
Nepal (2003-2004)			
Total expenditure share of food	59.0	39.1	62.9
Pakistan (2005-2006)			
Total expenditure share of food	43.05	35.17	49.56
Total expenditure share of cereals	8.00	6.00	11.00
Sri Lanka (2003-2004)			
Total expenditure share of food	34.0	25.0	36.0
Total expenditure share of bread and cereals	12.0	7.0	12.0

Source: ADB (2008b), Bangladesh Bureau of Statistics (2002), Federal Bureau of Statistics of Pakistan (2007), Central Bureau of Statistics of Nepal (2004) and Department of Census and Statistics of Sri Lanka (2007).

**Table 7: Share of Food Expenditure in Total Expenditure in South Asian Countries**

Quintile	Bangladesh (2000)	India (2004-05)	Nepal (2003-04)	Pakistan (2005-06)	Sri Lanka (2006-07)
1 <sup>st</sup>	69.3	62.0	73.0	55.61	58.9
2 <sup>nd</sup>	66.9	59.4	66.6	52.63	50.1
3 <sup>rd</sup>	63.2	56.2	64.8	50.91	49.1
4 <sup>th</sup>	58.7	50.8	58.1	46.29	41.8
5 <sup>th</sup>	45.2	36.4	40.1	33.14	25.6

Source: ADB (2008b), Bangladesh Bureau of Statistics (2002), Federal Bureau of Statistics of Pakistan (2007), Central Bureau of Statistics of Nepal (2004) and Department of Census and Statistics of Sri Lanka (2007).

The benefits to the poor from rising food prices obviously depend on whether they are net food sellers or buyers. There has been a growing body of literature on whether low food prices are pro-poor or not based on the approach of net food buyers and sellers. While some argue that high food prices are bad for the poor (for example, Ravallion, 1989 and Seshan and Umali-Deininger, 2007) others argue that high food prices good for the poor (for example, Schiff and Valdes, 1992 and World Bank, 1986). Aksoy and Isik-Dikmelik, (2008) have briefly reviewed this literature and have undertaken some further investigations of this issue. As reported in FAO (2008) using the results of studies such as Aksoy and Isik-Dikmelik (2008), both rural and urban households are adversely affected by the increase in price of rice since the percentage of net food sellers household is low in these countries as shown in Table 8. Further, the poorest of the poor are the hardest hit group in Bangladesh as shown in Table 9. For example, the bottom 20 percent of the income receivers are facing a net loss of 2.7 percent while the second poorest quintile are losing around 2.0 percent as a result of 10 percent increase in price of rice (FAO, 2008, p.36). Even

land owners in low income groups in Bangladesh lose. In contrast, land owners in Pakistan gain from rising food prices while non-land owners lose (see Table 9).

**Table 8: Share of Net Staple Food Seller Households (Percent)**

	Urban	Rural	All
Bangladesh (2000)	3.30	18.90	15.70
Pakistan (2001)	2.80	27.50	20.30

Source: FAO (2008), p.33.

**Table 9: Average welfare gain/loss from a 10 percent increase in the price of main staple, by income (expenditure) quintile and land-ownership category**

Country	Per Capita Expenditure Quintiles					All
	1	2	3	4	5	
Bangladesh						
Landowners	-1.22	-0.86	-0.29	-0.06	0.15	-0.34
Non-landowners	-3.48	-2.92	-2.36	-2.04	-1.45	-2.60
Pakistan						
Landowners	1.16	1.20	1.65	1.65	1.91	1.58
Non-landowners	-0.66	-0.63	-0.49	-0.39	-0.15	-0.48

Source: FAO (2008), p.37

In principle, the impact of a food price increase on the poor cannot be predicted without more information about the production related income effects. This places a question mark over use of partial equilibrium analysis to analyse the net effects of food price increases where large numbers of households are either directly engaged in food production or are likely to benefit from higher incomes generated in food production. Ideally, well structured CGE models can be useful for overcoming this limitation, but results can be very sensitive to model specifications and parameter values. These considerations must be borne in mind in assessing the reported results of many of the studies that report on the impact of food price increases on poverty in south Asia.

WFP and NDRI (2008) have estimated about 19.2 million rural poor in Nepal (or staggering 69.3 percent of total population) will be affected by rising food prices. A recent ADB (2008b) study using Pakistan and Philippines as examples reports that a 10, 20 and 30 percent increase in food prices in Pakistan will create respectively additional, 7.05, 14.67 and 21.96 million poor people (new poor) (4.4, 9.2 and 13.8 percent of the total population of Pakistan). The compensation required to help cushion the old and new poor in Pakistan under these three different scenarios were estimated at 0.29, 0.71 and 1.28 percent of GDP respectively. Ivanic and Martin (2008), using a global CGE model, reported that the rising food prices lead to large increases of poverty

in Pakistan (along with Nicaragua, Zambia and Madagascar), with the overall poverty ratio in Pakistan increasing by 0.3 and 0.8 percent under a 10 and 20 percent increase in food prices.

Unsurprisingly, given the absence of a strong positive income-side link to food prices, urban household sectors are likely to lose from rising food prices (IFPRI, 2008). Dessus, et al (2008), in a large sample of 73 developing countries, reported on the monetary cost of alleviating changes in poverty created by the rise in food prices since 2005, using the concept of “poverty deficit” (ie., “the variation in financial resources required to lift all urban poor out of poverty under perfect targeting”) under three different scenarios of relative food price changes, namely: lower scenario (10 percent rise), central scenario (20 percent rise) and upper scenario (30 percent rise). Results for the five leading South Asian countries under the central scenario are summarised in Table 10.

**Table10: Estimated Poverty Headcounts and Poverty Deficits**

Country	Urban poverty at US\$1 a Day				Urban poverty at US\$2 a Day			
	Initial situation 2005		Expected situation under a 20% rise in food prices		Initial situation 2005		Expected situation under a 20% rise in food prices	
	Poverty Headcount rate	Poverty deficit (% GDP)	Poverty Headcount rate	Poverty deficit (% GDP)	Poverty Headcount rate	Poverty deficit (% GDP)	Poverty Headcount rate	Poverty deficit (% GDP)
Bangladesh	8.7	0.2	13.7	0.3	47.4	3.5	53.2	4.8
India	5.7	0.1	9.0	0.2	44.2	3.4	51.0	4.7
Nepal	8.9	0.1	14.8	0.1	32.7	0.8	37.5	1.0
Pakistan	3.0	0.0	6.2	0.1	46.7	3.2	55.1	4.7
Sri Lanka	0.6	0.0	1.8	0.0	20.1	0.4	26.8	0.7

Source: Dessus, et al, 2008.

Urban poverty is estimated to rise after the food price shock in all five South Asian countries. In contrast, Polaski, et al, (2008) in a CGE study of India report that the poorest households gain in terms of real income as a result of an increase in price of rice.<sup>2</sup> Households across different categories in the rural sector experience 4 to 6.4 percent increase in real income as a result of a 50 percent increase in the world price of rice. According to this study, all rural households would gain from such an increase except the richest 10 percent. The most significant feature is that disadvantaged groups in the rural sector are expected to gain most. These are clearly very controversial results. Unfortunately, for a study that presents such a startlingly different

<sup>2</sup> While all rural categories of labour gain from a rise in food prices, the majority of labour categories in the urban sector are expected to lose from such a rise. The results on household income follow the pattern of the effects on different categories of labour.

conclusion, with immense implications for policy, the details of the model and implementation are not available in the public domain for scrutiny.

Rising food prices will have an impact on inequality as well. The impact of rising food prices on income distribution in some South Asian countries has also been examined in recent months. The World Bank estimates suggest that the Gini Coefficient of inequality has increased by 5 percent in Bangladesh (World Bank, 2008b, p.4). The ADB study (2008b) finds that in Pakistan the Gini coefficient will increase by 0.39, 0.78 and 1.16 percent, respectively, with an increase in food prices by 10, 20 and 30 percent, respectively.

In addition to poverty and inequality effects, the food crisis impacts on malnutrition in countries in the region. Table 1 in Section 3 has already demonstrated that all South Asian countries are vulnerable to food crisis in terms of the high proportion of undernourished people in total population. Nutrition and health of people living in South Asia may suffer, especially among women and children who are vulnerable to chronic malnutrition, as a result of global food crisis. As IFPRI (2008, p.6) noted “higher food prices lead poor people to limit their food consumption and shift to even less-balanced diets, with harmful effects on their nutritional status and health in the short and long run”. Pregnant and lactating women in the region are highly vulnerable to rising food prices. A number of recent studies have already highlighted this problem in the region.

According to the UN Inter Agency Assessment Mission (2008), a comprehensive study of this aspect of food price rises in Pakistan suggested that the number of people with inadequate food consumption, concentrated in the poorest regions, will increase by 12 million (from 72 million in 2005-06 to 84 million in 2008) as a result of the food prices increase. A recent report by the Ministry of Health and the Department of Census and Statistics in Sri Lanka, also claimed that rising food prices are expected to have negative impact on dietary quality and macro nutrient requirements leading to a rise in malnutrition (Colombo Page, [http://www.colombopage.com/archive\\_08/August7112523KA.html](http://www.colombopage.com/archive_08/August7112523KA.html)). The situation is worst in conflict affected areas. A World Bank report reports a projected increase of India’s rate of stunted children (at present at 47 percent); between 1.5 and 1.8 million more children in India are currently at risk of malnutrition as a result of rising food prices (see World Bank, 2008c).<sup>3</sup>

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<sup>3</sup> This proportion in India is twice as high as in Sub-Saharan Africa (24 percent) and around five times higher than that of China.

Nepal has also been listed as a high risk country in terms of the impact of rising food prices. It has a high level of food insecurity and nearly 41 per cent of undernourished people of total population. According to a recent report, “an inverse relationship between rising food prices and food intake can be observed for the extreme poor and poor wealth groups”... and “this may result in higher malnutrition rates” (WFP and NDRI, 2008, p.2).

Higher food prices also affect access to education, access to water, sanitation and health of the poor because of reduced household purchasing power.

At the end of this section it is important to note that the results of both econometric and CGE modelling studies on the impact of rising food prices surveyed in the previous section and this section are subjected to the limitations of implicit and explicit assumptions used in modelling and data used in different studies similar to any other empirical study in economics. For example, all CGE modelling exercises surveyed in this paper are based on neo-classical assumptions such as the utility maximisation of consumers, profit maximisation of producers, market clearance of all markets and perfect competition in factor and commodity markets. However, many markets are not perfectly competitive and the market rigidities and interventions are very common in real world. In addition, as noted earlier related to one CGE studies, the results obtained from some studies are not transparent and findings and inferences are not convincing. There are no sufficient discussions and explanations on modelling techniques and assumptions used in some modelling exercises. For example, the assumptions used in econometric projections on the impacts on rising food prices carried out by the IMF are not given in its reports.

## 6. A Time Series Analysis of the Price of Rice in Bangladesh, India, Pakistan and Sri Lanka

In this section, we consider the long-term trends in prices of rice and their effects on consumption using historical time series data for 4 countries, Bangladesh, India, Pakistan and Sri Lanka. There are not many published studies which have used time series analysis on the effects of prices on consumption of rice in a global sense. There are, however, a number of published International Food Policy Research Institute (IFPRI) research reports which look at this question but at a micro level in relation to food security, poverty etc. These include Weerahewa (2004) for Sri Lanka, Mahendra Dev et al (2004) for India, Dorosh and Shahabuddin (2002) for Bangladesh. Here we attempt to fill this gap by using more recent developments in time-series to analyse the data. First we present a comparison of the characteristics of the four countries in terms of population, GDP, Inflation and the supply and demand of rice production in these countries. The description of the data and the detailed analysis are provided in an appendix to this section.

### Population and Per capita GDP

Figure 5 presents the population of the four countries during the period 1972-2007. As can be seen, India is the most populous country while Bangladesh and Pakistan has similar population numbers and Sri Lanka is the smallest country. Looking at the population growth (not presented here), all countries except Sri Lanka had similar growth rate over the period 1972-2007. On average, Bangladesh grew at a rate of 2.23 percent per annum; India at a rate of 1.94 percent per annum, Pakistan at a rate of 2.67 per annum and Sri Lanka at 1.27 percent per annum. The lower growth rate in Sri Lanka can be attributed to the exodus of a vast number of its population to other countries due to the ongoing war in that country.

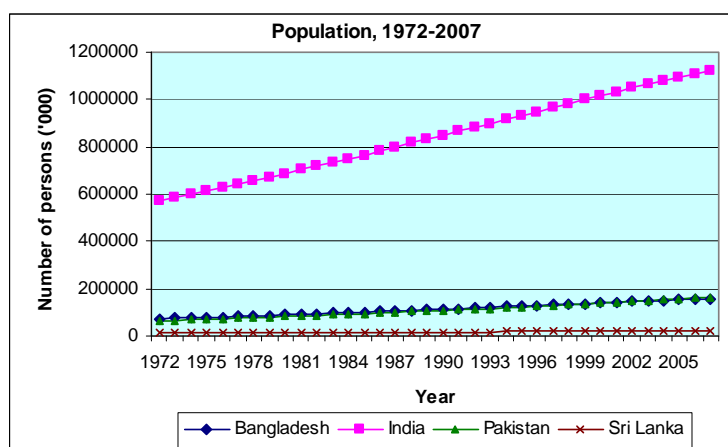
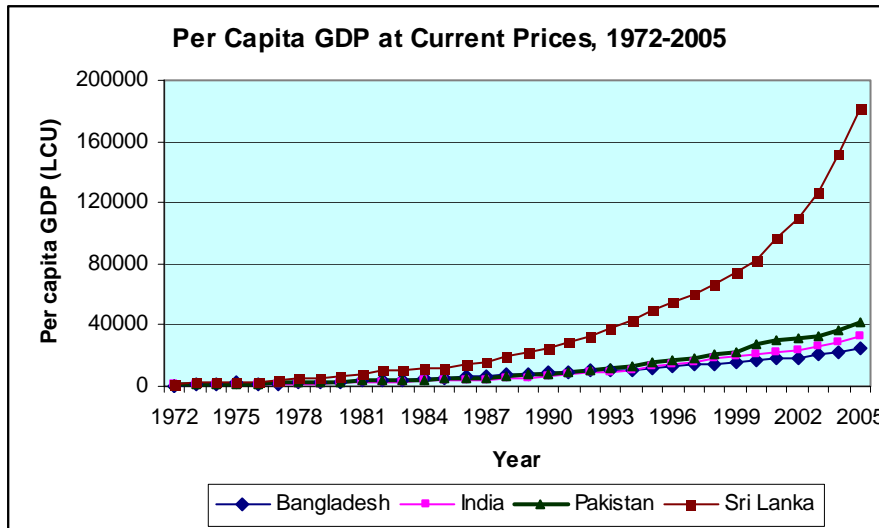


Figure 5 Population, Bangladesh, India, Pakistan, Sri Lanka, 1972-2007

Figure 6 presents the per capita GDP for the four countries during the same period. As can be seen, among the four countries Sri Lanka has the highest GDP per capita and, since 1984, has had the highest growth rate. Bangladesh, India and Pakistan all have similar levels of per capita GDP and growth rates throughout the sample period.



**Figure 6 GDP per capita, Bangladesh, India, Pakistan, Sri Lanka, 1972-2005**

Figure 7 presents the inflation and the food inflation for the 4 countries during 1990-2007. As can be seen, inflation and food inflation have been moving at similar levels over the past 17 years. Inflation and food inflation in India have been changing greatly until the year 2000 after which its movements have a similar pattern as the other countries. Food inflation, in general, can be seen to be greater than the overall inflation throughout the period 1990-2007.

### Supply and Consumption of Rice

Figure 8 presents the local production, imports, exports and consumption of (processed) rice during 1974-2005 in Bangladesh. Looking at the figure we can see that rice production has steadily increased while rice imports have always been very minimal. Based on this source of data, Bangladesh has also commenced exporting rice in the late 1970s which has increased gradually in the last decade. Nearly all the rice for local consumption is being supplied by locally produced rice.

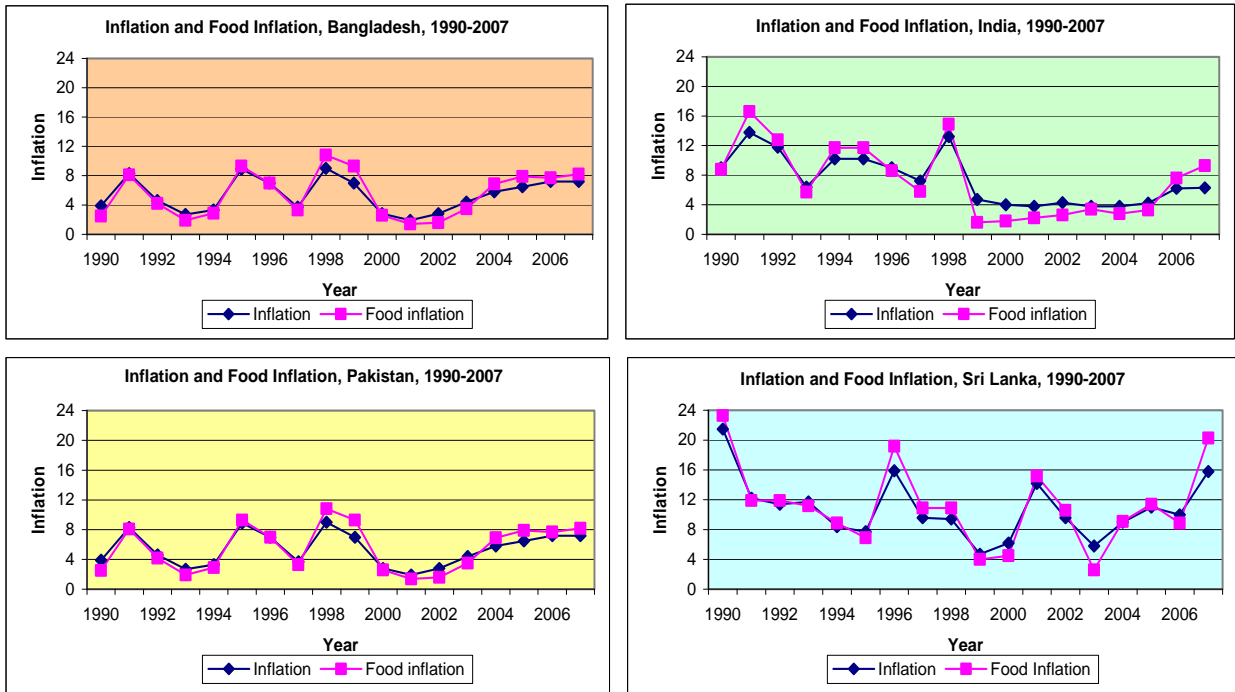


Figure 7 Inflation and Food Inflation, Bangladesh, India, Pakistan and Sri Lanka

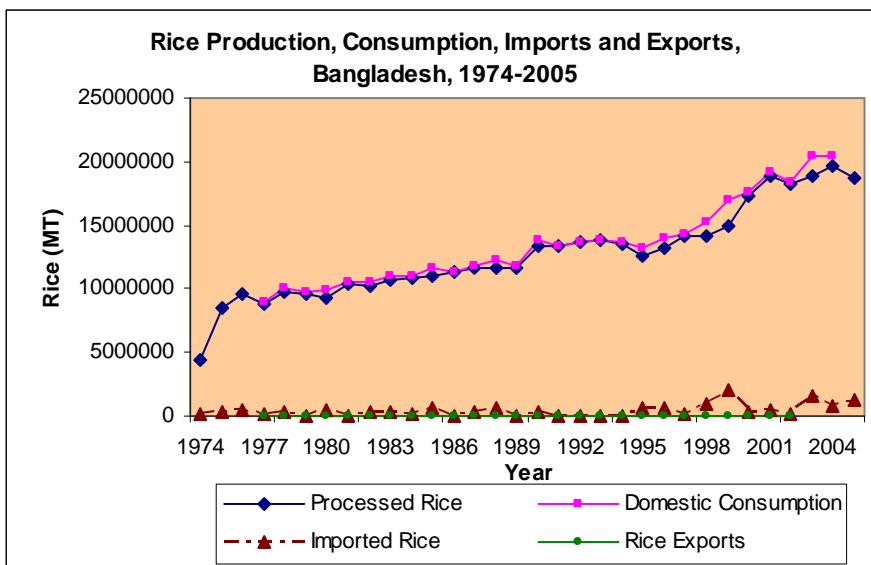
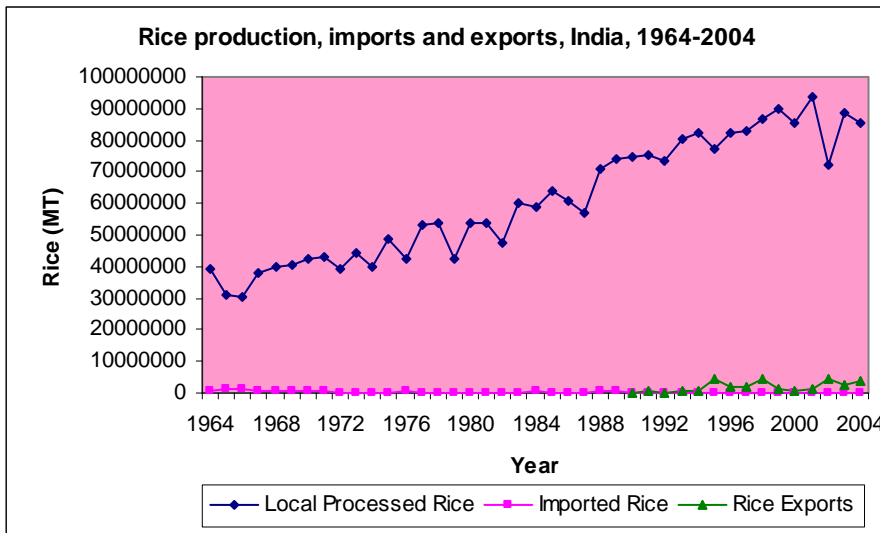


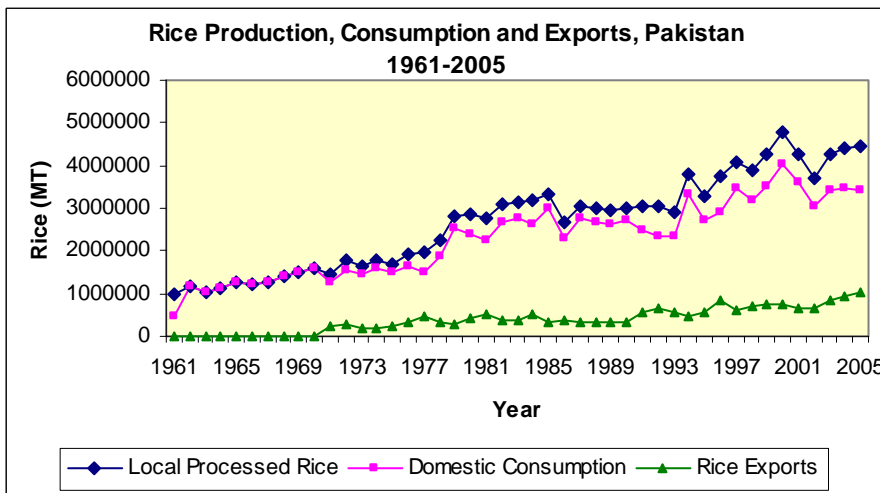
Figure 8 Rice production, consumption and exports, Bangladesh, 1974-2004

Figure 9 presents the local production, imports and consumption of (processed) rice for India during 1964-2004. It can be seen that rice production in India has steadily increased while rice imports have always been very minimal. Based on this source of data, India has also commenced exporting rice in the 1990s, which has increased gradually. Nearly all of the local rice consumption is being supplied by locally produced rice.



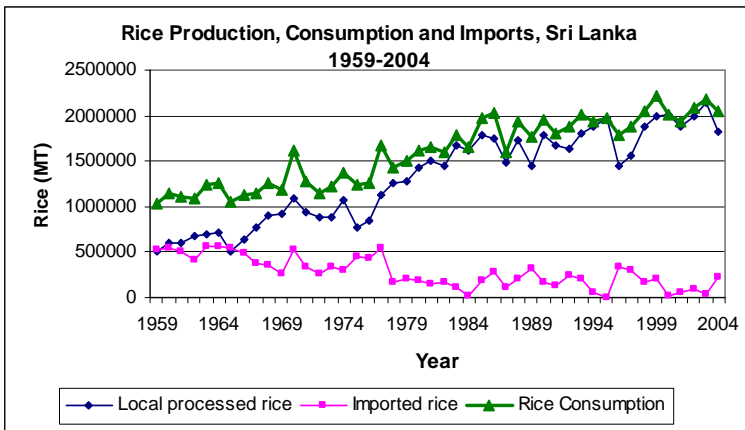
**Figure 9 Rice production, imports and exports, India, 1964-2004**

Figure 10 presents the local production, imports and consumption of (processed) rice for Pakistan during 1964-2004. Looking at the figure we can see that rice production has steadily increased while rice imports have always been very minimal. Based on this source of data, Pakistan has also commenced exporting rice in the 1990s which has increased gradually. Nearly all local rice consumption is being supplied by locally produced rice.



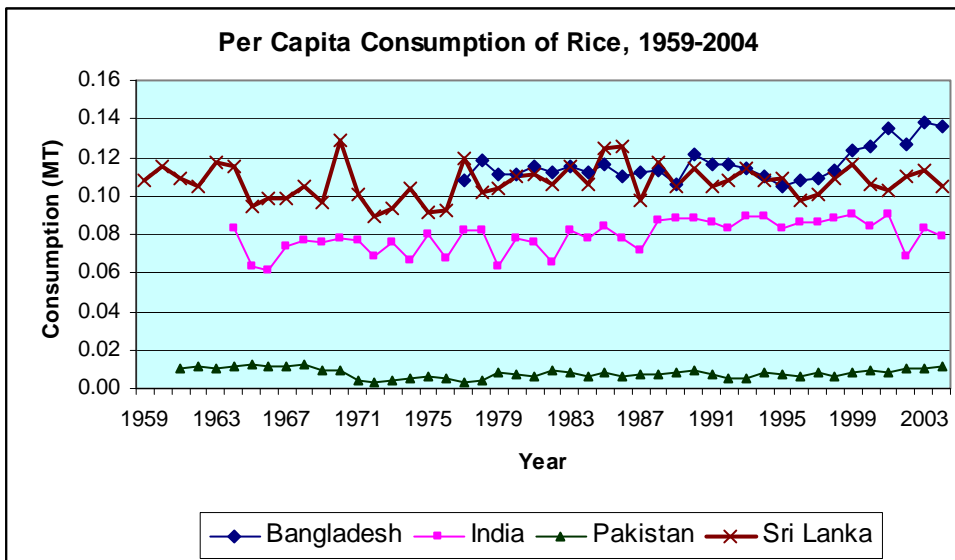
**Figure 10 Rice production, consumption and exports, Pakistan, 1964-2004**

Figure 11 presents the local production, imports and consumption of (processed) rice for Sri Lanka during 1959-2004. Looking at the figure we can see that rice production has steadily increased while rice imports have been declining during the last 5 decades and, by 2004, nearly all 100 percent of the local rice consumption is being supplied by locally produced rice.



**Figure 11 Rice production, imports and consumption, Sri Lanka**

The per capita consumption for the four countries presented in Figure 12 shows that, on average, per capita consumption of rice has remained stable for all four countries, except recently for Bangladesh where there is an increase in consumption in the last decade. As can be seen, the Bangladeshis and the Sri Lankans consume the highest per capita followed closely by the Indians. However, the Pakistanis, on average, consume between 0.00 and 0.02 metric tons of rice per annum. This low level of rice consumption could be due to the data considered in this study is related to Basmati rice only and the people of Pakistan may be consuming other types of rice or consuming more cereal.



**Figure 12 Per capita consumption of Rice, Bangladesh, India, Pakistan and Sri Lanka**

## Price of Rice

Here we present the review of annual trends in food prices for Bangladesh, India, Pakistan and Sri Lanka.

Figure 13 presents the wholesale price of rice for the four countries and retail price of rice for Bangladesh and Sri Lanka. As can be seen from the graph for Bangladesh, both prices have been stable until 1973 and have gradually increased until the mid 1990s after which there is a steep increase. Looking at the wholesale and retail price of rice for Sri Lanka, we can see that, in Sri Lanka, both prices have been stable until 1973 and have gradually increased until the mid 1990s after which there is a steep increase. As can be seen, on the whole, the wholesale price of rice has been increasing significantly since the 1970s in all countries.

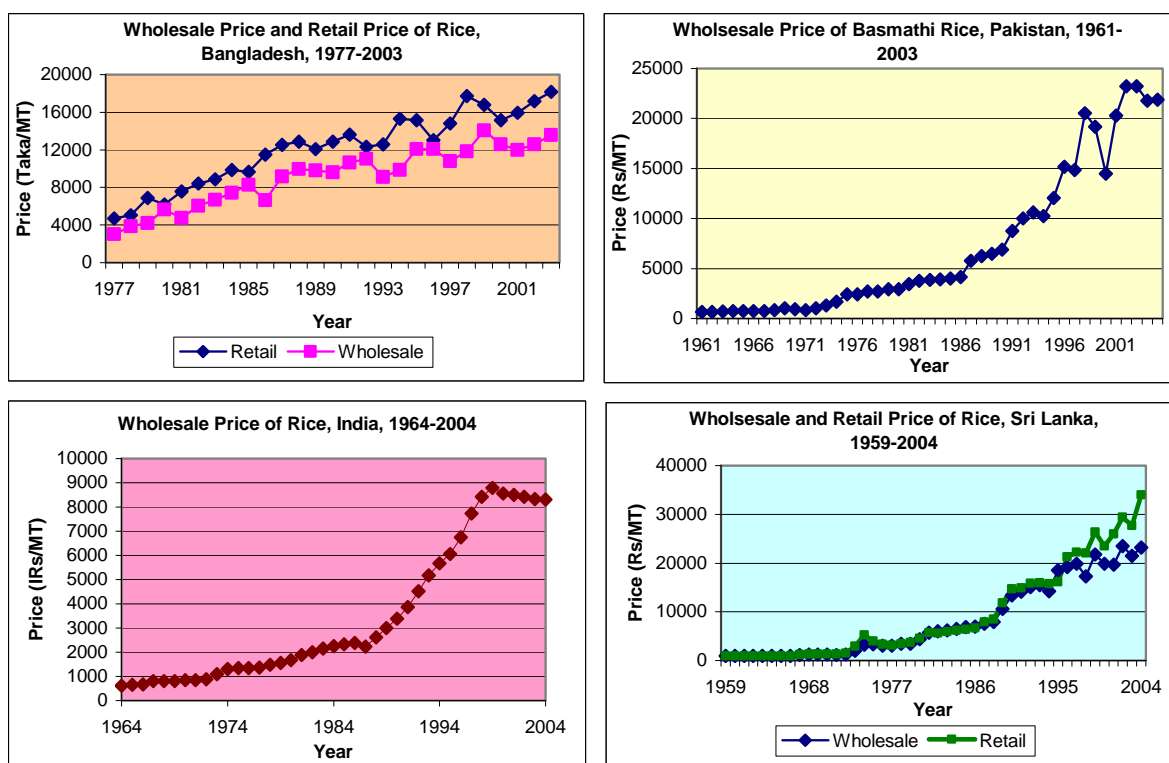


Figure 13 Wholesale and Retail Price of Rice, Bangladesh, India, Pakistan and Sri Lanka

## Demand Model

In this section, we present the demand model for the consumption of rice for Bangladesh and Sri Lanka. Due to unavailability of reliable data, modeling is not carried out for India and Pakistan. Details of the modeling processes are presented in the Appendix. We use a double-log demand model to estimate the relationship between per capita consumption of rice ( $q_t$ ), retail price of rice

$(p_t)$  and consumer's income ( $I_t$ ) using a double-log demand equation. The model can be written in the form

$$\ln q_t = \beta_0 + \beta_1 \ln p_t + \beta_2 \ln I_t + \varepsilon_t, \quad (1)$$

where  $\beta_0$ ,  $\beta_1$  and  $\beta_2$  are the coefficients to be estimated and  $\varepsilon_t$  is an error term which satisfies the usual regression model assumptions. As this is a double-log model, the coefficients  $\beta_1$  and  $\beta_2$  can be interpreted as the price and income elasticities of demand for rice.

The estimated demand models for Bangladesh and Sri Lanka are given as follows:

Bangladesh:  $\ln q_t = -1.544 - 0.223 \ln p_t + 0.164 \ln I_t$   
(0.013) (0.078) (0.021) (p-values)

Sri Lanka:  $\ln q_t = -2.002 - 0.127 \ln p_t + 0.098 \ln I_t$   
(0.000) (0.026) (0.016) (p-values)

As can be seen, the income elasticity is highly significant at the 5% level for both countries, while the own-price elasticity is significant at the 5% level for Sri Lanka and at the 10% level. As expected, the results show that over the time period considered, price has a negative effect on consumption while income has a positive effect on consumption. The own-price elasticities are both negative and less than one in absolute value, indicating that demand for rice is price inelastic. The income elasticities are positive and less than one, indicating that rice is a necessity in these countries.

### Supply Model

Now we present the estimation results of the supply model for the four countries where  $q_t$  and  $p_t$  represent the production of paddy (unprocessed rice) and wholesale price of paddy, respectively. Here also, we use all variables in logarithmic form. We model the relationship using a double-log equation which expresses production as a function of price. The model can be written in the form

$$\ln q_t = \alpha_0 + \alpha_1 \ln p_t + \varepsilon_t, \quad (1)$$

where  $\alpha_0$  and  $\alpha_1$  are the coefficients to be estimated and  $\varepsilon_t$  is an error term which satisfies the usual regression model assumptions. As this is a double-log model, the coefficient  $\alpha_1$  can be interpreted as the price elasticity of supply of rice.

The estimated supply models for the four countries are given as follows:

$$\begin{array}{lll} \text{Bangladesh:} & \ln q_t = 13.281 + 0.469 \ln p_t & R^2 = 0.72 \\ & (0.000) \quad (0.000) & (\text{p-values}) \end{array}$$

$$\begin{array}{lll} \text{India:} & \ln q_t = 15.14 + 0.354 \ln p_t & R^2 = 0.91 \\ & (0.000) \quad (0.000) & (\text{p-values}) \end{array}$$

$$\begin{array}{lll} \text{Pakistan:} & \ln q_t = 11.24 + 0.384 \ln p_t & R^2 = 0.85 \\ & (0.000) \quad (0.000) & (\text{p-values}) \end{array}$$

$$\begin{array}{lll} \text{Sri Lanka:} & \ln q_t = 4.989 + 0.316 \ln p_t & R^2 = 0.83 \\ & (0.000) \quad (0.000) & (\text{p-values}) \end{array}$$

As can be seen, the estimates are all highly significant. As expected, the results show that over the time period price has a positive effect on production in all countries. The price elasticities of supply of rice are similar for all countries and lie between 0.32 and 0.47.

## **7. Response to Food Crisis: retreat from policy liberalisation?**

As we have seen in previous sections of this paper, a large number of people in South Asia are vulnerable to the global food crisis. In addition to people who are already in poverty, a large number of additional people in countries in the region are at risk of experiencing food insecurity as a result of the global food crisis. For example, there will be additional 12 million people in Pakistan and 3.9 million people in rural Nepal with inadequate food consumption as a result of rising food prices. Bangladesh and the war torn area in Sri Lanka are also facing similar situation. Therefore, both global organisations and national governments responded immediately to face this human crisis.

## *Global response*

Many commentators, including the UN Secretary General, have already urged effective and immediate actions to address the impact of soaring food prices and resulting threat of hunger, malnutrition, and the risk of millions of world's vulnerable people. Leading economists such as Jeffrey Sachs are calling for another green revolution as a response to the current crisis. Clearly, there are short and long run roles for global aid agencies and developed countries' aid agencies to play in South Asian countries to mitigate the negative impact of the global food crisis. Currently a fully-coordinated attempt has been made by the international community led by the World Bank, UN agencies and the IMF to response to current food crisis around a "New Deal for Global Food Policy" under ten core actions or a "10-point plan" (World Bank, 2008, p.5) given below.

- Continue to fully fund the World Food Program's emergency needs, increase the flexibility of use of these funds and support its effort to purchase food locally.
- Support the expansion of safety nets programs in poor and capacity-constrained governments.
- Provide financial and technical support to design and implement 'market-smart and agronomically-intelligent' subsidies for agricultural inputs targeted at small scale farmers.
- Double total aid to agriculture to support investment in rural infrastructure, water and irrigation services, and post-harvest management and to increase in funding in agricultural research.
- Create an enabling environment to stimulate private sector led-investment in agrobusiness across the entire value chain.
- Encourage innovative instruments for risk management and crop insurance for small farmers.
- Agree on action in the US and Europe to ease subsidies, mandates and tariffs on bio-fuels that are derived from corn and oilseeds; accelerate the development of second generation cellulosic products.
- Call for the immediate elimination of taxation or restriction on humanitarian food aid, where applied.
- Move swiftly with an agreement of the Doha Round by reducing agricultural subsidies and tariffs.

- Agree on a mechanism to coordinate and inform the actions of key players and help make global food markets more stable and reliable in the future.

The World Bank is closely working with other international organisations like UN agencies on a common strategy to face global food crisis under “so-called” four main pillars. They are providing policy advice, expedited financial support, financial market insurance products and research support to fill critical knowledge gaps. The WFP has already provided immediate food assistance to countries such as Bangladesh, Nepal and Sri Lanka. Global aid agencies need to continue in providing food aid to these countries to help the most vulnerable people living in South Asian countries. These aid agencies have important roles to play.

*Response from national governments: retreat from policy liberalisation?*

The trend towards higher longer term food prices is not a surprise nor a temporary phenomenon, though the very sharp spike in prices observed in early 2008 may be temporary. The problem of rising food prices has become a medium to long-run issue and higher prices are likely to persist for some considerable time and prices are likely to remain high and volatile in the future. As Subramanian (2008a, p.1) stated, “pressure on food supplies, and associated high food prices, are likely to be a medium-to-long-term reality because some of the driving factors – rising prosperity in the developing world which creates more demand, high fuel prices, stagnant agricultural productivity, and climate-change induced pressure on agricultural supplies – are also of a durable nature”. It is important for countries in the South Asian region to implement appropriate measures to respond to this challenge rather than respond in knee-jerk fashion.

Table 11 shows the short-term policy responses implemented by South Asian governments. The details of different short-term measures implemented by these governments are shown in Appendix 2. They, as other governments elsewhere, responded to the immediate food price crisis by implementing a range of interventionist measurements including export bans and export restrictions, temporary removal of restrictions on food imports, introduction of price ceilings, higher minimum support prices and higher consumer and producer subsidies (see Appendix 2 for the details of these policies). What was striking was that these measures in almost all cases reversed the trend in recent years towards market based solutions and liberal trade policies. Though governments also pledged to increase investment in agriculture over the longer term (see, for example, the policy statements by the Government of Pakistan, Ministry of Finance,

2008), the short-term measures (though they may have provided some short-term relief) have the potential to derail necessary longer term solutions.

While mitigation measures such as targeted safety net programs to protect the vulnerable groups from rising food prices were necessary, other short-term interventionist policies such as export bans and other export restrictions had the effect of aggravating the problems for importing countries. They were, irrespective of the intentions of the governments that implemented them, clearly ‘beggar thy neighbour policies’ and went against the spirit of multilateral trade liberalisation and international cooperation.<sup>4</sup> The resort to immediate trade restriction by India and Pakistan highlighted the fact that South Asia remains a bastion of anti-liberalism in international agricultural trade with deep rooted, entrenched domestic distortions. Food importers similarly resort to inefficient and costly trade interventions. Thus South Asian countries like Sri Lanka introduce import bans and restrictions on food imports (such as rice and wheat) when domestic production conditions are good to encourage domestic production and self-sufficiency and liberalise food imports during a crisis (Weerahewa, 2006). Resort to price controls is a long established practice despite long experience of its drawbacks. It is much more difficult to establish and to enforce price controls in countries with weak institutional and legal frameworks and difficult to introduce price controls without using trade restrictions. Experience in India, Pakistan and Sri Lanka again demonstrated that price controls in crisis situations do more harm than good. For example, the introduction of price ceilings on rice in Sri Lanka led farmers and middlemen to hoard paddy and rice; recent reports suggest that farmers are not willing to sell their products at the controlled price (see, Ferdinando, 2008). These policies push food price further up as a result of panic and policy induced speculative hoarding (Birdsall and Subramanian, 2008). The Pakistan experience also demonstrates that domestic price controls led domestic producers and traders to export rice and wheat illegally (through smuggling to Afghanistan and Iran) in order to make a higher profit at the rising global food prices (see, State Bank of Pakistan, 2008). As the Chief Economist of the South Asian Division of the World Bank, Shanta Devarajan points out, “imposing price controls benefits the middle-class families and the non-poor” and discourages food production leading to further increase in food prices (World Bank, South Asia Division).

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<sup>4</sup> As pointed out by Subramanian (2008 a) using the results of his forthcoming paper (with Arcos Ivanic, Will Martin and Aaditya Mattoo), world food prices are estimated to increase by 20 percent as a result of export restrictions, creating particularly harmful effects in the case of rice. Export restrictions by large food exporting countries can lead to a reduction of world food supply and further rise in food price in food importing countries (Oxfam, 2008).

**Table 11: Country Policy Responses and Options**

Policy Responses	Afghanistan*	Bangladesh*	Bhutan	India	Maldives	Nepal*	Pakistan*	Sri Lanka*
Reduce taxes on food grains	X	X	X	X	X			X
Reduction on import duties							X	X
Increasing food-grain imports		X				X		X
Increases supply using food grain stocks		X	X	X	X		X	
Build reserves/stockpiles		X		X			X	X
Increase export restrictions		X		X		X	X	
Raise export duties				X			X	
Minimum export prices				X				
Price controls/consumer subsidies	X	X	X		X		X	X
Minimum support prices	X	X	X					
Action against profiteers				X				X
Cash transfers		X	X		X		X	X
Food for work	X	X		X		X		
Food ration/stamp		X		X				X
School feeding		X	X	X	X	X	X	X
Contain the pass-through of rising international food prices		X						

\*Countries listed in FAO list of countries in crisis requiring external assistance.

Source: World Bank (2008), ADB (2008) and FAO (2008) and other latest information.

The anti-liberalisation reaction of governments to the food price inflation was not a surprise. After all, average trade restrictiveness in agriculture in South Asia remains among the highest in the developing world (around 46 percent) (see Chauffour (2008a; see also recent studies on agricultural distortions in Bangladesh, India, Pakistan and Sri Lanka: Ahmed, et al, 2007, Prusell, et al, 2007, Dorosh and Salam, 2007 and Bandara and Jayasuriya, 2007). The welfare reducing nature of these distortions is well known. Indeed, the constraints imposed by them on efficiency of agricultural production and marketing have been at least partly responsible for the current supply problems that plague agriculture in this region.<sup>5</sup> There is no doubt that the short-run measures (particularly export bans and restrictions) implemented by national governments in South Asia, unless reversed soon, can exacerbate those problems. The complex and cumbersome systems of large consumer and producer subsidy systems are not sustainable and very costly in terms of government provision of essential public goods for growth. They prevent farmers from getting accurate price signals, discourage efficiency and long term investment in agriculture and work against increasing long-term supply of food. However, arguably the worst outcome of these interventions has been not the short term impact on already tight global food markets but the damage done to the international effort to achieve a successful conclusion of agricultural trade liberalisation under the Doha round which remains a major source of potential gain for all developing countries (Bhagwati and Panagariya, 2008).

Almost all the above mentioned measures have been short-term interventionist measures. However, some of these measures have been welfare reducing. Therefore, the message of “get the markets and price right to deal with food shortage” in South Asian countries has been recently advocated by some leading economists in the region when they gathered in Colombo during the recently concluded South Asian Association for Regional cooperation (SAARC) summit (Samaraweera, 2008). Many of these economists argue that farmers will respond to higher price when there is minimum distortion in the markets. Providing subsidies will not help the farmers in the long-run. They argue in favour of reducing agricultural subsidies in these countries and reallocating resources to improve agricultural credit market, investment in agricultural infrastructure, transport networks, research and development and agricultural extension service.

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<sup>5</sup> As summarised by Chauffour,(2008a, p.4, and 2008b, p.5), the adverse economic and social effects of these restrictions include distortions of price and resource allocations, prevention of local farmers receiving higher world market prices for their products, displacement of local production to crops that are not subject to export restrictions, discontinuation of the link between local production global buyers and distribution chains, creation of illegal trade and corruption, exacerbation of fluctuations and rising food prices and harming the multilateral trading system.

Countries in the region need to implement alternative long-term measures to address the problems of food supply, food security and related problems of poverty and malnutrition. It is important for countries in the South Asian region to implement correct, short, medium and long-run measures to respond to food crisis rather than using knee-jerk reactions. As a highly populated and a fast growing region, South Asia's demand for food will continue to rise. Therefore, the long-term challenge is to increase food production. As reported in many recent studies, the productivity in the food sector has been stagnated following the success of green revolution in the 1970s and 1980s. It is important to increase investment in the agricultural sector and rural infrastructure in these countries. The lack of investment in rural infrastructure in countries like Afghanistan, Nepal and Pakistan has been a main contributory factor to the food insecurity in these countries. Improving and increasing efficiency in credit markets and market access are required to improve food situation in these countries.

## **8. Concluding Remarks**

In this paper, we have surveyed the effects of rising food prices in South Asian countries and documented its effects. We have described how short term considerations led to government responses that may lead to serious long term problems. In particular, a sharp swing away from trade liberalisation and efficient policy instruments aggravated the crisis and undermined international cooperation. But to shift governments away from these types of interventionism is not an easy task. Irrespective of whether higher food prices are overall good or bad for the poor, there are compelling political imperatives that drive governments to attempt to minimise the likelihood of sharp (though temporary) increases in food prices. After all, poor urban consumers are directly affected with political implications that are clear and obvious. Unfortunately, there are no proven, credible measures that can persuade government not to resort to interventions that have undesirable and costly in the long term but promise short term effectiveness. Long term solutions to the upward shift in food prices, however, require a combination of policies and instruments that can deliver short term goals of food price stability and food security without undermining the longer term goal of liberalising agricultural trade. This is a formidable challenge.

## References

- Ahmed, N., Bakht, Z., Dorosh, P., and Shahabuddin, Q., 2007, Distortions to agricultural incentives in Bangladesh, Agricultural Distortions Working Paper 32, World Bank Washington, DC.
- Aksoy, M.A., and Isik-Dikmelik, A., 2008, Are low food prices pro-poor? Net food buyers and sellers in low-income countries”, Policy Research Working Paper, No. 4549, World Bank, Washington, DC.
- Asian Development Bank (ADB), 2008a, Bangladesh: Quarterly economic update, ADB, Manila.
- Asian Development Bank (ADB), 2008b, Food prices and inflation in developing Asia: Is poverty reducing coming to an end?” Special report, Economic and research department, ADB, Manila.
- Bandara, J.S., and Jayasuriya, S., 2007, Distortions to agricultural incentives in Sri Lanka, Agricultural Distortions Working Paper 31, World Bank, Washington, DC.
- Bangladesh Bureau of Statistics, 2002, Household income and expenditure survey 2000, Bangladesh government, Dakka.
- Bhagwati, J., and Panagariya, A., 2008, How the food crisis could solve the Doha round, Financial Times, June 22, 2008.
- Birdsall, N., and Subramanian, A., 2008, Food and free trade, Op-ed in the Wall Street Journal Asia, April 25, 2008.
- Blas, J., and Minder, R., 2008, Rice traders hit by panic as prices surge, Financial Times, April 17, 2008.
- Central Bank of Sri Lanka, 2008, Annual report – 2007, Central Bank of Sri Lanka, Colombo.
- Central Bureau of Statistics of Nepal, 2004, Nepal living standard survey 2003/04, Statistical report, Volume II, Government of Nepal, Kathmandu.
- Chand, R., 2008, “Rising Global Food Prices: Implications for India”, paper presented at the International workshop on Agricultural Trade Liberalisation and Domestic Market Reforms in Indian Agriculture, June 5, 2008, New Delhi (pp. 21)
- Chand, R., and L.M. Pandey, 2008, “ Fertilizer Growth, Imbalances and Subsidies: Trends and Implications”, NPP Discussion Paper 02/2008, National Centre for Agricultural Economics and Policy Research, New Delhi
- Chen, S., and Ravallion, M., 2007 ‘Absolute poverty measures for the developing world, 1981-2004’, World Bank Policy Research Working Paper 4211, World Bank, Washington, D.C.
- Chouffour, J-P., 2008a, Global food crisis: trade policy origins, PREM Notes, June 2008, Number 119, World Bank, Washington.
- Chouffour, J-P. 2008b, Global food price crisis: trade policy origins and options, Trade Note, July 24 2008, World Bank, Washington D.C.
- Clombo Page, Malnutrition before food crisis in Sri Lanka, [http://www.colombopage.com/archive\\_08/August\\_7112523KA.html](http://www.colombopage.com/archive_08/August_7112523KA.html).
- Dayaratna-Banda, O.G., Jayawickrama, J.M.A., and Ranathilaka, M.B., 2008, Sense and nonsense of rice price controls in Sri Lanka” Paper prepared for the Pathfinder Foundation, Colombo, Sri Lanka.
- Department of Census and Statistics of Sri Lanka, 2008, Household income and expenditure survey – 2006/07, Government of Sri Lanka, Colombo.
- Dessus, S., Herrera, S., and Hoyos, R. de., 2008, The impact of food inflation on urban poverty and its monetary cost: Some back-of-the-envelope calculations”, Policy Research Working Paper, No. 4666, World Bank, Washington, DC.
- Dorosh, P., and Salam, A., 2007, Distortions to agricultural incentives in Pakistan, Agricultural Distortions Working Paper 33, World Bank, Washington, DC.

- Dorosh, P. and Q. Shahabuddin (2002), “Rice Price Stabilization in Bangladesh: An Analysis of Policy Options”, MSSD Discussion Paper No. 46, Washington, DC: International Food Policy Research Institute.
- FAO, 2008, Soaring food prices: facts, perspectives, impacts and actions required”, Paper prepared for the High-Level Conference on World Food Security: The Challenges of Climate Change and Bioenergy, 3-5 June 2008, Rome.
- Federal Bureau of Statistics of Pakistan, 2007, Household integrated economic survey (HIES), Government of Pakistan, Islamabad.
- Ferdinando, S., 2008, Farmers won’t sell paddy at rates fixed by govt. Bid to store 140,000 tonnes of paddy in jeopardy”, 30 August 2008, *The Island*.
- Fischer, G., M., Shah, F., Tubiello, and van Velhuizen, H., 2005, Socio-economic and climate change impacts on agriculture: An integrated assessment, 1990–2080. *Philosophical Transactions of Royal Society B* 360: 2067–83.
- Government of Pakistan, 2008, Federal budget 2008-09, Ministry of Finance, Islamabad.
- IFPRI, 2008, High food prices: the what, who, and how of proposed policy actions”, Policy Brief, May 2008, Washington, D.C.
- IMF, 2008, Food and fuel prices – recent developments, macroeconomic impacts, and policy responses, A paper prepared by the Fiscal Affairs, Policy Development and Review, and Research Departments, June 30, 2008, IMF, Washington, DC.
- Ivanic, M., and Martin, W., 2008, Implications of higher global food prices for poverty in low-income countries, Policy Research Working Paper, No. 4549, World Bank, Washington, DC.
- Kumar A., and BIRTHAL, P.S., 2007, Changing composition patterns in South Asia. In *Agricultural diversification and smallholders in South Asia* ed. P.K. Joshi, A. Gulati, R. Cummings Jr., Academic Foundation, New Delhi.
- Mahendra Dev, S, C. Ravi, B. Viswanathan, A. Gulatti, and S. Ramachander (2004), “Economic Liberalisation, Targetted Programmes and Household Food Security: A Case Study of India”, MTID Discussion Paper No. 68, Washington, DC: International Food Policy Research Institute.
- Ninno, del C. (2008) The Case of Bangladesh, Presentation at the workshop on “Food and Energy Price Increases and Policy Options”, July 9-10, World Bank, Washington, DC.
- OECD, 2008, Rising food prices – courses and consequences, OECD, Paris.
- Oxfam, 2008, The time is now: how world leaders should respond to the food price crisis, Oxfam Briefing Note, 3 June 2008.
- Polanski, S., Panda, M., Ganesh-Kumar, A., McDonald, S., and Robinson, S., 2008, Policy dilemmas in India: the impact of changes in agricultural prices on rural and urban poverty, A paper presented at the Eleventh Annual Conference on Global Economic Analysis, 12-14 June, Helsinki, Finland.
- Pursell, G., Gulati, A., Gupta, K., 2007, Distortions to agricultural incentives in India, Agricultural Distortions Working Paper 34, World Bank, Washington, DC.
- Ravallion, M., 1989, Do price increases for staple foods help or hurt the rural poor, PRP Working paper WPS 167, World Bank, Washington, D.C.
- Rosegrant, M., Ringler, C., Msangi, S., Zhu, T., Sulser, T., Valmonte, R., and Wood, S., 2007, Agriculture and food security in Asia: the role of agricultural research and knowledge in a changing environment, IFPRI, Washington.
- Samaraweera, D., 2008, Get markets and price right to deal with food-shortages-economies, *The Sunday Times*, 08 June, 2008.

- Schiff, M., and Valdes, A., 1992, *The political economy of agricultural pricing policy: A Synthesis of the economics in developing countries*, John Hopkins University Press, Baltimore.
- Seshan, G., and Umali-Deininger, D., 2007, Agriculture and import liberalization and household welfare in Sri Lanka: Mimeographed.
- Smith, L. C., and Wiesmann, D., 2007, Is food insecurity more severe in South Asia or Sub-Saharan Africa? A comparative analysis using household expenditure survey data, IFPRI Discussion Paper 00712, IFPRI, Washington, D.C.
- Subramanian, A., 2008a, How to response to global food crisis”, *The Hindu*, 19 May, 2008.
- Subramanian, A., 2008b, US leadership in the global food crisis, Testimony before the US House of Representatives, Committee on Financial Services, hearing on Contributing Factors and International Responses to the Global Food Crisis, may 14, 2008.
- The State Bank of Pakistan , 2008, Third quarterly report for FY08, Government of Pakistan, Islamabad.
- The Economist, 2008, Famine, farm prices and aid, 27 March, 2008.
- The UN Inter Agency Assessment Mission, 2008, Higher food prices in Pakistan – Impact assessment and the way Forward, Prepared at the request of Ministry of Food, Agriculture, and Livestock, Government of Pakistan, Islamabad.
- von Braun, J., 2007, The world food situation: New driving forces and required Actions IFPRI’s Bi-Annual overview of the world food situation presented to the CGIAR Annual General Meeting, Beijing December 3, 2007.
- UNESCAP, 2008, *Economic and Social Survey of Asia and the Pacific 2008*, United Nations. New York.
- Weerahewa, J. (2004), “Impact of Trade Liberalization and Market Reforms on the Paddy/Rice Sector in Sri Lanka”, MTID Discussion Paper No. 70, Washington, DC: International Food Policy Research Institute.
- Weerahewa, J., 2006, Rice market liberalization and household welfare in Sri Lanka: A general equilibrium analysis” CATPRN Working Paper 2006-1, Canadian Agricultural Trade Policy Research Network, Canada.
- WFP and NDRI, 2008, Market and price impact assessment – Nepal, Final Report. July 2008.
- World Bank South Asia Division, (<http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/SOUTHASIAEXT/0,contentMDK:21712205~menuPK:158937~pagePK:2865106~piPK:2865128~theSitePK:223547,00.html>).
- World Bank, 1986, World Development Report 1986, World Bank, Washington D.C.
- World Bank, 2007, World Development Indicators, CD on line.
- World Bank, 2008a, Addressing the food crisis: The need for rapid and coordinated action, Background Paper prepared for the Group Eight Meeting of Finance Ministers, 13-14 June, Osaka.
- World Bank, 2008b Double jeopardy: responding to high food and fuel prices, A paper prepared for G8 Hokkaido-Toyako Summit, July 2, 2008.
- World Bank, 2008c, Guidance for responses from the human development sectors to rising food prices, Human Development Network, World Bank, Washington, D.C.
- World Bank, 2008d, <http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/SOUTHASIAEXT/>

## Appendix 1

### The Data

The data used in this study are annual production and wholesale price of paddy, per capita consumption and prices of rice, consumer price index (CPI) and consumer price index for food (CPI-Food), and gross domestic product (GDP). The sample period of the time series database used in this study for Bangladesh is 1977-2003, for India is 1964-2004, for Pakistan is 1961-2005, and for Sri Lanka is 1959-2004. The data for the four countries are obtained from various World Bank databases and the ADB.

### Supply of Rice

Figure A1 shows the production and wholesale price of paddy (unprocessed rice) in the four countries during the respective sample period. As can be seen, paddy production has increasing steadily in all countries during the respective sample periods. In all countries, wholesale price has been increasing moderately until 1990, and has since then increased at a faster rate. There has been some fluctuations in the price of rice in some years in Bangladesh, Pakistan and Sri Lanka but has generally been on the increase.

Figure A2 presents the graph for production against the wholesale price of paddy during the sample period for the 4 countries. As can be seen, there is a strong positive linear or curvilinear relationship between price and production.

### Demand Model

In this section, we present the demand model for the consumption of rice for Bangladesh and Sri Lanka. Due to unavailability of reliable data, modeling is not carried out for India and Pakistan. Let  $q_t$  and  $p_t$  be the per capita consumption of rice and price of rice, respectively. Here onwards, we use all variables in logarithmic form.

We model the relationship between per capita consumption of rice, price of rice and consumer's income using a double-log demand equation. Here consumer income is defined as the per capita income denoted by  $I_t$  at period  $t$ . The model can be written in the form

$$\ln q_t = \beta_0 + \beta_1 \ln p_t + \beta_2 \ln I_t + \varepsilon_t, \quad (1)$$

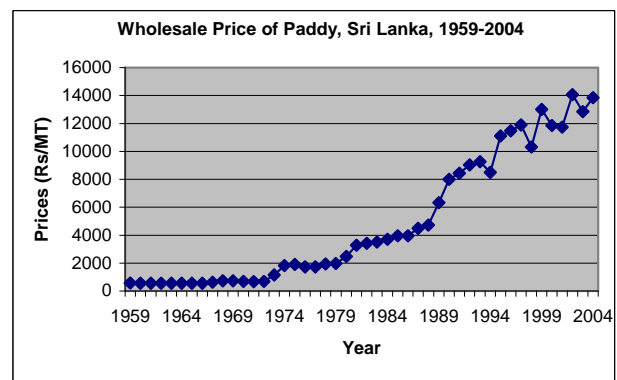
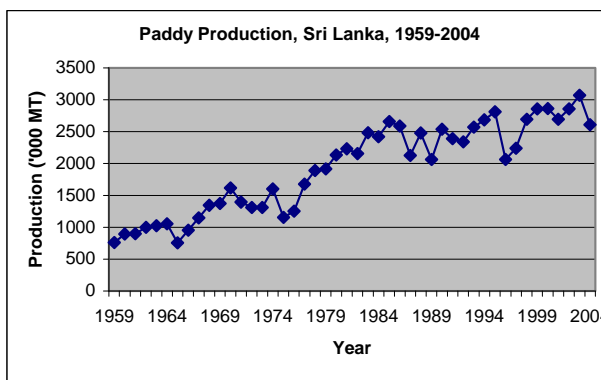
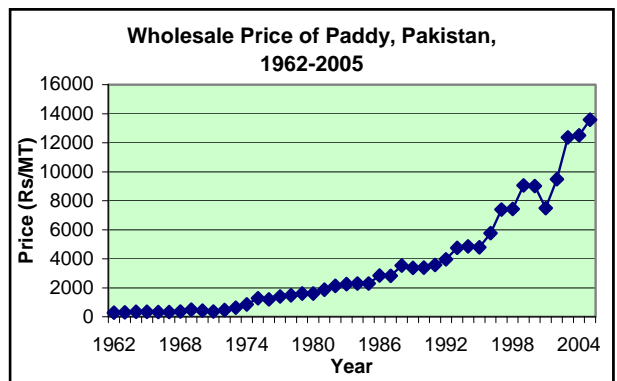
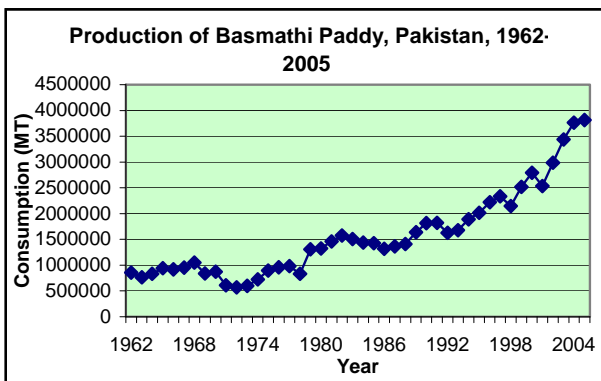
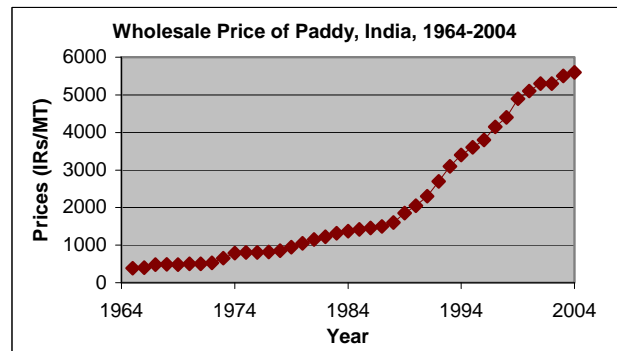
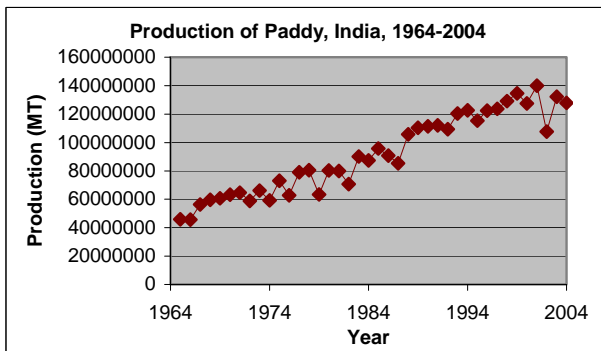
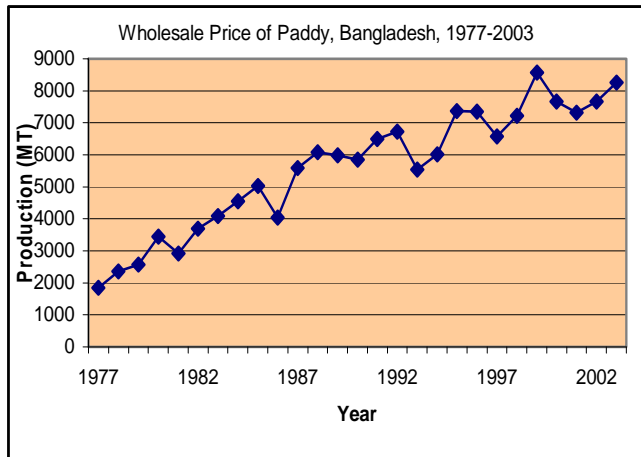
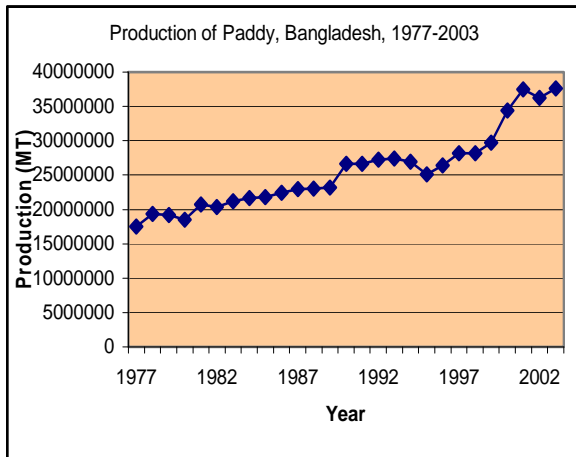
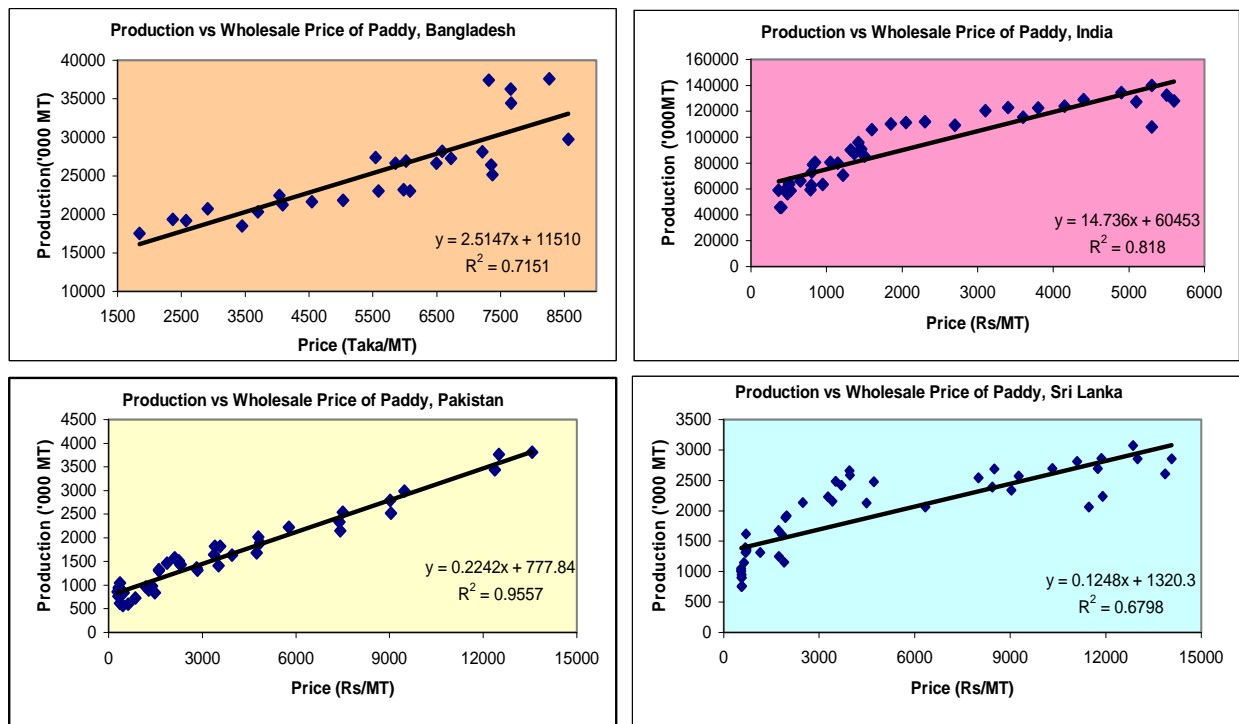


Figure A1 Paddy production and wholesale price during the sample period



**Figure A2 Paddy production vs wholesale price, Bangladesh, India, Pakistan and Sri Lanka**

where  $\beta_0$ ,  $\beta_1$  and  $\beta_2$  are the coefficients to be estimated and  $\varepsilon_t$  is an error term which satisfies the usual regression model assumptions. As this is a double-log model, the coefficients  $\beta_1$  and  $\beta_2$  can be interpreted as the price and income elasticities of demand for rice.

### *Stationarity of the variables*

When time-series variables are non-stationary, the regressions involving such variables are spurious (Granger and Newbold, 1974). The problem with spurious regressions is that while the variables used in the regression models may have no interrelationships, the estimated results could show high  $R^2$ - values and high values of t-ratios for the regression model parameters. Therefore, it is essential to investigate the stationarity of the variables to be used in the regression models.

### **Demand for Rice - Bangladesh**

We now investigate the stationarity of the three variables used in the regression model (1), namely, per capita consumption of rice, per capita income and price of rice for Bangladesh during 1974-2005. The results show that the log form of the three variables are stationary. Therefore, we can conclude that the demand model regression is not spurious.

We estimate this model using the LS method and the estimated equation and the t-values of the coefficient estimates are presented below:

$$\ln q_t = -1.544 - 0.223 \ln p_t + 0.164 \ln I_t$$

(-2.68) (-1.84) (2.47) (t-values)

As can be seen, the income elasticity is highly significant at the 5% level, while the own-price elasticity is significant at the 10% level. As expected, the results show that over the time period considered, price has a negative effect on consumption while income has a positive effect on consumption.

### **Supply Model - Bangladesh**

Let  $q_t$  and  $p_t$  be the production of paddy (unprocessed rice) and wholesale price of paddy, respectively. Here also, we use all variables in logarithmic form. We first model the relationship using a double-log equation which expresses production as a function of price. The results in the following model:

$$\ln q_t = 13.281 + 0.469 \ln p_t \quad R^2 = 0.72$$

(28.3) (8.01) (t-values)

As can be seen, the estimates are all highly significant. As expected, the results show that over the time period price has a positive effect on production.

### **Demand for Rice - Sri Lanka**

We now investigate the stationarity of the three variables used in the regression model (1), namely, per capita consumption of rice, per capita income and price of rice for Sri Lanka during 1959-2004. The results show that the log form of the three variables are stationary. Therefore, we can conclude that the demand model regression is not spurious.

We estimate this model using the LS method and the estimated equation and the t-values of the coefficient estimates are presented below:

$$\ln q_t = -2.002 - 0.127 \ln p_t + 0.098 \ln I_t \quad (2)$$

(-13.3) (-2.31) (2.51) (t-values)

As can be seen, the estimated coefficients for income and price are of the expected sign and are all highly significant; and the DW value larger than 2 indicating that there is no serial correlation problem. As expected, the results show that over the time period considered, price has a negative effect on consumption while income has a positive effect on consumption. For a 1% change in the price of rice, its consumption would decrease by 0.127%, and for a 1% increase in income, rice consumption would increase by about 0.10%.

### **Further Extension of the Demand Model**

Looking at the price of rice in Figures 5 and 6, we see that during some periods there has been a lift in the price of rice. In 1977, Sri Lanka embarked on a free trade policy. In addition to this, there has been a number of events which has contributed towards political instability in Sri Lanka. In the south there has been an uprising by the JVP (Jathika Vimukthi Peramuna) in 1970, which was ruthlessly crushed by the government, however, there was a resurgence of agitation during 1988-1990 as well. In the North and East, the Tamil liberation war with the LTTE (Liberation Tigers of Tamil Eelam) commenced as a guerilla war in 1983 but increasingly became a conventional war in the late 1980s until the Norway peace initiative in 2001. The war then restarted in 2006.

We now extend model (1) to take into consideration of such events by introducing 3 dummy variables. The three dummy variables, DJVP, DTAMIL and DTRADE, respectively, are included in the model to investigate the impact of these events on the consumption of rice. That is, the 1977 Trade liberalisation dummy variable,  $DTRADE_t = 1$  for  $t \geq 1977$  and  $DTRADE_t = 0$  for  $t < 1977$ ; the 1970, 1988-1990 JVP uprising dummy variable  $DJVP_t = 1$  for  $t = 1970, 1988-1990$  and  $DJVP_t = 0$  for other years; and the Tamil liberation war dummy variable,  $DTAMIL_t = 1$  for  $1983 \leq t \leq 2000$  and  $DTAMIL_t = 0$  for other years. The model can be written in the following form:

$$\ln q_t = \beta_0 + \beta_1 \ln p_t + \beta_2 \ln I_t + \delta_1 DTRADE_t + \delta_2 DJVP_t + \delta_3 DTAMIL_t + \varepsilon_t, \quad (3)$$

where  $\beta_0$ ,  $\beta_1$ ,  $\beta_2$ ,  $\delta_1$ ,  $\delta_2$  and  $\delta_3$  are the coefficients to be estimated and  $\varepsilon_t$  is an error term which satisfies the usual regression model assumptions. We estimated this model using the LS method but found that the coefficient for the DTAMIL dummy variable was insignificant. That is the war in the north and east of the country has had no effect on the rice consumption. This could be due to the fact that the war was confined to the North and East of the country with less than 20% of

the county's population affected. The preferred estimated equation and the t-values of the coefficient estimates are presented below:

$$\ln q_t = -1.841 - 0.132 \ln p_t + 0.077 \ln I_t + 0.091 DJVP + 0.098 DPOLICY$$

(-12.4) (-2.65) (2.06) (2.36) (2.28) (t-values)

The results show that the free trade agreement has had a significant positive effect on the consumption of rice. It also shows that the JVP agitation has had a positive effect on consumption of rice. This could be due to the fact that during this period of unrest with the lack of access to other complementary food items, the locals may have continued to consume more rice.

**Supply Model – Sri Lanka**

Let  $q_t$  and  $p_t$  be the production of paddy (unprocessed rice) and wholesale price of paddy, respectively. Here also, we use all variables in logarithmic form. We first model the relationship using a double-log equation which expresses production as a function of price. The results in the following model:

$$\ln q_t = 4.989 + 0.316 \ln p_t \quad R^2 = 0.83$$

(-28.5) (14.47) (t-values)

As can be seen, the estimates are all highly significant. As expected, the results show that over the time period price has a positive effect on production.

## Appendix 2

### Response from National Governments

National governments in South Asian countries have also responded to the food crisis with some short-term measures as discussed in Section 7. It is important to examine, however, the details of these responses in different countries in the region. As noted previously in Section 7, countries like Bangladesh, Pakistan and Sri Lanka faced serious problems with food inflation in the first half of this year and governments had to respond quickly considering the street protests broke out in these countries. Specific short-term responses by different countries are given below.

#### Bangladesh

A number of following short-term measures have been introduced in Bangladesh to as response to the food crisis.

- The government has planned to increase the stock of grains by a substantial amount by importing 450,000 tons of rice and 350,000 tons of wheat (in addition to 500,000 tons of rice to be delivered from India). It has also planned to procure 1.5 million tons of rice domestically.
- The expansion of the Public Food Distribution System (PFDS) of grains from 1.51 million metric tons to 2.40 million metric tons (including an increase in rice from 1.17 million metric tons to 1.94 million metric tons).
- The Bangladeshi government has taken measures to expand its well organised food security programs by increasing funds as shown in the following Table. There has been an increase in funds as percentage of GDP from 0.9 percent to 1.1 percent from 2007-2008 financial year to 2009-2009.
- The new 100 days employment guarantee scheme has been proposed (US\$291 million) to protect the hard core poor by providing cash for work during the lean months of October-November and March-April.
- An increase in fertilizer and fuel subsidies has been announced.

### Food Security Programs in Bangladesh (in Billion Taka)

Program	2007-08	2008-09	% Increase
Subsidy for Open Market Sales (OMS)	18.49	26.75	44.7
Vulnerability Group Development (VGD)	7.21	8.37	16.0
Vulnerable Group Feeding (VGF)	8.55	7.08	-17.2
Test Relief (TR)- Food	4.11	6.31	53.6
Gratuitous Relief (GR) for Food	1.74	2.01	15.8
Food Assistance in CTG-Hill Tracts Area	2.04	2.38	16.6
Food for Work (FFW)	5.03	15.78	213.6
<b>Total</b>	<b>47.17</b>	<b>68.68</b>	<b>45.6</b>
As % of Total Budget	5.5%	6.9%	
As % of GDP	0.9%	1.1%	

Adapted from (Ninno, 2008).

#### India

As observed in previous sections, the contribution of food inflation to overall inflation in India is less than other countries in the region. Even then, rising food prices has created some concern among policy makers. India initiated a number of following subsidy and trade policy measures to absorb the negative effects of food price shock.

- An export ban was introduced on non-basmati rice in October, 2007.
- It increased minimum exports of rice to Bangladesh a number of times since October 2007 (as shown in Figure 1).
- It removed 36 percent import duty on wheat flour until April 2009 and has extended duty free imports by private traders.
- It has suspended the ban on exports but increased the minimum export price of rice to US\$500 per tonne from US\$425.
- Removed ban on export of non-basmati rice, edible oil and pulses to Bhutan in may 2008.
- Support price for wheat just been increased from Rs. 8,500 tonnes in 2007/2008 to Rs. 10,000 per tonne for the 2008/2009 marketing year in July, 2008.
- An export ban has been introduced in July, 2008.

- Steps have been taken to increase stocks of food grains with the Food Corporation of India (FCI) and other government agencies. These stocks were 10.2 percent higher than that a year ago (April, 2007 to April 2008).

### Pakistan

Pakistan has responded by implementing a large number of measures in the short-run to as a response to the food crisis.

- Government has directed the Trading Corporation of Pakistan to import wheat and allocated an estimated amount of Rs 40 billions has been allocated in the current financial year (another Rs.20 billions for the 2008-2009 financial year) to subsidise the difference between the imported price and the subsidised sale price.
- Export of wheat has been banned and a 35 percent duty was introduced on export of wheat to Afghanistan. Further anti-smuggling measures have been introduced through the establishment of Federal Food Committee.
- The government has set up a ministerial committee to monitor prices of essential items under the chairmanship of Finance Minister.
- Continuation of providing various food items through Utility Stores Corporation outlets at subsidised rate. This subsidy has increased from Rs.1.8 billions in 2007-2008 to Rs. 2.7 billions in 2008-2009.
- Government decided to increase the support price of wheat from Rs. 510 to Rs. 625 per 40kg to encourage wheat production.
- It has also increased the fertilizer subsidy from Rs.25 billions to Rs. 32 billions to take the pressure off from rising cost of inputs.
- An exception of 10 percent customs duty has been introduced for imports of rice seeds and duty free import of machinery and equipment has been introduced for grain hoarding and storage facilities.
- The high-level ministerial monitoring committee negotiated with the Rice Export Association of Pakistan (REAP) to secure 200,000 metric tons of rice to distribute through USC outlets at a negotiated price. The REAP has also agreed to hold 300,000 metric tons to ensure its availability in order to stabilise the domestic situation.
- To protect the poorest of the poor, the new government has launched an income support scheme known as “Benazir Income Support Scheme” worth around Rs. 34 billions (to be raised upto Rs. 50 billion). The “Benazir card” holders are eligible to receive a cash grant of Rs.1,000 per month.

- Recently, the Pakistani government announced 20 percent wage increase to government employees and an increase of the minimum wage level from Rs.4,600 to Rs. 6,000 to protect fixed income earners.

In addition to the above short run measures, the government has promised in its latest budget to invest in the neglected agricultural sector to increase production and productivity.

### Sri Lanka

As noted previously, Sri Lanka has been another victim of global food crisis and it recorded highest food inflation in the region in recent months. The government mismanagement of wheat import and rice protection policy has partly been contributed to the crisis. When the crisis reached to a crisis point in March and April 2008 the Sri Lankan government responded by introducing the following short-run measures.

- Elimination of restrictions on rice imports in March and measures were taken to import rice.
- Price ceilings have been introduced for rice (Rs 70.00 per kg of *Samba*, Rs. 65.00 per kg of *Kekulu* and *Nadu* (par boiled) rice).
- Government has also promised to continue with poverty alleviation program and input subsidy program such as the fertilizer subsidy.
- Recently the government has encouraged the increase in its activities to procure rice since there has been sharp decline in government procurement in recent years.

### Nepal

Small countries like Nepal in the region have also responded quickly to rising food prices introducing some short-term measures.

- Following some reports in increase in wheat exports to Bangladesh Nepal introduced an export ban on food items.
- The government decided to release the food stock held by the Nepal Food Corporation in the market.

Nepal has also planning to expand its food security program and the World Bank has responded to its effort to response to the food crisis. The following measures are expected to implement as safety nets.

- Expanding a World Food Program (WFP) led food or cash for work program.

- Administering monitoring more efficient and transparent cash transfer system.
- Supporting the design of a medium term social protection system.

Afghanistan has also been negotiated government to government wheat imports from Pakistan and Kazakhstan.