

Vulnerability of the Rural Poor to Seasonal fluctuations in Food Consumption : Findings from Longitudinal Data Base

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EXECUTIVE SUMMARY

The study focuses on food consumption and vulnerability of the rural poor to seasonal variations in food consumption. The information for this study is derived from the Village study project (VSP) data on daily food consumption and household's income and expenditure in 13 VSP villages. The sample villages were selected from two clusters of BRAC programme concentrations, namely Jessore and Jamalpur. The two regions have spatial, topographic differences along with variations in socio-economic indicators. In selecting the villages factors like income distribution pattern, occupational distribution, political characteristics, land ownership and distribution, labour force participation, pattern of economic activities, category of rural institutions, literacy rates, health and sanitation etc, were taken into consideration so as to ensure that these represent a typical Bangladeshi village. A total of 459 target households (RDP member and non-member) were purposively selected for the study. The dietary sample consisted of 1,865 target population in the two study locations. The study on dietary intake was conducted by 24 hour recall method of food eaten by individual members of the study households.

The data presented in this study cover two agricultural periods - the peak period and the lean period. The data in each period was collected in four rounds. The peak period data was collected in Mid-December through Mid-February 1991 while the lean period data was collected in Mid-September through Mid-November 1991-92. The pre-Amon harvest time is defined as the peak season while the post-Amon harvest time is defined as the lean season. Two seasons were selected purposively to capture seasonality of food and nutrient intake for both RDP member and non-member households. The study came up with a number of important findings. These are as follows:

1. The food consumption of both RDP and non-RDP group member was observed to be rice dominating in both the seasons.
2. In peak season Rice, alone, contributes to 82% of total calorie, and 63 % of total protein consumption for RDP member and 85% and 71% respectively for Non-RDP member.
3. In lean season, Rice alone contributes to 86% of total calorie and 72% of total protein for RDP members and 85% and 70% respectively for non-members. As was observed that in both the reference seasons the major contributor to the daily intake of calorie and protein was rice.
4. It was observed that food consumption was not equally distributed between the seasons and between the rural poor belonging to the RDP member and non-member within the season. The consumption of food intake in peak season was higher than in the lean season. This difference in consumption between these two reference seasons can be attributed to a

number of differentials particularly in terms of availability and scarcity of food , employment and income.

5. The food consumption for RDP member in both the seasons was observed to be better than the non-member. The overall calorie for RDP member in peak and lean season was respectively was 2202 and 2007 kcals while for that of non-member it was respectively 2009 and 1827kcals. The non-members were found to be from greater nutritional stress compared to the RDP members.
6. In the same way the percentage share of rice to the total daily protein for both RDP member and non-member was higher in the peak season- indicating that the nutritional stress in the lean season was greater than the peak season and the life style of both RDP member and non-member in terms of daily diet was relatively little better in the peak season.
7. The calorie and protein consumption during the pre-Amon harvest was far below than that of what was recommended to be minimum (2310 kcals and 64 gram protein) for healthy life. The overall conclusion which follows from the analysis of data on calorie consumption that for both RDP member and non-member the peak season presents a better picture compared to the lean season because the diet in the lean season reveals one malnourished and underfed situation resulting from consumption of calorie far below poverty intake.

INTRODUCTION

Introduction

The magnitude of problems of undernutrition, malnutrition, and poverty in Bangladesh is widespread and staggering nature indeed. A vast majority of its people is unable to meet their needs of balanced and acceptable minimum diet. To ensure every person a daily diet is a difficult task and finding out a workable solution for it is not so easy as is generally believed as besides food grains people need variety of protective food. On an average the per capita food consumption per day gives a RDP member 2202 calories and non-member 2009 calories in the peak season as against the recommended daily allowance of 2310 kcals, hence falls short of 108 kcals per day for RDP member and 301 kcals for non-RDP member and so to that extent he/she (RDP member and non-member) suffers from under nutrition.

The extent of sufferings varies in season and out of season followed by variations and fluctuation in the production of cereal and other nutritious food items like edible oil, fat, milk, milk products, pulses and various types of fruits. In view of the situation it has therefore to meet its effective demand of the item through importing them from other countries. The effective demand however don't reflect the total requirement of the people as the majority of them live in vicious circle of poverty and have limited purchasing power and access to adequate quantities and qualities of food. And that maintaining good health and nutrition is difficult for those people who have income lower than the average expenditure needed for satisfying minimum acceptable diet (Quddus : 1991).

In the hierarchy of needs for human resource development, nutrition is likely to come first as the satisfaction of physiological needs is a pre-condition to satisfy other human needs. Malnutrition is a global problem. Possibly as many as 450 million to a billion in the world do not receive enough food. Most of the hungry people live in

poorer countries (of which Bangladesh is one) where the populations are destituted to grow rapidly for some into future. In a country like Bangladesh malnutrition is a problem that defies pat solution. It has many roots: inadequate food supply, limited purchasing power, income, malnutrition, and poor health condition. Over and above low per acre productivity, higher population growth and lack of equal opportunity of income and employment are some of the grim realities and forces which are at work for longtime to keep the majority of its population in situation of abject poverty. These causes and forces often combine in many ways over time and places in many countries like Bangladesh and they are often aggravated by certain political commitment. This makes it difficult for the government to develop strategies and plan to combat malnutrition. Moreover for the most part those government actions that were undertaken were not directed to the poorest segment of the population or to the most nutritionally vulnerable groups -the children and pregnant mothers. These limited efforts when failed to meet the nutritional requirement and needs of the people are often discarded as inappropriate or some times even too expensive. And malnutrition persists. However, attempts were made by the government to improve the foodpicture in the 1970's through the most traditional method-increased food production. This is no doubt is the main reason or a remedy in a country like Bangladesh where a large proportion of the poor have no access to land. In those cases increase in production and consumption can be nearly synonymous. keeping in view the evident failures of the government's endeavor towards this end many NGO's volunteered to supplement the government efforts in early 1980's of which BRAC is a leading one. BRAC's efforts towards this sector are operated through its health and rural development programme.

This study is an attempt to see the effects of season on food and nutrient intake of BRAC's target population -those already reached by BRAC and those not yet reached by BRAC. The study finds that the target population and households not yet served by BRAC have

greater nutritional stress in both reference period compared to those served by BRAC.

The problems of malnutrition and underfed situation of foodconsumption can be improved through development efforts directed towards diversifying the food consumption i.e. increasing the consumption of protective food both from plant and animal sources as well as intensifying the food assistance to the poor at a time of severe nutrition problems particularly during lean months of the year.

What is more importantly needed at this time to bring about a change in the existing pattern of food consumption habit is to change the current level of income and income distribution pattern through integration of nutritional considerations into development plans towards creation of income for remunerative employment and as well as more knowledge on food and nutrition and its dissemination must be the key to the success against hunger and malnutrition.

Objectives of the study

The objectives of the study were to:-

- Examine the food consumption habit of RDP member and non-member household in peak and lean season. |
- Compare the food and nutrient intake of RDP member and non-member in both peak and lean season.
- Study the variations of food consumption of RDP member and non-member. |
- Generate and provide bench-mark information for repeated subsequent surveys aimed at analyzing the trend in food consumption.

Specific research questions

The specific research questions which the study tried to answer were as follows:

- Is the per capita per day consumption level of food and nutrient intake of RDP member and non-member are influenced by season.
- What percentage of income of RDP member and non-member population is allocated to food and non food group?
- Is food consumption of RDP member and non-member is affected by variation and changes in seasons?

Methodology

The information for this study is derived from the Village study project's (VSP) longitudinal data on household's income, expenditure and daily food consumption available from 13 villages.

Village selection

The sample villages were selected from two clusters of BRAC programme concentrations, namely Jessore and Jamalpur. The two regions have spatial, topographic differences along with variations in socio-economic indicators. In selecting the villages factors like income distribution pattern, occupational distribution, political characteristics, land ownership and distribution, labour force participation, pattern of economic activities, category of rural institutions, literacy rates, health and sanitation etc., were taken into consideration so as to ensure that these represent a typical Bangladeshi village.

Sample selection

A total of 459 target households (RDP member and non-member) were purposively selected for the study. The sample households consisted of 1865 target population and were followed up longitudinally. The target households sampled were then divided into two groups (1) those who have joined BRAC and (2) those who have not joined BRAC

but eligible to join till the date of the study. The categorization of target households into RDP member and non-member households was done in accordance with a list collected from RDP area offices. Among the various livelihood initiatives pursued by the sample households agriculture was found to be the most dominating. Among the principal crops grown in the study area include: Paddy , Jute, and Rabi crops . Of the different variety of crops produced in the area Amon is the major crop. In respect of rabi crop production Jessore is relatively more better than that of Jamalpur. The data for the sample households was collected during the pre-and the post harvest period of Amon- a major crop of the study area. The data collection in the pre-Amon harvest period took place in Mid september through Mid-November, 1991 while the data collection in the post-Amon harvest period took place in Mid-november through Mid-February 1991-92. The data was collected in four rounds in each reference period. Two seasons were selected purposively to capture seasonality if any for the target population and households. The pre-harvest time of Amon is considered as lean season while the post harvest time is considered as the peak season. The village study field teams stationed at Jessore and Jamalpur collected the data. Each team was headed by a team leader responsible for co-ordinating all the field level activities relating to the village study project. One senior researcher at the head quarter was responsible for guidance, supervision, quality control, data processing, analyzing and report writing. The field researchers were given necessary training and orientations on different techniques and approaches of data collection. The data set did not include information on intra-family food distribution. As a result of which analysis on this aspect was not possible in this study.

Data collection method

The information for the study was collected through a structured questionnaire was administered at the household level. The information for the absentee households member and guests were not collected. Besides, a price list for daily essentials was collected

at an interval of 15 days along with the longitudinal data set for households income ,expenditure and wage and employment. Data on eight types of food such as-Rice, Flour, Pulse, Fish, Meat, Egg, Vegetable, Potato and Edible oil for each individual member of the household were collected by using 24 hours recall method. Then the information on consumption level of each of the food items during last 24 hours for target households of either category has been aggregated from which a mean (average) per capita consumption on each of the eight items has been computed.

Household income computation

It is very difficult to estimate rural income accurately because activities are out carried mainly on self employed basis and very few households maintain records. Also many households are engaged in various types of expenditure-saving activities such as vegetable in home garden, rearing poultry and livestock. Respondents in most of the cases underreport income from the self-employed activities as they do not consider cost-saving activities as income. Only recording of consumption and expenditure can capture income from these sources which are extremely time consuming. Despite here in this study we have tried to estimate income based on both production and expenditure account. The estimates of household income reported in table-(10.a and 10.b). The total average income for RDP member and non-member was estimated for constructing poverty line. The total average income of RDP member was estimated at Touchy 21288 and that of non-member at 19752. To estimate income in this way, the average fortnightly income for RDP member and non-member was multiplied by total number of fortnights (24) per year. Thus the annual income for both RDP member and non-member was computed. Then the average household size for the RDP member and non-member was used to obtained per capita income. The average size of the household for RDP member and non-member was respectively 4.1 and 4.0. So the per capita income for RDP member and non-member was 5.192 and 4.938 respectively. The same method was used to obtain per capita income for both category of households within the ranks

of RDP member and non-member group. The information on income of the studied households was collected fortnightly. Income data for each reference period was collected in four rounds. Then the income for each successive round (four rounds) in each period was aggregated and after that the aggregated income was divided by the number of visits during each period to obtain average fortnightly income for both the RDP member and non-member household.

Food intake

Then, food intake (expressed in gram per person per day) is converted to nutrients by using food value conversion factor developed by the INFS of Dhaka University (See Appendix-1). Data on food consumption was collected in kilogram and this was converted to Gram.

Rationale of the Study

Researchers have paid little or limited attention to the seasonal variation in food consumption as well nutritional stress of the rural poor particularly in season and out of the season. The present study is an endeavour to find out the nature and extent of nutritional variations (interms of food and nutrient intake) in two different seasons of the year and locations of BRAC programme concentrations having geographical and ecological variations. It is expected that the study will provide meaningful insight and information to the programme planner and implementor for the area and will be of immense interest to the programme planners of both the government and non government organizations who are involved in various nutrition intervention and programmes including the food assistance to the rural poor intended to alleviate nutritional problems from the rural societies.

SEASONAL EFFECTS OF FOOD AND NUTRITION

Introduction

Food is the most basic pre-requisite of life: it builds the body and provides the energy for keeping the vital organs of body functioning. The level of nutrients intake in the food depends on the types of food consumed. Various factors account for variation in the food consumption of a population. The important among these are people's income, resources, preference, knowledge, purchasing power, availability of food, season, family size and volume of expenditure on food. Variation in any of these elements may lead to a change in the people's living, welfare and food consumption. Inadequate access to food both in quantitative and qualitative terms mainly due to poverty makes an individual more prone to diseases, infection and thus in turn tends to increase the incidence of malnutrition. The wide spread form of malnutrition and vulnerability of the poor seasonal food fluctuations is illustrated in this paper.

Bangladesh is a country with a marked variations in seasons and that the climatic conditions of the country have significant bearing on food production, food supply, food consumption, income, employment, wage, prices and disease pattern. Food consumption is influenced by food production, food supply (availability) income, employment, wages, purchasing power and prices of different types of food consumed. So anything affecting any of these variables affect the pattern of food consumption. Daily intake of energy and nutrient in the average daily consumption of food is not a static thing over a year rather it varies with the variation in seasons, production and food availability. Depending on these, daily intake of calorie and protein from daily food consumption bundle vary around the agricultural seasons in Bangladesh. Food consumption pattern during pre and post Amon period is analysed in this chapter. The peak period here refers to the post- Amon harvest period while the lean period refers to the pre-Amon period. Let us now examine the

pattern of food consumption of RDP member and non- member during these two specific times of the year.

Food Consumption

The peak season hereinafter is referred to as the post Amon harvest period .This is a time when a better opportunity in terms of availability of food and employment do exist in rural areas of Bangladesh. What type of food during this season dominates the average diet of both the RDP member and non- member is illustrated in the table-4 which shows that the average daily intake of food for RDP member and non- member in peak season was respectively 727 and 665 gram as compared to 662 and 602 gram respectively in the lean period-indicating that average daily consumption of non-member in both the seasons was lower than the RDP member.Of the total dietary intake of RDP member (727 gram) in the peak season, 72% was from cereal group as against 7% and 16% respectively from vegetable and plants group while the contribution of cereal, animal food and vegetable and plants group to the average daily intake of food for non-member was respectively 75%, 6% and 16%. The overall conclusion which follows from the analysis of data on calorie consumption, the peak season presents a better picture for both RDP member and non-member compared to the lean season because the diet in the lean season reveals one of malnourished and underfed situation resulting from consumption of calorie below poverty intake.

Table 1: Daily intake of food and energy by season and membership (gram/person/day)

Food	Peak Season				Lean Season			
	RDP member		Non-member		RDP member		Non-member	
	Daily Intake	calorie	Daily Intake	calorie	Daily Intake	calorie	Daily Intake	calorie
Rice	521	1802	492	1702	499	1726	450	1557
Pulse	16	21	10	35	16	55	15	52
Flour	42	143	27	92	17	58	14	48
Fish	34	47	26	36	21	29	17	23
Meat	13	15	7	8	10	11	12	14
Egg	3	5	2	4	2	4	2	4
Oil	9	81	6	54	7	45	5	45
Vegetable	90	73	69	56	90	70	88	71
Potato	19	15	27	22	17	9	15	13
Total	747	2202	666	2009	679	2007	618	1827

Daily energy and protein intake

The lean season hereinafter is referred to as the pre-Amon harvest time. This is a time when a lesser opportunities in terms of availability of food, employment and income do exist in rural areas of Bangladesh. Depending on these, rural people consume more of what is available at cheaper prices and less of what is scarce and available at higher prices. The section presents information on seasonal variations as well as daily intake of nutrients for RDP member and non-member.

Tables (1 and 2) show that for RDP member the total calorie and protein intake available from consumption of food (same basket) was 2202 calories and 60 gram in the peak season and 2007 calories and 50 grams in lean season respectively as against the recommended minimum calorie and protein per capita per day for Bangladeshi (from daily food consumption basket) respectively 2310 and 64 - indicating a consumption level of per capita per day intake of calorie and protein far below the nationally recommended level. From overall analysis of situation on nutrients intake during these two

specific seasons of the year it is observed that for both categories of rural poor whether member of RDP or not, the lean season/period is worse off compared to the peak period particularly viewed from the points of consumption of daily intake of calorie and protein (far below the level of recommended daily allowance). From this stand point, we can say that the lean season reveals a highly malnourished situation particularly in relation to the consumption of calorie and protein intake.

Table 2: Variations in daily Intake of energy (Kcals) and protein among RDP member and non-member during peak and lean season.

Food	Peak Season				Lean Season			
	RDP member		Non-RDP member		RDP member		Non-RDP member	
	calorie	Protein	calorie	protein	calorie	protein	calorie	protein
Rice	1802	38	1702	36	1726	36	1557	33
Pulse	21	4	35	2	55	4	52	4
Flour	143	5	92	3	58	2	48	2
Fish	47	-	36	5	29	4	23	3
Meat	15	3	8	2	11	2	14	3
Egg	5	.3	4	.2	4	.2	4	.2
Oil	81	-	54	-	45	-	45	-
Vegetable	73	3	56	2	70	2	71	2
Potato	15	5	22	.7	9	.3	13	.4
Total	2202	60	2009	51	2007	50	1827	47

Daily intake of energy and protein

The pattern of daily intake of protein available from food consumed by RDP and non-RDP member during the peak and lean season of a year is illustrated in this section. Table -2 shows that in terms of protein, the actual level of consumption for RDP member and non-member was respectively 60 and 51 in the peak season and 50 and 47 respectively in the lean season-indicating that protein deficit for RDP member was lower than the non-member in both the reference period. As regards the consumption of calorie it was observed that

the actual level of calorie consumption for RDP member in the peak and lean period was respectively 2202 and 2007 and for that of non-member was respectively 2009 and 1827. The non-member poor were found to suffer from a greater nutritional stress compared to the poor RDP member.

Table 3: Percentage distribution of daily intake of energy and protein among RDP member and Non-member by season and their sources.

Food Item	Peak Season				Lean Season			
	RDP member		Non-RDP member		RDP member		Non-RDP member	
	Calorie %	Protn %	Calorie%	Protn %	calorie %	Protn %	calorie %	Protn %
Rice	82	63	85	71	86	72	85	70
Pulse	1	6	2	4	3	8	3	9
Flour	6	8	5	6	3	4	3	4
Fish	2	12	2	10	1	8	1	6
Meat	.7	5	.3	4	.5	4	.7	6
Egg Oil	.2	.5	.1	.3	.1	.4	2	.4
Vegetable	4	-	3	-	2	-	2	-
Potato	3	5	3	4	3	4	4	4
	.7	.5	1	1	.4	.5	.7	.6
Total	100	100	100	100	100	100	100	100

Table-3 shows the contribution of each specific food item to the total daily energy and protein intake in percentage terms. As was observed from the data that the major contributor to the total daily intake of calorie and protein for RDP member during the two reference season was rice. Rice alone contributes 82% of the total calories in the peak period and 86% of the total calories in the lean season for RDP member while for non-member it contributes respectively 86% and 85% in the peak and lean season. In the same way the percentage share of rice to the total daily protein for both RDP member and non-member in the peak season and lean season was also higher than other sources (Pulse, flour, fish, meat egg, oil, vegetable and potatoes).

Daily intake of nutrients by season.

Nutrients intake available from food consumed during peak as well lean season is demonstrated in table -4.

Table 4: Daily calorie and protein intake of RDP member and non-member by season.

Season	RDP member		Non-RDP member	
	Energy (Kcals)	Protein (gram)	Energy(Kcals)	Protein (gram)
Peak	2202	60	2009	51
lean	2007	50	1827	47

The seasonal variation in nutrient intake for the rural poor (RDP member and non-member reported in Table 8 which shows that the nutrients intake available in the diets of both categories of the rural poor during the post Amon-harvest was higher than the pre - Amon harvest. The calorie and protein consumption during the post - Amon harvest for both RDP member and non-member were observed to be far below than that of what was recommended to be minimum (2310 kcals and 64 gram protein) for healthy life.

DISCUSSION AND CONCLUSION

Food is the pre-requisite of life; it provides energy, builds up body and keeps vital organs of the body functioning. Keeping this in view, it is said that healthy life style is the result of healthy diet and in that there is denying to the fact that the well being of the people is determined by what people eat and what nutrients from the food consumed is derived daily. Now question arises, can all people eat what they need and can all food consumed provide nutrients equally. In a stratified society like Bangladesh this is not the case to happen because bulk of the people do not have access to adequate food for want of sufficient money and resources to buy what they need.

Moreover, natural calamities every year cause damage to the crops and food production resulting in the shortfall of food supply. The greater is the gap in supply the greater is the nutritional stress for the community people. The situation is more worse for the poorer segment of the society. Available data shows that nutritional stress is greater for the poor during the lean months of the year

Different food have different quantities of nutrient. So the diets of every one must be based on consumption of balanced and nutritious food. A balanced diet is a diet which ensures nutrients in correct proportion. For that over consumption of some food and under consumption of some other food gives rise to a unbalanced consumption pattern responsible for wide spread risks of malnutrition.

The overall food consumption pattern of the sample population is rice dominating. Based on the findings available, the following actions can be planned with a view to reduce the level of Nutrition Poverty as well educating people about the protein rich and nutritious food.

- Nutritional considerations must be incorporated into the Development plans in BRAC operating areas. In doing so nutritional education must be introduced in social awareness course and made a pre-condition for getting access to RDP facilities.
- RDP beneficiary must be educated about the significance of balanced diet and nutritious food habit and practice in an effort to raise the level of nutrition through diversification of food consumption (since the proportion of rice in the diet is very large food habit of the people needs to be diversified to gradually reduce dependency on rice to be replaced by protective food both from plant and animal sources in order to ensure healthy development as well as well of the people) - Remunerative jobs must be created based on traditional skill and occupation with view to raise the per capita income level of the poor people as well as promoting the income distribution of the poor. The best way to improve dietary conditions of rural poor is to improve their income as well as overall improvement of their socio-economic condition. A drop in per capita income for want of income earning opportunity will mean that poverty will escalate and more people will fail to have an income enough to satisfy basic food needs.

Problems of food deficit in the lean period covering mid- Sept-mid November can be minimised by intensifying the food assistance programme to those poor who are most vulnerable (at serious nutritional risks) to seasonal food fluctuations. However, ensuring every person a balanced diet is a difficult task and finding a workable solution for it is not as easy as is generally believed as besides food grains people need variety of protective food.

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