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BIDS Policy Brief

Rethinking Food Security Strategy: Self-sufficiency or Self-reliance¹

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1. Introduction

This Policy Brief discusses whether Bangladesh should continue to pursue a national food security strategy based on self-reliance or return to its earlier policy of food self-sufficiency through domestic production. It draws on the results of a study commissioned by the UK Department for International Development - DFID (Deb, Hossain and Jones 2009).

2. Food Security Strategies in Bangladesh

Ensuring national food security is a vital concern of all governments. Until the early 1990s, the Government of Bangladesh aimed to achieve food security by following a policy of self-sufficiency (growing within the country all the food the country needs). In 1993, however, the policy was changed to one of self-reliance (importing food from the world market when prices are cheaper than growing it at home, so as to release land for other uses for which Bangladesh has a comparative advantage).

The strategy of self-reliance worked well. The private sector was able to import the food needed to make up for the losses in domestic rice output following natural disasters (e.g., following the disastrous floods in 1998 and 2004) and, also, when

the domestic price of rice exceeded the price at which Bangladesh could import it (e.g., from India). Rice is now imported, mainly by the private sector.

However, the strategy broke down during the global food price crisis of 2007-08, when India introduced export restrictions followed by an export ban. In view of the high cost of importing wheat and price rises in the domestic market, India decided to restrict private sector exports of rice by fixing unusually high export prices. Major exporting countries such as Thailand and Vietnam followed India's lead and raised prices to similar levels. Later, India, Vietnam, Cambodia, and Egypt banned rice exports altogether. Major wheat exporting countries also imposed restrictions on international trade and Pakistan, India, Russia, Ukraine, Kazakhstan and China eventually banned wheat exports.

Bangladesh found it difficult to import the food it needed and domestic food prices rose rapidly as traders, farmers and consumers, anticipating higher prices, hoarded stored rice. This led to increased food insecurity and higher levels of poverty, especially for the poorest and most vulnerable.

Given the experience in 2007/08, this paper asks whether Bangladesh should continue to pursue a strategy of self-reliance or return to its earlier policy of

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self-sufficiency through domestic production, in order to ensure national food security?

3. What Happened to Prices and Poverty in 2007/08?

Volatility in Prices

Rice prices in Bangladesh were highly volatile between 2003 and 2009 (see Figure 1). In 2003 and early 2004, prices increased slowly; from mid-2004 to mid-2007 they rose more quickly; and then, between September 2007 and April 2008, there was a sudden escalation in prices due to speculative pressures. Prices remained high from April to September 2008 and then dropped quickly, reaching 2007 levels by April 2009. At the peak, in 2008, rice prices at Taka 35/kg were double those of 2003/04. Wheat flour (atta) prices followed a broadly similar pattern.

The rising retail price of rice resulted in higher farm gate paddy prices, which increased from Taka 500 per maund (37.4 kg) in June 2007 to over Taka 750 per maund by January 2008. Farmers responded by producing a bumper harvest of the dry season irrigated Boro rice crop. The escalation in prices stopped in the third week of April as Boro rice entered the market. However, prices did not fall immediately because farmers and millers continued to hold stocks as prices were still rising on the world market. They started to fall from mid-August when world market prices plateaued in anticipation of increased supplies from major

rice growing countries and later with the prospect of a good Aman harvest.

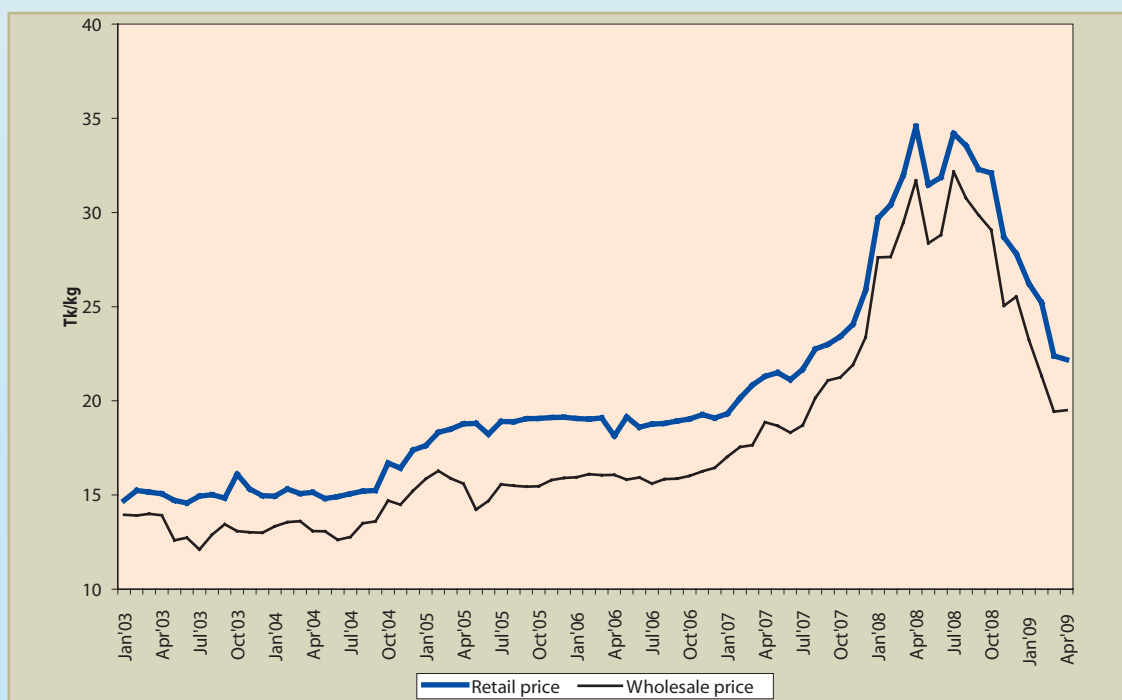
As food prices rose, retail prices closely followed wholesale ones as traders quickly passed the higher prices on to consumers. When food prices started to fall, however, consumer prices fell more slowly than wholesale prices, as traders tried to recoup some of the losses on rice bought near the top of the market (see Figure 1).

Impacts on Household Food Security

The rapid rise in food prices caused real incomes to fall and increased poverty and food insecurity in Bangladesh. A Centre for Policy Dialogue (CPD) study (Rahman *et al.* 2008) estimates that high inflation and rapid rises in rice prices increased poverty by 8.5 per cent (12.1 million people) between January 2005 and March 2008. In a second study, Raihan *et al.* (2005) estimated that the head count index of poverty in Bangladesh remained almost stagnant at 40 per cent during 2004-06, but increased by 2.1 per cent in 2006-07 and by a further 4.3 per cent in 2007-08. Finally, an FAO/WFP study (2008) estimated that the number of food-insecure people (with an intake of less than 2,122 kcals/person/day) in Bangladesh increased by 7.5 million as a result of rising food prices and general inflation. The report added that the number of undernourished people grew by 6.9 million (i.e., by almost 25 per cent).

Another Policy Brief in this series (Policy Brief No. 1 on Human Development) reports that wasting rates

Figure 1: Monthly wholesale and retail price of coarse rice: January 2003 to April 2009



Source: Department of Agricultural Marketing.

(indicating acute under-nutrition) rose rapidly as a result of the food price rises.

While recent falls in rice prices are likely to make more food available to the poor, they endanger future food availability by reducing farmers' incentives to sustain the growth in rice output. It is estimated that, at present price levels, tenant farmers will incur losses and owner farmers will just break even. If this happens, farmers next year may divert resources to more profitable non-rice crops, thus triggering price increases in rice markets. This may also impact negatively on wage rates for agricultural labourers.

4. Bangladesh's Participation in the World Market

Bangladesh is a net importer of both rice and wheat. The quantum of food grain imports fluctuates from year-to-year. Over 3 million tonnes is typically imported in years of natural disasters (e.g., after the floods in 1998 and 2004); while imports are relatively low in 'normal' years. Wheat imports have increased steadily over time, with big jumps in the years following natural disasters.

Bangladesh mainly imports milled rice. For the last ten years, India has been the major source. Other countries exporting rice to Bangladesh, recently, include Myanmar, Pakistan, Thailand and Vietnam.

The global rice trade is quite small (only seven per cent of global output is traded), therefore the policies of large exporters like India can greatly influence world market prices. Studies indicate that a one million tonnes increase in rice exports or imports by India changes the world market price by 4.7 per cent (Jha and Srinivasan, 1999). It is also clear from the behaviour of countries like Philippines, in 2008, that restrictions and speculative buying by other

countries can affect prices. Thus, food prices, food availability and food security in Bangladesh are affected by actions and policies carried out by other countries.

5. Can Bangladesh Rely on Regional Partners?

Can Bangladesh depend on the world market to meet its food deficits when needed? This is a critical question for Bangladesh, if it intends to follow a strategy of self-reliance to achieve food security. If Bangladesh cannot depend on the world market, should it revert to its earlier strategy of food self-sufficiency?

Despite a remarkable increase in food grain production from 10 million tonnes in 1972/73 to almost 30 million tonnes in 2007/08, Bangladesh still imports food – in some years over 3 million tonnes. Can it rely on its regional partners to supply this food, when needed?

To answer this question, we will assess the reliability of Bangladesh's main trading partners – Myanmar, Thailand and India.

Myanmar was the leading rice exporter in the world in the middle of the 20th century. Its land and climate are well suited to rice production but current levels of fertiliser and irrigation use are much lower than other Asian countries. Over the last 15 years, its rice exports have fallen from over one million to between 200,000 and 400,000 tonnes a year. Annual exports of rice vary widely and, in some years, exports have been less than 60,000 tonnes (e.g., 1999, 2006/07).



Conclusion: Myanmar does not have the capacity to provide the relatively large quantities of rice needed to meet Bangladesh's needs but Bangladesh could consider importing, when exportable surpluses become available at a reasonable price.

Thailand is the world's leading rice exporter. It currently accounts for one-third of global exports and sells both parboiled and non-parboiled rice. Although Thailand has extensive land suited for rice production, only 20 per cent of rice land is irrigated and output has grown more slowly than in many other Asian countries in recent years.

Despite this, the Government has large rice surpluses for export because: (a) it procures large quantities of rice from farmers, at above market prices, as part of its anti-poverty programme, and (b) middle income people in Thailand are consuming less rice, as they move to a more diversified diet. Thailand currently exports half its rice output and in 2008 sold 10.2 million tonnes for over US\$ 6 billion. During the food price crisis, Thailand did not ban exports, as other countries did.

Conclusion: Thailand is likely to continue to generate substantial rice surpluses and could meet the future demands of Bangladesh. However, Thai prices are generally higher than those of India and transport costs are often higher.

India started to export rice, following the 'green revolution' in the 1970s and 1980s. Annual exports currently average about 5 million tonnes. Although food grain output increased from 90 million tonnes in 1980/81 to 175 million tonnes in 2007/08, it is uncertain whether India will be a reliable source of future imports. This is because:

- rice production in India is currently heavily subsidised (e.g., fertiliser subsidies of over 40 per cent). If subsidies were cut, output would fall and prices would rise, reducing the surpluses available for Bangladesh to import rice at an attractive price;
- demand for rice is growing within India (e.g., in the poorer states in eastern India), which could reduce the amount of rice available for export;
- most rice is rain fed and production is often hit by droughts and floods, which could become more frequent with climate change;
- trade policies in India are dictated by the needs of Indian consumers and can impact adversely on Bangladesh. This happened in 2002/03, when India 'dumped' rice on the Bangladesh market and in 2007/08 when export restrictions and then an export ban were introduced, causing a rapid rise in rice prices

in Bangladesh, which hit the poorest and most vulnerable people in the country.

Conclusion: India could be a low-cost source of rice imports for Bangladesh, but there are a number of uncertainties which would make it inadvisable to rely on India alone.

6. Costs of Production and Comparative Advantage

Whether Bangladesh should pursue a strategy of self-sufficiency or self-reliance depends on its unit costs of production (can Bangladesh produce rice and/or wheat more cheaply than its competitors?) and its comparative advantage.

Costs of Crop Production

Table 1 shows the variable costs of producing rice in Bangladesh, compared to Vietnam and the main Indian surplus producing states of Punjab and Andhra Pradesh. It shows that, in 2007:

- The unit *variable* cost of producing Boro rice (the main rice crop in Bangladesh) at \$122/tonne was higher than in India or Vietnam. The main reason for this is that: (a) the cost of fertiliser in Bangladesh at \$21/tonne is higher than the highly subsidised price in India (\$10-\$12/tonne) and (b) the cost of irrigation at \$28/tonne is much higher than it is in Vietnam and India at \$5 to \$15/tonne, again due to higher levels of subsidy. Bangladesh fertiliser subsidies are lower than India's; and diesel pump-based irrigation in Bangladesh is more expensive than subsidised canal irrigation in Vietnam or electric pump sets in India.
- The unit *variable* cost of producing rainfed Aman rice is cheaper than growing irrigated Boro and cheaper than rice production in Vietnam, but more expensive than in India. Aman is highly profitable but it is low yielding and is a risky economic activity due to uncertain monsoons and frequent floods.

The analysis indicates that Bangladesh will not be able to export rice and compete in the world market at current costs and market prices. Taking transport costs and trade margins into account, Bangladesh may be able to withstand competition from relatively costly Vietnamese imports, but is unlikely to be able to compete with imports from India.

Table 2 shows the costs of producing wheat in Bangladesh, compared to the main Indian states. The unit cost of wheat production in Bangladesh is between 35 and 50 per cent higher than major wheat growing states of India. At current

Table 1: Costs of producing paddy in Vietnam, India and Bangladesh – 2007/08 (US \$)

	Mekong Delta Vietnam	Punjab, India	Andhra Pradesh India	HYV Aman	HYV Boro Bangladesh
Total cost* (\$)	649	458	479	356	652
Yield (t/ha)	5.8	6.5	5.2	3.7	5.3
Unit cost (\$/tonne)	112	71	91	97	122
Price (\$/tonne)	146	161	161	208	183
Price (\$/tonne)/ Unit cost (\$/tonne)	+30%	+127%	+77%	+112%	+50%

Note: The costs do not include the cost of land rent and interest charges on working capital.

Table 2: Costs of producing wheat in India and Bangladesh – 2007 (US \$)

	Punjab	Haryana	Uttar Pradesh	Madhya Pradesh	Bangladesh
Total cost (\$)	329	401	415	251	425
Yield (t/ha)	4.2	3.9	3.1	2.2	2.4
Unit cost (\$/ton)	79	102	136	116	179
Price (\$/ton)	238	275	263	238	369

Note: The costs do not include the cost of land rent and interest charges on working capital.

prices, Bangladesh cannot withstand competition from imported wheat from the world market.

Comparative Advantage in Crop Production

Comparative advantage refers to the ability of one country, compared with another, to produce a good at lower cost relative to other goods. Under conditions of perfect competition and undistorted markets, countries tend to export goods in which they have comparative advantage. Because most markets in developing countries are distorted (because of import and export duties, taxes and the exchange rate) estimating the comparative advantage involves by adjusting for these distortions.

Comparative advantage in the production of a given crop is measured by imputing the value of production and the costs of tradable inputs at the border price (world market price adjusted for transport cost and trade margins) and the opportunity costs of non-tradable inputs, and comparing the value added with the social and opportunity cost of producing, processing, transporting, handling and marketing an incremental unit of the commodity. If the opportunity cost of producing a crop in

the country is less than the border price, then the country has a comparative advantage in producing that crop.

Shahabuddin *et al.* (2002) estimated the comparative advantage of producing rice and wheat in Bangladesh using recent input-output prices, market distortions and production coefficients. They conclude that:

- At export parity price (the price a producer can expect to get, at the port, for exporting a product), Bangladesh has a comparative advantage in the production of Aman rice. Bangladesh could gain by increasing production, provided surpluses can be exported to the world market. The Aman crop, however, is risky due to floods and droughts. If provision is made for frequent production losses, the normalised unit cost will be higher, and Bangladesh will not have comparative advantage at that cost.
- At import parity prices (the price that a purchaser can expect to pay for an imported good transported from the port and received at his location in the country) Bangladesh has comparative advantage in the

production of Boro rice. Bangladesh will not be able to compete in the export market for this crop. But because of the transport costs and trading margins, the cost of importing these commodities into Bangladesh would be higher than the opportunity cost of producing them within the country.

- Bangladesh does not have comparative advantage in the production of wheat. The country will gain by importing these commodities, if the resources tied in the production of these commodities can be diverted to the production of other crops. The farmer in Bangladesh has already started shifting land from wheat to maize since the agro-ecological conditions are better suited to the production of maize.

7. Key Policy Conclusion and Recommendations

1. World prices and the trade policies of other countries, especially India, affect domestic prices and availability of rice and wheat in Bangladesh. In view of this, the Government of Bangladesh should:

- constantly monitor international prices and the prices and policies of India and other major rice and wheat exporting countries;

- regularly review the Aman and Boro production situation in Bangladesh, so as to set and modify its trade policy in an effective manner.

2. Bangladesh has a comparative advantage in rice production at import parity prices, indicating that it would be cheaper to produce domestically than to import rice for domestic consumption. On the other hand, Bangladesh does not have a comparative advantage in rice production at export parity prices, indicating that Bangladesh is not currently capable of competing in the international market with its current production practices, prices and technology.

3. Bangladesh does not have comparative advantage in wheat production except in limited areas. This implies that Bangladesh should focus on promotion of other crops such as maize, potato and vegetables in the winter season instead of wheat, with domestic demand for wheat being met through imports from the international market.

4. The higher costs of irrigation using diesel-operated engines in Bangladesh, compared to cheaper electric powered engines and canal irrigation in India, Thailand and Vietnam indicates that the country must provide electricity for irrigation if it is to attain a cost efficient irrigation system and reduce unit costs of rice production. Promotion of electricity operated irrigation systems will also help



Bangladeshi farmers to achieve comparative advantage in rice production and may open up export opportunities.

5. There is also scope to reduce per unit cost of production if the yield of rice can be increased by research and development of new rice cultivars and crop husbandry practices. Higher food grain output requires investment in agricultural research, technology dissemination and, most importantly, assured supply of inputs (fertiliser, quality seed, electricity and diesel for irrigation, and agricultural credit). Cultivation in seasonally fallow coastal lands and in Sylhet Division, and increasing efficiency in agricultural production, would also be needed.

6. On the question of self-reliance vs. self-sufficiency, Bangladesh should target self-sufficiency in rice production, which will satisfy domestic demand in normal production years. If there is a natural disaster or any other major events, which disrupts production, then Bangladesh will have to depend on the international market and buffer stocks to ensure food security. Food grain export restrictions imposed by exporting countries (e.g., India, especially on rice), mean that Bangladesh will have to

undertake precautionary measures to ensure food security in disaster years.

7. One such measure would be to increase the level of current food stocks and involve the public sector more. To this end, Bangladesh will have to expand its targeted social safety net programmes to ensure the food security of low income and poor households. Another complementary measure could be to enhance regional cooperation and take steps to establish the South Asian Association for Regional Cooperation (SAARC) Food Bank. If it is operated in an effective manner, it would be able to provide food to Bangladesh and other member countries when it is badly needed. In the national budget for 2008/09, the Government has already announced an expansion of the social safety net programmes of 3 million (30 lakh) tonnes. This must be effectively implemented.

8. There is currently a debate about estimates of food grain demand and actual production, which the Bangladesh





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Bureau of Statistics (BBS) should resolve urgently by undertaking a thorough and consultative review with concerned experts.

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