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NUTRITIONAL STATUS OF DIFFERENT AGE GROUPS OF POPULATION IN MALDA DISTRICT OF WEST BENGAL, INDIA: A GEOGRAPHICAL PERSPECTIVE

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ABSTRACT

Nutritional status is one of the most important indicators of the overall well being of population and human resource development. Unbalanced or inadequate diets and chronic illness are responsible for poor nutrition among people. In the present study an attempt has been made to examine the nutritional status of different age groups of population. The entire study is based on primary data which have been collected through field survey. To assess the nutritional status of population among different age groups, measurements of weight and height/length are obtained for them. Data on weight and height/length are used to calculate the following three summary indices of nutritional status. Weight-for-age, Height-for-age and Weight-for-height. More than 64 per cent adults are normal, having body mass index in between 18.5 and 24.99, while only 42 per cent of the children are normal in the study area.

KEYWORDS: Age-Group, Health Care, Household, Nutritional Status, Overweight, Socio-Economic Status, Under Weight

INTRODUCTION

Our health and well-being, quality of life and ability to learn, work and play depend on how well we are nourished. Good nutrition or nutritional status is the outcome of many multifaceted and interrelated determinants such as access to adequate, safe, affordable and nutritious foods, care and health care services. Although good nutrition is universally accepted as a basic human right, it is estimated that globally, more than 800 million people suffer from malnutrition and in developing countries, more than 20 per cent of the total population are hungry (Hester, H., *et al.,* 1997).

According to Macintosh, C., Morley, J. and Chapman, I. (2000) nutritional well-being is a fundamental component of the health, independence and quality of life in older individuals. The nutritional status of an individual depends on how well requirements for energy and more than 50 different nutrients are met. Requirements and eating behavior (what, where, when and how often specific foods are eaten) are determined by a large number of physiological, pathological, psychological, cultural and socio-economic factors.

Because of this, there is no single measurement that will give comprehensive information on nutritional status. Therefore, a combination of methods, including anthropometric measurements, biochemical analyses, nutrient intakes and clinical signs of malnutrition is usually used. The interpretation of these variables and conclusions reached will depend on the norms or standards used for comparison.

Today, more than three quarters of the population live in households whose per capita calorie consumption is less than 2,100 in urban areas and 2,400 in rural areas – numbers that are often cited as ‘minimum requirements’ in India.

A related concern is that anthropometric indicators of nutrition in India, for both adults and children are among the worst in the world. Furthermore, the improvement of these measures of nutrition appears to be slow relative to what might be expected in the light of international experience and of India’s recent high rates of economic growth. Indeed,

according to the National Family Health Survey, the proportion of underweight children remained virtually unchanged between 1998-99 and 2005-06 (from 47 to 46 per cent for the age group of 0-3 years). Undernutrition levels in India remain higher even than for most countries of Sub-Saharan Africa, even though those countries are currently much poorer than India, have grown much more slowly, and have much higher levels of infant and child mortality.

LITERATURE REVIEW

The nutritional status among adults in general and children in particular has attracted attention of many scholars from different disciplines resulting in a voluminous and diverse literature from different standpoints. Some of the important contributions are mentioned here.

Alok Bhargava (2001) revealed that most developing countries face different resource and infrastructural constraints that limit their economic growth. Nutritional deficiencies, poor environmental conditions and inadequate educational infrastructure hamper children's learning, which is critical for the future supply of skilled labour and hence for economic development. Improved sanitation and vaccines against infections will prevent loss of vital nutrients.

Nutrition and health policies based on long-term considerations will lead to a well trained labour force enabling nonrecourse-rich developing countries to escape from poverty traps.

Lily Yaa Appoh and Sturla Krekling (2001) examined the relationship between mother's nutritional knowledge, maternal education, and child nutritional status (weight-for-age) was the subject of investigation in this study. They depicted that maternal formal education and marital status were also found to be associated with child nutritional status in bivariate analyses.

Radhakrishna and Ravi (2004) studied that the malnutrition levels are uneven across the Indian states. Some middle-income states such as Kerala and Tamil Nadu have comparatively better nutritional achievements than higher income states like Maharashtra and Gujarat.

Mathura *et al.* (1989), Poh Siang Choo (1990), Gidhvani *et al.* (1993), Khader and Kavita (1994), Fernandol *et al.* (2000), Sunita Kumari (2005) and Oninla *et al.* (2007) in their studies indicated that malnutrition (under weight, wasting and stunting) constituted major health problems among school children.

Pollitte Ernesto (1998), Fernstrom *et al.* (2001) and Upadhyaya *et al.* (2001) highlight the relationship between nutritional status and intelligence of the children. They observed that there was significant difference in the performance of well nourished and undernourished children during intelligence test.

Pelto *et al.* (1991), Rao *et al.* (1993), Haijiang *et al.* (1995), Kennedy and Goldberger (1995), Arya and Rohini (1997), Mujeeb -ur- Rehman and Visweswara (2000) and Gaishuddin *et al.* (2005) revealed that the nutritional status of children is directly associated to socio-economic conditions and adequate nutrition.

The studies conducted by Gowri *et al.* (2004), Khalifa *et al.* (2004) and Andre *et al.* (2007) pointed out that there is direct relationship about nutritional status of children with participation in sport activities. They also analyzed that children from high and medium socio-economic status involved in sport participation than low socio-economic status.

Thus, the above literature reviewed emphasize on nutritional status, relationship between nutritional status, socio-economic status of the family, intelligence and participation in extracurricular activities of the children.

Keeping these observations in mind, in the present analysis, an endeavor has been made to study the 'Nutritional Status of Different Age Group of Population in Malda District of West Bengal, India'.

OBJECTIVES

The objectives of the present study are as follows:

- To assess the nutritional status of children in Malda district.
- To analyze the nutritional condition of women in the study area.
- To suggest measures for solving the problem of hunger.

STUDY AREA

Once upon a time Malda was the capital of Gour-Banga and now the gate way of North Bengal. It is located between 24^0 40' 20" to 25^0 32' 8" North latitudes, and 87^0 45' 50" to 88^0 28' 10" East longitudes. Malda district is bounded by Bangladesh and Dakshin Dinajpur district to the east and north-east, by Uttar Dinajpur to the north, Bihar to the west, south-west part is bounded to Jharkhand and by Murshidabad district across the river Ganga. Malda is spreading over a geographical area of 3,733 square kilometers and covering 4.2 per cent of the total landmass of the West Bengal and support a large number of population (32,90,468), which is about 4.1 per cent of the total population of the state. The density of population is 881 persons per square kilometers.

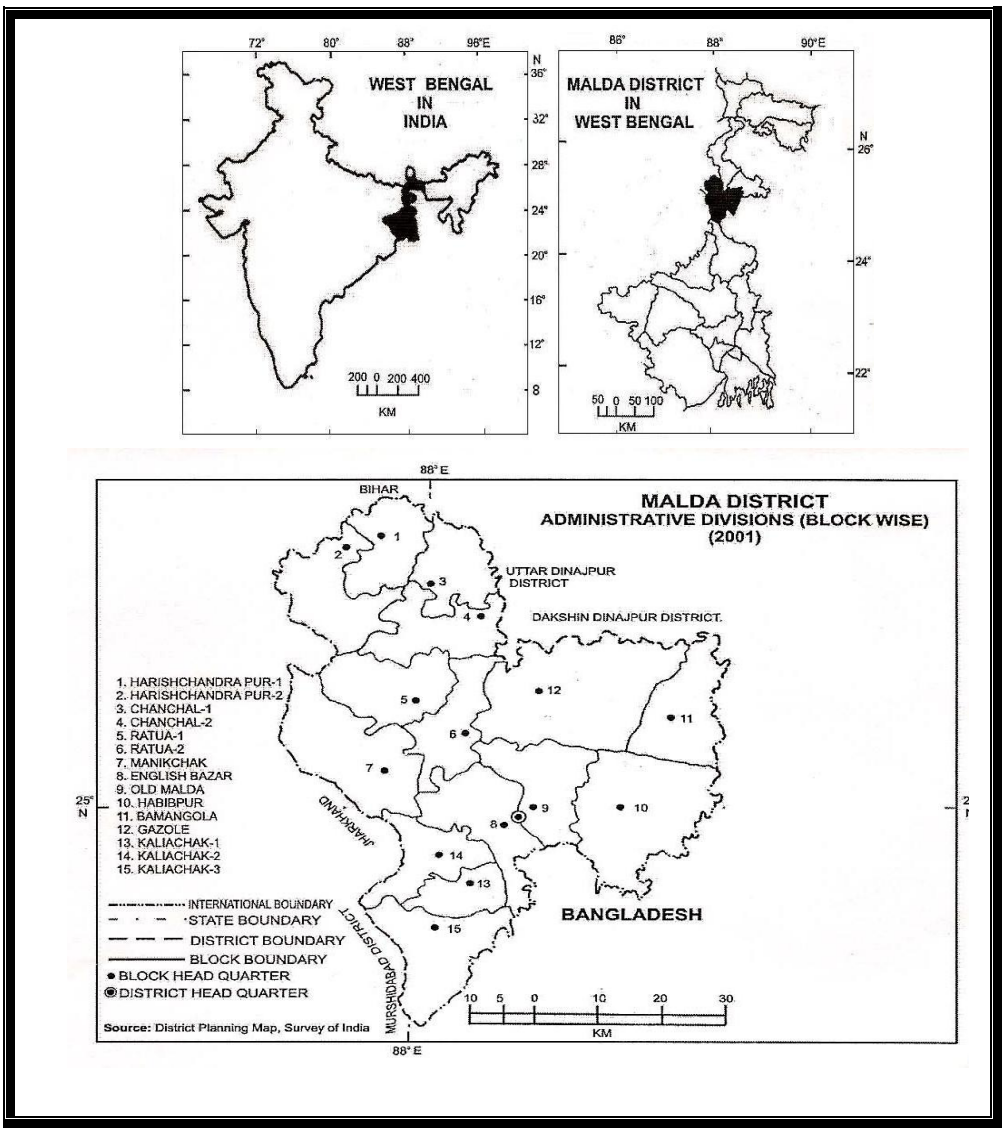

Figure 1: Location Map of the Study Area: Malda District

DATA BASED AND METHODOLOGY

Samples Selection

The present study is based on a sample of 506 households drawn from the selected 15 villages of Malda district. The relevant data were collected through a primary survey by visiting the households with a detailed questionnaire. Near about 10 per cent of the total households has been taken from each sample villages. The opportunities given by meeting the households in person provides a great scope for an in depth investigation.

The villages were selected on the following criteria: (1) they had more than 100 households since a minimum of 10 per cent household per village was surveyed for the research, (2) keeping these considerations in mind, planned to select villages some of which are nearer to the road while others are farther from the road. Similarly some villages are inhabited by single community while others are inhabited by multiple communities. Some are connected by a good road while other is only linked by *Katchha* (unmetaled) road. Similarly some are developed, semi-developed and others are remote villages selected.

Size of Sample and Villages

Size of the sample is very important factors for study of any problems. Keeping this point in mind, the present study has been taken total 1,246 adults and children from the 506 households and one male, one female and one child has been taken from every household**.**

Methods of Data Collection and Processing

Both quantitative and qualitative methods were used in the data collection. The quantitative methodology used in both socio-economic and nutrition surveys to collect data from 506 households over the 15 villages in the district. The qualitative methodology use to highlight the ethnographic reports and case studies of the selected households. These methods are useful for identifying location specific pattern. The data also provided a qualitative explanation on the results of the household's survey. The secondary sources of data were also used for analyzing the concept, and determinants.

Methodology

The present study is based on primary data which is collected by field survey. All the data are converted into percentages, ratios and other relative number. The Z-scores test is applied for established relationship among the variables and composite z-scores are used for identify the overall situation. The results of the study area have also been presented in the forms of tables and diagrams.

DISCUSSIONS

Nutritional Status of Children

Children constitute one of important segment of our population. Their nutritional status is considered to be sensitive indicator of community health and nutrition. Growth and development of the children is mainly dependent on its nutritional status. The nutritional status of children is assessed by various methods viz., Anthropometry, Biochemical, Clinical, Dietary Intake. Nutritional status assessed by anthropometric measurements indicates physical growth of a child. Among the various anthropometric measurements height and weight either single or in combination are used to assess the physique. Anthropometry is simple and reliable method for assessing the growth status progress of normal children. It helps to identify the abnormalities at the sub clinical level. Hence anthropometry is considered as one of the important tools for assessment of malnutrition.

The prevalence of underweight, wasting and stunting among children is determined by anthropometric measurements and clinical assessment of deficiency indicator, weight and heights of children are compared with the references standards chart (WHO) and the degree of anthropometric deficit is usually expressed as the percentage of children below a specified cut-off such as 90 per cent of the standard from the median value.

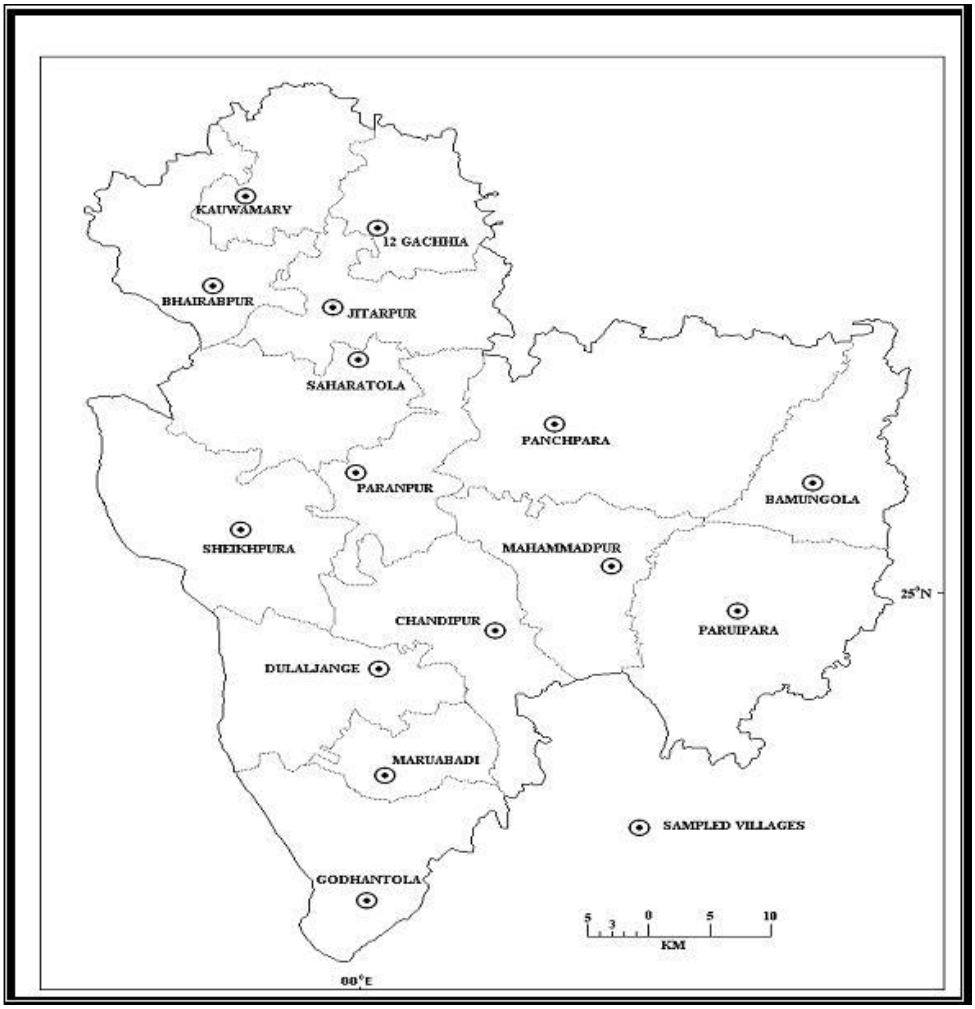

Figure 2: Location of Selected Villages in Malda District

Weight for Age (Underweight)

According to Indian Academy of Pediatrics, weight for age is classified into different nutrition status. The National Nutrition Monitoring Bureau (NNMB) surveyed during 1975-76 and the data showed that about 6 per cent of children in the country were normal and about 15 per cent were under weight, while a great majority was in the moderate or mild categories. Surveyed again in the same areas during 1988-89 showed a decline in the prevalence of the severely underweight from 15 per cent to 8.7 per cent with a corresponding increase in the proportion of normal children.

Table 1: Categories of Nutritional Status given by Indian Academy of Pediatrics

Category	Grade Range (Percentage)	Status
Grade Normal	Above 80	Standard
Grade- 1	71-80	Mild
Grade-2	61-70	Moderate
Grade-3	51-60	Sever
Grade-4	Below 50	More sever

Source: Compiled by the Authors

Under weight expressed as actual weight/standard weight x100 is considered to be a better indicator of nutritional status of children. Table 2 show the percentage distribution of children by nutritional index through weight-for-age in Malda district. Study reveals that only 42.30 per cent of the total children are normal followed by 20.17 per cent of grade-1, 12.32 per cent of grade-2, 14.85 per cent of grade 3, and 10.36 per cent of grade 4 in the study area. Majority of the children fall under the below standard of nutritional index in the study area.

Table 2: Distribution of Nutritional Index through Weight-For-Age among 0-14years Children in Malda District, 2009

Category	Grade Range (Percentage)	Status	Percentage
Grade Normal	Above 80	Standard	42.30
Grade- 1	71-80	Mild	20.17
Grade-2	61-70	Moderate	12.32
Grade-3	51-60	Sever	14.85
Grade-4	Below 50	More sever	10.36
Total			**100.00**

Source: Field Survey, 2009

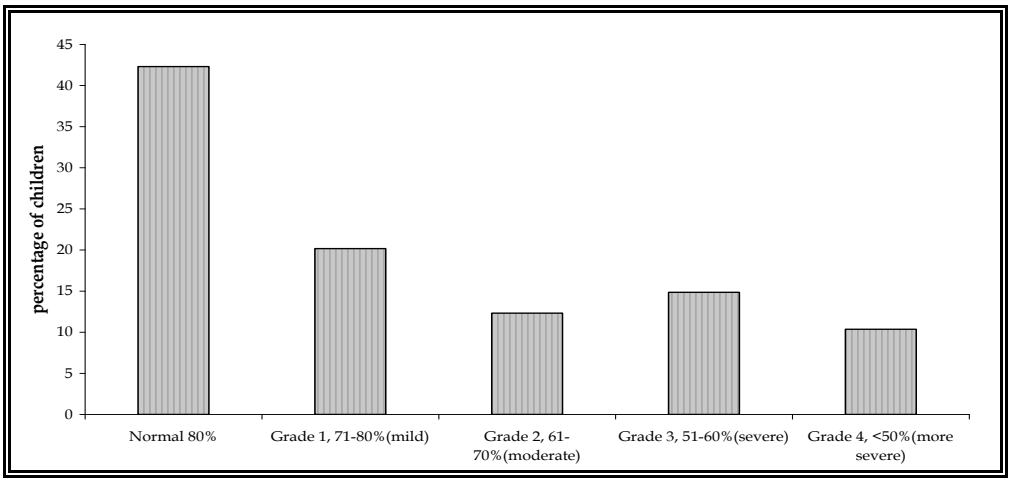

Figure 3: Distribution of Nutritional Index through Weight-for-Age among 0-14 Years Children in Malda District, 2009

Height for Age (Measurement of Stunting, WHO)

Height for age is another important indicator of nutritional status of children. It is expressed as actual height / standard height of that age x100 is considered to be good nutritional status of children. According to World Health Organization (WHO), height for age is used to classify children in to various nutrition grades, namely, normal (more than 90 per cent of the standard), stunting (80-90 per cent) and sever stunting (less than 80 per cent). Table 3 depicts that 57.98 per cent children of the study area are normal followed by 23.25 per cent stunting and 18.77 per cent severe stunting. In the study area, majority of the children come under the normal grade of nutritional status in terms of height for age measurement.

Table 3: Distribution of Nutritional Index through Height-for-Age among 0–14 Years Children in Malda District, 2009

Type	Grade Range (Percentage)	Status (Percentage)
Normal	Above 90	57.98
Stunting	80-90	23.25
Severe stunting	Below 80	18.77
Total		**100.00**

Source: Field Survey, 2009

Weight-for-Height

Wasting is another indicator of nutritional measurement of children. The children falling above 80 per cent of the scale are known as normal, between 70 and 79 per cent are considered as wasting and below 70 per cent are classified as being severely wasted. It is calculated in this way- actual weight / standard weight in that height of the children x100. Table 4 reveals that 55.74 per cent of the total children in the study area fall under normal category, 25.77 per cent under wasting category and 18.49 per cent under severe wasting category (Table 4). The table further reveals that majority of the children come under normal nutritional index through weight-for-height in the sample area.

Table 4: Distribution of Nutritional Index through Weight-for-Height among 0–14 Year's Children in Malda-2009

Type	Grade Range (Percentage)	Status (Percentage)
Normal	Above 80	55.74
Wasting	70-79	25.77
Severe wasting	Below 70	18.49
Total		**100.00**

Source: Field Survey, 2009

Table 5: Village-Wise Distribution of Men's and Women's Body Mass Index in Malda District, 2009

Village Name	Total Sample	Male					Female				
		<18.50	18.50-25.00	>25.00	UW+OW	T	<18.50	18.50-25.00	>25.00	UW+OW	T
Bhairabpur	115	23.68	71.04	5.26	28.95	33.04	13.16	76.32	10.53	23.68	33.04
Kauwamary	103	19.44	66.67	13.89	33.33	34.95	25.71	51.43	22.86	48.57	33.98
12gachhia	133	12.24	61.31	22.45	34.69	36.84	18.37	53.06	28.57	46.94	36.84
Jitarpur	42	43.75	50.00	6.25	50.00	38.10	13.33	53.33	33.34	46.67	35.71
Saharatola	139	10.00	54.00	36.00	46.00	35.97	10.00	66.00	24.00	34.00	35.97
Paranpur	19	00	50.00	50.00	500.00	31.58	00	75.00	25.00	25.00	42.11
Panchpara	22	25.00	75.00	00	25.00	36.36	13.00	70.00	00	30.00	45.45
Maruabadi	47	00	92.86	7.14	7.14	29.79	11.76	76.47	11.76	23.53	36.17
Dulalgaunj	93	7.41	66.67	25.92	33.33	29.03	16.22	72.97	10.81	27.03	39.78
Godhantola	71	16.00	68.00	16.00	32.00	35.21	23.08	69.23	7.69	30.77	36.62
Sheikhpura	131	2.08	66.67	31.25	33.33	36.64	18.75	58.33	22.92	41.67	36.64
Chandipur	64	21.74	56.52	21.74	43.48	35.94	25.93	55.56	18.52	44.44	42.19
Mahmmadpur	67	12.00	72.00	16.00	28.00	37.31	28.57	60.71	10.71	39.29	41.79
Bamungola	132	15.79	71.05	13.16	28.95	28.79	21.57	64.71	13.73	35.29	38.64
Paruipara	68	22.73	59.09	18.18	40.91	32.35	36.00	52.00	12.00	48.00	36.76
Total	**1246**	**14.59**	**65.41**	**20.00**	**34.59**	**34.11**	**19.61**	**62.72**	**17.67**	**37.28**	**37.24**

Source: Field Survey, 2009

Note: OW= Over Weight, UW= Under Weight, T= Total

Nutritional Status of Adults Population

The average value of BMI is differing for both males and females and the same BMI classification is used for both. Table 6 shows that 64 per cent of the adult have BMI in between 18.5 and 25.0, who are considered as normal and only 18.79 per cent adult are found over weight /obese and 17.21 per cent adult are belong to underweight category in the study area.

But, India shows a different pictures, about 50 per cent of the population had less than 18.5 per cent and only a negligible proportion (0.2 to 05 per cent) are found to be overweight (Naidu *et al* ., 1991). Table 5 shows the inter-village variation of male and female Body Mass Index of the sample area. When the BMI values are examined in relation to occupational structure, it is observed that adult men and women from households with more than 5 *Bigha* (1.653 acre) of land have better BMI status compared to the landless laborers.

Table 6: Men's and Women's Body Mass Index in Malda District, 2009

Type	Range	Percentage
Underweight	Below 18.5	17.21
Normal	18.5 to 24.99	64.00
Overweight	25.00 and above	18.79
Total		**100.00**

Source: Field Survey, 2009

CONCLUSIONS AND SUGGESTIONS

The above analysis revealed that the occurrence of both severe and mild under-nutrition among 0-15 years' old children is strikingly high, which is 20.0 and 10.36 per cent respectively. However, stunting (both mild and severe) is more pronounced in Malda district. Wasting (25.77 per cent) in its mild form is more prevalent in the sample villages. Incidence of under nutrition in rural area is 52.02 per cent. Similarly stunting and wasting proportions in rural parts of Malda district are 23.25 per cent and 25.77 per cent respectively that were significantly higher than in urban areas.

The study depicts that the nutritional status of children and adult groups of population is not so good in the study area. To improve the nutritional status in the study area following remedial measures should be adopted.

- Appropriate actions should be taken immediately as per the guidelines of the National Food and Nutrition Policy and National Plan of Action for Nutrition to save the study area from the silent curse of malnutrition.
- There is an urgent need to intensify efforts to improve the nutritional profile of people to optimize human resource development.
- Diet food for people needed to be ensured.
- Compassionate attitude towards mother by the family member.
- Promotion of breastfeeding.
- Strategies to promote complementary feeding, with or without provision of food supplements.
- Micronutrient interventions.
- The nutritional and health status of children in the age group 0-14 years should be improves.
- More than 57.70 per cent of the children had low birth-weight. Nutritional programmes and policies should be focused on: (a) intervention from the early pregnancy period; (b) importance in rural areas; and (c) targeting young women.
- Special attention should be given to weaker sections of the society.
- Special attention should be given on female education, because education has emerged as the single most important factor affecting food and nutrition security. The strong positive correlation between literacy and various education levels of mothers with children's nutrition levels has been verified in various studies across diverse developing countries and has also been shown to have the largest impact.

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