Self-sufficiency and Food Aid

Since independence in 1971, Bangladesh has made considerable progress when it comes to rice and wheat production. The production has increased from around 11 million Mt in the 1970s to more than 20 million Mt in the late 1990s. In correspondence with this, the inflow of food aid slowly decreased from as high as 20 percent of the total food supply in 1974 to 2 percent in 2000. (see Figure 1).

The sustained increases in domestic production of food grain have led, more recently, to the claim that Bangladesh has reached self-sufficiency in food grain production. This raises a couple of important questions that need to be considered by a food aid agency such as WFP:

1. How valid is this statement and what does it mean in terms of food security?
2. Are food aid imports still required or would it be more appropriate to purchase food locally or even withdraw completely?

This food security brief provides a perspective.

How food self-sufficient is Bangladesh?

The question of whether Bangladesh is self-sufficient in food grain production can be answered by comparing the national supply with the domestic requirement. This seems straightforward. There are however various factors that complicate the equation. Firstly, the domestic production can be estimated by either following a supply- or demand-oriented approach. The outcome of these approaches might not necessarily be the same. A second point concerns the level set for the domestic food grain requirement. Let’s have a look at these issues in more detail.

Estimates of domestic production

Based on agricultural production estimates, the total food availability for 2000/01 is estimated at 25.3 million Mt with a domestic production of 24.0 million Mt. (see table 1).

<table>
<thead>
<tr>
<th>Food Availability (million Mt.), 2000/01</th>
<th>Rice</th>
<th>Wheat</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net production*</td>
<td>22.6</td>
<td>1.5</td>
<td>24.1</td>
</tr>
<tr>
<td>Net commercial Imports</td>
<td>0.5</td>
<td>0.5</td>
<td>1.0</td>
</tr>
<tr>
<td>Food aid imports</td>
<td>0.5</td>
<td>0.5</td>
<td>1.0</td>
</tr>
<tr>
<td>Stock changes</td>
<td>-0.4</td>
<td>0.1</td>
<td>-0.3</td>
</tr>
<tr>
<td>Food grain availability</td>
<td>22.6</td>
<td>2.6</td>
<td>25.3</td>
</tr>
</tbody>
</table>

* Domestic production minus seeds and losses (10 percent)

Table 1

Source: FAOSTAT

Figure 1

However, when following a demand-oriented approach, we arrive at a different estimate for the domestic food grain production. The 2000 Household Income and Expenditure Survey (HIES) estimates the national average daily consumption of food grain at 476 grams per person. The total annual food grain consumption can therefore be calculated as:

Food grain consumption = 476 grams x 365 days x 130 million people* = 22.6 million Mt

This amount should equal the total availability of food when, as is the case in Bangladesh, no exports are taking place and no excessive wastage can be observed. Domestic net food grain production can then be derived at by subtracting the imports, food aid received and change in national stock, i.e.

Domestic food grain production = 22.6 - (1.0 + 0.5 - 0.3) = 21.4 million Mt.

Comparing this outcome with the production figure presented earlier we observe a difference of 2.7 million Mt. The consumption data are confirmed by findings of other national household surveys. The

* The preliminary findings of the 2001 population census suggest a population size of 123 million. This figure is likely to be adjusted and we have therefore taken the results of the 1991 population census as a base for estimating the total population, assuming a growth rate of 1.6. With a population of 123 million, the estimate for the total availability of food grain would be 21.4 million Mt.
Poverty Monitoring Survey (May 1999), for example, estimates the average food grain intake at 477 gram per person, while the Nutrition Surveillance Project (NSP) of HKI/IPHN yields an estimate of 464 gram per person for the period December 2001 – January 2002\(^\text{**}\). It is therefore plausible that the domestic supply as presented by the production figures is overestimated by approximately 11 percent.

**Level of domestic requirement**

Turning to the other side of the self-sufficiency equation, we require an estimation for the domestic requirement. In Bangladesh the requirement for food grains is fixed at 454 grams per person per day. This translates into an annual requirement of:

\[
\text{Domestic requirement} = 454 \text{ g/cap/day} \times 130 \text{ million people} \times 365 \text{ days} = 21.5 \text{ million Mt.}
\]

However, given the Bangladeshi diet in which on average 75 percent of the energy intake is derived from food grains, we may question whether the requirement level is not set too low?

The FAO/WHO recommend a daily energy availability of 2400 Kcal per person per day\(^\text{***}\). If 75 percent of the energy intake comes from food grain, and we use a conversion factor of 3.57Kcal/g for a 10 percent wheat / 90 percent rice diet, the domestic food grain requirement can be calculated as:

\[
\text{Food grain requirement} = (75 \% \times 2400 \text{ Kcal}) \div 3.57 = 504 \text{ g/cap/day}
\]

This requirement corresponds with the average food grain intake of non-poor households as can been seen in table 2.

### Table 2

<table>
<thead>
<tr>
<th>Food Item</th>
<th>All</th>
<th>Poor</th>
<th>Non-poor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food grain</td>
<td>477</td>
<td>439</td>
<td>504</td>
</tr>
<tr>
<td>Potato</td>
<td>64</td>
<td>52</td>
<td>72</td>
</tr>
<tr>
<td>Vegetable</td>
<td>149</td>
<td>122</td>
<td>169</td>
</tr>
<tr>
<td>Milk and Milk Products</td>
<td>32</td>
<td>12</td>
<td>47</td>
</tr>
<tr>
<td>Meat, Poultry, Egg and Fish</td>
<td>65</td>
<td>33</td>
<td>89</td>
</tr>
<tr>
<td>Pulses</td>
<td>24</td>
<td>19</td>
<td>29</td>
</tr>
<tr>
<td>Others</td>
<td>115</td>
<td>65</td>
<td>152</td>
</tr>
<tr>
<td>Total</td>
<td>928</td>
<td>741</td>
<td>1060</td>
</tr>
<tr>
<td>Kcal</td>
<td>2200</td>
<td>1900</td>
<td>2500</td>
</tr>
</tbody>
</table>

\(\text{**}^\text{ For 2000, the NSP estimates the average daily food grain intake at 425 gram per person. However, this figure does not include consumption of special food grain preparations such as for example puffed rice.}

\(\text{***}^\text{ This recommended level takes into account the composition of the population, size of individuals, physical activity level, climate, type of diet, disease level, and distribution inequality.}

* Naturally, the table shows the actual consumption of food items and not the requirement. It does however show that Bangladeshis have a strong preference for food grains in their diet (rice in particular). Households that are less poor tend to consume more food grain. This strengthens the argument that the current domestic requirement level for food grain is set too low and should be increased to a more realistic requirement reflecting the preference for a rice-based diet. With a daily food grain requirement of 504 gram per person, the annual domestic requirement is:

\[
\text{Domestic requirement} = 504 \text{ g/cap/day} \times 130 \text{ million people} \times 365 \text{ days} = 23.9 \text{ million Mt.}
\]

**Summary**

Table 3 summarizes the discussion so far:

<table>
<thead>
<tr>
<th></th>
<th>Domestic food grain production</th>
<th>Domestic food grain requirement</th>
<th>Self-sufficiency</th>
<th>Food gap*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Claimed</td>
<td>24.1</td>
<td>21.5</td>
<td>2.6</td>
<td>-3.3</td>
</tr>
<tr>
<td>Our estimate</td>
<td>21.4</td>
<td>23.9</td>
<td>-2.5</td>
<td>1.8</td>
</tr>
</tbody>
</table>

* Difference between the requirement and food availability net of food aid

According to government estimates, Bangladesh is self-sufficient in food grain production. In fact, it claims that the domestic food grain production is more than enough to satisfy the domestic requirement with a surplus production of 2.6 million Mt. Add to this the net commercial imports and the off-take from national stocks, Bangladesh has a negative food gap of 3.3 million Mt. This translates into an additional 69.5 grams of food grain per person per day over and above the set requirement of 454 grams/cap/day. This equals a total consumption of 523.5 grams/cap/day. As can be seen in table 2, even an average non-poor household does not reach this level of food grain consumption.

As argued above, a more realistic estimate of the food gap can be arrived at by looking at the actual food intake as given by various consumption surveys. In doing so we’ve estimated a food gap of 1.8 million MT.

**What is the role of Food Aid?**

A decreasing dependency on food grain imports is one measure of long-term national food security. However, self-sufficiency is not a pre-requisite for
attaining national food security. As long as food grains can be imported without putting undue pressure on the foreign exchange reserves to meet the domestic requirement there is no problem. National food security does not however ensure food security at the household level. The figures in table 4 provide the following picture of Bangladesh:

Thus, 45 percent of the population lives below the poverty line and 20 percent are not even able to meet the emergency food intake level of 1805 Kcal per day. There is a contradiction in the claimed food sufficiency and the under-consumption by a large part of the population. This is also reflected in the nutrition status of women and children. Forty-five percent of children are stunted and 48 percent are underweight, while 45 percent of women have a body mass index lower than 18.5. Thus, despite coming close to food security at the national level, the massive problem of poverty prevents food security at the household level in Bangladesh. Food aid can play a substantial role for bridging this gap between national and household food security.

Table 5 shows the food aid imports for the period 2001-02. Could this amount also have been purchased locally without disturbing local markets, if, instead of food aid, donors had provided resources in the form of cash? Or is the amount consistent with what can safely be imported?

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disturbing local markets (see figure 3). Here \( P_x \) denotes the world market price (export parity). Local procurement adds to national demand and will shift the demand curve to the right, substituting commercial exports.

Bangladesh however, is not an exporter of food grains. There is a lack of established export channels, the rice is of mixed quality, and for wheat there is a large unmet demand within the country. Furthermore, due to outdated production technology it is unlikely that Bangladesh would be able to produce an export surplus on a sustained basis at world market prices. Domestic procurement on any large scale will therefore have an immediate affect on the domestic price with detrimental consequences for the ultra poor.

Because of this food aid imports will still be required to overcome the gap between actual food grain demand and requirement of poor households. WGTFI (1994) estimates that it would cost US$ 1.3 – 2.6 billion per year to enable all poor households in Bangladesh to purchase enough food to meet their minimum caloric requirement level. The challenge is therefore to increase the amount of food aid that can be imported without depressing market prices. This is what the World Food Programme tries to achieve through its targeted programmes. Wheat directly distributed to poor households increases the demand for wheat by increasing their purchasing power. This is depicted in Figure 4 by an outward shift of the demand curve compensating the negative price effects of food aid imports.

A study by IFPRI (March 2000) concludes that for each 1 kg of wheat provided to Food For Work participants, their wheat consumption increases by 0.3 kg (the marginal propensity to consume). It is likely that other targeted programmes have a much higher effect on demand. A WFP programme such as school feeding, for example, would likely to have a marginal propensity to consume close to one; biscuits are distributed in small quantities on a daily basis and are consumed directly in the classroom by the children. As long as these biscuits are not substituting meals received at home, wheat distributed through such programmes would have no disincentive effects on local production.

Through analyses undertaken by the Vulnerability Analysis and Mapping unit, WFP aims to improve the targeting and design of its development programmes in such a way that they benefit the ultra poor, minimizing any adverse affects it may have on local food grain markets.

Conclusions:

1. Although progress has been made in ensuring food security at the national level this has not lead to improved food security at the household level.
2. The recent claim of food self-sufficiency is contradicted by the continuation of widespread under-nutrition.
3. Estimates based on consumption data provide a more realistic picture of the food gap in Bangladesh than the one based on production figures.
4. For the foreseeable future food aid imports are required to ensure a certain level of food security among the extreme poor.

5. Food aid need to be targeted to the extreme poor in an appropriate way to avoid any disincentive effects it may have on local production.

6. Naturally, people need more than just food grains for a healthy diet and there is considerable scope for increasing local production of other food items that are currently imported.

References:


Working Group on Targeted Food Interventions (WGTFI), Options for Targeting Food Interventions in Bangladesh, IFPRI, 1994.