# Nutritional Problems and Programs in Bangladesh

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## Introduction

This paper provides a review of Bangladesh nutrition situation with exphasis on the nutritional programs of the country. It is based on information obtained from various GOB (Government of Bangadesh) offices, NGO's (Non-Government Organization) and other international agencies involved in nutrition research. The paper has three sections. The first Section deals with the nutritional problems of the country; the second section summarizes the GOB and NGO's ongoing programs to deal with malnutrition and the third section suggests some measures to improve the nutrition of the country's population.

## Nutritional Problems

***Protein-Energy Malnutrition (PEM):*** The prime nutritional problem of the country is that of PEM. According to the latest (1985-86) household expenditure survey (HES) average calorie intake of Bangladesh amounted to 2191 Kcal; about 2203 Kcal in rural and 2107 Kcal in urban areas[1]. Average intake met 96 percent of the set requirement. for energy. Average protein intake was calculated to be 63.5 gm; 63.2 gm in rural and 65.4 gm in urban areas.The Bangladesh Bureau of Statistics (BBS) did not analyze their HES data in terms of other nutrients and on household and individual basis. Although the average intakes by HES looked satisfactory, the last national nutrition survey (1981-82) findings to this effect, indicated that 76 percent of the households studied did not meet the caloric requirement. Families of the lowest income group have an average intake (1802 Kcal) well below their requirement[2]. About 86 percent of the poor families had deficient intake of this nutrient. Another report on the poverty situation of the poorest of the poor in six villages, claimed that the per capita caloric intake has fallen sharply on an average to as low as 1526 Kcal from 2000 Kcal[3]. In one village, the entire sample of 30 households,all poor, consumed on an average 1118 Kcal per person per day. These figures, cannot be generalized for whole of

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Bangladesh because the sample is drawn only from the poor. However, they can throw some light on the nutritional problems of the rural poor. Studies concerning intrafamilial distribution of food reveals a sharp sex differentials in matters of food allocation[4,5]. Females of all age group had lower share of food compared to their male counterparts. Also the children could not have their due share of food. As a result none of the age group of mothers and children could fulfill their energy requirement. The deficiency ranged from 28 to 52 percent for children and 10 percent for mothers[4]. A recent study in two villages also estimated the deficiency to be 35 to 50 per cent for children and5 to 11 per cent for mothers even without giving any allowance for pregnancy and lactation[5]. Again during the lean seasons, early monsoon and early winter which are the pre-harvest periods, the calorie intakes are specially low[6]. Accordingly incidence of PEM appears to be most severe during these periods. It is to be noted that 83 percent calories come from carbohydrate, 11 percent from protein and 7 percent from fat [2]. The conspicuous absence of fat in the diet (corresponding to only 7 percent calories) explains the big bulk of our dietary carbohydrate intake. The findings of the national nutrition survey further indicated the presence of severe deficiencies of Vitamin A, riboflavin and Vitamin C in the diet [2].

As a consequence of severe inadequacy of food and nutrients a great majority of people of Bangladesh suffer from malnutrition. Malnutrition begins during fetal development, but can be traced back to the malnutrition of mothers since their childhood.The weight and height of pregnant women (Table 1) shows how pervasive the problem is[7]. Virtually all low income pregnant women in Bangladesh weigh less than 50 Kg; so one can assume that many among them have been malnourished for years. Moreover, the problem becomes more acute with high fertility still prevailing in Bangladesh. Malnourished mothers obviously give birth to low birth-weight babies as evidenced from Table 2 [8].

Nutrition surveys since 1981 have consistently reported a high rate of PEM among children (9,10,11). According to the 1986 BBS Nutrition Survey Module 57.6 percent of rural Bangladesh children under-5 suffer from chronic malnutrition and 8.2

percent suffer from acute malnutrition (Table 3). Table-4 describes the incidence of stunting as a measure of long-term chronic malnutrition, and wasting as a measure of current acute malnutrition. Both problems are worse in the rural than in the urban areas. Both affect girls more frequently than boys. These BBS data are broadly similar to those in other national surveys dating back to 1981, suggesting that there has been no mitigation of PEM in the country. The 1988 flood has, however, aggravated the situation further. UNICEF has recently compiled a series of four reports on post-flood monitoring of child nutrition status in Bangladesh with data collected from a number of NGO's which have nutrition monitoring activities[12-15]. The results suggest that there has been a dramatic rise of PEM in areas affected by flood (Table 5). In Mymensingh, the Prevalence of severe malnutrition in October 1988 was almost twice as much as in 1987. The percentage of children with moderate malnutrition increased from 27 percent in October 1987 to 41 percent a year later. The same trend have been observed inDhaka, Jamalpur and other flood affected areas. However, this has not been observed in non-flooded areas. In non-flooded Chittagong district, for example, the prevalence of severe malnutrition in 1988 is much lower than in 1987 (Table 5). Table -6 presents an update of the post-flood changes in PEM among the under-5 children. The results suggest that there has been no improvement in the prevalence of severe malnutrition in November-December and even in January which arose following the flood in August 1988. There occurs usually an improvement in the level of malnutrition by November-December, when the country's biggest rice crop (Aman) is harvested. This has not happened in 1988. In urban areas people residing in slums represent the poorest of the poor. Data collected from Aga Khan Community Health Program in four areas of Dhaka on middle upper arm circumference (MUAC) of under -5 children from both slum and 'mohalla' areas (middle class people) for the four quarters of 1988 show how severe is the problem of PEM among the slum population[14]. The percentage of malnourished children (MUAC less than 12.5 cm) varies widely between the slum and the mohalla (middle class) communi-ties (Table 7).

### *Nutritional Anemia*

It is widespread in Bangladesh. Despite the adequate intake of iron an estimated 73 percent of children below 5 years of age; 74 percent of boys and 73 percent of girls, aged 5-14 years; 60 percent of adult man and 70 percent of non-pregnant and non-lactating women suffer from anemia (11.) Factors such as malabsorption and low bio-availabilty of iron contribute to anemia amongst the general population.

### *Xerophthalmia*

Average vitamin A intake is less than one third of the recommended daily allowance and results among other problems in xerophthalmia leading to night blindness. According to the Bangadesh Nutritional Blindness study 1982-83, 900,000 children below six years of age suffer from night-blindness and other degrees of xerophthalmia; 30,000 children become blind each year an 50 per cent of the blinded children die within a few months of the blinding episode. About 15,000 children are surviving irreversible blind. The pevalence of bilateral blindness in early childhood is 6 per 1000 (9). A recent study indicated B-carotene to be more effective in curing conjunctival xerosis and bitot's spots in patients with PEM and diarrhoea than the high potency vitamin A capsule itself [16].

***Iodine Deficiency Disorder (IDD) :*** Iodine deficiency results in a high prevalence of goitre in Bangladesh. The prevalence is 10.5 percent amongst its population. This translates into about 10 million people with IDD in 1985. In affected areas the prevalence rate is still higher. It is 30 percent for general population in these districts. In certain pockets its endemicity even ranged between 50 to 70 percent[17]. The areas most affected by IDD are in the northeast followed by the southeast, southwest and north.

### *Lathyrism*

Lathyrism, a crippling paralysis of the lower limbs, is caused by the toxic effect of excessive consumption of khesari dal, a pulse eaten primarily by the poor specially when other food grains are scarce. Though it is limited mostly in the districts of Kushtia and Rajshahi, there are also sporadic cases from other districts. In affected areas about 25,000 people suffer from this disease. The Institute of Nutrition and Food Science of the University of Dhaka, however, developed a possible preventive

measure by using vitamin c against this disease. It has also developed a procedure for detoxification of Lathyrus sativa by simple soaking in lime water overnight followed by boiling.

### *Nutrition Programs*

This section sumarizes the GOB and NGOs on going programs to address the problem of hunger and malnutrition in Bangladesh.

### *Public Foodgrain Distritbution System (PFDS) :*

One of the major objectives of PFDS is to maintain a nutritionally significant level of food grain consumption of people in general and vulnerable groups in particular. It takes place under six broad heads: statutory rationing (SR); distribution to priority categories; modified rationing (MR); open market sales (OMS); food for work program (FFWP); vulnerable group development (VGD) and gratitious relief. Recipients of SR program is provided with food at subsidized rates. They include the Government employees, defense personnels, city workers and other urban consumers. An irregular system known as MR is also in practice; through this system the rural people are supplied occasionally with subsidized food grains. The OMS system is constructed to initiate sales of foodgrain specially during pre-harvest lean seasons to stabilize price in the market and facilitate grain consumption of the people. It is estimated that foodgrain distributed through the PFDS contained a share of 25-30 percent of the total annual market supplies of the foodgrains in Bangladesh[19]. Progam directly intended to increase food consumption such as FFW and VGD, have made some progress in addressing the problem of inadequate food consumption.

### *FFW Program*

The FFW program aims at providing employment and payment in the form of foodgrains to landless rural laborers in non-agricultural seasons. In 1986-87 an estimated 84 million mandays of employment were generated by FFW utilizing 534,000 metric tons of wheat. In addition CARE's FFW road maintenance program employed 60,000 women around the coutnry. In 1988-89 FFW constituted 30 percent of the total grain distributed through PFDS. During the post-flood periods this program has proved to be very successful in reaching the poor.

### *VGD Program*

The VGDP aims at providing direct food rations to certain high risk vulnerable groups. The VGD program reaches to an estimated 450,000 destitute women, lactating and pregnant mothers and children under 5 from the poorest families. Under this program the women beneficiaries are usuallty selected for a period of two years and receive their ration on a monthly basis. In 1988-89 VGD constituted about 20 percent of the total grain distributed through PFDS (20). VGD consists of two sub-projects. The major one which takes up 90 percent of the resources is implemented through the Government Union Parishad centers and involves the provision of a family take- home ration of 31.25 kg of wheat per month. The other sub-project called Institutional VGD consists of two parts; one which involves a monthly dry ration supplied to women in women's training centers, the other part involves institution on which women and children are provided with cooked meal at the centre consisting of a daily allowance of wheat, pulse and oil.[21] Instead of providing a short term solution to the food problem of the risk groups WFP has now been trying to reorient itself toward an income generating approach to make it self sustaining. This program too has proved to be very effective in addressing the problems of hunger during the post-flood periods.

### *IDD Control Program*

In order to combat the problem of IDD two types of program have been undertaken: (a) short term lipiodol injection program and (b) long term salt iodization program.

#### *The Lipiodol Injection Program*

Under lipiodol injection program people of 'at risk' population in the hyper endemic areas are provided with iodine in oil (lipiodol) injection as an interim measure to control IDD. So far 175,000 people were covered under this program. GOB with assistance from UNICEF has decided to continue this program upto June 1991 to cover a target population of one million[22]. However, while this treatment is effective, it is also expensive.

### *Salt Iodization Program*

Iodized salt provides a much cheaper and effective method of introducing iodine on a mass basis. This is the ultimate solution to the problem of IDD and accordingly the Government of Bangladesh together with UNICEF

has undertaken a program of universal salt iodization for the entire country by 1993.

A law to this effect has already been enacted. Such a program is seemed to be relatively easier to implement in Bangladesh, where all salt is crushed and refined at 200 plants spread out in the country's 9 crushing zones. Bangladesh Small and cottage Industries Corporation (BSCIC) with assistance from UNICEF has so far installed 7 salt iodization plants in the country to meet the partial needs of people. By 1990, 30 more plants will be installed by BSCIC in the same way. The remaining plants will be installed later. It is hoped that by 1993 these plants will be able to produce 430,000 tons of iodized salt as against the requirment of 427,000 tons to meet the salt need of about 117 million population. Institute of Public Health and Nutrition (IPHN) is the focal monitoring agency of this prgram. Institute of Food Science & Technology (IFST) of Bangladesh Council for Science & Industrial Research (BCSIR) has already developed a simple paper strip method to estimate iodine levels in the salt.

### *National Blindness Prevention Program*

Nutritional blindness problem is addressed from three fronts: (a) Vitamin- A capsule (VAC) distribution program (b) Home garden and (c) Nutrition Education.

### *Vitamin A Capsule (VAC)*

The blindness prevention program (BPP) distributes high potency VAC and aims to cover all children under six years of age and night blind children aged 7 to 15 years age twice a year. Though VAC distribution, has been initiated in 1973 in rural areas its systematic distribution in urban areas has started from 1988. This program is also monitored by IPHN with financial assistance from UNICEF and technical support from HKI. Current VAC coverage is claimed to be 47 percent of rural households. Recent study by BRAC in 40 upazilas covering 5,000 children, however, recorded the coverage to be 33 percent.

Public policies seemed to be either ineffective or have limited value in influencing vitamin A intake that causes xerophthalmia[23]. Alternative strategies of home garden and nutrition education are therefore seemed to be important to combat the problem.

### *Home Garden*

Home garden is a long term alternative to VAC. Promotion of the production and consumption of vegetables and fruits rich in vitamin A together with nutrition education has received attention of Government as well as the NGOs in recent years. However, it has not yet turned into a national program. Home garden is persued in a number of Government programs in conjunction with health programs. The Rural Development Board through women cooperative encourage the development of home gardens. The Department of social Welfare through their women's club also promote home gardens. The Agricultural Extension service has a program for promoting the production of vegetables and poultry in home gardens. In recent years FAO extended its support towards the Government in strengthening its kitchen gardening program. Apart from the Government many NGOs have come forward to promote home gardens. HKI in conjunction with Rangpur Dinajpur Rehabilitation service (RDRS) developed a home gardening project in northern areas and impart training to the near landless farmers (both men and women) on the subject. Necessary inputs are distributed to them at a moderate cost. Similar programs are also undertaken by WIF, BRAC and SCF/USA in their project areas.

### *Nutrition Education*

Nutrition education has not yet evolved into a national program. There are very few small scale programs such as the BIRTAN and the few mobile teams to impart training on weaning and supplementary feeding among rural mothers and tribal people by INFS. A number of NGOs such as WIF, BRAC, SCF, CARE, however, have launched a rigorous nutrition education program to control vitamin A deficiency and nutritional blindness in their project areas. The nutrition blindness prevention program of WIF has launched a prevention campaign using radio, television, cinema and Government Health Workers in their project areas in some northern districts of the country. The program was evaluated and found to be successful.

### *Other Programs*

There are quite a few special nutrition project around the country in which children found to be specially malnourished are taken for periods of 4 to 6 weeks

and feed nutritious food until their weight and growth improve. Most of these programs insist that the mothers also participate and learn to prepare the types of food which will prevent recurrence of the problem.

Government has already incorporated nutrition education as a component in the syllabus of the primary education in recent years. Its inclusion at the secondary level as well as in the medical curriculum is also under the active consideration of the Government.

Government is actively considering to launch a national deworming program during the Fourth plan period of the country through its existing health infrastructure.

**Table 1.** Weight and height of pregnant women, 1983.

| Socio-Economic Indicator | % with weight below 50 kg. | % with height below 147 cm. |
|---|---|---|
| High income Urban | 44.8 | 32.4 |
| Low income Urban | 83.4 | 44.6 |
| High income Rural | 76.9 | 38.5 |
| Low income Rural | 100.0 | 57.1 |

**Table 2.** Birth weight of newborn babies (kg).

| Sicio-Economic Category | Number | Mean Weight | SD |
|---|---|---|---|
| High income Urban | 112 | 2.80 | 0.55 |
| Low income Urban | 339 | 2.63 | 0.46 |
| High income Rural | 16 | 2.33 | 0.61 |
| Low income Rural | 29 | 2.38 | 0.37 |

Cited from : UNICEF, An Analysis of the situation of Children in Bangladesh, Dhaka, 1987.

**Table 3.** Nutritional status of under-5 Bangladeshi children as per the three national surveys (in percent).

| Indicator | INFS 1981-2 | HKI 1982-83 | BBS 1985-86 |
|---|---|---|---|
| Stunting (< 90% median height for age) | 57.3 | 42.0 | 56.1 (National)<br>57.6 (Rural)<br>44.2 (Urban) |
| Wasting (< 80% median Weight for height) | 20.0 | 6.0 | 8.1 (National)<br>8.2 (Rural)<br>6.9 (Urban) |
| Mid-upper arm circumference (<12.5 Cm.) | | 10.0 | 14.4 (National)<br>14.9 (Rural)<br>44.2 (Urban) |
| Sample size | 510 Rural Cross-Sectional | 2800 Rural Cross-Sectional | 3283 Urban and Rural Cross-Sectional |

*Source : INFS =Istitute of Nutrition and Food Science, University of Dhaka, 1983,*
*HKI =Helen Keller International, Bangladesh, 1983,*
*BBS =Bangladesh Bureau of Statistics, 1987*

**Table 4.** Incidence of malnutrition among the under-5 children of Bangladesh by area and sex

| Indicator | | Rural % | Urban % | All % |
|---|---|---|---|---|
| Stunting | M | 56.3 | 42.4 | 54.8 |
| | F | 59.1 | 46.1 | 57.6 |
| | All | 57.6 | 44.2 | 56.1 |
| Wasting | M | 6.8 | 6.7 | 6.8 |
| | F | 9.8 | 7.1 | 9.5 |
| | All | 8.2 | 6.9 | 8.1 |

*Source : BBS. 1987*

**Table 5.** Effect of flood on nutrition.
*(Prevalence of severe malnutrition in October 1987 & 1988)*

| Area | 1987 | 1988 |
|---|---|---|
| Mymensingh | 5.4 | 10.0 |
| Demra, Dhaka | 6.8 | 11.0 |
| Jamalpur | 5.4 | 12.4 |
| Lalmonirhat & Kurigram | 0.8 | 1.3 |
| Chittagong | 11.8 | 7.3 |

Note : Malnutrition defined as weight for age less than 60% of reference median for areas other than Lalmonirhat and Kurigram. It is defined as weight for height less than 70% of the standard in Lalmonirhat and Kurigram.

*Source : CONCERN for Mymensigh, Dhaka and Chittagong, SCF, UK for Jamalpur, RDRS for Lalmonirhat and Kurigram; Compiled from UNICEF Reports (1 & 2)*

**Table 6.** Prevalence of malnutrition in post-flood periods.
*(Oct-Dec, 1988 and Jan. 1989)*

| Districts | % of Severe malnutrition | | | |
|---|---|---|---|---|
| | October | November | December | January |
| Sirajgong | 14.6 (294) | 15.1 (651) | 15.8 (643) | 6.9 (216) |
| Matlab | 13.1 (312) | - | 12.2 (262) | 4.2 (189) |
| Mymensingh | 10.0 (201) | 12.2 (181) | 12.2 (164) | 15.9 (163) |
| Demra, Dhaka | 11.0 (209) | 10.3 (301) | 10.2 (576) | 8.0 (561) |

Note : Weight for age less than 60% of the reference median

*Source : ICDDR-B for Sirajgong and Matlab, G.V.P. for Madaripur and CONCERN for Dhaka and Mymensingh. Compiled from UNICEF Reports (1-4).*

**Table 7.** Proportion of of middle upper arm circumference (MUAC) less than 12.5 cm, in slum and mohalla (middle class) areas in Dhaka, 1988.

| 1988 | Slum Area | | Mohalla Area | |
|---|---|---|---|---|
| | <12.5 cm. % | Children Measured N | 12.5 cm. % | Children Measured N |
| Oct.-Dec. | 8.0 | 1384 | 1.0 | 3702 |
| Jul.-Sept. | 7.0 | 1107 | 1.0 | 2976 |
| Apr.-Jun. | 8.0 | 839 | 2.0 | 2669 |
| Jan.-Mar. | 10.0 | 611 | 2.0 | 1373 |

Source : *Aga Khan Community Health Program*
Area : Paltan, Fakirapool, Shantinagar and Shah jahanpur
Cited from : UNICEF, Report No. 3, Feb. 1989.

## Discussion

The present nutrition situation of the country is a matter of great concern. The major constraints to better nutrition are inadequqte food intake, poor bygienic condition and lack of knowledge in nutrition. Inadequate food intake is linked to the problem of income and hence the overall problem of poverty in Bangladesh. The national nutrition survey, Grameen Bank and other studies show that families with a higher income or with more land consume more calories, more protein and more of the most other nutrients [24]. The major thrust should, therefore, be directed towards providing more purchasing power amongst the population particularly the poor. Programs directly intended to increase food consumptions such as FFW, VGD and Grameen Bank have made some progress in addressing the problem of inadequate food consumption of the poor and the vulnerable groups. These be further intensified and income generation programs be undertaken to benefit the poor. Nutritional surveillance are of vital importance in this respect as most people in Bangladesh even in the best of times remain only marginally nourished or merely survive. Using the already identified socio-economic indicators such as wage, price and anthropomertic indices of weight and height monitoring of tbe nutrition situation of the country is needed in order to fix priorities in resources allocation as well as in meeting emergency

situations. Such a monitoring by the NGOs during the last flood proved to be very useful in saving many lives from death.

On the supply side production of low priced high calorie food stuffs such as sweet potato be encouraged in order to meet the calorie gap. Without disturbing the present level of cereal production diversification of agriculture shuld be done with emphasis on pulses production. As fat consumption is very low in Bangladesh, effort should be made to grow more oil seeds. Necessary steps should be taken to make its production economically profitable to farmers. Protein problem will disappear if calorie deficiency is removed as a large amount of protein deficiency is caused by calorie shortage. In order to improve the quality of diet food from animal origin should be increased. Re-exavation of derelict ponds, extensive fish farming in lowlying areas and paddy fields and poultry raising in rural areas, to this effect, be encouraged. In order to eliminate seasonal malnutrition specially during pre-harvest periods, as seen now, alternative strategies in production and availability should be worked out. This may include introduction of early maturing varieties and other measures.

Poor hygienic condition resulted in infection and higher incidence of malnutrition in Bangladesh. It may be attributed to lack of appreciation about quality of life and inadequate health services. Intestinal parasites (which is very common in Bangladesh) alone can lead to a food loss of 25 percent of ingested calories. It also causes serious impairment of absorption of iron from the gut. A part from raising food production measures should also be taken to improve the environmental hygiene so as to reduce these losses and improve the quality of life of the people. Dissemination of non-formal health education and a range of interventions to improve traditional hygiene and child care practices can also go a long way in improving the nutrition situation of the people.

Lack of knowledge on nutrition resulted in deleterious food beliefs, improper allocation of food among children and mothers, inadequate intake of limiting micronutrients, poor food and personal hygiene and weaning practices. In order to bring about a change in these behavioral patterns it is necessary to carry out a community based nutrition education program. Promotion of homegardens (i.e. nutrient rich fruits and vegetables) can coincide

with, and strengthen the nutrition education program. A part from mass media, NGOs working at grass-root levels health and development, secondary schools can be used as a vehicle for dissemination of nutrition knowledge among the villagers. There are at present about 9000 secondary schools with a student population of 2962,000 in approximately 68,000 villages in Bangladesh[25]. There is no village in Bangladesh without a secondary school and no para (a small cluster of village) without at least one student going to school. The communication channel between rural community and the secondary schools through their students, is therefore, the easiest, most effective and widely dispersed. The students can easily engage themselves in disseminating nutrition knowledge in their families and among the folks around their neighbourhood. The process is self-sustaining as every year new generations of students will be pouring in from the villages surrounding the schools. Using these schools the entire country can be taken into the folds of nutrition education provided that nutrition is made compulsory in the curriculum at secondary levels with practical nutrition work at community level, as partial requirement for qualifying for promotion to the higher classes. This strategy of improving nutrition in rural locations by INFS using the secondary schools their students and teachers in four areas of Bangladesh on a pilot basis met with some degree of success[26]. Large scale pilot project should, therefore, be undertaken and then duplicate the same phase-wise for the nation as a whole.

## Summary

This paper provides a review of Bangladesh nutrition situation with emphasis on the nutritional programs of the country. The review indicated that the nutrition situation of the country is a matter of great concern and the programs targeted have achieved limited succes. It has identified some of the main constraints to better nutrition, lapases in the existing programs and suggested some measures to improve the situation.

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