

# **FIVIMS in Bangladesh**

A Tool for Comprehensive  
Data Management and Use

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## Executive Summary

Like many other developing countries, malnutrition and hunger are widely prevalent in Bangladesh. Recent data indicate that 50% of the new-borns are of low birth weight and more than 90% of the under-5 children suffer from mild to severe forms of malnutrition in the country. Also, micronutrient malnutrition (e.g., anaemia, goitre and nightblindness) is widely prevalent, commonly affecting women and children. Since mid nineties, the government and donor communities have shown their firm and long-term commitment to improve the situation as indicated by high investments in many nutrition-related projects. For example, the Bangladesh Integrated Nutrition Project (BINP) and National Nutrition Programme (NNP) implemented by the Ministry of Health and Family Welfare with financial assistance from the World Bank and other donors. A number of NGOs (non-governmental organisations) have also come forward with their own programmes largely addressing the poor households. Despite these efforts, malnutrition and hunger continue to remain as the most severe public health problems in Bangladesh. Few operational problems including proper targeting of the malnourished population and timely and appropriate interventions have been thought to be the major reasons of low programme effectiveness partly due to inadequate co-ordination and linkages between sectors and/or organisations concerned.

The 1996 World Food Summit (WFS), held in Rome, resolved to eradicate hunger and achieve food security for all. It was estimated during the summit that 800 million people from developing countries were malnourished, of who 170 million were under-5 children. Participating by 186 member countries of the Food and Agriculture Organization (FAO) of the United Nations, the WFS resolved to reduce these figures by 50% at the end of 2015. Properly targeting people and areas who are most at risk of hunger and malnutrition, determine their causes, and identify most cost-effective interventions received much attention during the summit. It was re-invented during the summit that reliable and area specific data on food insecurity and vulnerability were lacking/inadequate in many countries. To address this gap, FAO endorsed the establishment of a user-friendly information system in its member countries through installing the Food Insecurity and Vulnerability Information and Mapping System

(FIVIMS). FIVIMS is defined as a system that continuously generate information regarding who are malnourished and vulnerable, where are they located, and how and why they become vulnerable and malnourished. The FIVIMS is a framework within which a wide range of activities may be carried out both at the national and international levels in support of improved information flow system to achieve WFS goals.

The government of Bangladesh has already identified a National Focal Point within the Ministry of Planning to co-ordinate the activities related to FIVIMS. Although a number of organisations in Bangladesh are working with food insecurity and vulnerability and involved in nutrition studies, recent experience suggest that sharing of data among these organisations is limited. Availability of reliable and area specific data on many of these issues are either limited or not available when needed. Variations in methodology, frequency and level of data collection also limit the usefulness of such data. This results in severe information gap in planning, implementing, monitoring and evaluating many of the targeted nutrition projects.

With the aim of establishing FIVIMS, Bangladesh Institute of Research and Training on Applied Nutrition (BIRTAN), Ministry of Agriculture with technical assistance from FAO has planned to organise a national workshop on 12-13 July, 2000 at the Islamic Development Bank (IDB) Bhaban, Dhaka. The main objectives of the workshop are to discuss the conceptual issues of FIVIMS in Bangladesh context and to review the current policies and actions related to the information collection, processing, dissemination and use on food insecurity and vulnerability in the country including the range of indicators used. The workshop also aims to create an opportunity for discussion among various stakeholders on further scopes and opportunities for future actions towards establishing the information and mapping system in Bangladesh. The Sectoral Nutrition Focal Points in 16 ministries, as are identified by the Bangladesh National Plan of Action for Nutrition (NPAN), and representatives from concerned national, international and UN bodies are expected to attend the workshop.

The workshop is expected to form a conceptual basis to draft a Technical Co-operation Project on FIVIMS in Bangladesh, which would be implemented by an

appropriate organisation selected by the government. The selected organisation should preferably be within the Ministry of Agriculture having mandates for research and training on nutrition and having infrastructures down to regional or district level. A National Task Force with representatives from the government agencies, NGOs, donor communities and UN bodies who have active involvement in food insecurity, vulnerability and nutrition-related activities should also be formed to guide the FIVIMS implementation process. The success of a national FIVIMS lies in addition to top level policy support and long-term budgetary allocation, to a large extent with capacity building of the selected and other associated organisations as well as the capacity of the Task Force Members. A user-friendly environment for sharing and smooth flow of data should also be created to optimising the use and benefits of such an information and mapping system.

## Introduction

With technical assistance from FAO, Bangladesh Institute of Research and Training on Applied Nutrition (BIRTAN), Ministry of Agriculture has planned to organise a workshop on Food Insecurity and Vulnerability Information and Mapping System (FIVIMS) in Bangladesh on 12-13 July, 2000 at the Islamic Development Bank (IDB) Bhaban, Dhaka. The main objectives of the workshop are to discuss the conceptual issues of FIVIMS in Bangladesh context and to review the current policies and actions related to information collection, processing, dissemination and use on food insecurity and vulnerability in the country including the range of indicators used. The workshop also aims to create an opportunity for discussion among various stakeholders on further scopes and opportunities for future actions towards establishing the information and mapping system in Bangladesh. The Sectoral Nutrition Focal Points in 12 ministries and 2 departments, as identified by the Bangladesh National Plan of Action for Nutrition (NPAN), (Annex I) and representatives from concerned national, international and UN bodies are expected to attend the workshop.

The 1996 World Food Summit (WFS), held in Rome, resolved to eradicate hunger and achieve food security for all, which was participated by 186 member countries of the Food and Agriculture Organization (FAO) of the United Nations. It was estimated during the summit that 800 million people from developing countries were malnourished, of whom 170 million were under-5 children. The WFS resolved to reduce these figures by 50% at the end of 2015. Properly targeting people and areas who are at risk of hunger and malnutrition, determine their causes, and identify most cost-effective interventions received much attention. It was re-invented during the meeting that reliable and area specific information on food insecurity and vulnerability were lacking/inadequate in many countries. To address this gap, FAO endorsed the establishment of a user-friendly information system in each member country through installing the Food Insecurity and Vulnerability Information and Mapping System (FIVIMS).

## Bangladesh: Food security, vulnerability and nutrition profile

In 2000, it has been estimated that 182 million (32.5%) under-5 children in developing countries are stunted and 150 million (26.7%) are underweight (ACC/ACN 2000)<sup>1</sup>. Bangladesh is no exception to it, with one of the highest malnutrition rates and associated death rates in the world. The global under-5 mortality rank of Bangladesh is 48 with under-5 and infant mortality rates of 106/1,000 and 70/1000 live births<sup>2</sup>, respectively.

### Food security

Bangladesh has an approximate total population of 124 million, which is growing at the rate of 1.67%. The population density is 880 per square km. The country has one of the lowest per-capita gross national product (GNP) of US\$ 360, with 24% (approx. 30 million) of the total population living below hard core poverty (less than 1800 kcal/capita/day) and 14% (approx. 18 million) below ultra poverty (less than 1600 kcal/capita/day).

*Food production:* The total land area of Bangladesh is 13,017 thousand hectares (ha), of which 9,694 thousand ha is arable land and crops land, 600 thousand ha is permanent pasture and 1,900 thousand ha is forest and woodland. The agricultural land as percentage of total land increased from 70% in 1983 to 74.5% in 1993 and the share of irrigated land increased from 20% to 32%. The application of mineral fertilisers (plant nutrients) increased from 60 kg to about 100 kg per ha during the same period. There were 5,300 tractors used in agriculture in 1994. The population engaged in agriculture decreased from 72% in 1984 to 66% in 1994. Domestic rice production has been increased by 100% in the last 25 years, i.e., from 10 to 20 million tons. Cropping intensity has been increased from 143% to 180% over the last 25 years<sup>3</sup>. At present, the

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<sup>1</sup> ACC/SCN. 4<sup>th</sup> report on the world nutrition situation: nutrition throughout the life cycle. Geneva: ACC/SCN in collaboration with IFPRI, 2000.

<sup>2</sup> UNICEF. The state of the world's children 2000. New York: UNICEF, 2000.

<sup>3</sup> A cropping intensity of 100% means that in average there is one harvest per year on all agricultural land; a cropping intensity of 200% results in two harvests.

average yield of (HYV) aman rice is 2.2 tons/ha, boro rice 2.7 tons/ha and wheat 2.1 tons/ha. Potatoes and sweet potatoes are the only tubers of some importance in the Bangladesh diet. No roots, in any significant quantities, are grown in the country. The production of sweet potatoes dropped from 713 thousand MT in 1984 to 398 thousand MT in 1998. Its yield per ha as well as under cultivation have gone down considerably, the latter decreased from 161,000 ha to 103,000 ha during 1984 to 1998. The production of all varieties of pulses was 551 thousand MT in 1984 and 519 thousand MT in 1998. Only 483 thousand MT of oil seeds were produced, mainly mustard, groundnut and coconut in 1998. The increase in production during the last decade has been nominal. Excluding melon, 1,455 thousand MT of various fruits was produced in 1998. The situation has not changed much during the last decade. All other tropical and sub-tropical fruits are grown in Bangladesh in small quantities. Total vegetables production grew at an average annual rate of 2.3% increasing from 1,205 thousand MT in 1984 to 2,819 thousand MT in 1998. Livestock sector has done well during the last decade. Livestock production index of 100 for 1979-81 went up to 107.13 in 1984 and to 131.8 in 1994. In fact this index stayed slightly ahead of the population growth index. Fisheries sector has also made good progress during the last decade, which increased at a rate of 2.3% (inland) and 8.3% (marine) during 1983-93.

*Food availability and requirement:* Food availability is obtained from food balance sheets. After harvesting, the volume of food appears in the market for human consumption constitutes food availability. The production figures must therefore be corrected for post harvest food losses, balance between imports and exports, government food stocks, food losses in transportation and storage, and non-food uses of food. There is no precise knowledge of food losses in Bangladesh, which occur between production and availability. Studies in India have reckoned such losses to be 12.5%. Bangladesh needs to calculate such losses. For converting food availability into food consumption FAO has suggested that 10% be subtracted. Requirement is expressed as energy, which must be obtained from food consumption. In individuals this energy must provide for Basal Metabolic Rate (BMR) and for work and leisure. Requirement is calculated using a methodology developed by WHO, FAO and United Nations University. It is based on the



population composition, levels of physical activity, and observed body weights. For Bangladesh, FAO calculated requirement per-capita per day is 2,039 kcal. For planning and for setting targets, the requirement of 2039 kcal must be topped up first by 10% to take into account food losses between availability and consumption levels and by another 12.5% to account for food losses between production and availability. The target figure for planning food production, therefore, must not be less than 2,550 kcal per-capita per day. This figure still assumes a normal pattern of food distribution in the population. For skewed distribution additional allowances may have to be made depending upon the degree of skewedness.

*Food consumption:* Daily per-capita consumption of energy, protein, vitamin A and iodine as percentage of requirement in 1963-64, 1975-76, 1981-82 and 1995-96 are shown in the following Table.

Daily per capita food consumption as percentage of requirement<sup>4</sup>

Nutrient	Year of survey			
	1963-1964	1975-1976 <sup>a</sup>	1981-1982 <sup>a</sup>	1995-1996
Energy (kcal)				
Consumption	2118	2094	1943	1868
Requirement <sup>b</sup>	2039	2039	2039	2039
Con. as % of req.	104	103	95	92
Protein (g)				
Consumption	55	58	48	47
Requirement	45	45	45	45
Con. as % of req.	122	129	107	104
Vitamin A (IU)				
Consumption	1670	730	763	1668
Requirement	1712	1712	1712	1712
Con. as % of req.	98	43	45	97
Iron (mg)				
Consumption	9	22	23	11
Requirement	22	22	22	22
Con. as % of req.	41	100	105	50

<sup>a</sup> only rural areas of Bangladesh; <sup>b</sup> per-capita energy intake needed for work and leisure, calculated on reference weights for the population.

<sup>4</sup> INFS. Bangladesh national nutrition surveys of 1962-64, 1975-76, 1981-82 and 1995-96. Dhaka: University of Dhaka.

Cereals represent the main source of energy in Bangladeshi diet. The share of animal product is less than 5%, therefore indicating that the average diet is not only deficient in total calorie, but also not balanced and, thus of poor quality.

### **Vulnerability**

Although vulnerability covers a wide range of dimensions relating to cultural, social, economic and environmental concerns, this report mainly uses poverty as an indicator of vulnerability, which results in as consequences of short as well as long term deprivation and crisis. A number of methods are available to assess poverty. For example, while the nutritionists are interested in per-capita daily 'direct calorie intake' to draw a line below which a group of population may defined as poor, the economists are commonly interested in an indirect method, 'cost of basic needs'. Whichever method (s) is (are) used, it is clear that poverty has declined significantly in Bangladesh in the last 10 years (MHFW 1997)<sup>5</sup>. The incidence of 'very poor' has declined from 43% in 1991 to 36% in 1995 (World Bank 1998)<sup>6</sup>. However, although the proportion of poor persons has been declined, the absolute number of the poor persons has increased due to the high population growth. Declines in poverty has been observed in both urban and rural areas, but a high proportion of the rural population is still very poor (40%). A recent BBS estimate using the 'headcount poverty index, shows that as high as 45% of the total population in Bangladesh is poor, which had a wide regional variation, ranging from 34% in Kushtia to as high as 56% in Mymensingh (BBS 2000)<sup>7</sup>. In Bangladesh, BBS identified 8 different sources of major income through a survey done in May 1999, such as, wage and salary, agriculture self employment, non-agriculture self employment, agriculture daily wage, non-agriculture daily wage, pension, rent and donation, relief, charity and others. The headcount measures of poverty at the national level is highest among households having agriculture daily wage as the main source of income (69%),

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<sup>5</sup>Ministry of Health and Family Welfare. Bangladesh National Plan of Action for Nutrition. Dhaka: MoHFW, 1997.

<sup>6</sup>The World Bank. Bangladesh: from counting the poor to making the poor count. Washington D.C.: The World Bank, 1998.

followed by non-agriculture daily wage (63%). The poverty has been found lowest among households receiving rent (26%), either from land or other assets, e.g., house (BBS 2000)<sup>8</sup>. Income inequity has increased nationally, but significantly more so in urban than rural areas. Average income in each urban poor household was Tk. 902 compared to Tk. 2,270 in a non-poor household. In rural area, average income in each poor household was Tk. 559 compared to Tk. 1,067 in non-poor household (BBS, 2000)<sup>9</sup>. Poor households are more susceptible to both chronic and acute crises because they have little or no access to strategies to cope with the crises. It has been suggested that usually women-headed households have a higher chance to become poor due to a less income opportunity and other social and cultural constraints (World Bank 1998)<sup>9</sup>. For example, wage rates are increasing for both men and women but female wage rates remain significantly lower than male rates (UNDP 1998)<sup>10</sup>. Women are usually involved in under-valued work, have less access to credit, have less control over productive assets, are exposed to high insecurity such as violence and abuses and have poor access to appropriate health care and educational facilities.

## Nutrition

Birth weight is one of the indicators of nutritional status of a population, which indicates nutritional status of both mother and children and reflects a wide range of deprivations with respect to social, cultural, economic, environmental and other aspects of life. Anthropometric assessments are made on the basis of height or length (for infants), weight, and mid-upper-arm circumference of a person, which are commonly used to assess nutritional status of a population. Nutrition and poverty are closely linked, forming a vicious cycle. The nutritional status of under-5 children is assessed using three major indices. Weight-for age (underweight) indicates both short and long-term growth disturbances, weight-for-height (wasting) indicates acute or short-term weight loss, and

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<sup>7</sup>Alam MS. Poverty profile of Bangladesh 99: selected socio-economic indicators. Dhaka: Bangladesh Bureau of Statistics, 2000.

<sup>8</sup>Alam MS. Poverty profile of Bangladesh 99: selected socio-economic indicators. Dhaka: Bangladesh Bureau of Statistics, 2000.

<sup>9</sup>The World Bank. Bangladesh: from counting the poor to making the poor count. Washington D.C.: The World Bank, 1998.

height-for-age (stunting) indicates long-term growth disturbances. Body mass index (BMI) is commonly used to assess nutritional status of adult women, which is a ratio of weight in kg and height in metre square. In Bangladesh 50% of the new-borns are of low birth weight (UNICEF 2000)<sup>11</sup>. The prevalence of underweight, wasting and stunting among under-5 children is 64%, 17% and 60% (INFS 1998)<sup>12</sup>, respectively. While the prevalence of underweight was higher among females than males (68% vs. 60%), the prevalence of wasting and stunting did not significantly differ between males and females aged less than 5 years. The prevalence of malnutrition among under-5 children with respect to all the three indicators was higher in rural than urban areas (underweight, 66% vs. 58%; wasting, 18% vs. 15%; stunting, 63% vs. 50%) (INFS 1998)<sup>13</sup>. The survey divided the country in four regions, such as, northern, western, central and south-east. Although there were some variations in the prevalence, similar magnitude of the prevalence of malnutrition was observed in all these regions. Among adult women, the prevalence of malnutrition (chronic energy deficiency, i.e., BMI<18.5) was 50% in rural and 26% in urban areas.

Micronutrient malnutrition is also highly prevalent in the country. Women and children are commonly affected with some few exceptions. The major problems include anaemia due to iron deficiency and other causes, nightblindness due to vitamin A deficiency and iodine deficiency disorders.

A recent national survey indicates that 45% of non-pregnant women and 50% of pregnant women in Bangladesh had anaemia (HKI 1999)<sup>13</sup>. However, using capillary blood for haemoglobin concentration estimation, a study done in Fulbaria *thana* of Mymensingh district indicates that anaemia was highly and equally prevalent both among adult men (69%) and women (71%) (Hyder et al. 2000)<sup>14</sup>. Data on iron deficiency among population of any group is limited in the country. It has been reported that 54% of

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<sup>10</sup>United Nations Development Programme. Human development report. New York: UNDP, 1998.

<sup>11</sup>United Nations Children's fund. The state of the world's children 2000. New York: UNICEF, 2000.

<sup>12</sup>Jahan K & Hossain M. Bangladesh national nutrition survey 1995-96. Dhaka: INFS, University of Dhaka, 1998.

<sup>13</sup>Helen Keller International/Institute of Public Health Nutrition. Dhaka: HKI, 1999.

<sup>14</sup>Hyder Z, et. al. Anaemia among males and females in in rural Bangladesh. South Asian J Nutr 2000. Accepted.

pregnant women in a rural area of Mymensingh had signs of iron deficiency (serum ferritin  $<12 \mu\text{g/L}$  and/or serum transferrin receptor  $>8.5 \text{ mg/L}$ ) and 33% had iron deficiency anaemia (Hyder et al. 2000)<sup>15</sup>. According to the same study, 66% of the anaemic women had signs of iron deficiency, indicating presence of other factors in causing anaemia. The anaemia prevalence was 47% among school-aged children, 64% among children aged 12-23 months and 78% among children aged 6-11 months.

There has been a declining trend in vitamin A deficiency among pre-school aged children, from 3.6% in 1982/83 (HKI/IPHN 1985)<sup>16</sup> to 0.67% in 1998 (HKI/IPHN 1999)<sup>17</sup>. However, among women of reproductive age, vitamin A deficiency continues to be a serious problem. More than 2.7% of pregnant women, 2.4% of lactating women and 2.0% of non-pregnant/non-lactating women reported to suffer from nightblindness in 1997 (HKI/IPHN 1999)<sup>18</sup>.

Goitre is one of the common clinical manifestations of iodine deficiency disorders (IDD). In children aged 5-11 years, the prevalence of total goitre (goitre grade 1 & 2) was 47% among boys and 53% among girls (Yusuf et al. 1993). Among the adult sample, the prevalence of goitre was 33.6% for men and 55.6% for women (Yusuf et al. 1993)<sup>19</sup>.

## **FIVIMS: some basic concepts**

### **FIVIMS**

FIVIMS is defined as a system that continuously generate information regarding who are malnourished and vulnerable, where are they located, and how and why they become

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<sup>15</sup>Hyder Z, et. al. Anaemia and iron deficiency among pregnant women in rural Bangladesh. Submitted for publication. 2000.

<sup>16</sup>Helen Keller International, Institute of Public Health Nutrition. Bangladesh nutritional blindness study 1982-83. Dhaka: HKI/IPHN, 1985.

<sup>17</sup>Helen Keller International, Institute of Public Health Nutrition. Vitamin A survey of rural Bangladesh (unpublished). Dhaka: HKI/IPHN, 1999.

<sup>18</sup>Helen Keller International/Institute of Public Health Nutrition. Vitamin A deficiency survey in rural Bangladesh. Dhaka: HKI, 1999.

<sup>19</sup>Yusuf HK, et al. National iodine deficiency disorders survey in Bangladesh. Dhaka: University of Dhaka, 1993.

vulnerable and malnourished. The FIVIMS is a framework within which a wide range of activities may be carried out both at the national and international levels in support of improved information flow system to achieve WFS goals.

A global FIVIMS is implemented through a programme of activities to support the national level activities and establish a common database and information exchange network for the international community. Also the international FIVIMS is expected to establish a common standard and provide technical support for the improvement of the quality of national data.

On the other hand, a national level FIVIMS aims to collect (if necessary), collate and analyse data to measure and monitor food insecurity and vulnerability by linking different information system. Through generating, linking and updating data, FIVIMS may facilitate the assessment of policy and programme options to improve nutrition. It may be a helpful tool in the improvement of policy formulation and programme management process, effective designing and targeting of interventions and effective networking of different sectors and institutions towards nutrition improvement.

FIVIMS, from its conceptual viewpoint, addresses one of the themes that was identified during the FAO/WHO-organised International Conference on Nutrition (ICN) in 1992, "Assessing, analysing and monitoring nutrition situation" (FAO/WHO 1992)<sup>20</sup>. The government of Bangladesh recognised the immense importance of the theme, which has been reflected by its inclusion in the Bangladesh National Plan of Action for Nutrition (MOHFW 1997)<sup>6</sup>. The flow of information that FIVIMS can provide will be valuable in solving nutrition problems as basis for deciding priority problems and possible actions.

### **Food insecurity**

Food insecurity has a wide range of dimensions in terms of its severity. As reported in a recent publication: "The least severe form of food insecurity that people experience is

the uncertainty in obtaining food in socially acceptable ways. The worst form of food insecurity occurs when people do not get enough to eat as a result of insufficient resources experiencing physical and psychological consequences of hunger” (Frongillo E 1999)<sup>21</sup>. Food security has to be seen in the overall context of poverty, which is made up by a bundle of unsatisfied basic needs. The access to food or an adequate nutrition is one element of poverty. Health, safe drinking water, education shelter and other basic needs may be other elements of similar importance to a person or family living in poverty with respect to food insecurity. As mentioned in the ICN 1992 document (theme paper no. 1), *food security is defined, in its most basic form, as access by all people at all times to the food needed for healthy life. Access to food is necessary, but of course, not a sufficient condition for a healthy life; a number of other factors such as the health, sanitation, environment and household or public capacity to care for the vulnerable members of society also come into plan.....At the household level, food security is the ability of the household to secure enough food to ensure adequate dietary intake for all of its members* (FAO/WHO 1992). Another definition of food security is “A household is food secure when it has access to the food needed for a healthy life for its all members (adequate in terms of quality, quantity, safety, and culturally acceptable), and when it is not at undue risk of losing such access” (ACC/SCN 1991)<sup>22</sup>. The worst form of food insecurity is famine.

Food security has three main dimensions, which apply to the national, regional, household and individual levels:

- Availability
- Accessibility
- Biological utilisation

Food security does not depend on own (at national or household level) food production. So, self-sufficiency in food is not the only condition of food security. Although a high

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<sup>20</sup>FAO/WHO. International Conference on Nutrition: major issues for nutrition strategies. Italy: Food and Agriculture Organization/World Health Organization, 1992.).

<sup>21</sup>Frongillo EA. Validation of measures of food insecurity and hunger. J Nutr 1999;129:506S-09S.

degree of own food production at national level results generally in lower risk of food insecurity than an accentuated dependency on food imports at national or food purchase at household level.

#### Availability of food

At national level, volume of food required to meet the demand is determined by domestic yield, commercial imports, food aid, and food stocks.

At regional level, availability of food at a certain geographic point in the country is determined by regional food production, regional food stocks and food distribution system, such as, transport system, local procurement of food in surplus areas and efficiency of food distribution system.

At household level, the factors determining food security include yield at household level, food purchase, receipt of food through development activities and food aid (e.g., food-for-work, Vulnerable Group Development, etc.), receipt of food through feeding programme (e.g., Vulnerable Group Feeding, distribution of wheat-soya-blended food) and donations.

#### Access to food

A number of factors determine the access to food.<sup>22</sup> For example, family food expenditure, belonging to a special population type who are eligible to receive food from government and other sources and selected school children, i.e., food-for-education programme. Access to food has a number of aspects, which include access to food at all times, no access during disaster periods, no access in lean periods, and permanently no access. Food security at household level may not ensure adequate food for all members in the household. Intra-family distribution of food poses great importance in determining 'who get in what amount' of a particular food item. The distribution system is mainly determined by cultural and social norms, which is often biased towards the male members

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<sup>22</sup>ACC/SCN. Nutrition relevant actions: some experiences from the eighties and lessons from the nineties. Geneva: ACC/SCN State of the Art Series Nutrition Policy Discussion Paper no. 10, 1991.



of a household in Bangladesh. Quality of diet is another important dimension of access to food. A household may be food secured in terms of rice/wheat (carbohydrate like food grains), but do not have adequate access to other foods rich in protein, fat, vitamins and minerals.

#### Utilisation of food

The capacity of the human body to absorb, appropriately use and physiologically convert the food offered to him/her is an important factor in determination of the nutritional status and consequently of food security. This capacity is influenced by a number of factors such as health problems including digestional, diarrhoeal, intestinal worms and general health status, quality of sanitation such as no safe drinking water, unhygienic latrine use, insufficient health services and so on, educational standards and nutritional awareness and consumption habits.

#### Hunger

Hunger is the worst form of food insecurity, which should be defined within a specific social context. There has been a great deal of debate on what hunger is and how it should be assessed in a defined population (Food Research and Action Center 1984)<sup>23</sup>. A commonly agreed definition of hunger is not yet available and perhaps it is not practical to have such an agreed definition to assess hunger across different population groups. According to Radimer et al, three main components of hunger may be identified: the physical sense of hunger, the interruption of a socially accepted eating pattern, and inadequate food (Radimer 1989)<sup>24</sup>. Inadequate has been used to refer to food quality, food consumption, and to food supply, which may be chronic, intermittent or occasional. Because of socio-cultural variations of people's perceptions and other methodological reasons, direct measurements of hunger are diverse and not readily available. The indirect measures include indicators of income, unemployment, food assistance programme participation, dietary intake, and health and nutritional status. In addition,

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<sup>23</sup>Food Research and Action Center. Hunger in the eighties: a primer. Washington D.C.: Food Research and Action Center, 1984.

<sup>24</sup>Radimer KL, et. al. Development of indicators to assess hunger. J Nutr 1990;120:1544-8.

people's behaviour in relation to hunger is also important to look into. Income and poverty are often associated with hunger (Rose 1999)<sup>25</sup>. However, it has been observed that some households who are above the poverty level became food insecure. For example, in the US, 50% of the households have been found affected by hunger who had income above poverty level (Rose 1999)<sup>26</sup>. The next question comes in one's mind, why do some households with income above poverty level are food insecure and consequently go hungry? One explanation is that income-based poverty measures do not give an accurate picture of food insecurity since it does not take into account the price differences in housing, food, or health care. Also, annual income-based poverty measures are static in nature since it does not take into account the sudden economic change that contributes to increasing food insecurity. All members in a household are not at similar risk of being hungry. If the children are designated to be hungry, their mothers and households were also very likely to be hungry. Assessing hunger or food insecurity scale should be area and culture specific. A series of in-depth interviews are necessary to initially develop such a scale, which thereafter is required to be tested through a questionnaire survey for validation and finalisation. Three levels of scales have been suggested to formulate hunger scale (Radimer 1989):

#### Household hunger

- Do you worry whether your food will run out before you get money to buy more?
- The food that I bought just did not last and I did not have money to get more.
- I run out of food that I needed to put together a meal and I did not have money to get more food.
- I worry about where the next day's food is going to come from.

#### Women's hunger

- I can not afford to eat the way I should.
- Can you afford to eat properly?
- How often are you hungry, you do not eat because you can not afford enough food?

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<sup>25</sup>Rose D. Economic determinants and dietary consequences of food insecurity in the united states. *J Nut* 1999;129:517S-20S.

- Do you eat less than you think you should because you do not have enough money for food?

#### Children's hunger

- I can not give my child (ren) a balanced meal because I can not afford that.
- I can not afford to feed my child (ren) the way I think I should.
- My child (ren) is/are not eating enough because I just can not afford enough food.
- I know my child (ren) is/are hungry sometimes, but I just can not afford more food.

#### Mapping system

A mapping system, in this instance a nutrition mapping system, mainly refers to characterises and identifies different locations of the country providing specific answers to a number of questions with respect to:

- Who are malnourished (children of specific age group and/or sex, adolescent girls, pregnant women, lactating women, etc)?
- Where are they located (location by administrative region, land type, natural disaster, coastal, river erosion, etc)?
- What kind of problems they are suffering from?
- How are they affected (consequences of a particular problem)?
- How many of them are affected?
- Does the number change over time?
- For how long are they suffering?

A nutrition mapping system should also be able to map other aspects of nutrition such as soil type in terms of nutrient contents, area specific seasonal calendar of types of crops/fruits/vegetables grown, and also to detect the changes over time.

## **FIVIMS: a preliminary idea for Bangladesh**

The FIVIMS is a framework within which a wide range of activities may be carried out both at national and international levels to improve nutrition. The national FIVIMS is intended to collect, collate, and analyse relevant data for measuring, and monitoring food insecurity and vulnerability by linking relevant information system, and if needed by collecting new data. However, a national FIVIMS should maximise the use of nationally available data to avoid duplication of efforts. In addition, timely dissemination of data, advocacy and training are integral parts of FIVIMS.

For proper implementation of FIVIMS at the national level, a proper implementing institution within the government framework needs to be identified. Such an institution should be mandated to undertake research as well as training activities related to nutrition and should be equipped with adequate research and training infrastructure and expertise down at the regional/district levels. Ministry of Agriculture may designate such an agency within the country for institutionalising FIVIMS, which should also be linked with the vast network of other government institutions involved in information collection, processing and dissemination system, the local government units, and NGOs. The identified institution may be given the responsibility of preparing a concept of FIVIMS in the country to present to an inter-sectoral committee for building a common understanding and support. A National Task Force may be formed with concerned nutrition sectoral focal points, representatives from food and nutrition research committee, academe and representatives from NGOs already involved in nutrition surveillance and poverty/vulnerability monitoring. The Task Force should work out on a number of operational issues such as operational definition of the key terms of FIVIMS appropriate for Bangladesh context, identification of goals, objectives and main customers. A list of indicators should also be identified and finalised to be used in the system. The FAO guidelines should be considered in drafting the goals and objectives of FIVIMS. A national FIVIMS may have the following goals and objectives:

### *Objectives:*

- ◆ To increase national and international attention on food security issues particularly of the ultra poor to receive priority in policy formulation and budgetary allocation.
- ◆ To provide relevant and accurate national, district and *thana* level data on food production, availability, consumption and vulnerability.
- ◆ To promote better access and use of information, organisational networking and sharing.
- ◆ To strengthen multi-sectoral skills in data processing and analysis for programme planning, monitoring and evaluation.

### **Main users of FIVIMS**

The users of FIVIMS are multi-dimensional, which among others may include: policy makers, ministries and government agencies at national, district and *thana* level, NGOs particularly those involved in programmes for the poor and tackling food security issues, donor community, researchers and academe, training institutions, and media.

### **List of indicators**

All government and non-governmental agencies/institutions need to make an inventory of their respective data and information systems. The inventory should take into account the agency's range of data and information type, frequency of data collection, and data management. The Task Force may review the indicators from which an initial list may be prepared to identify food insecurity and vulnerability. The list may be finalised through a series of workshops and scientific discussions to design an appropriate FIVIMS framework, and identify linkages and co-ordination requirements. The capacity building of the Task Force members should also be given priority for technically sound designing and implementation of FIVIMS. The Research and Evaluation Division of BRAC is currently conducting a study jointly with the Nutrition

Division, Cornell University, USA, which initially aims to gather in-depth understanding on women's perception of different types and/or levels of food insecurity and thus to develop indicators. A questionnaire will be developed and employed on a larger sample to validate the indicators, which can, therefore, be used to map food insecurity and vulnerability in Bangladesh.

### **Finalisation of FIVIMS**

A preliminary design of FIVIMS should be formulated which, among others, would yield the system's goal and objectives, conceptual framework, and initial structure for networking and linkages. A comprehensive design of the system should be formulated using the proposed preliminary design as a guide. The core indicators should be well defined to formulate the data management sub-system of FIVIMS. Since the national FIVIMS is expected to use existing yet relevant data systems of different member agencies, the focus of the design may be the interfacing and integrating these systems into one information system to map out the areas in the country most vulnerable to hunger and malnutrition as soon as possible. To avoid duplication of efforts, the core indicators to be selected may use data currently collected by member agencies. However, it is also important to consider the possible differences in the data requirements for FIVIMS when compared to the agency's own purpose for data collection, e.g., frequency and level of collection. Thus, certain adjustments in the treatment of the agency's collected and processed data should be made to suit the objectives of FIVIMS.

The design should also include the specific roles and responsibilities of member agencies in all phases of information flow, to ensure that relevant as well as timely data are provided to the major users. The roles of the member agencies particularly involved in data collection for the system should be further defined and clarified.

Support mechanisms such as advocacy, social mobilisation, and capacity building would facilitate the smooth implementation of the data management and response mechanism systems. A scheme for monitoring and evaluation of indicators needs to be developed for regular updating of information based on the users' need. The efficacy and

effectiveness of the FIVIMS as an information and mapping system should also be done at regular interval.

### **Up-grading and capacity building of information technology**

The efficient and effective implementation of FIVIMS would depend to a large extent on the capacity of the people who would have primary responsibility to run it. It is essential that the lead agency of FIVIMS implementation has necessary skills and knowledge on information technology, mapping, data analysis and use through training and other capacity development activities. The use of information technology must be optimised for data sharing and network building. Focus of human resource development should therefore be the use of information technology in data handling, processing as well as use of information via the Internet. Training on epidemiological aspects to the persons concerned should also be given proper consideration to facilitate easier and faster detection of malnutrition problems and identification of action areas. Short training on mapping system using user-friendly geographic information system complemented with latest computer technology should be provided to those involved in data management of FIVIMS to improve data analysis, interpretation and presentation.

### **FIVIMS related developments in Bangladesh**

Bangladesh has already made a commitment at the FAO-organised WFS in 1996 to establish a national FIVIMS in the country. Accordingly the Divisional Chief, Programming Wing, Ministry of Planning has already been identified as the National Focal Point of FIVIMS. However, given the mandates, scopes and expertise in implementing projects in nutrition research and training, BIRATN may be proposed as an Associated Focal Point of FIVIMS to support and strengthen the already identified National Focal Point within the Ministry of Planning. This workshop should build a basis and conceptual platform to select the lead agency within the Agriculture sector. The lead agency would take responsibility to form a national FIVIMS Task Force to conceptualise, design and finalise the information and mapping system in Bangladesh.

FAO may provide technical assistance to GoB in the implementation of FIVIMS as part of its commitment to the government.

### **Existing national information systems relevant to FIVIMS**

#### 1. Bangladesh Bureau of Statistics (BBS)

- ◆ Household health and demographic survey
- ◆ Household expenditure survey
- ◆ Bangladesh fertility survey
- ◆ Agriculture and livestock census
- ◆ Population census
- ◆ Child nutrition survey
- ◆ Poverty monitoring

#### 2. Helen Keller International

- ◆ Nutritional Surveillance Project

#### 3. Institute of Nutrition and Food Science, University of Dhaka

- ◆ Bangladesh National Nutrition Survey, 1962-64, 1975-76, 1981-82 and 1995-96

#### 4. Bangladesh Institute of Development Studies

- ◆ Monitoring of Rural Poverty

#### 5. Institute of Child and Mother Health

- ◆ Breastfeeding surveillance in Bangladesh

#### 6. World Food Programme

- ◆ Vulnerability Assessment Mapping

#### 7. EGIS

- ◆ Integrated Environmental Analysis using Geographic Information System and Remote Sensing technology.



## 8. Bangladesh Agriculture Research Council

- ◆ Utilisation of agro-ecological zones database and installation of geographic information system for agricultural development.

### **Conclusion**

The adoption of the National Plan of Action for Nutrition (NPAN) by the government of Bangladesh in 1997 has formed a milestone and indicated strong national commitment towards improving nutrition situation in the country. Since early nineties, the government and the international communities have significantly increased their investment in nutrition related projects. Also, the national NGOs, which have already proven their efficiency to reach the most vulnerable groups (mainly poor), are also actively involved in implementing nutrition projects either independently or in partnership with the government. However, despite many efforts, a large proportion of the population in Bangladesh are continuing to be malnourished as indicated in many recent national surveys. Malnutrition does not only affect human development and well being but also slows down economic development and growth. In addition to some large-scale nutrition projects, Bangladesh has a number of information collection system related to food insecurity, vulnerability and nutrition. But an effective mechanism between different organisations collecting as well as using the information to share and timely use of data seems lacking, resulting in under and/or misutilisation of scarce resources.

Thus, the FIVIMS established at the national level would contribute significantly in locating the malnourished population including its causes and probable solutions by disseminating quick and accurate information to the decision makers for timely actions, which should intensify the national nutrition situation. Efforts towards institutionalisation of FIVIMS should be intensified by immediately identifying a central co-ordinating agency preferably within the Ministry of Agriculture and then forming a FIVIMS national Task Force with other government agencies, local government units,

NGOs, academe and donor communities. By building capacity of the co-ordinating agency as well as of the Task Force, the FIVIMS should be able to collect, collate, process and disseminate information about the population who are most at risk of malnutrition in Bangladesh including causes and choice of interventions for taking timely actions. Through continuous monitoring and surveillance, such a system may also contribute significantly to monitor and evaluate different interventions being carried out in the country. However, proper implementation and sustainability of such an activity as FIVIMS would largely depend on commitment and intersectoral co-ordination of all the sectors concerned. A successful FIVIMS, in addition to skills of persons concerned, requires political commitment, long-term budgetary allocations, and legal support from the top-level policy makers in the government.

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## Annexe I

List of ministries with Nutrition Focal Points as identified by the NPAN:

1. Ministry of Agriculture
2. Ministry of Health and Family Affairs
3. Ministry of Food
4. Ministry of Livestock and Fisheries
5. Ministry of Environment and Forests
6. Ministry of Disaster Management and Relief
7. Ministry of Social Welfare
8. Ministry of Women and Children Affairs
9. Ministry of Education
10. Ministry of Information
11. Ministry of Local Government, Rural Development and Co-operatives
12. Ministry of Planning
13. Primary Education and Mass Education Affairs
14. NGO Affairs Bureau