

Understanding Food and Nutritional Security Status Through A Regional Perspective



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Preface

Food is the basic need and everyone has birth right but everywhere people are facing food problems. Worldwide people are not getting basic food to live active and healthy life. According to WHO report (2020) more than 690 million people are food insecure in the world and Asia, Africa and Latin America are called the storehouse of food insecure population. Worldwide various organizations, agency and each countries government were taking initiative to reduce to poverty level as well as provide minimum food but due to lack of infrastructure, management, lack of funds, government corruption and various associated factors are vital caused to reduce poverty very slowly. The developing countries are facing more problems where nearly 90% under nourished people are living. World produced sufficient amount of food but everyone could not get availability, accessibility and stability. When worldwide billions of tons food is wasted by people, government and so one, at the same time millions of people do not get minimum food for feeding. Mainly unequal distribution and lack of purchasing are other reasons for food insecurity. Five years after worldwide targets to end poverty but still 8.9% of the world population are food insecure. WHO said that 57percent population in Southern Asia and sub-Saharan Africa cannot afford a healthy diet and two billion population worldwide did not have access to sufficient amount, safe, nutritious food in 2019. According to WHO, currently 21.3% of children under 5years of age were stunted, 6.9percent wasted and 5.6 percent overweight. India, China, Bangladesh, Pakistan Nepal etc. are countries where regional inequality and unequal distribution of food are the major challenges and government still fails to reduce poverty satisfactorily. So large percentages of people are living here under below poverty level and most of the households are maintaining caloric requirement from staple food. In India, its 27% population are living below the poverty level and in terms of caloric intake and healthy food intakes very low percentage of households are food secure. The study area is very backward region in India where almost every year flood occurs and washes away crops, food storage, collapses houses and properties. According to government estimates, more than 50percent population are still living under the below poverty level and this district has the habitants of minority Muslim, Santhal tribes, Scheduled caste and Scheduled tribes' populations. Socio-economically these sections of populations are backward all over India and here also same situation prevails. Malda district is predominantly agriculture based where maximum households depend on crops field and migratory works. The main aims of this study is to show the food security status on various dimensions, area and various communities are considered for determinants. Because food security status also varies from community to community due to their food habits as well as socio-economic conditions. The study will be very useful to those researchers who will

work in the fields of food insecurity, poverty, hunger, malnutrition, and related aspects and this study gives very clear explanation on the basis of various dimensions.

Dr. Md Ismail

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This book is based on research and fieldwork conducted in 2015, and it highlights the scenario of food security status in Malda district from various perspectives. Firstly, I am grateful to Dr. Md. Mustaquim and all of the geography department's faculty members, as well as research scholars at Aliah University. I am also grateful to Prof. Sanat Kumar Guchhaite, Prof. Ranjan Basu, Prof. Giasuddin Siddique, Prof. Atikur Rahman, Prof. Maloy Mukhopadhyay, Prof. Vishwambhar Prasad Sati, and Professor. Azizur Rahman Siddiqui for their guidance and support. I am really thankful to a number of friends and juniors for their consistent support and help all the time. Finally, I would like to acknowledge with gratitude, love, and respect my parents and family members. Finally, I would like to thank RK Book Publisher, New Delhi, for providing opportunities to share my work and skills.

Dr.Md Ismail

Dedication

Dedicated to my parents,

MD. FARMAN ALI AND SAYEDA KHATUN

List of Abbreviation

WHO-World Health Organizations
NSS-National Sample Survey
ICMR-Indian Council of Medical Research
FAO-Food and Agriculture Organization
HDI-Human Development Index
HAD-High developed areas
MDA- Medium developed areas
SDA-Santhal Dominated areas
AMD-Muslim dominated areas
LDA-Low developed areas
FPA-Flood prone areas
LPG-Liquid petroleum gas
PDS-Public Distribution System
APL -Above Poverty Line
BPL -Below Poverty Line
AAY-Antyodaya Anna Yojana
BMI-Body mass index
CED-chronic energy defeciency
NNMB-National Nutrition Monitoring Bureau
RDA-Recommended Dietary Allowances
MBI-Medical and Biomarker indicator
AFSI-Anthropometric food Security Index
PUP-percentage of underweight population
PWC-Percentage of wasting children
PUC-Percentage of underweight children
PSE-Percentage of stunting children

GHI-Global hunger Index

RFSAI-Regional food security analysis index

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Introduction

Struggle for food is not a new phenomenon that started with the origin of humans. Ancient people struggled for food and searched for food in forests and rivers, as well as hunting animals and birds. But due to the scarcity of food and rapid population growth, they were bound to settle in a suitable location where they could produce food grains. So, most of the human civilizations were found in fertile river valleys, which were the best places for agricultural production and easy to communicate through water from one place to another. Ancient civilizations were also starting businesses from one place to another that were mainly exchanges of goods, food grains, and all other essential requirements. These processes were slowly converted into business and today's monetary values. In ancient times, there were problems communicating from one far-distance place to another, so inequality and regional imbalances were great, and at the time, it was impossible to remove and quick transport goods, such as food grains, to other places. But now, all types of facilities are available, and the world has surplus food production. In spite of this, worldwide, more than 690 million (WHO) people are food insecure, which is 9.8 percent of the world population, and under-5-year-old children are living in measurable conditions. At the same time, nearly 33% of global production is wasted, which will serve more than 3 billion people annually. The developed world wastes more food at the dining table as well as everywhere, as compared to the developing world. According to a report, 931 million tons (UNEP-2019) of food were wasted in the world in 2019, and Indian households are also wasting an average of 50 kg annually, while more than 31 percent of the population is not getting sufficient amounts of food to maintain their diet. According to WHO estimations, India has a minimum food requirement of 1760 kcal per person per day, and NSS data reported that Indian people received more than the required number of calories. Whereas average caloric availability in rural areas is 2099 kcal per day, urban people receive 2058 kcal per day. But the continuously released report indicates that every year since 2014, India's ranking decreased, which means the level of poverty and hunger increased. Nearly 6.2 crore more populations are adding to the poverty list in 2019 as compared to 2014. Now, India only accounts for more than 22% of the world burden of food insecurity, while India has a nearly 17% world population. India has the highest hunger population in the world, and India was ranked 103 out of 119 countries according

to the 2018 global hunger report (The Hindu). The poverty populations are also unequally distributed across the country. Bihar, Orissa, etc. have the highest percentage of below-poverty-level populations, and a few states in India have marginal numbers of poor populations. But West Bengal has a large number of poor people. According to a recent survey, more than 18.7 percent of households in West Bengal have gone to bed hungry in the last 30 days, and 44 percent of households are reporting that they have to borrow to meet their food requirements (a statement issued by the Right to Food Campaign). The study was conducted over 21 districts in West Bengal, and 2906 samples were collected for this study. The study also traces out that 68 percent of households have reduced their daily pulse consumption, followed by vegetables (69%), wheat, and rice (66%), and 80 percent have seen a decline in consumption of non-vegetable foods like meat, eggs, fish, etc. in the last 30 days. This is the impact of COVID-19, and due to lockdown, a large proportion of people are losing their jobs and incomes, which directly affects food security systems (13th December, 2020, News Citis Kolkata, Hunger Situation in West Bengal critical, field survey, Sandeep Saxena, Shiv Sahay Singh.) pictures and actual situation in the district as well as regional and various ethnic communities' food security status.

Conceptual framework

Food requirements and various types of nutrients are important for living an active and healthy life. The human body is in need of a variety of nutrients for various physiological growths. The Indian Council of Medical Research suggests the daily amount of food for Indians on the basis of weight and age. Each country has different recommended dietary allowances according to requirements. Food contains various types of food components that are derived from different foods, and the amount of each food is essential for individual growth. In this way, the requirements of the dietary allowances depend on the body weight, age, climate, and physiological and metabolic status of the individual (ICMR, 2009). Food variation and food components of the diet must be selected consciously to supply all the nutrients needed to meet the daily human body requirements in proper proportions for proper functioning. The amount of each food component and nutrient is very essential for maintaining individual body weight and height and also ensuring proper body function. Adults need all types of required amounts of food components for the maintenance of body weight and ensuring proper body function. Infants and

young children are not maintaining their body weight and height; they are also growing very quickly. According to the ICMR, the daily recommended amount of calories is 2400 kcal for rural areas and 2100 kcal for urban areas. But this recommended amount of food required a balanced diet, and most Indian households consumed less than the recommended amount. About 80% of caloric intakes come from cereals and other main staple foods. Food securities generally refer to ensuring a sufficient amount of food for an active and healthy life. It does not mean an increase in caloric consumption from the recommended amount.

Food security as a concept originated in the mid-1970s in the discussions of international food problems during the time of the global food crisis. The initial focus of attention was primarily on food supply problems—ensuring the availability and, to some degree, the price stability of basic foodstuffs at the international and national levels. That supply-side, international, and institutional set of concerns reflected the changing organization of the global food economy that had precipitated the crisis. A process of international negotiation followed, leading to the World Food Conference of 1974 and a new set of institutional arrangements covering information, resources for promoting food security, and forums for dialogue on policy issues.

According to the Food and Agriculture Organization (FAO), food security exists when all people, at all times, have physical and economic access to sufficient, safe, and nutritious food to meet their dietary needs and food preferences for an active and healthy life. Food security has three components, viz., availability, access, and absorption (nutrition). The three are interconnected. Many studies have shown that improvement in nutrition is important, even for an increase in the productivity of workers. Thus, food security has intrinsic (for its own sake) as well as instrumental (for increasing productivity) value.

The concept of food security cannot be restricted to the boundaries of a country alone; it is a global concept. Hunger and deprivation in any part of the world are totally incompatible with the food security concept of the modern world. No region of the world is totally free from scarcity and crop failure, but on a world-wide basis, the surplus of one region would go a long way in meeting the deficit of others. In countries with chronic deficits, however, domestic production may not be adequate to sustain the necessary reserves, and in their case, the stocks could be built through imports alone. Such deficit countries are generally short of foreign exchange to finance the import bill, and they will need the assistance of the surplus countries as well as of the

international financial institutions to build up their reserve and the infrastructure needed for it. It is in this sense that the concept of food security is global (Acharya, 1983).

World Health Organization (WHO): "Food security means that, (a) all people at all times have both physical and economic access to enough food for an active, healthy life (b) the ways in which food is produced and distributed are respectful of the natural processes of the earth and thus sustainable; (c) both the consumption and production of food are governed by social values that are just and equitable as well as moral and ethical; (d) the ability to acquire food is ensured; (e) the food itself is nutritionally adequate and personally and culturally acceptable; and (f) the food is obtained in a manner that upholds human dignity."

In 1986, the highly influential World Bank report "Poverty and Hunger" focused on the temporal dynamics of food insecurity. It introduced the widely accepted distinction between chronic food insecurity, associated with problems of continuing or structural poverty and low incomes, and transitory food insecurity, which involved periods of intensified pressure caused by natural disasters, economic collapse or conflict. This concept of food security is further elaborated in terms of: "access of all people at all times to enough food for an active, healthy life". "Food and nutrition security is achieved, if adequate food (quantity quality, safety, Socio-cultural acceptability) is available and accessible for and satisfactorily used and utilized by all individual at all times to live a healthy and active life. "This definition combines food and nutrition security and emphasizes several aspects, i.e. availability, accessibility, inclusion of the used and utilization aspect underscores the fact that nutrition security is more than food security. Food security means that food is available at all times, that all persons have means of access to it, and that it is nutritionally adequate in terms of quantity, quality and variety; and that it is acceptable within the given culture. Only when all these conditions are in place, can a population be considered "food secure" (food and agriculture organization (FAO) of the United Nations 1996).

Ganapathy et al. (2005) and power see the core of food security as a bivariate concept composed of anti-hunger or poverty elimination goals on the one hand and goals related to food system issues on the other. The two dimensions of the concept essentially relate to food access goals in terms of quantity and quality, respectively. An anti-hunger or anti-poverty approach argues that

people should have a sufficient quantity of food and/or enough income to access a sufficient quantity. The food system approach expresses a concern with the quality of food that is available, how food is produced, and the impact of its production, distribution, and consumption on individuals and communities.

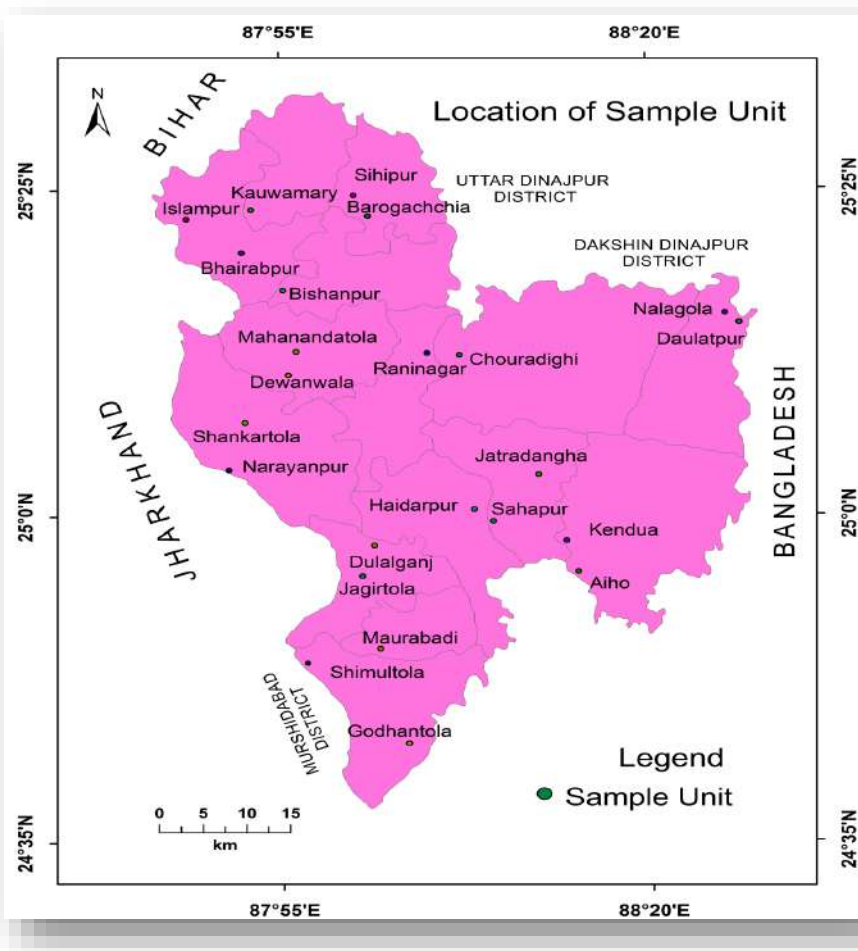
Research Methodology

The study is based on both primary and secondary sources of data, but more attention is given to primary sources. The primary data is collected through a personal interview with a suitable questionnaire. The procedure for data collection is based on sampling techniques. The whole district has been divided into three categories based on the HDI report, which is fully dependent on secondary information. All 24 sample units are randomly taken from 15 community development blocks in the district. All the sample units are taken from categorically three regions, namely, low-developed regions, medium-developed regions, and high-developed regions (classification based on the HDI report, 2007, Appendix Table I). A minimum of one sample unit is taken from each community development block, and after that, a few numbers of selection criteria are adapted for the collection of sample units. The sample units are randomly taken from flood-prone areas, border (frontier), urban areas, Muslim-populated areas, and tribal-populated areas in the district. The studies try to show the food security variation on the basis of five dimensions that have a great impact and are the most effective factors for determining food security. Food security status varies by caste, class, religion, and area. Food security varies from hilly areas to plain areas and has found huge differentiation, and socio-economic status and food habits also determine the food security status. So, here, firstly, the whole district has been divided into three types, and data has been collected on the basis of five dimensions. The whole data has been calculated on the basis of three dimensions, namely, high, medium, and low-developed areas, and secondly, the food security has been found on the basis of five dimensions. Secondary data are collected from Census of India publications, statistical handbooks, district HDI reports, various district planning reports, as well as research papers, theses, articles, newspapers, etc. Various statistical methods and diagrams were applied to show an accurate result.

Tools Used

During the field survey, a weight machine is used for the weight measurement of household members, and tape and chains are used for the measurement of height. Four members have been considered from each household for measurement of weight and height; among them, one is an adult male member, followed by one adult female, one female child below 14 years of age, and one male child. All the members of households are not considered for the study.

Fig3.1 Location of Sample Units in the Blocks of Malda District



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Analysis of regional food security determinants

Food security is an important and burning problem in the 21st century. So, it is a great concern for researchers, academicians, and planners. The status of food security in regions, countries, and communities depends on a number of factors, which can be identified on the basis of indicators. The indicators of food security are not only composed of the status of food security; they're also dependent on a number of determinants that can properly measure the status of food security at the regional or even individual level. Food security is a multi-complex issue, and its definition has changed from time to time. The question of food security status has depended on a number of dimensions that go beyond production, availability, use, utilization, and demand for food. The following determinants are very fundamental to measuring the status of households' food and nutritional security.

Sex Ratio

Women are playing an important role in reducing food insecurity and have great significance in providing supplementary food, both through supply-side linkages as food producers and through demand-side linkages as food consumers. Females are guarantors of food security at the household and community level. Women are the first family members to go hungry when there is not enough food (Mukherjee, 2001). Where women's work participation is high, growing subsistence crops ("kitchen gardens") do exist; they are monitored and maintained primarily by women and are shown to have increased the food security of the household (Yiridoe & Anchirinah, 2005). About 75% of the food in developing countries is produced by women, and they account for 70% of the impoverished in the same regions (Silva, D. et. al., 2002). According to a study by Osman Ibnouf (2009), women are more able than men to improve their household's food security when they have access to and control over resources such as land and income a study done by Osman Ibnouf (2009). As reported by IFPRI in Smith et. al. (2003). Specifically in India, Dyer and Bruce (1988) found that rural women spent the majority of their income on basic household needs, while men spent a noteworthy amount of their income on personal wants like alcohol and tobacco. The sample area has been divided into eight categories on the basis of their

characteristics. High-developed areas refer to those areas where socio-economic status is high as compared to other rural areas in the sample area. Table 1 shows the sex-wise distribution pattern among sample areas in Malda district. The whole area has been divided into six dimensions, and special attention has been given to Santhal and Muslim-dominated areas. So, parallel food security status is shown in this study, and these two areas are also considered for two separate dimensional regions. The highest sex ratio is found in flood-prone areas, with 941 females per 1000 male members, followed by Santhal-dominated areas with 918 females per 1000 males. Overall, the sex ratio in the sample area in Malda district is very low as compared to the national average as well as the state average. The sex ratio among high-developed areas is 914 females per 1000 males, followed by low-developed areas (965), medium-developed areas (870), very close to border areas (869), urban areas (859), and a very low ratio found among Muslim-dominated areas in the district, which is 847 for 1000 males. The average sex ratio among sample areas in the district is 892 females for 1000 males. Balanced sex plays an important role in promoting the food security status of households because males are still the main sources of income, and today, females also play a great role in reducing the level of food insecurity within households. Deaton (1989) examined the problem of gender discrimination in the allotment of goods by developing an 'outlay equivalent' technique. This study establishes a link between consumption of food relative to non-food and the ratio of males to females in a household. He evaluated whether the reduction in expenditure on adult goods is larger for households with a female child or larger for households with a male child.

Age-Sex Composition

According to (2012), the Food Security and Agriculture Cluster's Emergency Food Security and livelihood study draft report for Afghanistan reported that girls under five years of age and people over 65 years of age are the most food insecure groups in the population. Nearly 38 percent of the population among 50–59-year-olds experienced marginal food insecurity from 2007–2009, but only above the 20 percent increase among those over the age of 60 and less than 46 percent increase among those over the age of 40. Another study shows similar trends for food insecurity as we saw for marginal food insecurity, with the exception that rates of food insecurity for 40–49-year-olds increased by an astounding 68 percent compared to 38 percent for 50–59-year-olds and 25 percent among those over 60. This study again finds that very low food security

rates are higher among middle-aged groups than for seniors, but in this case, the 40–50-year age group had comparable increases to those in their 30–40-year age group (69 percent versus 71 percent) (James, P. Z., and Craig, G. 2011). Age-sex composition is an important determinant of socio-economic development.

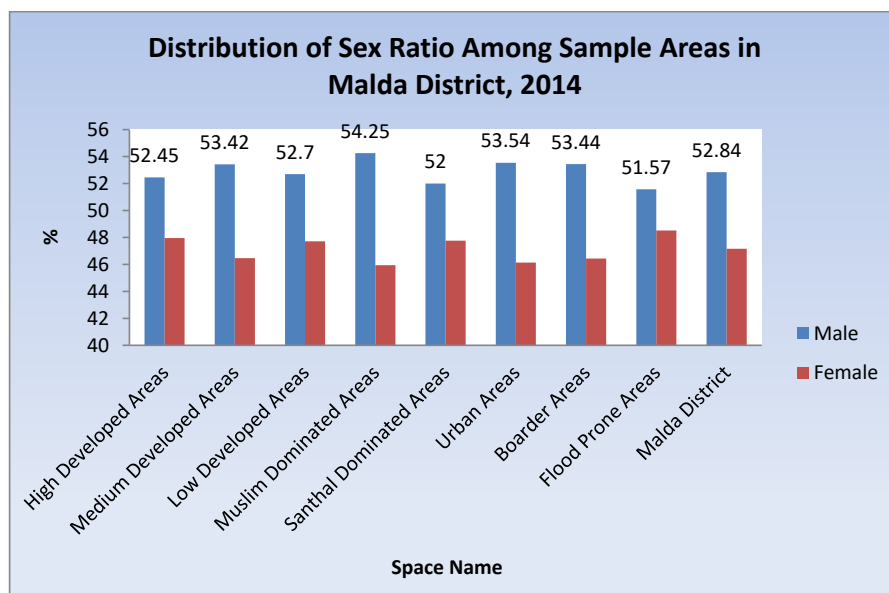


Fig. 1

Age structure is determined to measure the working populations according to the primary survey. Nearly 14.88% of the of the population among samples in the Malda district belongs to the below-0–6-yyear age group, and 20.69% belong to the 6–15-yyear age group, followed by the working population 15–59 years old (60.42% and 4.06% are old (60 and above). The distribution of population is unevenly distributed over the district, and there is also an age variation from region to region. The highest number of 0–6-yyear-olds is found in flood-prone areas in the district, which is 17.95% of the total population, followed by low-developed areas (17.46%), medium-developed areas (16.54%), Muslim-dominated areas (15.41%), Santhal-dominated areas (14.18%), high-developed areas (14.11%), border areas (13.77%), and urban areas (11.75%).

The 6–15-yyear population shared more than 20.69% of the total population in the study area. According to the field survey, the highest number of 6–15 year-old population groups are found

in low-developed areas, which is more than 25% of the total population in the areas, followed by Muslim-dominated areas (24.06%), flood-prone areas (22.52%), high-developed areas (20.55%), border areas (20.42%), medium-developed areas (18.97%), Santhal-dominated areas (18.18%), and urban areas (16.65%), which are recorded as the lowest number.

Table 2: Age- Sex Composition of Population in Malda District, West Bengal, 2014

Study Units	0-6 YEAR %			(6-15 years)			15-59years			60 years &Above		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
High developed areas	14.11	50.00	50.00	20.55	55.72	44.28	62.47	51.39	48.61	3.27	56.25	43.75
Medium developed areas	16.54	48.41	51.59	18.97	60.00	40.00	61.64	52.82	47.18	2.74	53.85	46.15
Low developed areas	17.46	58.06	41.94	25.02	48.87	51.13	53.74	52.40	47.60	4.18	51.92	48.08
Muslim dominated areas	15.41	64.42	35.58	23.06	51.23	48.77	57.37	52.39	47.61	4.35	56.52	43.48
Santhal dominated areas	14.18	51.28	48.72	18.18	58.00	42.00	64.61	51.22	48.78	2.79	39.13	60.87
Urban areas	11.75	49.07	50.93	16.65	57.52	42.48	64.31	54.48	45.52	6.96	45.31	54.69
Boarder areas	13.77	51.69	48.31	20.42	58.29	41.71	61.84	53.02	46.98	3.85	42.42	57.58
Flood prone areas	17.95	54.25	45.75	22.52	53.01	46.99	56.14	50.53	49.47	3.47	43.90	56.10
Malda District	14.88	54.08	45.92	20.69	54.78	45.22	60.42	52.10	47.90	4.06	48.36	51.64

Source: Field Survey, 2014

Age group 15-59 populations are mainly considered working populations. These groups of people change the socio-economic set-up of any region. About 60.42% of the population among the sample areas in the Malda district belongs to the 15- to 59-year age group. The highest number of working populations is mainly concentrated in Santhal-dominated areas, which make up 64.61% of the total population, followed by urban areas (64.31%), high-developed areas (62.47%), border areas (61.31%), medium-developed areas (61.64%), Muslim-dominated areas (57.37%), flood-prone areas (56.14%), and low-developed areas (53.74%).

Nearby 4.06% population is the study areas of old age population belongs to 60 and above 60 years. The highest number of elderly people is recorded in urban areas, which is 6.96%, followed by Muslim-dominated areas (4.35%), local developed areas (4.18%), border areas (3.85%), flood-prone areas (3.47%), high developed areas (3.27%), medium developed areas (2.74%), and Santhal-dominated areas (2.79%). Sex ratios among various groups of people vary from region to region. The given table shows the age-wise sex ratio, which is based on various determinants in the study areas.

Literacy Rate and Level of Education

The Food and Agriculture Organization and the World Food Programme (2010) reported that lower literacy results in a high level of undernourishment that indicates low food security. According to the result, basic education also significantly helps in increasing food security and nourishment by enhancing the farm productivity of small and subsistence farmers. As expressed in the Human Development Report of South Asia (1998), "According to the World Bank report, a farmer with only four years of education is 9 percent more productive than his counterparts with zero education." Burchi (2006) studied the relationship between education, human development, and food security status across the countries, and his study found that a 100 percent increase in younger children's attendance at school can reduce about 22 percent of food insecurity, but this relationship was observed only for basic education and not for higher education. The World Food Programme and Food and Agriculture Organization (2010) observed a negative relationship between the Global Hunger Index and education, along with many other indicators. Literacy and female education play pivotal roles, while a lack of knowledge may result in caloric deficiency despite the availability and access to ample food (Kugelman and Hathaway, 2010). Emphasis on women's education may alleviate undernourishment in society. A primary-pass woman is instrumental in reducing undernourishment three times as much as increments in income by 10 percent (Alderman and Garcia 1993). In the case of Pakistan, it was observed that a 10 percent increase in male literacy causes a 2.7 percent rise in farm productivity, while 10 percent enhancements in any other input augment half the level of output as compared to education (Rosegrant and Evenson 1993). Illiteracy has been termed economic backwardness, which is a major cause of conflicts (Do and Iyer, 2009), leading to the immobility of the people due to dread and, consequently, food insecurity amongst them. Ample education infrastructure definitely helps to promote the literacy rate, which is one of the key components of human development indicators.

Literacy has a great impact on poverty alleviation as well as on hunger reduction. The uneducated people are the most poor and malnourished. In urban areas, the impact of literacy on poverty is the highest. Education, even above the primary level, is extremely effective in reducing both food security and hunger. Graduate and technical education is, of course, the most important instrument for reducing insecurity. But its impact is most visible in poverty reduction. Therefore, the education policy of the country must be geared to decrease illiteracy as soon as

possible, as 35 percent of the population is still illiterate. Free education up to the eighth standard coupled with a midday meal in the schools will go a long way in reducing both poverty and hunger and will thus help build a strong India. It will also greatly reduce the violation of child labour rules and offset some of the non-tariff restrictions imposed by developed countries on exports from developing countries on the ground of the use of child labour. The population commission of the United Nations considers the ability to both read and write a simple message with understanding in any language a sufficient basis for classifying a person as literate (the census of India has adopted this definition). The 2004 State of Food Insecurity Report (FAO 2005, pp. 28–29) highlighted the strong relationship between food insecurity and illiteracy and lack of education on the other hand. More specifically, in rural areas, education improves agricultural productivity, leading to food security (e.g., Jamison et. al., 1982; Pudasaini, 1983; Koffio-Tessio et. al., 2005). FAO is “acclaimed as one of the most powerful engines for reducing hunger and poverty” (FAO 2005, p. 14), and the impact of education on food security is often exclusively conceived in economic terms.

Table 3: Literacy Rate & Level of Education among the Sample Areas in Malda District, 2014

Study Units	Literacy	Primary	Middle	Secondary	Senior Secondary	Graduate & others	PG	Technical
High developed areas	63.81	25.19	39.37	15.67	18.10	11.19	1.87	0.00
Medium developed areas	70.96	22.95	39.32	15.66	14.95	8.01	0.53	0.00
Low developed areas	44.05	32.96	32.52	17.92	7.08	5.31	2.43	0.00
Muslim dominated areas	53.41	30.96	31.38	18.20	9.21	8.16	1.88	0.00
Santhal dominated areas	56.07	22.17	39.80	15.11	12.09	8.56	1.76	1.51
Urban areas	73.37	22.86	22.02	13.45	13.95	14.96	7.39	5.04
Boarder areas	76.73	15.34	40.04	19.93	14.29	9.52	1.76	1.06
Flood prone areas	44.17	36.45	33.18	17.29	6.78	4.21	2.34	0.00
Malda District	58.06	27.14	33.40	16.11	12.21	8.98	2.99	1.21

Source: Field Survey, 2014

The average literary rate among sample areas in the Malda district is 58.06%, which is very low as compared to the national average as well as the state average. The highest literary rate is found in boarder areas in the district, which is 76.73%, followed by urban areas (73.37%), medium-developed areas (70.96%), high-developed areas (63.81%), Santhal-dominated areas (56.07%),

Muslim-dominated areas (53.41%), and the lowest literary rate recorded in flood-prone areas (44.17%).

The study established a very clear relationship between high food insecurity and educational participation in rural areas. Countries with the lowest levels of rural basic education generally have the highest levels of rural food insecurity. However, the relationship between food insecurity and higher levels of education is worth investigating. The study also presents similar results for countries with lower or lower rates of secondary participation and higher or higher levels of food insecurity. The Brown study indicates that in countries where there is high or very high rural food insecurity, along with low or very low secondary education participation, there would appear to be a general dependency, but not a high correlation. (Pasquale De Muro and Francesco Burchi, 2007)

The level of education is another determinant that reduces the level of poverty. Most of the people educated up to primary to middle (primary pass 27.14% and middle pass 33.40%), followed by secondary (16.11%), senior secondary (12.21%), only 8.78% are graduates, postgraduate (2.99%), and 1.21% are technical educated.

Primary Pass

About 27.14% of the total literate population is primary-educated. The highest primary educated population is found in flood-prone areas among eight dimensions, which is more than 36%, and the 2nd highest primary educated people are found in low-developed areas (32.96%), followed by Muslim-dominated areas (30.96%), high-developed areas (25.19%), medium-developed areas (22.95%), Santhal-dominated areas (22.17%), urban areas (22.86%), and the lowest primary educated population is found in border areas, which is 15.34%.

Middle Pass

About 33.40% of the population among the samples in the study area is educated up to middle school. The highest numbers of middle-educated people are found in border areas among sample areas in the Malda district, which is more than 40% of the total educated population. The second-largest number of middle-pass literary areas are concentrated in Santhal-dominated areas among the sample literate in Malda district, which is 39.80%, and medium-developed areas are very close to Santhal-dominated areas, which is 39.52%, followed by flood-prone areas (33.18%), low-developed areas (32.52%), Muslim-dominated areas (31.38%), and urban areas (22.02%).

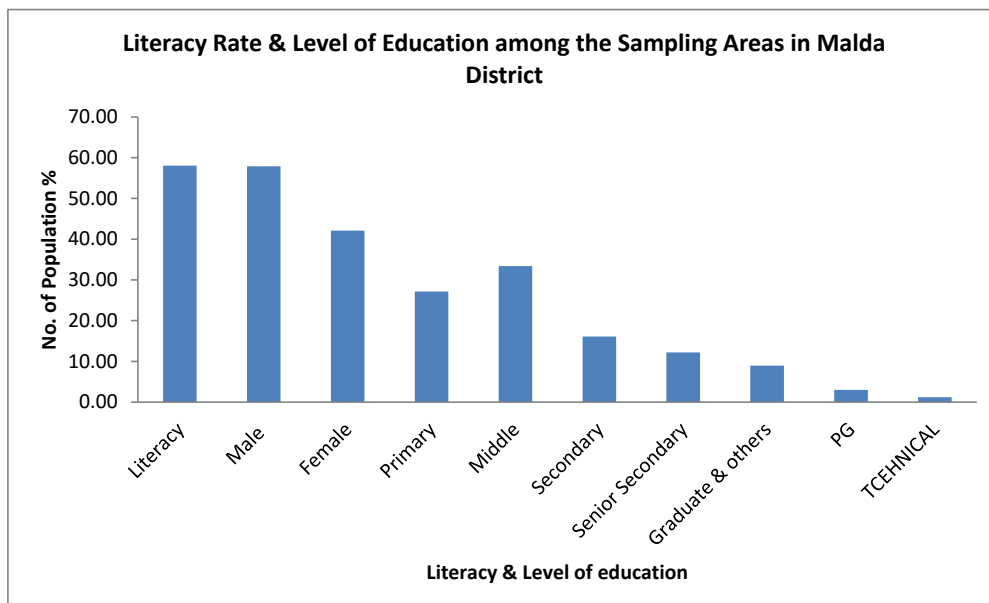


Fig. 3

Secondary Pass

Nearly 16% of the total literate populations among the sample areas in Malda district are secondary educated. The highest number of secondary pass educated population is found in border areas, which is 19.23%, followed by Muslim-dominated areas (18.20%), LDA (17.92%), flood-prone areas (17.29%), high-developed areas (15.67%), medium-developed areas (15.66%), Santhal-dominated areas (15.11%), and urban areas (13.45%).

Senior Secondary Pass

According to the field survey, 12.21% of the population is a senior secondary pass among the sample in the Malda district. High-developed areas have the highest senior secondary-pass educated population, which is 18.10%, followed by medium-developed areas (14.95%) and border areas (14.29%). About 13.95% of the of the population is educated up to senior secondary in urban areas, followed by Santhal-dominated areas (12.09%), Muslim-dominated areas (9.21%), and a very low number of senior secondary pass population is found in flood-prone areas (6.78%) and low-developed areas (7.08%).

Graduates and others

8.98 percent of the total literate population is a graduate, equivalent to a graduate pass, among sample areas in Malda district. The highest number of graduates are found in urban areas, which is 14.96%, and the second largest number are concentrated in developed areas in the Malda district. Nearly 9.52% of people are graduates in border areas, followed by Santhal-dominated areas (8.56%), Muslim-dominated areas (8.16%), medium-developed areas (8.01%), and a very low number of graduate-passed populations are found in low-developed areas (5.31%) and flood-prone areas (4.21%).

Post Graduate

2.79% of the population among the literate are post-graduation-passed. The highest number of postgraduate passers is living in urban areas, which is 7.39%, and others in the region have a very low postgraduate population. According to the field report, 2.43% of the of the PG pass population lives in low-developed areas among the sample in the Malda district, followed by 2.34 percent (flood-prone areas), high-developed areas (1.87%), Muslim-dominated areas (1.88%), border areas, and Santhal-dominated areas (1.76%). A very low number of postgraduate pass populations live in medium-developed areas, which is only 0.53 percent.

Technical Education

The participation rate in technical education is very low. Only 1.21% of the population among the total literate are technically educated. The highest number of technically educated people live in urban areas in the Malda district, which is 5.04%, followed by Santhal-dominated areas (1.51%), and 1.06% are found in border areas. In the remaining regions among the sample, no educated people are found.

Work Participation

Work participation rate and dependency ratio are closely interrelated. The average work participation rate among sample areas in Malda district is 32.25%, which is very low. Almost all the sample regions in the Malda district have an equal work participation ratio. The highest is 35.15% for urban areas, and the lowest is 29.92% for low-developed areas. Nearly 36.97% is the highest work participation ratio recorded in Santhal-dominated areas; out of them, female work participation is very high, at 21.64%, and most of the labourers are engaged as agricultural labourers as well as bidi workers. The work participation ratio in medium-developed areas is

54.56%, followed by border areas (33.16%), 30.67% (highly developed areas), 29.87% (Muslim-dominated areas), 28.87% (flood-prone areas), and the lowest number of workers are found in low-developed which is 27.92%.

Table 4: Showing the Work Participation, Dependency Ratio, Worker Ratio & Type of Worker

Study Units	No of Worker			Worker Ratio		Type of Work	
	Persons	Work Participation	Dependency	Male	Female	Formal	Non-Formal
High developed areas	300	30.67	69.33	85.00	15.00	48.00	51.33
Medium developed areas	328	34.56	65.44	81.40	18.60	50.61	49.39
Low developed areas	347	27.92	72.08	93.95	6.05	34.87	65.71
Muslim dominated areas	316	29.87	70.13	93.04	6.96	34.18	66.46
Santhal dominated areas	305	36.97	63.03	78.36	21.64	41.97	58.03
Urban areas	323	35.15	64.85	86.69	13.31	35.29	64.71
Boarder areas	285	33.26	66.74	84.21	15.79	41.40	58.60
Flood prone areas	341	28.87	71.13	90.32	9.68	45.45	54.55
Malda District	1940	32.25	67.75	85.57	14.43	39.74	60.26

Source: Field Survey, 2014

Among total workers, more than 85.57% are male workers, and the remaining 14.43% are female workers. The highest rate of female work participation is found in Santhal-dominated areas due to their low level of socio-economic status, and most of the females are engaged as agricultural labourers, household workers, and bidi workers. Rural areas in Malda district have high female work participation because most of the females are engaged as bidi workers, and in urban and developed areas, females are mainly engaged as servicemen. The second largest number of female workers are found in medium-developed areas (18.60%), followed by border areas (15.79%), high-developed areas (15%), urban areas (13.31%), flood-prone areas (9.68%), Muslim-dominated areas (6.96%), and very low work participation among females is found in low-developed areas (6.05%) in the district.

Types of work participation are another important indicator of food security. According to the survey, more than 60.26% of workers are informal, which refers to all work that is not recognized as a normal income source and on which taxes are not paid. The term is sometimes used to refer to only illegal activity, such as an individual who earns wages but does not claim them on his or her income taxes or a cruel situation where people are forced to work without pay. The remaining 39.74% of workers are formal workers among the sampling areas in Malda

district. Formal workers refer to all work with normal hours and regular wages and are recognized as income sources on which income taxes must be paid. The highest numbers of formal workers are found in urban areas, which account for 64.74% of the total workers, followed by high-developed areas (48%), medium-developed areas (50.61%), flood-prone areas (45.45%), Santhal-dominated areas (41.97%), border areas (41.40%), low-developed areas (34.87%), and the largest numbers of formal workers are lived in Muslim-dominated areas (34.18%). The highest numbers of informal workers live in border areas, which are 58.60%, followed by Santhal-dominated areas (58.03%) and flood-prone areas (54.55%).

Female Worker Participation

Women also play a greater role in food security. According to some estimates, women comprise 26 percent of the labour force in agriculture. As far as fisheries are concerned, there is no separate data available, but it could be assumed that the percentage is almost the same (Yadav, Y.S., and Juneja, C.J. 2000). The extensive poultry production, which is limited in the rural sector and managed by housewives, produces 80 percent of eggs and poultry meat in China, compared to 75 percent in Africa and 40 percent in India and other South Asian countries (Kurukshtra, vol. 56, No. 8, page 24).

In Malda district, more than 12.85 percent are female workers; they are engaged as servicemen and in different primary sectors, but most of them are agricultural labourers and Bidi workers. They provide additional family income, which is very important for food security. The highest percentage of housewives supply green leaves weekly for their families, followed by daily supply through collection from outside and cultivation on homestead lands.

Daily farm women enhance the self-life of cereals and pulses through fermentation for the preparation of different types of cake, and weekly through the preparation of dry food mixes. The role of farm women in the supply of staple foods is very important. Some women are involved monthly in the preparation of flattened rice, puffed rice, and valued flattened rice and puffed rice. For the supply of all these food items, the women mobilize their resources through daily labour work (12.86), part-time economic activity, and the sale of farm products (Ismail, M., 2009, unpublished .Phil.).

Employment Structure

A close relationship between employment structure and food security has been observed at the national level. Nearly 54% of workers directly or indirectly fully depend on agricultural sectors. On the other hand, the incidence of food insecurity is the lowest (35.33%) among government servicemen and private job holders (Ismail, M., 2009, M.Phil.). It is generally described that households with their members not being permanently employed have a greater chance of becoming victims of food insecurity.

The space-wise primary sources of data have been used for the present research work. The space-wise rural working force, i.e., total space workers in proportion to the total rural population in percentage, has been calculated. After that, the percentage of workers falls under the six broad categories: (1) service holders; (2) business; (3) farmers; (4) daily labourers; (5) agricultural labourers; and (6) other workers.

Service Holders

The service holders who are engaged in both the government and private sectors made up about 8.7% of the total workers among the sample areas in the Malda district. The highest percentage of service holders recorded in urban areas is 27.55%, followed by high-developed areas (12%), medium-developed areas (7.62%), border areas (6%), Santhal-dominated areas (4.61%), low-developed areas (4.36%), Muslim-dominated areas (3.7%), and flood-prone areas (3.28%).

Self-Employment

Self-employed workers contribute 15.69% of the total workforce. The self-employed include small shopkeepers, large shopkeepers, whole salespeople, various types of shop owners, and all kinds of hawkers, as well as selling activities. The distribution of self-employed persons varies from region to region, likely from 31.25% in border areas to 9.09% in flood-prone areas. The very high percentage of self-employed people are found in border areas (31.25%), followed by high-developed areas (27.6%), urban areas (24.15%), Muslim-dominated areas (18.14%), medium-developed areas (15.72%), Santhal-dominated areas (14.75%), low-developed areas (12.7%), and a very low number of self-employed people are found in flood-prone areas in the Malda district.

Table 5: Employment Structure in Sampling Areas in Malda District, 2014

Study Units	Employment Structure					
	Services	self-employed	Farmer	Daily labour(NA)	Agriculture labour	Others
High developed areas	12	27	19	14.33	8.33	19.34
Medium developed areas	7.62	15.72	23.48	13.1	6.1	33.98
Low developed areas	4.36	12.7	33.72	15.22	20.17	13.83
Muslim dominated areas	3.7	18.14	30.06	15.19	15.82	17.09
Santhal dominated areas	4.61	14.75	16.39	33.11	3.93	27.21
Urban areas	27.55	24.15	16.72	11.15	5.88	14.55
Boarder areas	6	31.25	25.81	9.92	7.02	20
Flood prone areas	3.28	9.09	31.35	26.98	17.3	12
Malda District	8.7	15.69	25.4	18.87	11.49	19.85

Source: Field Survey, 2014

Farmer

Increased agricultural productivity and production can enhance household food security and nutritional status directly through food production as well as indirectly through increased incomes. Farmers shared the highest 25.4% of total workers. The maximum percentage of farmers is recorded on the basis of the primary survey in low-developed areas (33.72%), followed by Muslim-dominated areas (30.06%), flood-prone areas (31.35%), border areas (25.71%), medium-developed areas (23.48%), high-developed areas (19.1%), urban areas (16.72%), and Santhal-dominated areas (16.39%). The high percentage of farmers living in urban areas is due to the fact that the fact that two urban centres are newly designated census towns and Santhal-dominated areas have a low percentage of farmers due to a lack of land ownership.

Daily labourer (non-agricultural, NA)

Daily labour is work done where the worker is hired and paid one day at a time, with no promise that more work will be available in the future. It is a form of contingent work in which a in which a large number of workers in the study areas are engaged as daily labour. More than 18.87% of the total workers are employed as daily labourers in various regions of Malda district. 33.11 percent of the total workers of Santhal-dominated areas in the study areas are engaged in daily labour, followed by flood-prone areas (26.98%), low-developed areas (15.22%), Muslim-dominated areas (15.19%), high-developed areas (14.33%), medium-developed areas (13.1%), urban areas (11.15%), and 9.92% are border areas.

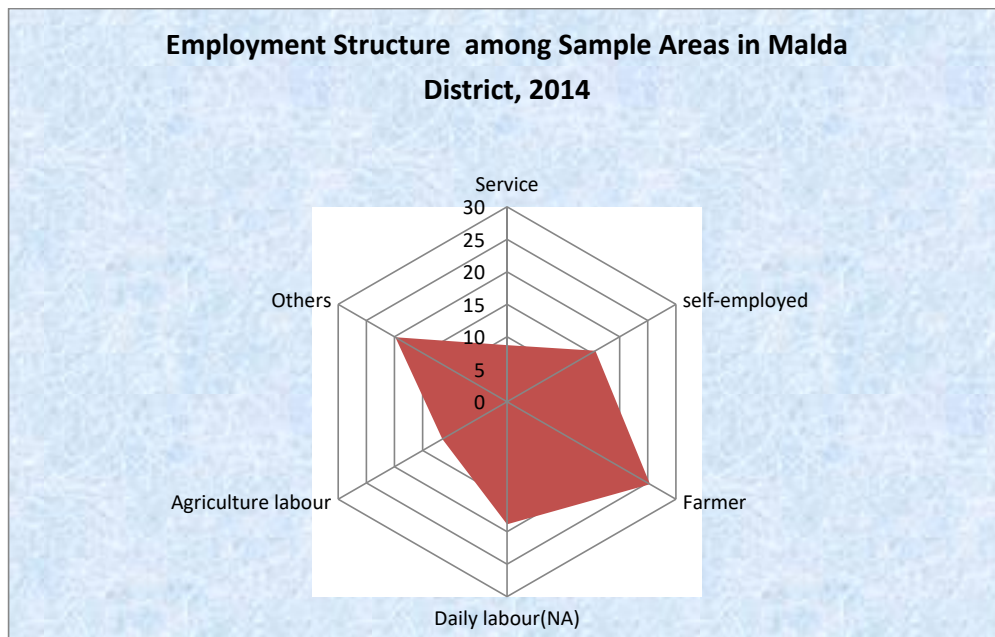


Fig.7

Agricultural labourer

The distribution of agricultural labourers depends on the size of the farmer and the size of his landholding. About 11.49% of the total numbers of workers are engaged as agricultural laborers. The high percentages of agricultural labourers who belong to Low-developed and Muslim-dominated areas contribute more agricultural labourers. The highest percentages of agricultural labourers are recorded in low-developed areas (20.17%) and flood-prone areas (17.3%), followed by Muslim-dominated areas (15.82%), high-developed areas (8.33%), border areas (7.02%),

medium-developed areas (6.1%), urban areas (5.88%), and Santhal-dominated areas (9.73%).



Fig.8

Others Worker

Others include forestry, orchards, fishing, hunting, driving, mining and quarrying, construction, and other household workers, which contributed more than 19.85% of the total workers. The distribution pattern of other workers is shown in the table. The very high percentage of other workers is found in medium-developed areas (33.98%), followed by Santhal-dominated areas (27.2%), border areas (20%), high-developed areas (19.34%), urban areas (14.55%), Muslim-dominated areas (17.09%), low-developed areas (19.83%), and flood-prone areas (12%).

Ownership of land

Since the population of Malda district is an agricultural society, food security for the majority of people is ensured through livelihood security in agriculture. An agricultural livelihood provides the entitlements that ensure access to food. Destruction of agricultural livelihoods during floods or droughts leads to entitlement failure and, hence, food insecurity. It is a little clear that most of the reports of starvation deaths come from the country. The famines of 1942 and 1877 were also reflections of the food insecurity faced by peasants.

The majority of the landless people are poor in Malda district. Even a small amount of land can greatly reduce both insecurity and poverty. The incidence of hunger and poverty gets reduced as one is able to meet even part of their dietary energy requirement through growing their own food. Land is a very important aspect of food security. About half of the sub-marginal farm population is poor and undernourished, and their number is increasing day by day. The highest attention must be given to the marginal farm group for increasing their income and employment. The marginal farmers are not buyers and need cash to buy the food available in the market. Their only caring source is to sell labour and/or undertake diversified productive farm activities. Ownership or access to land for farming had a substantial impact on the food security status of rural households, even when income levels were controlled. The prevalence of food insecurity tended to be higher among landless or quasi-landless households that were more dependent on other sources of income than farm income.

Table 6: Ownership of Land Availability and per capita Land Availability in Malda District, 2014

Study Units	Ownership of Land		
	Yes	No	Per capita Land in Bigha
High developed areas	53.5	46.5	0.68
Medium developed areas	51	49	0.56
Low developed areas	85.5	14.5	0.74
Muslim dominated areas	75.5	24.5	0.72
Santhal dominated areas	51	49	0.38
Urban areas	35	65	0.58
Boarder areas	64.5	35.5	0.64
Flood prone areas	68.5	31.5	0.76
Malda District	57.25	42.75	0.64

Source: Field Survey 2014

Most food households own the largest amount of land above average (20 bigha), followed by having sufficient food throughout the year, against the most insecure households owning on average less than 5 bigha of land. The majority of the food-secure households that were engaged in cultivation cultivated their own land, followed by the households with food security in either season, against the lowest number of food-insecure households (Ismail, M. 2009). Ownership of land among the sample houses in the study area is important for security, which reduces the level of food insecurity and raises the standard of living. About 57.25% of households in the study

have agricultural land, and most of the farmers are marginal farmers. Variations in land ownership vary from region to region. The highest numbers of households having their own land are found in low-developed areas, which are more than 85% of households, followed by Muslim-dominated areas (75.5%), flood-prone areas (68.5%), border areas (64.5%), high-developed areas (53.5%), medium-developed areas (51%), and Santhal-dominated areas (37%). The lowest number of households having land is in urban areas, which is 35% of households.

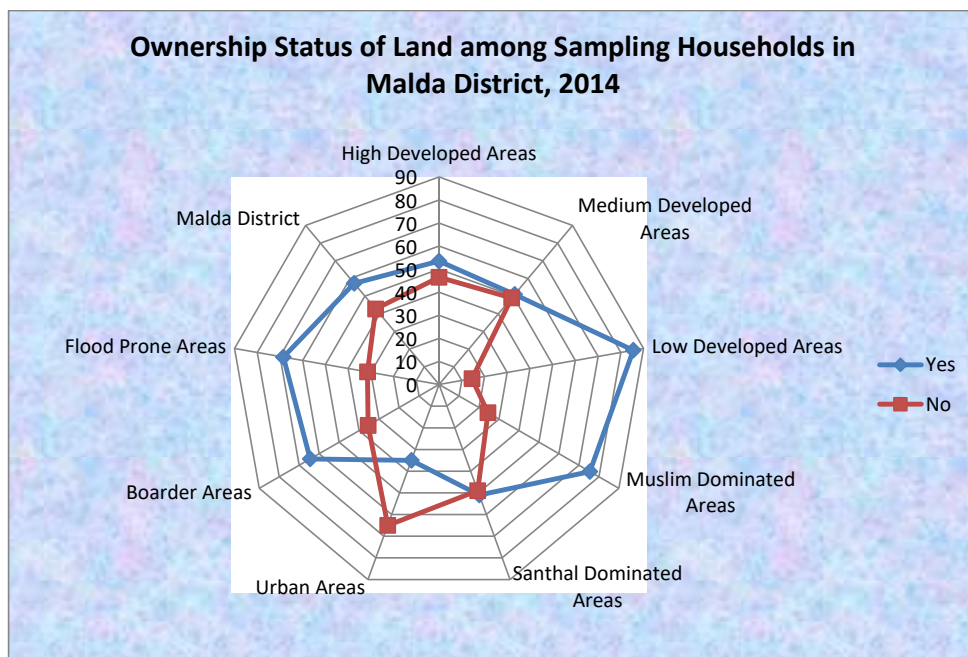


Fig.10

Per capita land availability is another indicator of food security, and the size of the land determines and reduces the level of food security. According to the primary survey, the average size of landholding among sample households in Malda district is 0.64 bigha per head. The highest amount of land is available in flood-prone areas, which are 0.76 bigha per head, followed by low-developed areas (0.726/PH), high-developed areas (0.68/PH), border areas (0.646/PH), urban areas (0.58/PH), and medium-developed areas (0.546/PH). The lowest per capita land is available in Santhal-dominated areas, which is 0.38 bigha per head.

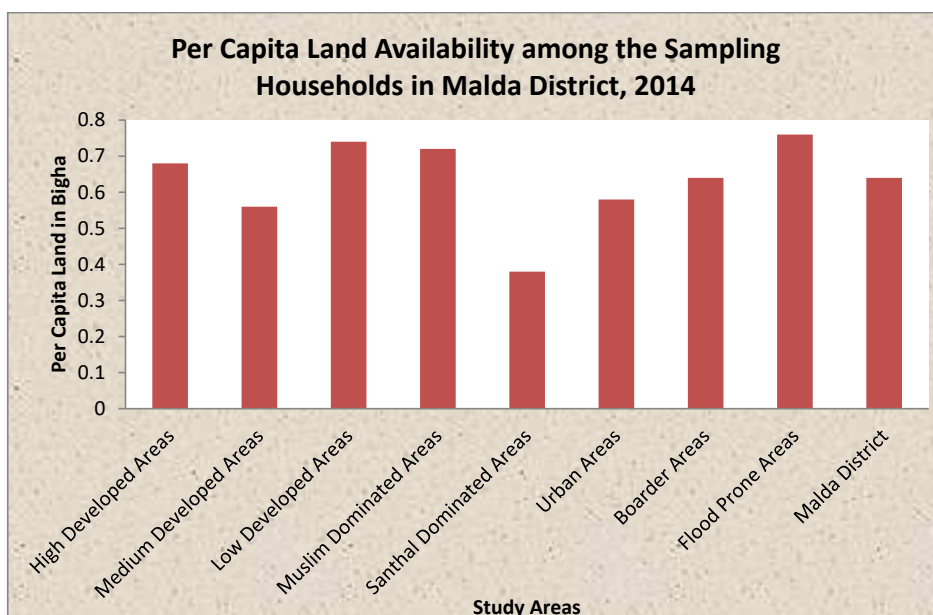


Fig.11

Income

The FAO (2001) report said that households must have sufficient income to purchase food. Food security refers to when people get an adequate amount of food for a healthy and active life. When people have sufficient income, they purchase all types of essential commodities from the market. Per capita income among sample households is shown to be high as compared to actual per capita income in the district as well as in other north Bengal districts. According to the field survey, more than 25.58% of households in the study have less than Rs. 5,000 in income per month, followed by 19.42% of households with between Rs. 15000 and Rs. 15000-20,000, and only 15.58% of households with more than Rs. 20,000 in income per month.

Table 7: Household Wise Monthly Income in Sampling Areas in Malda District

Study Units	Income Rs.				
	<5000	5001-10000	10,000-15000	15000-20000	Above 20000
High developed areas	14.5	32	23	11.5	19
Medium developed areas	20.5	33	25	10.5	11
Low developed areas	30.5	33.5	18	7	11
Muslim dominated areas	31.5	33	17.5	7.5	10.5

Santhal dominated areas	35.5	25	13	8	18.5
Urban areas	11.5	21.5	25.5	10.5	31
Boarder areas	18	24	21	13	24
Flood prone areas	31	40	18	5.5	5.5
Malda District	25.58	30.83	19.42	8.58	15.58

Source: Field Survey, 2014

A household with less than Rs. 5,000 in income per month is considered a marginal-income household. The highest numbers of marginal income groups are found in Santhal-dominated areas (35.5%) households, followed by Muslim-dominated areas (35.5%) households, low-developed areas (30.5%), flood-prone areas (31%), medium-developed areas (20.5%), border areas (18%), high-developed areas (14.5%), and urban areas (11.5%).

Income between Rs. 5001 and Rs. 10,000 is considered a low-income group population. The highest low-income group population is found in flood-prone areas of the district (40% of households), followed by low-developed areas (33% of households), and the third largest low-income group population is lived in Muslim-dominated areas and medium-developed areas, both with 33% of households. Income in the range of Rs. 10,000–15,000 is considered a medium-income household. According to the study, the highest number of medium-income groups are found in urban areas in the district, which are more than 25.5% households, followed by medium-developed areas (23%), border areas (21% households), low-developed and flood-prone areas, both having 18% of their total households, Muslim-dominated areas having 17.5% households, and the lowest number are found in Santhal-dominated areas (13% households).

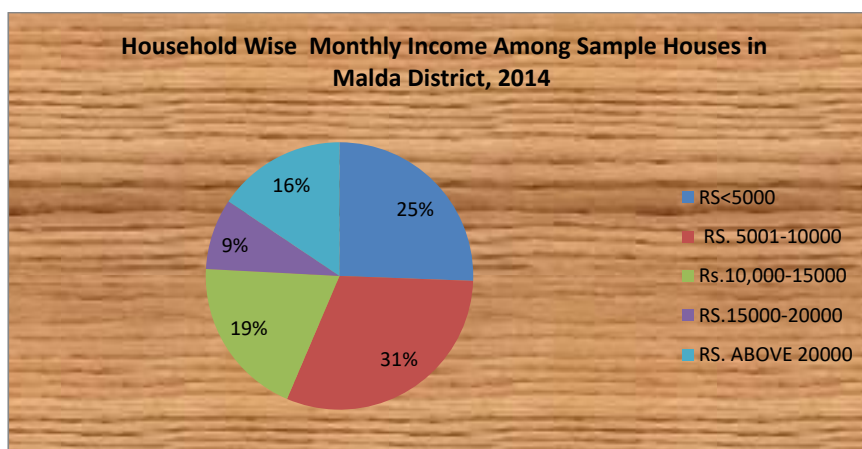


Fig.12

An income group of between Rs. 1500 and Rs. 20,000 per month is considered a high-income group household. Only 8.58% of households in the study areas belong to high-income households. The highest number of this income group households are found in border areas, which is 13% of the total, and after that, the second position occupies high-developed areas (11.5% households), and the 3rd largest high-income group population is lived in both urban areas (10.5% households) and medium-developed areas (10.5% households), followed by Santhal-dominated areas (8% households), Muslim-dominated areas (7.5% households), low-developed areas (7% households), and flood-prone areas (5.5% households). The very high-income group is considered to be those with an income above Rs. 20,000 per month. The highest number of very high-income people are living in urban areas, which is 31% of households, followed by the 2nd largest occupied boarder areas (24%), high-developed areas (19%), Santhal-dominated areas (18.5%), medium-developed areas and low-developed areas both (11%), Muslim-dominated areas (10.5%), and flood-prone areas. Only 5.5% of households have very high incomes.

Share of Female Income

The share of female income is also shown in Table 8, which has great significance for reducing household poverty. Field Survey fined, 10.85 incomes are shared by female (one of 100%). The study traces the close relationship between female income and food security. The highest percentage of female contribution is found in Santhal-dominated areas (18.83% of the total income of the areas), followed by urban centres (17.37%), border areas (11.21%), low-developed areas (8.54%), medium-developed areas (7.11%), flood-prone areas (6.77%), and Muslim-dominated areas (6.85%).

Table 8: Distribution of Male, Female income and Per capita income among Sample areas in Malda district, 2014

Study Units	Share of income & Per capita income(RS)		
	Female Income	Male income	Per Capita income(RS)
High developed areas	6.25	93.75	2378.73
Medium developed areas	7.11	92.89	1689.83
Low developed areas	8.54	91.46	812.47
Muslim dominated areas	6.85	93.15	1115.41

Santhal dominated areas	18.83	81.17	1069.09
Urban areas	17.37	82.63	3388.52
Boarder areas	11.21	88.79	2188.51
Flood prone areas	6.77	93.23	873.71
Malda District	10.85	89.15	2164.81

Source: Field Survey, 2014

Per capita income among sample areas in the Malda district is Rs. 2165. The highest per capita is found among sample areas in Malda district in urban households, which is Rs. 3388 per month, followed by high-developed areas at Rs. 2378 per month. Boarder areas: Rs. 2188; medium-developed areas: Rs. 1690 per month; Muslim-dominated areas: Rs. 1115; Santhal-dominated areas: Rs. 1069; and very low amounts of per capita income found in low-developed areas and flood-prone areas, respectively, Rs. 812 and 873 per month.

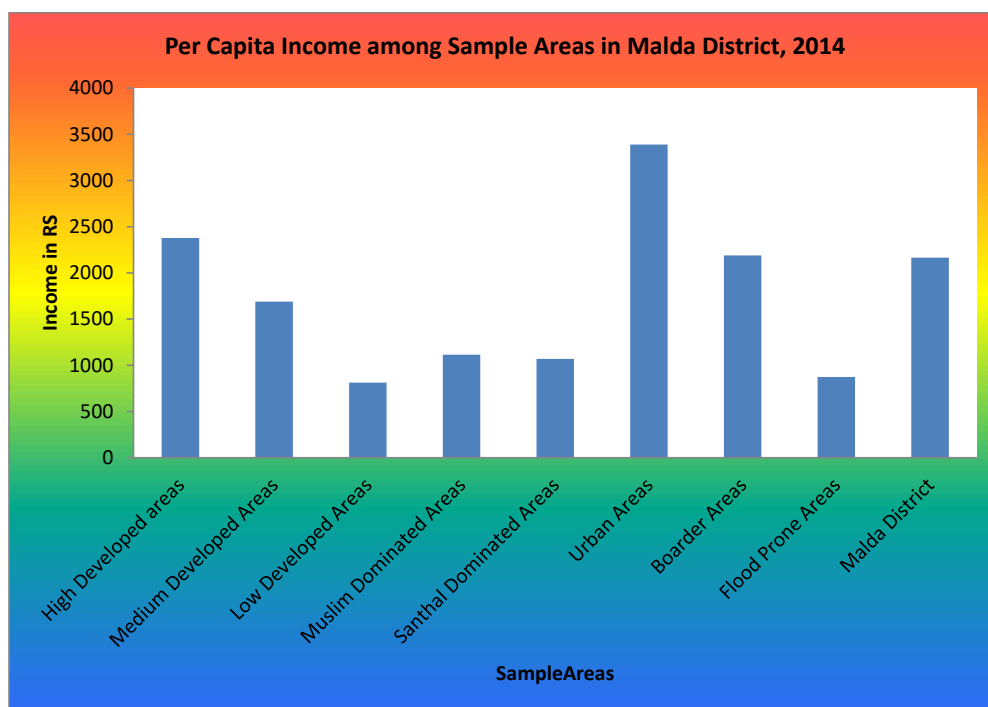


Fig.13

Expenditure Patterns

Average annual total expenditure followed the same trend as income. Average annual total expenditure was the highest for food-secure households, followed by insecure households. Lower-income households, for their low level of income, usually have to spend a larger fraction of their income on food.

Patterns of expenditure are also a very important determinant of food security. About 53.5% of the total income is expended for food purposes, and it varies from region to region. Flood-prone areas in the study area expend about 63.12% of their total income for food purposes, followed by low-developed areas (58.40%), medium-developed areas (57.34%), Muslim-dominated areas (56.47%), Santhal-dominated areas (55.05%), high-developed areas (53.99%), urban areas (49.04%), and border areas (45.13%).

About 12.4% of incomes are expended for education in the Malda district. High-developed areas expend more than 15.13% of their incomes for education purposes, followed by urban areas (14.45%), border areas (12.99%), Muslim-dominated areas (12.68%), Santhal-dominated areas (11.95%), medium-developed areas (10.78%), and flood-prone areas (9.42%). Nearly 9.65% of income is expended for health purposes. The health condition of the study area is bad, and nearly 40% of the population is facing various kinds of diseases. The highest amount of money expended for health is found in border areas, which have a population of 18.52%, and Muslim-dominated areas expend more than 7.85% of their income for health purposes, followed by low-developed areas (7.53%), urban areas (7.39%), high-developed areas (6.94%), medium-developed areas (6.23%), and flood-prone areas, which expend only 6.45% of their money for health.

Table 9: Expenditure Patterns among Sample Households in Malda District, 2014

Share of Expenditure in Rs. in percentage						
Study Units	Food	Education	Health	Housing	Clothes	Others
High developed areas	53.99	15.13	6.94	8.45	7.45	8.04
Medium developed areas	57.34	10.78	6.23	8.49	8.09	9.08
Low developed areas	58.40	11.34	7.53	7.90	6.50	8.32
Muslim dominated areas	56.47	12.68	7.85	7.55	6.75	8.68
Santhal dominated areas	55.05	11.95	6.25	9.45	8.31	8.99
Urban areas	49.04	14.45	7.39	10.63	8.68	9.80

Boarder areas	45.13	12.99	18.52	8.24	6.94	8.18
Flood prone areas	63.12	9.42	6.45	7.08	6.62	7.31
Malda District	53.53	12.40	9.65	8.58	7.39	8.45

Source: Field Survey, 2014

Housing is another human basic need to live a healthy and happy life. More than 8.58% of income is expended for the maintenance and construction of their houses. Urban areas in the district expend the highest amount of money to maintain their houses (10.63%), and Santhal-dominated areas also expend a large amount of money (9.45%), followed by medium-developed areas (8.49%), high-developed areas (8.45%), border areas (8.24%), low-developed areas (7.90%), Muslim-dominated areas (7.55%), and flood-prone areas (7.08%).

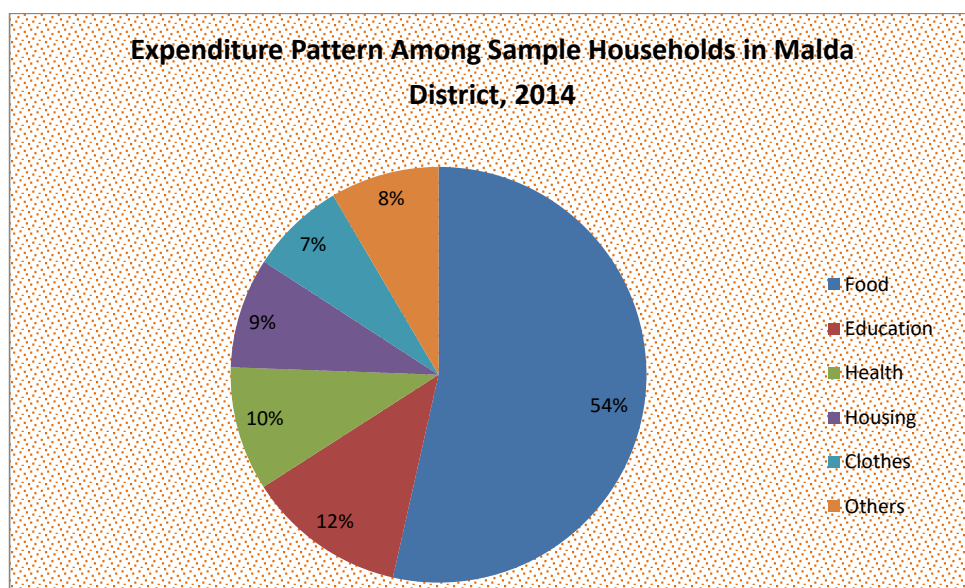


Fig.14

Another basic need is clothes. More than 7.39% of money is expended on clothes. Urban areas are expending the highest amount of money, which is 8.68%, followed by Santhal-dominated areas (8.31%), medium-developed areas (8.09%), high-developed areas (7.45%), border areas (6.94%), Muslim-dominated areas (6.75%), flood-prone areas (6.62%), and low-developed areas (6.5%).

Other expenditure means, except for the above-mentioned expenditure, more than 8.45% of money is expended for other purposes. Urban areas expend the highest amount of money for other purpose, which is 9.80% of their total income, followed by medium-developed areas (9.08%), Santhal-dominated areas (8.99%), Muslim-dominated areas (8.68%), low-developed areas (8.32%), border areas (8.18%), high-developed areas (8.04%), and flood-prone areas (7.31%).

Housing Condition

Housing conditions are another important indicator of food security. Housing material quality varies from location to location, but generally speaking, household income leads to regulation of the housing structure and quality. Better housing conditions are judged or divided on the basis of the condition of the houses. Such as the number of rooms per person, wall material, condition of the roof and floor, etc.

With growing concern about a decent standard of living these days, the significance of infrastructure and amenities related to the environment has increased. The majority of people prefer to stay in rural areas, even in smaller towns, which have a better physical and social environment. But, in India, large cities, which provide better opportunities as well as a better socio-cultural environment, have become attractive centres for rural areas. So, rural infrastructure is very important for measuring the level of food security status.

Table 10: Pattern of Housing Condition among Sample Areas in Malda District, 2014

Study Units	Housing Type		
	Kutchra	Pucca	Both
High developed areas	31	54	15
Medium developed areas	31	40.5	28.5
Low developed areas	76	13.5	10.5
Muslim dominated areas	76.5	10.5	13
Santhal dominated areas	41	40	19
Urban areas	21	63.5	15.5
Boarder areas	25	58	17
Flood prone areas	70.5	17	12.5
Malda District	47	36	17

Source: Field Survey, 2014

In Malda district, only 36% of the total sample households are puccas. According to primary data, urban areas have higher percentages of pucca houses as compared to other dimensional regions. Nearby, 63.5% of households are puccas in urban areas, whereas only 10.5% of households are puccas in Muslim-dominated areas in Malda district. The second largest number of pucca housing is found in border areas, which is 58%, followed by high-developed areas (54%), medium-developed areas (40.5%), Santhal-dominated areas (40%) due to Indira Awas Yogana, and 10.5% of households are found in low-developed areas. The majority of households in the study areas are kutchas, which make up more than 47% of the total households among the sample in the Malda district. It is most interesting to note that more than 76.5% of households in Muslim-dominated areas in the Malda district are kutchas, which are made up of bamboo, wood, mud, tally, straw, dry leaves, and other low-quality materials. Low-developed areas are very close to Muslim-dominated areas (76%). About 75.5% of households in flood-prone areas are kutchas, followed by Santhal-dominated areas (41%), high and medium-developed areas both (31%), border areas (25%), and urban areas also have a remarkable number of kutchas, which is $\frac{1}{4}$ of the total houses. Both types of houses are those that are made of partially pucca and partially kutchas. According to the primary survey, more than 17% of houses are mixed houses, and the highest number of such types of houses are mainly constructed in medium-developed areas (28.5%), followed by Santhal-dominated areas (19%), border areas (17%), urban areas (15.5%), high-developed areas (15%), Muslim-dominated areas (13%), flood-prone areas (12.5%), and low-developed areas (10.5%).

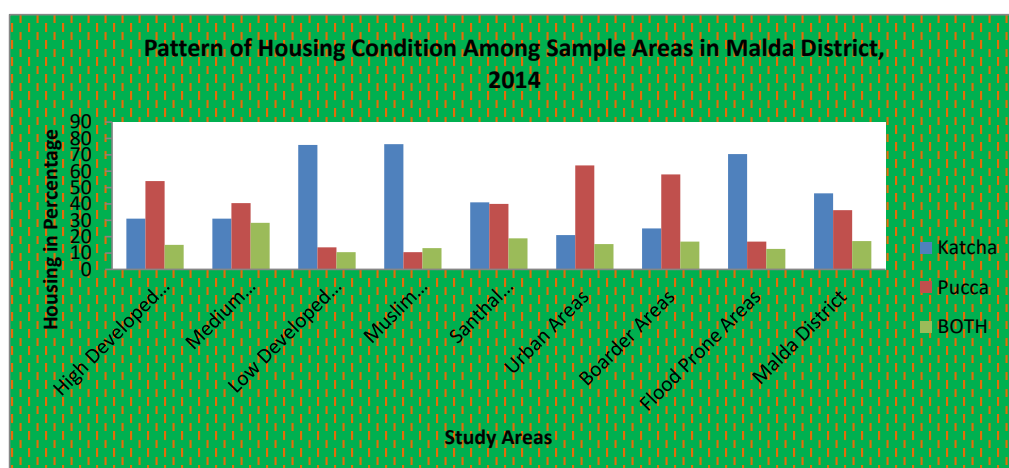




Fig.16



Fig.17

Sanitation/Toilet Availability

About 16 percent of the world's population—approximately 1.1 million people—is still without some form of improved water supply. Close to 40 percent of the world population lives without adequate sanitation. Appropriate access to water and sanitation is unequally distributed between urban and rural areas and across geographic regions. Rural coverage of water and sanitation is 71 percent and 38 percent, respectively, whereas coverage in urban areas is 94 percent and 86 percent. The majority of households with poor access to water supply and sanitation are in Asia and Africa; two-thirds of those are without water supply, and 80 percent of those without sanitation live in Asia (sources).

Sanitation is closely linked to both shelter and water supply. According to government estimates (UNICEF 1990, page 141), in 1981, only 25.1 percent of the urban population and 0.5 percent of the rural population had access to basic sanitary facilities. By 1985, this percentage had increased to 28.4 percent and 0.7 percent, respectively. A study on water sources was carried out by the NSSO during 1986–1987. Only 16 percent of rural and 72 percent of urban populations use a tap as their main source of drinking water.

The government of India has spent nearly 32,000 crores (6.8 billion) in the rural water supply and sanitation (RWSS) sector since 1954, but the results are not very good. At the national level, only 24 percent of households had toilet facilities in 1991. This picture came up marginally to 36 percent in 2001. There exist considerable disparities between rural and urban areas. Nearly 74% of urban households have toilets attached to their dwellings; it is only 22 percent in rural areas. In the backward states of Orissa, Chhattisgarh, Jharkhand, and Bihar, more than 80 percent of the total households do not have toilet facilities, but in Madhya Pradesh and Rajasthan, it is between 70 and 80 percent. In 2001, nearly 84 percent of the households in Kerala had latrines attached to their houses (Ismail, p. 70).

Table 11: Sanitation Condition among Sample Areas in Malda District, 2014

Study Units	Toilet Facilities			
	Yes	No	Kutcha	Pucca
High developed areas	73	27	20	80
Medium developed areas	60	41	29	71
Low developed areas	21	80	41	59

Muslim dominated areas	22	78	52	48
Santhal dominated areas	54	46	31	69
Urban areas	81	19	11	89
Boarder areas	74	27	22	78
Flood prone areas	15	85	30	70
Malda District	51	49	25	75

Source: Field Survey, 2014

About 51 percent of households among the sample areas in Malda district have toilet facilities, and the remaining 49% depend on open space. Toilet facilities among sample areas vary from one dimensioned region to another's dimensioned region. The highest numbers of toilets are found in urban areas, with more than 81% of households and 74% of households in border areas having toilet availability, followed by a very close figure in the case of highly developed areas, where 73% of households have their own toilet within premises. About 60% of households have toilet availability in medium-developed areas, followed by Santhal-dominated areas (54%). Remaining in all the regions, sanitation conditions show a very poor picture. Only 21% of households in low-developed areas have toilet facilities, followed by Muslim-dominated areas (22%), and a very negligible number of households in flood-prone areas (15%) in the district.

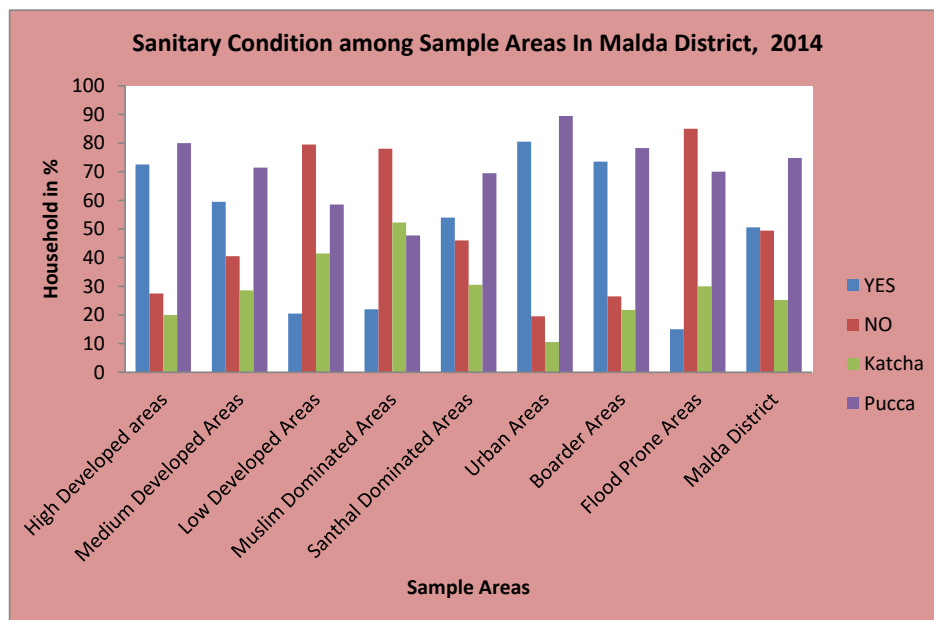


Fig.18

According to the field report, only 51% of households have toilet facilities among them. Only 75% of toilets are pucca, and the remaining 25% of toilet facilities are temporary, or kutchra. Out of 100 percent, 80% of households in highly developed areas have pucca toilet facilities, and the remaining are other types. The highest number of pucca toilet facilities are available in urban areas, which is 89%, followed by border areas (78%), medium-developed areas, and flood-prone areas both (70%). Santhal-dominated areas have 69% of pucca toilets, which are basically provided by various governments. Schemes, followed by low-developed areas (59%), and a very low number of pucca toilets are found in Muslim-dominated areas. Due to socioeconomic conditions, a large number of kutchra toilets are found in study areas. More than 52% of toilets in Muslim-dominated areas are kutchra types, followed by 41% in low-developed areas, Santhal-dominated areas (31%), flood-prone areas (30%), and medium-developed areas (29%). The low number of kutchra toilet facilities is available in urban areas (11%), high-developed areas (20%), and border areas (22%).

Bathroom Availability

Punjab (82.76%), Maharashtra (81.60%), and Gujarat (80.62%) had the highest number of household bathroom availability within premises in 2001, but in 2011, Karnataka (91.70%), Kerala (88%), and Goa (88.69%) had higher shares of bathroom availability within preemies. In both years, West Bengal and Tamil Nadu have reported a relatively lower share of such households (West Bengal: 58.56% in 2001 and 59.97% in 2011, and Tamil Nadu: 66.42 in 2001 and 75.50% in 2011) (Banerjee, A., and Saha, J., 2014).

Table 12: Bathroom Facilities and Type of Bathroom among Sample Areas in Malda District, 2014

Study Units	Bath Room Facilities				
	Yes	No	Kutchra	Pucca	Open Space
High developed areas	54	45	17.59	82.41	0.00
Medium developed areas	52	48	15.38	80.77	3.85
Low developed areas	8.5	91.5	29.41	64.71	5.88
Muslim dominated areas	10.5	89.5	19.05	71.43	9.52
Santhal dominated areas	44	56	23.86	76.14	0.00
Urban areas	69.5	26.5	6.47	83.45	10.07
Boarder areas	63	37	11.90	85.71	2.38
Flood prone areas	7.5	92.5	33.33	60.00	6.67
Malda District	40	60	14.10	78.42	7.48

Source: Field Survey, 2014

According to the field, only 40% of households in the Malda district (among the sample) have bathroom availability within their premises. The higher number of bathroom availability within premises is shared by urban areas (69.5%) and border areas (63%), followed by high-developed areas (54%), medium-developed areas (52%), and households in the remaining dimensional regions with less than 50% bathroom availability within premises. The very low numbers of households sharing bathroom availability within premises are found in flood-prone areas among the sample in Malda district, which is only 7.5% households, followed by Muslim-dominated areas (10.5%) and low-developed areas (8.5%). But nearly 44% of households have bathroom facilities within their premises in Santhal-dominated areas.



Fig.19

Out of 100%, only 78.42% of households in study areas have pucca bathroom facilities, and most of these households are located in urban areas, highly developed areas, border areas, etc. highest number of pucca bathrooms available in border areas, which is more than 85.71%, followed by urban areas (83.45%), HDA (82.41%), MDA (80.77%), SDA (76.14%), Muslim-dominated areas (71.43%), LDA (64.71%), and FPA (60%). The very low number of pucca bathrooms available in FPA is due to the very bad socio-economic conditions among the sample households

in the areas. About 14.10% of bathrooms are of the of the kutchha type among the whole sample, and the remaining 7.48% of households used open space for taking their baths.

Safe drinking water

According to the 2001 census, most households used tap water in Maharashtra, Gujarat, and Karnataka, and hand pumps were popularly used in Punjab, West Bengal, and Haryana. Another source of drinking water for the first-ranking state is Mizoram. In 2011, the percentage share of households using tap water was higher in Goa, Maharashtra, and Gujarat; hand-pump water in West Bengal and Punjab; and other water sources in Mizoram. Sources of safe water are considered like taps, hand pumps, and tube wells together, and in spite of this, Punjab's performance is quite enviable. On the other hand, Gujarat, Tamil Nadu, Karnataka, Haryana, and West Bengal have also performed quite well. But there is controversy; one should consider spring water to be safe drinking water because more than 12% of households in Mizoram use spring water as a source of drinking water (Banerjee, A., and Saha, J. 2014).

According to the primary survey, the status of Malda district is far better as compared to other regions in the country, and 92.50% of households together used tap and hand pump water for drinking as well as daily uses, while only 7.50% of households used pond, Bill River, etc. water. The primary report calculated that 26.83% of households used government supply water (tap water) and 64.83% used hand pump water. About 98.5% of households in border areas used safe drinking water, followed by urban areas (97.5%), medium-developed areas (99%), Muslim-dominated areas (100%), low-developed areas (97%), high-developed areas (9%), flood-prone areas (91%), and Santhal-dominated areas (77.5%).

About 64 percent of tap water users are found in urban areas, followed by border areas (57%), Santhal-dominated areas (41.5%), high-developed areas (40%), medium-developed areas (32.5%), and the remaining regions still lack tap water supply facilities. The most common source of domestic water was tube well water, according to 64.83% of households across all livelihood areas. The highest proportion of households (92.23%) obtain water for domestic use from tube wells in Muslim-dominated areas, followed by low-developed areas (97%), flood-prone areas (91%), medium-type and low-user areas (66.5%), followed by high-developed areas (51%), border areas (41.5%), Santhal-dominated areas (36%), and urban areas (33.6%)

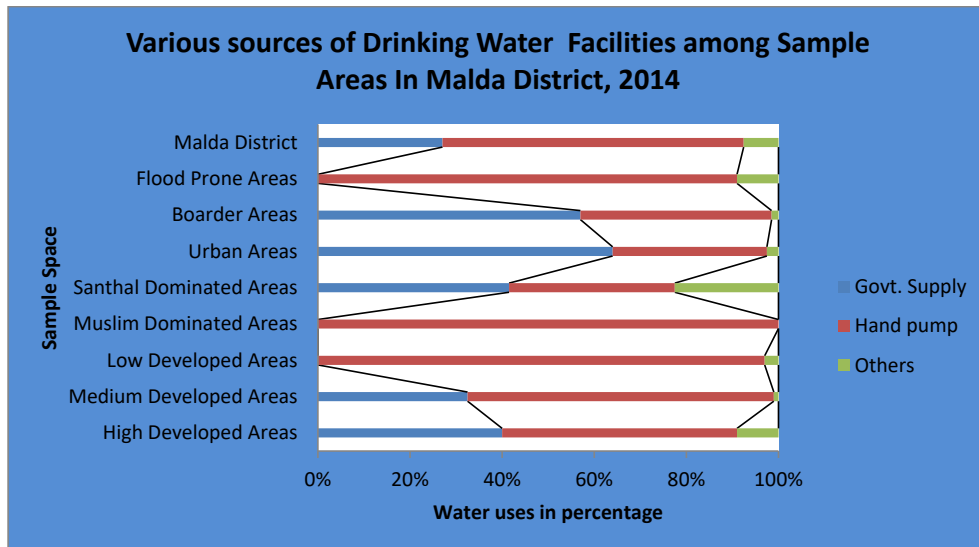


Fig.21

Other sources of water are referred to as ponds, lakes, rivers, bills, springs, etc. A very small number of households use other sources of drinking water. About 22.5% of households in Santhal-dominated areas use other sources of water for their drinking, followed by flood-prone areas (9%), high-developed areas (9%), low-developed areas (3%), urban areas (2.5%), border areas (1.5%), and medium-developed areas (1%).



Fig.22, Source of Drinking Water

Status of banking facilities

About 50% of Indians do not have a simple savings bank account, and the CRISIZ inclusive index says that about 50% of the Indian bottom-line districts have just three banks per 100,000 people. It is disheartening to know that there are more than 50% of the populations who just have a simple savings bank account. Presently, there are 684 million bank accounts with a population of 1.2 million, and while there are four districts in north India, there is only one bank per district. The factors that contribute to the lack of financial literacy are lack of awareness, low incomes, poverty, and illiteracy (www.siliconindia.com). Only about 35% of Indians—almost 1.3 million people—have access to bank accounts, compared with a global average of 50%, according to the World Bank 2011.

The Prime Minister-initiated People Wealth Programme has targeted the opening of 150 million new bank accounts, two accounts per household, including one in the name of women, for 75 million poor rural and urban families over the next year. Malda district is also a very important backward district in West Bengal as well as in India. According to the 2014 field estimate, only 27.99% of the sample population has a bank account number, and the remaining huge percentage of people have no relationship with banking services. Out of 27.99%, only 37.59% of account holders are women due to various government programs. There is inequality in basic banking services among sample areas in Malda district. The highest number of people having bank accounts is in border areas, which make up 41.54% of the population, followed by Santhal-dominated areas (31.88%), and urban areas (29.82%). Medium-developed areas (29.93%), high-developed areas (28.53%), Muslim-dominated areas (28.17%), low-developed areas (27.67%), and flood-prone areas (17.10%). Nearly 63% of account holders are male members, and the remaining 37% are female. The high proportion of male account holders are mainly in flood-prone areas (70.79%) due to the low literacy ratio among female members as well as the lack of banking facilities in flood-prone areas in the district. On the other hand, a high number of female account holders are found in MDA, which is more than 41.90%, almost close to male status. The above table shows the status of male and female account holders' status.

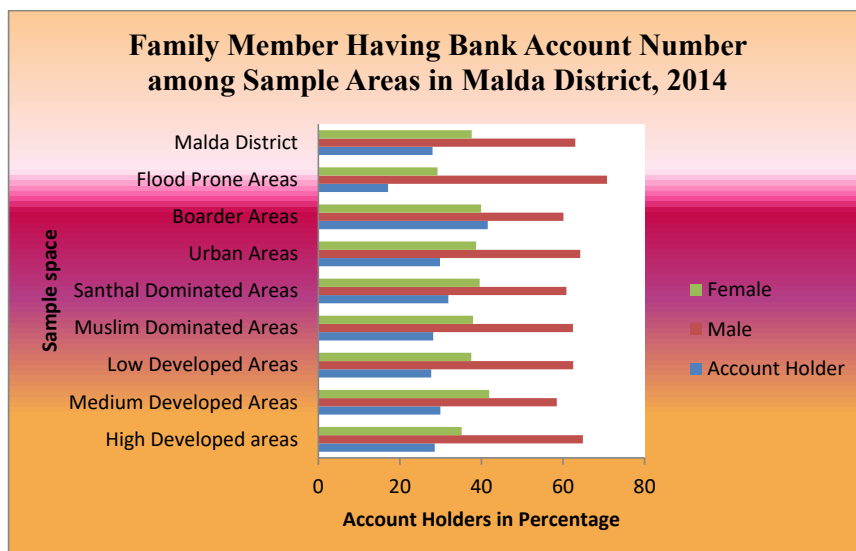


Fig.23

Household assets and infrastructure

There are various types of household assets, but here is only a list of those assets that are essential for daily life.

Television

Television is one of the important household assets that provide additional relaxation and education through various programs. Average 44% of households among the sample in the Malda district have television sets in their houses, which is less than the country average. It depends on electricity availability. The regional variations of television are very large. More than 73.5% of households in urban areas have television, followed by border areas (66%), high-developed areas (62.5%), medium-developed areas (54%), Santhal-dominated areas (49%), low-developed areas (17.5%), and only 17% in Muslim-dominated areas due to religious restrictions. Only 10% of households in flood-prone areas have televisions due to a lack of electricity.

Motor cycle

Motorcycling is one of the most important personal quick transport machines. According to the field survey, only 23% of sample households have motorcycles, and a higher percentage of motorcycles are found in urban areas, which is 30%, followed by border areas in the district,

which are 27.5%, and highly developed areas, which have more than 29%. Nearly 20% of households in medium- and low-developed areas have motorcycles, followed by flood-prone areas (19%), Santhal-dominated areas (16%), and Muslim-dominated areas (18%).

Bicycle

Another important mode of transport is bicycles, which are most popular all over the world. About 64% of households among the sample areas in Malda district have bicycles. This is the most important mode of transport for vehicles. Nearly 73.5% of households in low-developed areas have bicycles, followed by high-developed areas and low-developed areas both (66.5%), border areas (66.5%), flood-prone areas and Muslim-dominated areas both (66%), and Santhal-dominated areas (61%). A very low number of households have bicycles in urban areas in the Malda district.

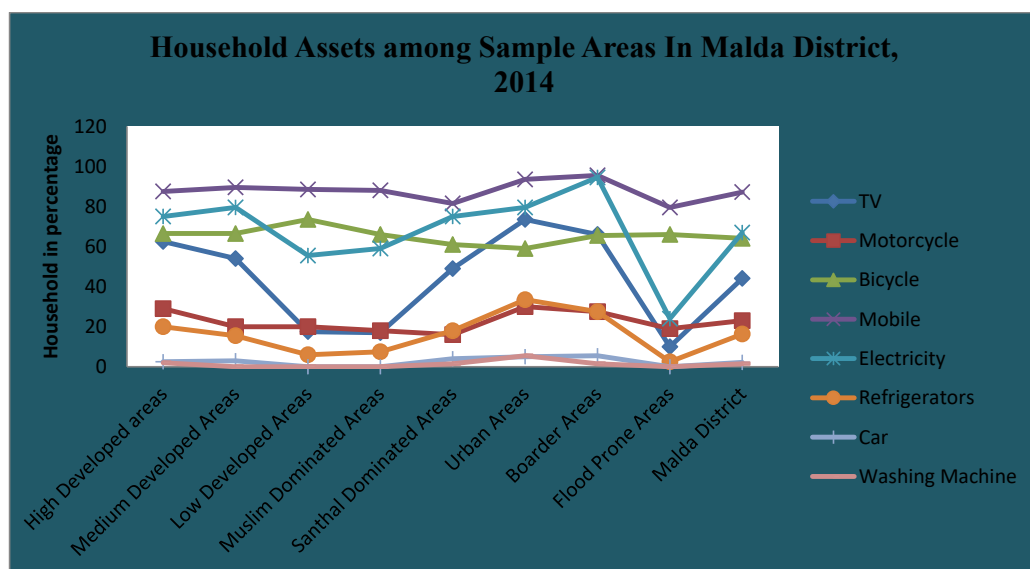


Fig.24

Mobile

The communication system all over the country is good after the mobile phone revolution; every part of the country is connected by various communication networks. India is the 2nd largest mobile phone user country in the world. In spite of this, only 87% of households among the

sample have their own mobile phone connection in Malda district. The highest number of mobile phone user families is found in border areas of the district, which is more than 95.5%; households followed by urban areas (93.5%), LDA (88.5%), Muslim-dominated areas (88%), high-developed areas (87.5%), and Santhal-dominated areas (81.5%); and the lowest number of mobile phone user families are found in flood-prone areas, which is below 79.5% households.

Refrigerator

Only 16.33% of households among the sample have refrigerators in the Malda district. The higher percentage of household shared refrigerators in urban areas (33.5%) in the district is followed by border areas (27.5%), high-developed areas (20%), Santhal-dominated areas (18%), medium-developed areas and Muslim-dominated areas both (7.5%), low-developed areas (6%), and flood-prone areas (less than 2.5%).

Car/Four wheeler

Car means personal four-wheeler vehicles. Only 2.17% of households have their own cars in Malda district. About 5.5% of households in border areas have their own four-wheelers, followed by urban areas (5%), Santhal-dominated areas (4%), medium-developed areas (3%), and high-developed areas (only 2.5%), and the remaining sample areas do not have their own car facilities.

Washing Machine

Washing machines are rare in the study area. Only 1.5% of the of the sample household used a washing machine, and a higher number of washing machine user families are found in urban areas (5.5% of households), followed by highly developed areas (2%), border areas (1.5%), and Santhal-dominated areas (1.5%). The remaining four regions of sample households do not use washing machines.

Electricity Status

Out of the total 29 states of India, only 9 states have achieved 100 percent space electrification as of August 31, 2013. About 90–99% of the 12 states in India, namely Assam, Bihar, Gujarat, Himachal Pradesh, Jammu and Kashmir, Madhya Pradesh, Chhattisgarh, Maharashtra, Mizoram, Rajasthan, Uttaranchal, and West Bengal, have achieved 100% electrification.

According to the primary survey, still only 67% of the houses among the sample households in Malda district are electrified. Large percentages of households do not have electricity

connections. Nearly 94.5% of households in border areas have an electricity connection, which is recorded as the highest percentage among sample areas in Malda district. The urban areas in Malda district do not have satisfactory electric connections. Only 79.5% of households have an electricity connection, followed by medium-developed areas (79.5%), high-developed areas and Santhal-dominated areas (75%), Muslim-dominated areas (5.9%), LDA (55.5%), and flood-prone areas (24%).

Sources of Energy for Cooking

According to a report, more than 85% of rural India uses firewood as fuel. Still, more than 50% of Indian households depend on wood and cow dung for cooking. According to the field report, more than 32.5% of households among the sample are using cow dung cake for cooking, followed by 39.4% of households using LPG or wood (25.5%), and only 3% of households depend on others energy for cooking. The highest percentage of LPG is shared in urban areas, which is more than 76% of households, followed by high-developed areas (61%), border areas (5.5%), medium-developed areas (52.5%), Santhal-dominated areas (42.5%), low-developed areas (9%), Muslim-dominated areas (8.5%), and flood-prone areas (only 6%).



Fig.25

Others Sources of Cooking Fuel

Cow dung cake is an important source of energy for cooking in rural areas. On the basis of the field survey, the highest numbers of households use cow dung cake in low-developed areas, areas that is 82% of households, followed by Muslim-dominated areas (49.5%), flood-prone areas (52%), border areas (29%), high-developed areas (21%), urban areas (12%), and medium-developed areas (only 11%).



Fig.26, Cow Dung Cake



Fig.26A

Wood is another important source of fuel energy for cooking in the kitchen. A higher percentage of households are using wood found in flood-prone areas in the district, followed by Santhal-dominated areas (38.5%), Muslim-dominated areas (30.5%), medium-developed areas (34%), low-developed areas (28%), high-developed areas (17%), border areas (15%), and urban areas (12%).

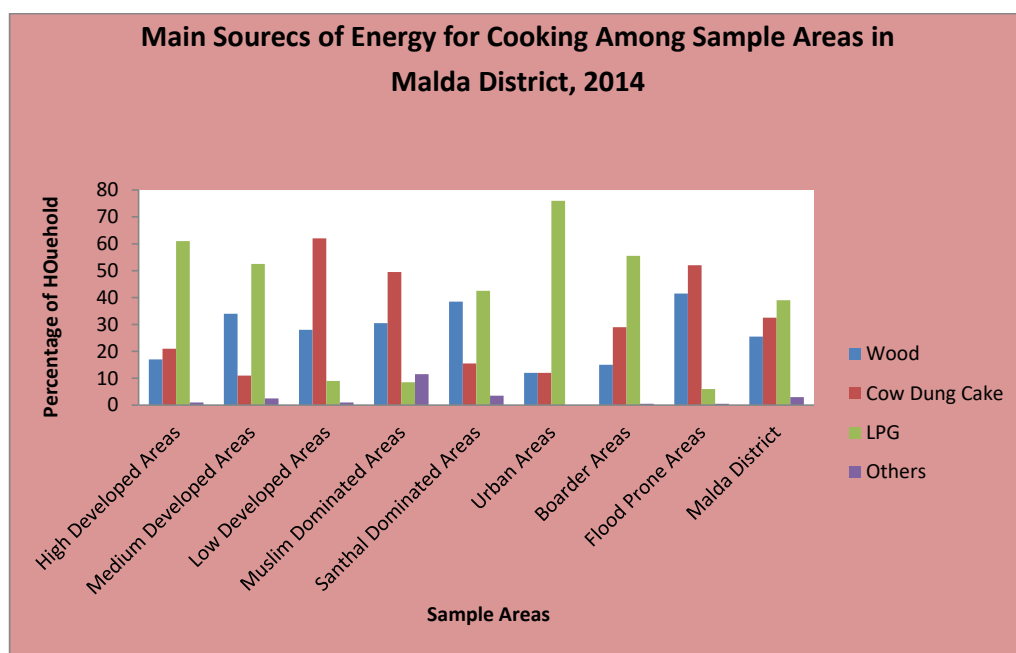


Fig.27

Only 3% of cooking energy comes from other sources. The highest number of households using other sources of energy for cooking are found in Muslim-dominated areas, which is 11.5%, followed by Santhal-dominated areas (3.5%), medium-developed areas (2.5%), high-developed areas (1%), border areas, and flood-prone areas (both 0.5%).

Main Sources of Light

Urban areas are covered by electricity, meeting lighting needs. Electricity is not only used for lighting houses; it is also used for cooling and heating purposes, for industrial work, pumping water, meeting cooking requirements, etc. According to the 2011 census, more than 89.1% of Indian households have no access to modern cooking and heating fuels, which include LPG/LNG, electricity, and biogas sources, and only 12.3% of households in rural areas do not

have access to any modern sources of energy. About 1/10 households in rural Bihar and 2/3 of houses in the Bihar urban areas use electricity to light their houses (Census 2011 figures reveal). Nearly 50% of houses in rural India use electricity as their main source of lighting, an increase of 12% over 2001. More than 43% of rural households still use kerosene to light their houses. In urban India, the spread of electricity is more complete, with 93% of households using electricity as their primary source of light.

According to a field survey, more than 32.7% of households in Malda district use oil lamps as their main sources. This is heartening to know that more than 78.5% of houses are still depending on oil lamps in flood-prone areas, followed by LDA (43%), Muslim-dominated areas (40%), SDA (25%), HDA (22.5%), urban areas (20.5%), MDA (18.25%), and border areas (4.5%). Only 63.6% of houses in Malda district use electricity as their main source of house lighting, followed by 3.4% using oil lamps and electricity, and only 0.3% using other types of energy for house lighting. The highest number of electrified households are found in the border area, which is more than 93.5% of the sample houses, followed by urban areas (75% of the houses), SDA (75%), HDA and MDA, both (75%), LDA (49.5%), Muslim-dominated areas (44.25%), and FPA (19%), respectively. Both refer to the use of oil lamps and electricity for lighting houses. There is a high number of both types of light use among Muslim-dominated areas (10.5%), followed by LDA (5.5%), MDA (4.5%), urban areas (2.25%), border areas (2%), and FPA (1.5%) only.

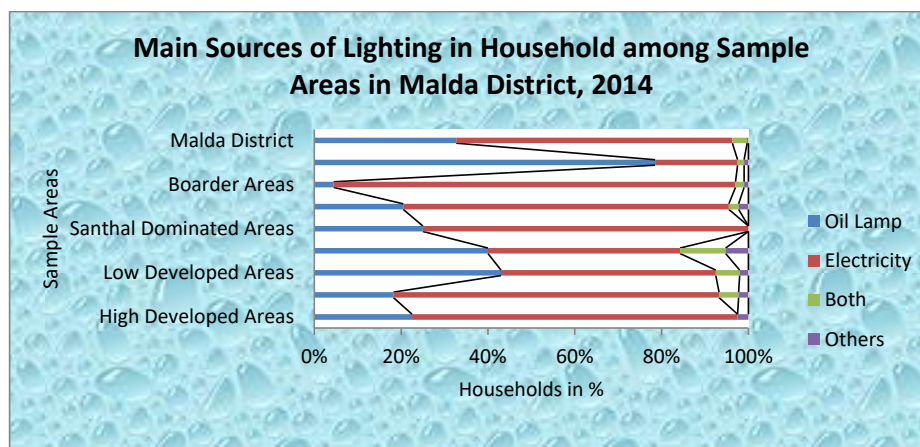


Fig.28

Public Distribution System

The public distribution system is very popular in India, and the Public Distribution System (PDS) evolved as a system of management of scarcity and for the distribution of food grains at affordable prices. Over the years, PDS has become an important part of the government's policy for managing food security in the country. PDS is supplemental in nature and is not intended to make available the entire requirement of any of the commodities distributed under it to a household or a section of society. Under the PDS system, total households have been divided into four types based on their basic economic status: APL (above poverty line), BPL (below poverty line), AAY (Antyodaya Anna Yojana), and Annapurna Anna Yojana. Table No. 20 presents the scale of the public distribution system, the amount of food item per head, and the price person. Under the PDS, only Annapurna categories get food grains of 10 kg/head per month free of charge.

Table 18: Scale of Distribution & Price

Category	Rice	Wheat	Sugar
Annapurna	10 Kg/Head/ month free of cost	XXX	XXX
AAY	1Kg/Head/week @ Rs 2.00/Kg	750 gm/H/W @ Rs 2.00/Kg	500gm/H/ week @ Rs 13.50/Kg
BPL	1 Kg/Head/ week @ Rs 2.00/Kg	750 gm/Head/Wk @Rs 4.65/Kg	500 gm/H/ month @ Rs 13.50/kg
APL	1.5 Kg/Head/ Week @Rs 9.00/Kg	750 gm/ Head/week @ Rs 6.75/Kg	XXX

Sources: Food Inspector and design by author

Table 19: Household Wise Type of Ration Card Status among Sample Areas in Malda District, 2014

Study Units	Type of Ration Card			
	APL	BPL	Annapurna	Antodayaya
High developed areas	51.00	46.00	2.00	1.00
Medium developed areas	54.50	45.00	0.50	0.00
Low developed areas	39.00	59.50	0.50	1.00
Muslim dominated areas	39.50	59.50	0.50	0.50
Santhal dominated areas	52.50	47.00	0.50	0.00
Urban areas	46.50	47.50	2.50	3.50
Boarder areas	66.50	31.00	2.00	0.50
Flood prone areas	31.50	66.00	1.50	1.00
Malda District	45.83	51.67	1.42	1.08

Source: Field Survey, 2014

There are four types of ration cards that are available in India based on basic economic conditions, except the fourth, the Annapurna category, based on age. According to the field survey, 45.83% of households in the study area are APL households. APLs are those households that have more than Rs 32 per day per capita. The highest number of APL households are found in border areas of the district, which is 66%, followed by Medium-developed areas (54.50%), Santhal-dominated areas (52.50%), high-developed areas (51.00%), urban areas (46.50%), Muslim-dominated areas (39.5%), low-developed areas (33.9%) and flood-prone areas (31.5%).

According to this revised methodology, the world had 872.3 million people below the new poverty line, of which 179.6 million lived in India. In other words, India, with 17.5% of the total world's population, had a 20.6% share of the world's poorest in 2011. About 21.92% of populations in India live below the poverty line, and more than 19.98% of populations in West Bengal live below the poverty line.

Any single person who spends less than or Rs. 32 per day in rural areas and less than or Rs. 47 in urban areas is called poor, but the previous income level was so low as compared to the present scale. In 2011, under UPA, governments decided that anyone with Rs. 27 per capita in rural areas and Rs. 33 in urban areas should be getting subsidized food and other supplies (Ghosh).

According to the UPA government scale, nearly 29.5% of the total country population is living below the poverty line as recommended by the Rangarajan committee, as opposed to 21.9% according to Tendulkar. For 2009–10, Rangarajan estimated that the share of BPL population in the total population of India was 38.2%, and after two years, the poverty ratio declined by 8.7 percentages due to the adaptation of the new method of scale.

More than 51.67% of households are living below the poverty line, and this presents very bad pictures. The highest number of BPL populations is found in flood-prone areas, which is 66%, and these areas are basically very backward due to floods that occur every year. Another's very backward area is Muslim-dominated areas, where more than 59.50% of households live under BPL, and low-developed areas in Malda district contribute 59.50%, which is the same as Muslim-dominated areas, followed by urban areas (47.50%), Santhal-dominated areas (47.0%),

high-developed areas (46.0%), medium-developed areas (45%), and border areas (31%). About 1.42% of the sample population is Annapurna, and 1.08% is the Antodoyaya population.

Mode of Public Choice

The public distribution system in the country is sadly affected by various levels of corruption. So, the public distribution systems are not maintaining the quality of food. In terms of food quality, it is very poor and not likes to be used as food. According to the primary survey, 65.83% of households are not interested in taking food from ration dealers, and 34.17% of households want to buy commodities from ration shops. A majority of households suggested that the government should provide money on behalf of food grains. The higher percentage of household respondents among urban areas and developed areas suggests that the government should be providing money on behalf of food grains. About 73.5% of urban area respondents said they were interested in taking money, followed by medium-developed areas (73.5%), Muslim-dominated areas (72%), Santhal-dominated areas (68.5%), high-developed areas (67.5%), low-developed areas (65%), border areas (61%), and flood-prone areas (54.5%). Table 20 shows the household-wise result.

Table 20: Household Wise Preferences of Commodities from Ration Dealer among Sample Areas in Malda District, 2014

Study Units	Which one you prefer			
	Receiving commodities		Receiving money	
	Number(Household)	In Percentage	Number(Household)	In Percentage
High developed areas	65	32.5	135	67.5
Medium developed areas	53	26.5	147	73.5
Low developed areas	70	35	130	65
Muslim dominated areas	56	28	144	72
Santhal dominated areas	63	31.5	137	68.5
Urban areas	53	26.5	147	73.5
Boarder areas	78	39	122	61
Flood prone areas	91	45.5	109	54.5
Malda District	410	34.17	790	65.83

Source: Field Survey, 2014

Health Condition

Health Population conditions are very important for socio-economic development as well as a positive indicator of food security. According to the field survey, more than 2626 people (43.65%) out of the 6016 people are affected by various diseases. The highest number of diseases affected People are found in Santhal-dominated areas (51.52%) and border areas, which have a population of more than 50.29%, followed by urban areas (48.10%), medium-developed areas (47.65%), Muslim-dominated areas (43.38%), low-developed areas (38.18%), high-developed areas (38.55%), and flood-prone areas (38.10%).

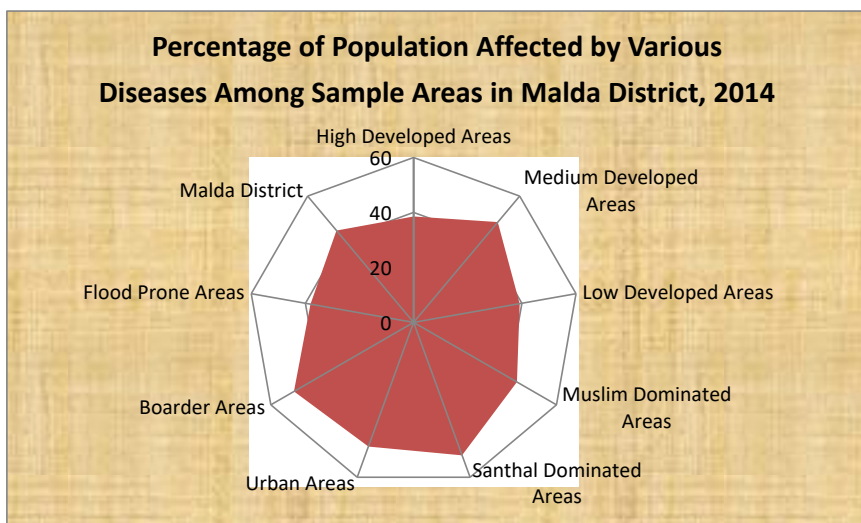


Fig.31

Medical Disparities

In our traditional societies, women are always considered second citizens and do not get their proper rights. Male-dominated societies are always engaging in various types of misbehavior and discrimination against women. It is surprising and heartening that women are not getting proper treatment facilities during the time of illness.

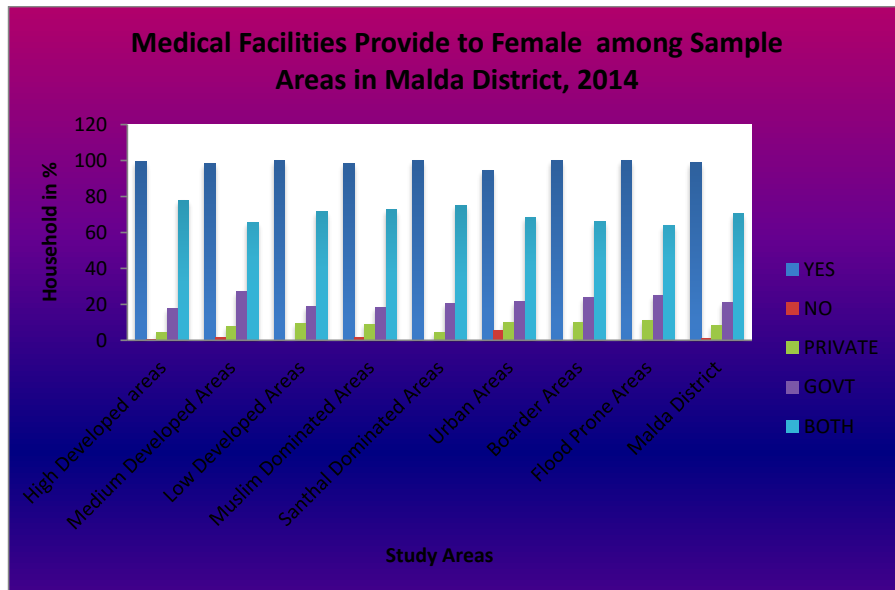


Fig.32

The study tries to find out actual ground reality, and the report said that still 1.5% of households are not providing proper treatment facilities for women in their families, but 98.5% of households provide proper medical care. Attitudes of people are not identified by the scale of economic development; they are measured by their behaviours. Higher percentages of households providing proper medical care among female members of their families are found in border areas (100%), flood-prone areas (100%), low-developed areas (100%), Santhal-dominated areas (100%), high-developed areas (99.5%), and urban areas do not provide equal opportunities among a few households (5.5%). About 70.33 households' members are enjoying both types of medical facilities, which include private and government medical facilities. Out of them, 21.25% of household members are fully dependent on government medical facilities, and 8.42% of households only depend on private doctors.

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Regional analysis of nutritional status

Body mass index (BMI), expressed as weight (kg)/height² (M²), is considered to be a better indicator of chronic energy deficiency (CED) in adults. Recent studies have revealed the risks associated with a low BMI (Pryer, 1989). Analysis of maternal anthropometric data has shown a good correlation between the BMI of mothers and the incidence of low birth weight (Naidu et al., 1991). In another study (Satyanarayana et al., 1991), mortality rates were examined in relation to the BMI status of adult men. BMI's were calculated based on their heights and weights recorded in 1979, when they were aged between 45 and 65 years. There were 133 deaths among the 792 men during the 10-year period between 1979 and 1989. The mortality rate was 12.4 percent for the younger age group (50 years) and 22.4 percent for those aged above 60 years in 1979. The mortality rate of men with a normal BMI was 12.1 percent and showed a progressive increase with lowering BMI values, reaching 32.5 percent in those with severe undernourishment (<16 BMI). The average value of BMI differs for both males and females, and the same BMI classification is used for both. But in India, the picture was different; about 50 percent of the population had less than 18.5 percent, and only a negligible proportion (0.2-05) were found to be overweight (Naidu et al., 1991). More recently, studies were conducted by the Nutrition Foundation of India (NFI) on affluent children younger than five years in seven different cities (Agarwal et al., 1991). Several studies (e.g., Hanumantha Rao et al. 1976), including NNMB surveys, show that the heights and weights of rural children are lower than 'well-to-do' Indian children or NCHS standards. Longitudinal data are also available from special studies of linear growth in Indian children. In a study conducted by NIN, Hyderabad (Satyanarayana et al. 1986), a cohort of 700 rural children was followed from the age of 5 years to 20 years.

Thus, the regular national NHANES surveys in the United States of America (Stevens et al. 1999) allowed the magnitude of the problem of overweight to be recognized, and many cardiovascular surveys, for example, the WHO MONICA surveys (Dobson et al. 1998), also documented the high prevalence of overweight and obesity in Europe and Australasia. Other surveys, such as the INTERSALT study (Dyer and Elliott 1999), revealed a high prevalence of

excess weight in some developing countries, including Brazil (James and Francois 1988). It is recognized that women have substantially more fat tissue than men at equivalent BMIs (Shetty and James 1994). The Caribbean and the United States show that the relationship of waist circumference to disease seems to vary by region, perhaps because of concomitant regional dietary differences (Okosun et al., 1998, 2000). An excess of abdominal fat has been associated with a range of metabolic abnormalities and diseases (Despres et al., 2001).

Measurement of the nutritional status of the male population through the body mass index is considered a good way of measuring. About 60.7% of the of the male adult sampling population have a normal body mass index, and 13.47% of male adults are classified as overweight; their body mass index lies between 25.0 and 29.9, and 5.09% of male members are considered obese; those people have a have a body mass index above 30, and a large number of people live underweight. According to the primary survey, 10.7% of adults have mild types of chronic energy deficiency whose body mass index is between 17 and 18.4%, 6.13% of men have moderate chronic energy deficiency, and 3.89% of male adult health conditions are very measurable because their body mass index is less than 17 and they are considered a severe chronic energy deficiency population.

Obesity is a medical term in which excess body fat has accumulated to the extent that it may have a negative effect on health, leading to a reduced life expectancy and an increase in various health problems. People are considered obese when their body mass index is above 29. The highest numbers of obese adult males are found in urban areas, nearly 13.40%, and border areas, 6.74%, followed by highly developed areas (6.28%). Medium developed areas (4.00%), flood-prone areas (1.58%), Santhal-dominated areas (1.78%), low-developed areas (1.06%), and Muslim-dominated areas (0.54%).

Overweight

Overweight and obesity are defined as abnormal or excessive fat accumulation that may impair health. Body mass index (BMI) is a simple index of weight for height that is commonly used to classify overweight and obesity in adults (kg/m^2). The WHO definition of a BMI greater than or equal to 25 is overweight and (b) a BMI greater than or equal to 30 is obesity. In 2014, more than 1.9 billion adults aged 18 and older were overweight; of these, over 600 million were obese.

About 13% of the world's adult population was obese in 2014, of which 11% were men and 15% were women. According to a 2014 report, more than 39% of adults aged 18 and over (38% of men and 40% of women) were overweight. The world-wide prevalence of obesity more than doubled between 1980 and 2014 (google.com). The highest number of overweight populations are found in 19.07% of urban and medium-developed areas (12%), followed by Santhal-dominated areas (11.36%). Men are overweight; nearly 10.67% of men are overweight in border areas, followed by high-developed areas (9.45%), flood-prone areas (5.79%), and low-developed areas (4.76%).

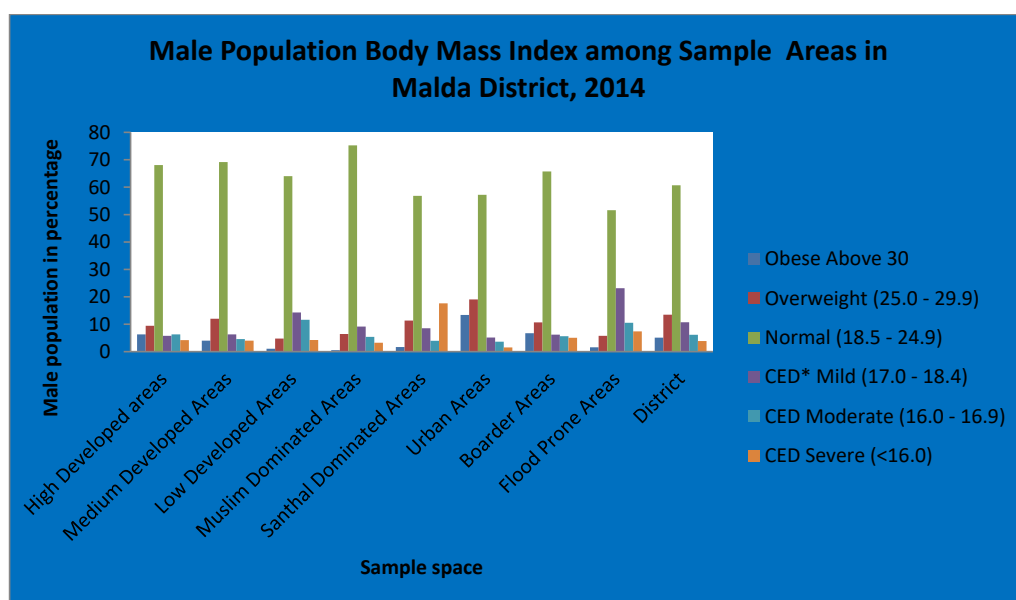


Fig.42

Normal Body Mass Index of Male

The results show that nearly 51% of the adult rural population is normal, and the remaining 49% is suffering from some degree of chronic energy deficiency (CED). The adult BMI and children's nutritional status are associated. Mean BMI values were lower in landless agricultural occupational groups and in low per capita income group households compared with cultivators, artists, and higher income groups. The 'average household BMI' values were derived from the BMI of adult males and females in the household (Naidu et al., 1991). The higher number of

normal BMI males are found in Muslim-dominated areas, which is more than 75.27%, and medium-developed areas have the second largest and very close to high-developed areas, respectively, 69.14% and 68.06%, followed by border areas (65.73%), low-developed areas (64.02%), urban areas (57.25%), Santhal-dominated areas (55.62%), and flood-prone areas (51.58%).

Underweight

Underweight is a term used to define a person whose body weight is considered too low to be healthy. The underweight people were divided into three categories. a) Mild chronic energy deficiency; b) Moderate chronic energy deficiency; and c) Severe chronic energy deficiency:

Mild chronic energy deficiency populations are concentrated in flood-prone areas in Malda district, which is 23.16%, and 14.29% are in low-developed areas, followed by Muslim-dominated areas (9.14%), Santhal-dominated areas (8.62%), border areas (6.18%), medium-developed areas (6.29%), high-dominated areas (5.76%), and urban areas (5.15%).

Moderate chronic energy deficiency is another problem faced by a large number of Indian populations. According to the primary survey, the highest numbers of moderately chronic energy deficiency populations are found in low-developed areas, areas that is 11.64%, followed by flood-prone areas (10.53%), high-developed areas (6.28%), border areas (5.62%), Muslim-dominated areas (5.38%), medium-developed areas (4.57%), Santhal-dominated areas (3.98%), and urban areas (3.61%).

Severe chronic energy deficiency is another serious health condition, and more than 3.89% of the sample population belongs to this group. The highest 17.61% severe chronic energy deficiency population is found in Santhal-dominated areas, and the next largest population is living in flood-prone areas (7.37%), followed by border areas (5.06%), low-developed areas (4.23%), high-developed areas (4.19%), medium-developed areas (4%), Muslim-dominated areas (3.23%), and urban areas (1.55%).

Body Mass Index (BMI) of the Female Population

The body mass index (BMI) of the female population presents a different picture from that of men. A separate study shows and explains the variation and gender-wise nutritional gaps.

According to a field survey, more than 62.09% of women belong to the normal body mass index group, compared to 60.71% of men. Among the women, only 9.48% are overweight and 5.23% are obese, followed by mild chronic energy deficiency (10.36%), moderate chronic energy deficiency (6.38%), and severe chronic energy deficiency (6.46%).

About 65.98% of women of normal body mass index population are found in border areas, and the second largest number of normal females are lived in Santhal-dominated areas, followed by a very close figure of high-developed areas (64.02%), Muslim-dominated areas (60.10%), flood-prone areas (59.28%), medium-developed areas (57.67%), and urban areas (54.69%).

The overweight female population is high as compared to the male population. The highest numbers of overweight females are recorded in low-developed areas, which is 22.34%, and urban areas, which are 20.83%, followed by Muslim-dominated areas (20.73%), border areas (13.92%), severe-dominated areas (10.94%), medium-developed areas (11.11%), flood-prone areas (10.82%), and high-developed areas (7.41%).

But the obese female population is higher as compared to the male population among the sample areas in Malda district. The highest number of obese people is found in urban areas (12.50%), followed by high-developed areas (5.82%), border areas (5.67%), medium-developed areas (5.29%), flood-prone areas (3.61%), and Santhal-dominated areas (3.61%).

About 10.36% of females in Malda district suffer from mild chronic energy deficiency, and the highest number of mild CED women are found in flood-prone areas (6.38%), followed by low-developed areas (7.11%), Muslim-dominated areas (6.74%), high-developed areas (6.35%), medium-developed areas (4.76%), Santhal-dominated areas (4.17%), border areas (4.12%), and urban areas (3.13%).

Severe CED women are another serious health problem, and the highest number of severe CED women are found in low-developed areas (5.58%), followed by high-developed areas (4.23%), Muslim-dominated areas (4.15%), border areas (4.12%), medium-developed areas (3.17%), severe-dominated areas (3.13%), flood-prone areas (3.09%), and urban areas (2.08%). The highest numbers of mildly CED-affected women are found in medium-developed areas, which is 17.99%, and in severely dominated areas, which is 15.10%, followed by high-developed areas

(12.17%), flood-prone areas (12.37%), low-developed areas (8.12%), Muslim-dominated areas (7.25%), urban areas (6.77%), and border areas (6.19%).

Nutritional Status of Children

Children constitute the most vulnerable group of the population, and their nutritional status is considered a sensitive indicator of community health and nutrition. The prevalence of underweight, wasting, and stunting among children is determined by anthropometric measurements and clinical assessment of the deficiency indicator. The weight and height of children are compared with the reference 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 percent of the standard from the median value.

The National Nutrition Monitoring Bureau (NNMB) surveys between 1975 and 1979 show that about 6 percent of children were normal and about 15 percent were surely underweight, while great majorities were in the moderate or mild categories. Surveys again in the same areas during 1988–89 showed a decline in the prevalence of the severely underweight from 15 percent to 8.7 percent, with a corresponding increase in the proportion of normal children.

able 34: Distribution of Nutritional Index through Weight for Age among Male Children in Malda District, 2014

Weight-for-Age (underweight), Above 80% of the standard					
Study Units	Normal	Mild (71-80%)	Moderate (61-70%)	Severe (51-60%)	Less than 50%
High developed areas	63.53	15.40	8.34	7.80	4.94
Medium developed areas	58.17	16.30	10.01	7.73	7.80
Low developed areas	55.41	17.52	15.03	5.08	6.97
Muslim dominated areas	54.31	21.53	13.65	5.57	4.94
Santhal dominated areas	54.70	17.39	11.92	7.15	8.85
Urban areas	68.22	17.75	7.02	4.87	2.15
Boarder areas	58.53	18.54	9.63	6.27	7.05
Flood prone areas	50.19	20.14	13.61	7.72	8.35
District Total	57.08	18.74	11.16	6.58	6.44

Source: Field Survey, 2014

Under nutrition in childhood is one of the most serious health conditions, and due to malnutrition, high child mortality rates are observed in developing countries. Lack of nutrition among children is linked to delayed development and fatal health impairments later in life that reduce the quality of life of children. So nutritional status is an important method for measuring the quality of children. It is the proper channel to understand the nutritional status of children, which has far-reaching implications for the better development of future generations. The nutritional status of children does not only reflect the socio-economic status of the family and the social wellbeing of the community; it also indicates the poor health care system and the bad health situation of surrounding areas. Weight for age expressed as a percentage or individual weight to the 50th percentile of the international population reference (WHO, NCHS) is generally considered one of the indicators of underweight, and children above 80% of the standard percentile are considered to have a normal condition among the various regions in Malda district. The largest number of normal condition children are found in urban areas, which is 68.22%, and another high ranking in terms of normal condition children is also found in high-developed areas amongst sample regions in Malda district, which is 63.53%, followed by border areas (58.53%), medium-developed areas (58.17%), and flood-prone areas, which are only 50.19% of normal children, and this area is socio-economically very backward, followed by Muslim-dominated areas (54.31%), Santhal-dominated areas (54.7%), and low-developed areas (55.41%). The report said that more than 18.74% of children's nutritional status falls between 71 and 80%; those are considered mild, followed by 11.16% with moderate nutritional status (61–70%) and severe conditions. Children's lives in the study areas are very serious for those whose nutritional status is below the 50th percentile.

Height for Age

Height for age is considered one of the best indicators of stunting or short stature in individuals due to under nutrition. It is expressed as the actual height or standard height of that age $\times 100$, which is considered to be a good nutritional status for children. According to the World Health Organization (WHO), height for age is used to classify children into various nutrition grades: normal (more than) $< 90\%$ of the standard or normal, 80-90 percent stunting, and less than 80 percent severe stunting. Table 35 shows the nutritional status of boys according to height for age, and it is seen that the proportions of boys with normal, moderate, and severe forms of growth

retardation are 67.24%, 21.32%, and 11.44%, respectively. Thus, it indicates that the overall status of normal children of average age is higher in boys (67.24%) than in girls (66%). The highest numbers of children with normal health conditions are found in urban areas (79.01%) among the sample regions in Malda district. Another highest number of normal children with nutrition is found in developed areas (77.97%), followed by border areas (68.19%), medium-developed areas (67.75%), LDA (63.91%), Muslim-dominated areas (63.39%), Santhal-dominated areas (63.72%), and flood-prone areas (58.75%). The huge number of stunting children found in the study area varies from one-dimensional region to another. The stunting children are divided into two types. a) Stunting, and b) Severe Stunting. South East Asia and Africa continents are the storehouse of stunting children; herewith, more than 21.37% are under the category of stunting based on nutritional measurement, and severe stunting is also more than 11.44%, which together constitutes more than 1 in 3 children in the study area.

The highest numbers of stunting children are found in Muslim-dominated areas due to low socio-economic conditions, and Muslim areas are the most vulnerable areas among sample regions in Malda district. The second largest numbers of stunting children are found in low-developed area, which is 23.78%, followed by flood-prone areas (23.23%), Santhal-dominated areas (22.54%), medium-developed areas (22.30%), border areas (21.05%), urban areas (17.53%), and high-developed areas (13.79%). Severe conditions are the most vulnerable condition of children, which indicate long-term deficiency of children's, and it is nearly 11.44% of total children's under severe conditions. The high concentration of severely ill children is mainly concentrated in flood-prone areas in the district, which is 18.03% where floods occur at regular intervals or every year. This area is mainly based on the rural agriculture economy, and the second highest number is found in another's socio-economically backward region of Santhal-dominated areas, which is 13.74%, followed by low-developed areas (12.31%), border areas (10.77%), medium-developed areas (9.95%), high-developed areas (8.25%), and urban areas (3.47%).

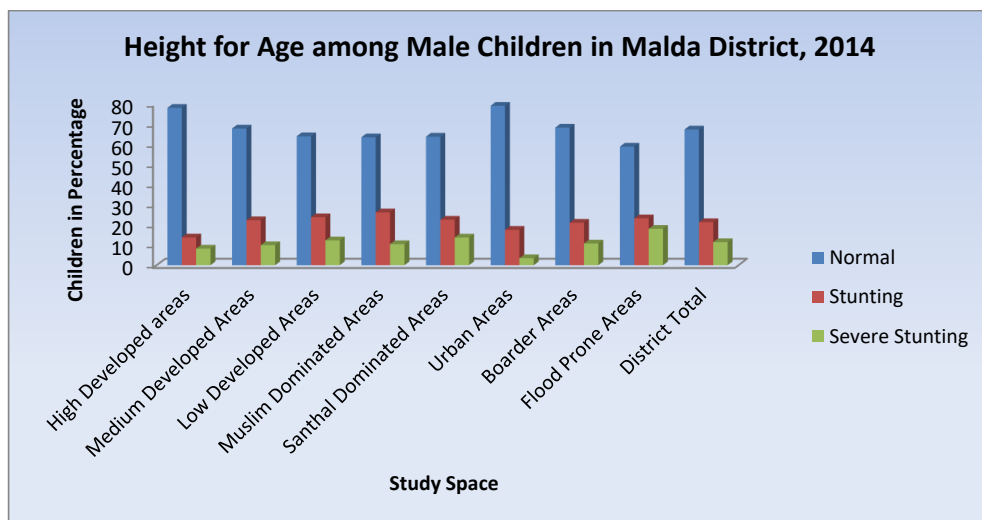


Fig.45

Weight for Height

Weight for height is the common indicator for nutritional measurement, which is considered an indicator of male children's body mass, wasting, and severe wasting. Children falling between 70 and 79 percent are considered to be wasting, while those below 70 percent are classified as being severely wasting. It is calculated in this way: $\text{actual weight} / \text{standard weight in that height of the children} \times 100$. There are no significant differences between male and female children. Nearly 68% of male children belong to normal conditions for weight and height, and 21% of children are wasting, followed by 11% of children with severe wasting.

The highest number of normal health conditions in male children is found in urban areas (81.38%), followed by high-developed areas (75.5%), medium-developed areas (72.97%), border areas (70.81%), sane-dominated areas (66.33%), Muslim-dominated areas (63.17%), and flood-prone areas (55.99%).

Together, 32% of the male children in the district, among the sample, are living in critical conditions. The highest number of wasting males are living in flood-prone areas (27.24%),

followed by Muslim-dominated areas (25.98%), LDA (20.45%), Santhal-dominated areas (20.17%), medium-developed areas (19.53%), border areas (17.90%), high-developed areas (15.68%), and urban areas (13.91%). The severe condition is another important feature that represents the very worst health condition of children, and more than 11% belong to this index. The high percentage of severely ill children are mainly lived in these regions, where socio-economic conditions are very low and households do not manage the minimum amount of required food for their children's. The highest number of severe children's are lived in flood-prone areas (16.77%), where households fail to manage minimum food on a long-term basis, and low-developed areas (16.37%) are very close to flood-prone areas, followed by Santhal-dominated areas (13.51%), border areas (11.30%), Muslim-dominated areas (10.63%), high-developed areas (8.67%), medium-developed areas (7.51%), and a very low number of severe wasting children's are lived in urban areas, which is only 4.72% due to reputed socio-economic status as well as better opportunities.

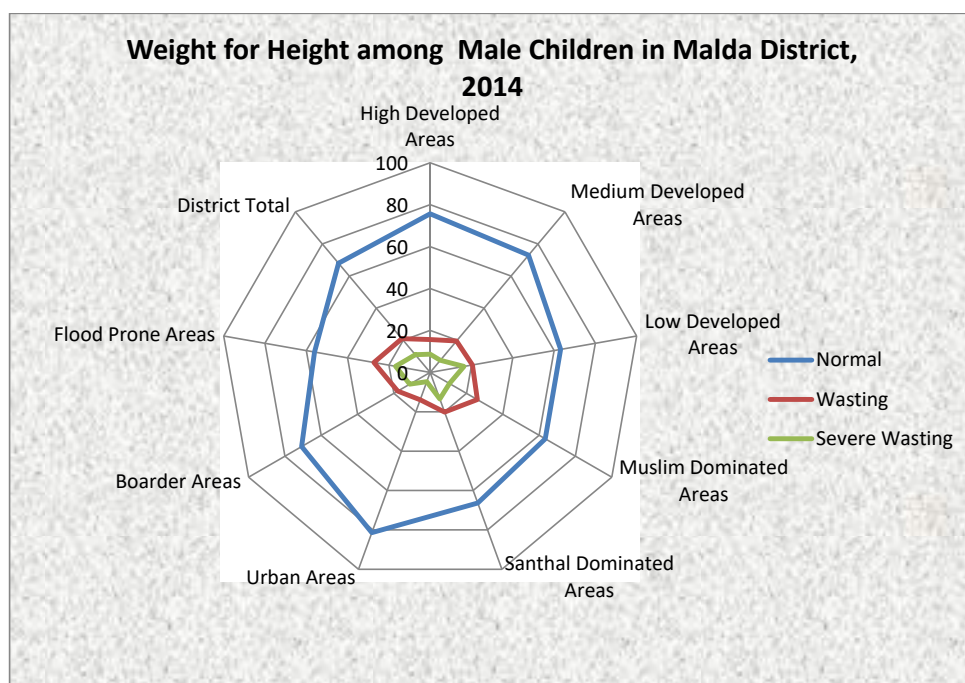


Fig.46

Nutritional Status of Female Children

Weight for Age (Female Children)

Females are the most vulnerable group in India, and female children are considered the most vulnerable children in almost 50% of families. The nutritional status of male and female children in study areas shows great variation among sample areas. According to the field study, only 52.33% (Table 37) of female children are living in a normal condition, compared to 57% of males. The highest number of female children with normal health conditions are mainly concentrated in socio-economically developed areas, likely urban areas (71.13%), high-developed areas (54.13%), low-developed areas (53.44%, especially), border areas (50.21%), Santhal-dominated areas (51.18%), Muslim-dominated areas (49.50%), and flood-prone areas (48.38%).

The distribution of mild health condition females is densely concentrated in high-developed areas (20.44%), followed by flood-prone areas (20.29%), border areas (20.09%), Muslim-dominated areas (19.95%), LDA (17.99%), Santhal-dominated areas (17.86%), medium-developed areas (16.29%), and urban areas (11.97%).

Moderate types of nutritional status are considered for those who lived under 61–70% conditions. Nearly 11.88% of female children are living under these conditions, and the highest numbers of such female children are found in low-developed areas (15.51%), respectively, Santhal-dominated areas (14.82%), flood-prone areas (13.56%), Muslim-dominated areas (12.71%), border areas (10.56%), high-developed areas (9.67%), medium-developed areas (8.83%), and urban areas (7.44%).

Severe underweight children are considered to be those whose measure is between 51–60% percentiles. About 9.32% of children with severe weight conditions are living in Malda district, and the highest numbers of severe-wasting female children are found in medium-developed areas (13.46%), flood-prone areas (10.42%), border areas (10.22%), Santhal-dominated areas (8.73%), high-developed areas (8.71%), and low-developed areas (5.36%).

Nearly 7.67% female children in the study area are found whose health status is surprising and they all are living less than 50 percentile nutritional status. The highest numbers of vulnerable

children are found in (8.90%) border areas, respectively: medium-developed areas (8.80%), Muslim-dominated areas (8%), flood-prone areas (7.36%), high-developed areas (7.04%), LDA (6.48%), and urban areas (4.11%).

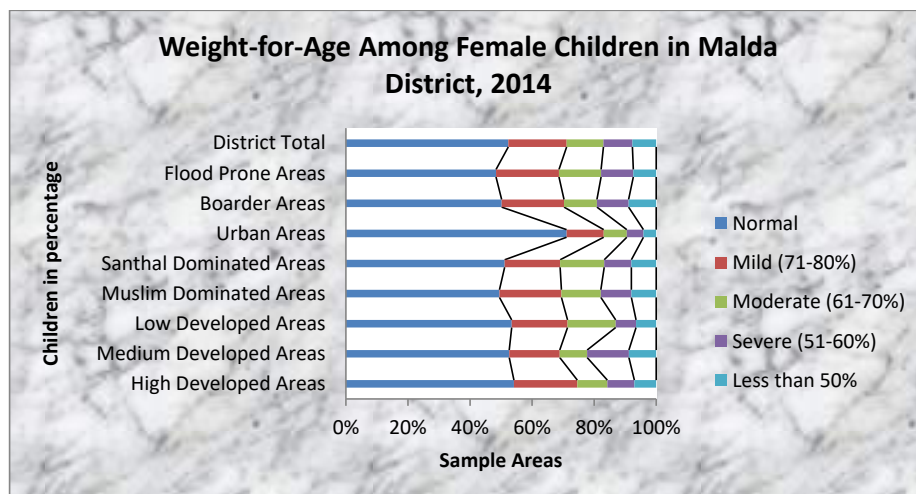


Fig.47

Height for Age(Female)

In terms of height for age, female children's nutritional status is better as compared to their national conditions. According to the field report, more than 66% of female children are living under normal conditions. According to research, more than 66% of female children are living under normal conditions. The high concentration of normal health status children are living in high-developed areas (74.83%), medium-developed areas (72.16%), respectively, urban areas (71.25%), border areas (70.15%), LDA (66.90%), Muslim-dominated areas (65.05%), Santhal-dominated areas (59.86%), and flood-prone areas (59.45%).

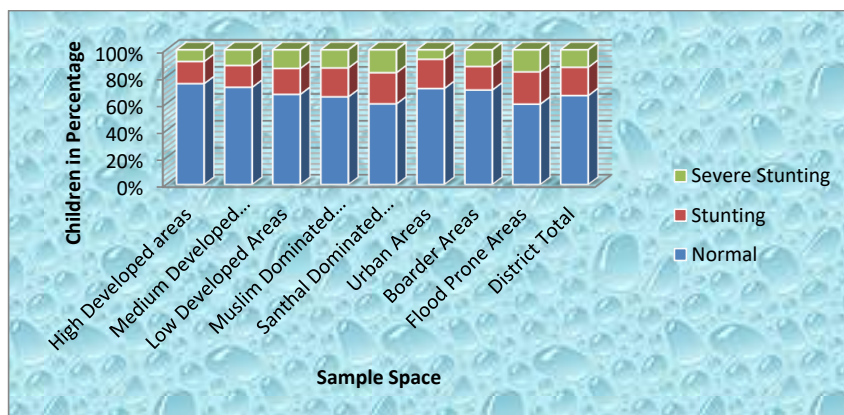


Fig.48

India is the storehouse of the stunting population, but compared to the study areas, the condition is far better. Only 21% of female children are stunted, and 15% are severely stunted. The highest number of stunting female children are living in flood-prone areas in the district (23.86%), and the second largest number are living in Santhal-dominated areas in the study area, followed by Muslim-dominated areas (21.44%), urban areas (21.73%), LDA (19.25%), border areas (17.44%), high-developed areas (16.46%), and medium-developed areas (16.19%).

Severe stunting of female children is mainly concentrated in Santhal-dominated areas (17.05%) and close to flood-prone areas (16.38%), followed by low-developed areas (13.85%), Muslim-dominated areas (13.51%), border areas (12.42%), medium-developed areas (11.66%), high-developed areas (8.71%), and urban areas (7.02%).

Weight for Height (Female Children)

Male and female children's health conditions are almost similar in terms of weight and height. Weight for height is mainly the malnutrition status of children. The female children have been divided into three types: normal-condition children, wasting, and severe wasting. Nearly 60% of female children in the study areas are normal, and a high concentration of normal female children is found mainly in urban areas (78.51%), border areas (69.80%), medium-developed areas (65.96%), high-developed areas (64.84%), Santhal-dominated areas (62.55%), Muslim-dominated areas (56.37%), flood-prone areas (55.03%), and low-developed areas (50.03%).

About 23% of female children are living in wasting conditions. The highest numbers of wasting conditions in children are found in low-developed areas (27.24%), flood-prone areas (27%), Muslim-dominated areas (26.36%), medium-developed areas (20.53%), high-developed areas (19.67%), Santhal-dominated areas (19.68%), border areas (18.44%), and urban areas (17.38%).

Severe wasting children are nutritionally the most vulnerable group, and more than 17% of female children are still under categorized in this group. The highest percentage of severely wasting female children is found in low-developed areas (22.46%), flood-prone areas (17.98%), Santhal-dominated areas (17.77%), Muslim-dominated areas (17.28%), high-developed areas (15.50%), medium-developed areas (13.53%), border areas (11.70%), and urban areas (4.11%).

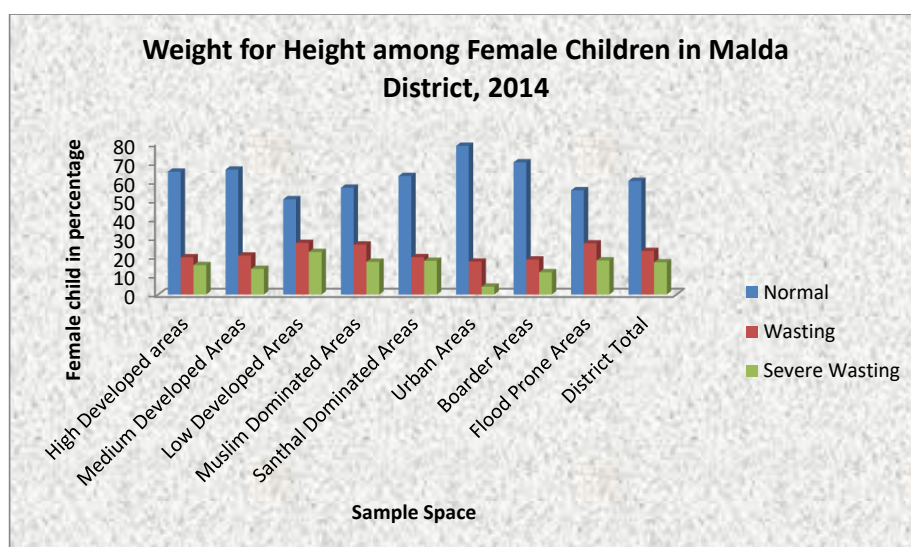


Fig.49

Overall analysis of nutritional status

High Developed Area (HDA)

Nutritional status of population is one of the important indications of food security. The nutritional status measured the various level of food security status. According to field survey, more than 63.95% adult population of High developed areas are having normal body mass

index and 11.05% adult people are lived under overweight conditions, basically overweight population are considered as over nutritious population and remaining 25% population of HDA are having less than 18.5 BMI, those are call unsecured population. Why the developed areas population are facing food problem? The study tries to find the reasons behind it. According to primary study, only four villages have been taken from five blocks and most of the village people are light worker as compared to others village and their natural food intake capacity is low. But there are huge numbers of family have not sufficient income to maintain the life style. The literate and level of education among sample household are not depicted good picture only 63.81% are found as literate and work participation rate is also very low (30.67%). More than 42% household among the High developed areas are still depending on agricultural activities which is not represent very sound economic environment. About 46% household of High developed areas are having less than Rs. 10,000 income per month. Nearly 89% household in the area feel that they have not more money to buy more food for their requirement and 66.5% household feel that they could not get required amount of healthy meals. Most interesting matter is that 7.5% household in the study areas children are not get food for a whole day or half day due to shortage of money and 93% household feel that they are not able to buy expensive food for their children due to lack of purchasing power. Children nutritional status is important food security indicator and three methods have been used for measured the children nutritional status. According to weight for height, only 76.99% children are having normal nutritional index and they are considered as food secured followed by wasting (14.16%) and more than 8.85% children belong to very marginal grade which is called severe wasting and to above mentioned reasons. Another method is height for age and reported that 75.22% children of HDA are having normal nutritional grade followed by stunting (16.8%) and severe stunting (7.96%). Weight and age ratio is also good indicator of nutrition of children. According to weight for age, only 63.72%, children are food secure and remaining percentage of children are facing various scale of nutrition problem due to various reason describe above.

Medium developed areas (MDA)

Medium developed areas are those blocks whose ranking is (six) 6-10 (ten) position based on district HDI report. Nutritional status of adult population among sample in MDA is close to High developed areas. According to field report, 65.38% adults population are living under normal

conditions and 8.97% population are having overweight followed by remaining 25.64% people are living very critical situation and they are considered underweight. But the children nutritional status is poor as compared to adult population in Medium developed areas. According to weight for height, only 63.87% children are having normal nutritional scale followed by wasting due to various underlying causes which is related to socio-economic aspects. Another way based on height for age, about 63.87% children are having normal status followed by 24.37% are stunting and 11.76% are severe stunting. Per capita income is low which is the vital factor determined the level of purchasing power. More than 46.5% households in the Medium developed areas are having less than Rs. 10,000 income per month and more than 67% population in the MDA are solely depending on primary activities which is very difficult to maintaining the life of the people. More than 92% families feel they are not able to take healthy meals and not get required amount of daily food due to shortage of money. According to weight for age, only 55.46% children are having normal weight followed by 20.17% children are having very close to normal weight, 9.24% children are moderate type of weight, severe (8.40%) and less than severe condition which is very critical situation is 6.72% children's.

Low developed areas

According to Low developed areas are those whose ranking is 11-15th position among the blocks in Malda district. Socio-economic conditions are closely related to food security where economic condition is better there food security status is also better. According to primary Survey, only 44% people are literate among sample villages in Low developed areas and work participation rate is also low (27.92%) which can determine the food security status. Only 6.05% are female worker and female play important role to increase the family income. More than 66% household in the study areas are fully depending on agriculture which is most unprofitable action arise. The nutritional status of children is also shown very bad conditions due to various causes. The important reason is per capita income is very low and more than 59.50% household still lived under below poverty line. Purchasing power is the significant factors which can reduce or increase the level of food security but more than 64% household have not sufficient income per month which is less than Rs 10,000. This kind of economic situation cannot lead better food security status among sample areas in the district. According to Weight for height, only 56.20% children are living under normal situation and remaining 25.55% children are living under

wasting conditions and 18.25% children are severe wasting which is described as a critical condition of children. About 59.12% children are normal based on height for age which can also be explaining the food security situation and large population of children are stunting (24.09%) and severe stunting (16.79%). Weight for age is another method which can best explain the nutritional grade of children. According to primary survey; only 50.36% children are food secured and remaining children are facing various grades of nutritional problems likely 20.44% are mild followed by moderate (14.60%), severe conditions (6.57%) and below severe condition (8.03%). Due to above underlying causes, large population of children are facing various nutritional problems. In the Low developed areas, more than 95% families feel that they have not money to get more essential commodities and 69% households feel that they could not afford to eat healthy meals. According to field report that 11.5% household's children are not getting food for a whole day or half day due to lack of purchasing power of the family heads and 85% family are not able to buy expensive food for their children due to shortage of money.

Urban areas

Highest number of overweight population are found in Urban areas in Malda district which is 32.90% of the total sample and only 55.96% adult population are having normal body mass index and remaining only 11.14% adult are underweight due to various causes. Due to high participation of education (73.37%) and higher level of education, nutritionally status is much better condition in Urban areas because education system reduces the level of poverty. More than 51.70% working population are engaged as servicemen and businessmen in Urban areas which lead better economic situation of any region and 79% household are depending on secondary and tertiary activities. Only 33% household have less than Rs. 10,000 income per month and per capital income is very high which Rs. 3389 per month.

Nutritional index of children is also high as compared to others sample region in Malda district, according to weight for height, more than 81.40% children are having normal grade of nutritional status followed by wasting only 13.65% and severe wasting rarely (4.65%).

But another method reported that 79.07% children are having normal health condition which is depend on adequate amount of food and 17.44% children are stunting and 3.49% children are

severe stunting which is very low as compared to national average. Children nutritional status varies measurement from method to method. Little number of children is normal based on weight for age but same children are stunting or wasting based on others method. According to weight for age, 68.60% children are normal and remaining 31.40% are facing various grades of nutritional problems. But the urban households are able to buy expensive food for their children and only 10.5% hunger household are found in Urban areas.

Boarder areas

Boarder areas refer to international boarder, national boarder and district boarder. The nutritional status of boarder areas is well as compared to other sample region in Malda district. About 65.86% and 18.55% adult population are normal and overweight those are considered food severe population and only 15% adult population are underweight those people are facing food problems. Children nutritional status is also comparatively better and 71.05% children are having normal nutritional scale based on weight for height and 17.54% children are wasting due lack of food availability followed by severe wasting more than 10.53% children in Boarder areas. There are various important reasons having here which play great role to minimize the percentage of malnutrition children. Educational status is better as compared to Urban areas and maximum numbers of people are depending on business due to its location and more than 58% household having more than Rs. 10,000 income per month. The per capita income of Boarder areas people are Rs. 2189 which is adequate to Malda's environment. Height for age said that 68.42% children among sample are having normal condition and they are considered food secured and 21% children are stunting and 10.53% children are severe stunting due to various under lying causes which is already describes above.

Flood prone areas

Flood prone areas are having only 44.17% literate people which are the highest among the sample regions in Malda district. The nutritional status is representing very poor picture due to various reason which is responsible for low nutritional status in the areas. More than 88% household workers are engaged as primary worker and among them 12% working people are have not any specific regular work and nearly 83.5% household are depending on primary

activities, among them 50% household are depending on agriculture. The economic condition of Flood prone areas in Malda district are very bad where were more than 71% household are having less than Rs. 10,000 income per month. The per capita income is very low as compared to others region in Flood prone areas in Malda district which is only Rs. 874 per month. This reason is the store house of BPL population where were more than 66% household lived under below poverty line. But the children are most vulnerable among sample region in Malda district. About 55.56% children are having normal health status based on weight for height followed by wasting (27.08%) due to various underlying causes. About 81% household feel that they are not getting sufficient amount of food due to lack of money and 69% household also feel that they could not afford to eat healthy meals. Nutritional status of children is vulnerable where were 8.5% household children not take food for a whole day or half day due to the shortage of money and 88.5% family feel that they are not able to buy expensive food for their children due to the shortage of money. According to height for age, 58.33% children are having normal grade of nutritional status followed by stunting (23.61%) and severe stunting (18.06%). But others method reported that 48.6% children are having normal nutritional grade scale followed by moderate type (14.58%), severe (7.64%) and less than severe (8.33%) respectively.

Muslim dominated areas

Nutritional status is quiet better as contrast to Low developed areas. According to field report, 67.55% adult population are having normal body mass index, basically they are called food secured followed by overweight (14.51%) and only 17.94% population are lived underweight condition. Children nutritional status is measured by three methods which is weight for height, 63.45% children are normal for weight for height followed by wasting (26.90%) and severe wasting (9.66%). According to height for age, 63.45% children are normal health status followed by stunting (26.21%) and severe stunting (10.34%). But another method is showing quiet different picture, weight for age reported that 54.48% children are having normal health and large proportion of children are facing various types of problems likely 25.17% are moderate type of problem followed by severe (5.52%) and more severe (4.83%). There are found number of reasons which are responsible for variation of nutritional status from region to region. Large number of uneducated people are mostly insecure and dependency ratio is very high (70.13%). About 45% household depend on agricultural activities and among them, 15.82% are agriculture

labourer and 17.09% household member have not any specific works. But the 52% family said that agriculture is the basic source of income in their family and per capita land availability is only 0.72 bigha. About 64.5% household are having less than Rs. 10,000 income per month and per capita income is only Rs. 1115 per month which is very low to maintain standard life of living. Muslim population are most economically vulnerable and more than 71% household feel always or sometimes feel that they did not have money to take more food from market. Again 70% household reported that they could not acquire to eat healthy meals due to lack of purchasing power and 12% family children go to head with hungry. About 87.5% in the Muslim dominated areas are reported that they are not able to buy expensive food for their children due to the shortage of money.

Santhal dominated areas

Another backward area in Malda district is Santhal dominated areas. But the Nutritional status is quiet better as compared to Muslim dominated areas in the district. But the adult's population nutritional status is poor. According to field report, only 60.60% adult population are having normal body mass index which is lying 18.5 to 24.99 and overweight population are 13.32% and underweight population is 26.09%. There are various reasons which are directly or indirectly affect the nutritional status of population. Firstly, literacy rate and level of education are not present satisfactory pictures where were only 56% people are educated, among than 62% educated people are educated upto middle pass. More than 81% working population are doing work as primary worker and among them 27% worker have not regular work but more than 31% family said that primary activities are not their basic sources of income. They earn from business and govt. services. Nearly 60.5% household are having less than Rs. 10,000 income per month but the higher income group household are also present (18.5%). Per Capita monthly income among sample household in Santhal dominated areas in Malda district is Rs. 1069 per month. There are 82% household feel that they have not required amount of purchasing power and 76% family also feel that they could not arrange to eat healthy meals due to lack of money. Highest percentage of larger household are found in Santhal dominated areas where more than 13% household's children not take food for a whole day or half day due to the shortage of money and 87.5% household feel that they are not able to buy expensive food for their children due to the shortage of money. According to weight for height, 66.67% children are normal status followed

by wasting (19.82%) and severe wasting (13.5%) due to above mentioned reasons. Heights for age another indicator which also calculates the various scale of children nutritional status and 63.96% children are normal followed by stunting (13.5%). Another determinant is weight for age which also calculates the various level of children nutritional status. According to this method, only 54.95% children are having normal scale of health and remaining children are facing various grade of nutritional problems likely mild type where is close to normal (17.12%), severe types (7.21%) and less than severe are 2.39% children.

District Status

Only 61.42% adults population in Malda district are having normal body mass index which are considered as food secure population and others 16.30% overweight also food secured but they are not living in normal condition due to their overweight conditions. Only 22.28% adults are underweight due to various reasons. Overall nutritional status by weight for height of children among sample are not good and 65.74% children are having normal nutritional grade followed by 22.29% wasting condition and 11.87% are severe wasting. Height for age reported that 65.53% children are having normal nutritional status followed by stunting (22.39%) and severe stunting (12.07%). Weight for age is third methods which represent children nutritional status. Weight for age reported that 56.04% children are having normal nutritional status and remaining are facing various grade of nutritional status likely moderate type (30%), severe (6.60%) and less than severe (6.81%).

Nutritional Deficiency Diseases

Health is one of the foremost important resources and health conditions indicate vibrant economic conditions of any region. According to report more than 50% children and women suffer from anemia (IDA) and the regional variation observed due to development of medical sciences. Vitamin A deficiency has become rare, (NNMB Technical Report No. 22.2003), rickets has become also rare diseases, but recent studies reported that north and south India show that vitamin D deficiency among adults. Iodine Deficiency Disease (IDD) has been significantly reduced after the introduction of iodized salt According Primary survey, 377 people

are facing various types of nutritional deficiency diseases which are more than 38% of the sample population in High developed areas in Malda district.

A combination of chronically lower than required dietary intakes of vitamin A-rich foods (eggs, milk, liver, deep orange fruits and dark green leafy vegetables, etc.) combined with mal absorption and increased vitamin A excretion rates associated with some common illnesses places many women and children at risk of developing vitamin A deficiency (Christian et al. 1998b; IVACG 1997; Sommer and West 1996; Stephensen 2001).

(1) Vitamin A and Night blindness, (2) Vitamin B (B3 and Pellagra, B1 and Beriberi, and B complex (B12), (3) Vitamin C and scurvy, (4) Anemia (Iron deficiency), (5) Rickets (Vitamin D), (6) TB, (7) Cancer, (8) Skin diseases, (9) Respiratory, (10) Goiter (iodine), (11) Hypertension

(12) Kidney problem and (13) others.

Vitamin A

Vitamin A is one of the important factor for determine child health condition. Vitamin A deficiency can cause night blindness and reduce the body's resistance. In children Vitamin A deficiency can also cause growth of retardation. According to estimate about 250 million children are facing the problem of Vitamin A deficiency. Another estimate reported that every year 250,000 to 500,000 people are facing the problem of vitamin A deficiency and more than 50% are losing their eye sight within one year (WHO-1998). Blindness and an increased risk of all-cause mortality are two of the most well-established adverse outcomes associated with vitamin A deficiency in preschool-age children (Sommer 1982; Sommer and West 1996). According to field survey, more than 6.78% people are facing the problem of Vitamin A deficiency in the district. But the deficiency of Vitamin A varies from region to region.

The highest numbers of night blindness patients are found in Muslim dominated areas which are 9.79% of the total patients (100%) due to low Socio-economic conditions and food intake capacity. Another important area is Santhal dominated region where were more than 9.5% patients are facing the problem of Vitamin A deficiency due to lack of food composition and

Socio-economic condition lead to lack of purchasing power which lead to night blindness among poor people. About 8.8% people are having Vitamin A deficiency in Low developed areas in Malda district. Large proportions of people are facing Vitamin A deficiency due to their lack of per capita income as well as their lack of awareness. Flood prone areas in Malda district are another important region which is more economic backward areas and 8.20% people among patient are having Vitamin A deficiency. In Flood prone areas, more than 70% people having less than Rs. 5000 income per month which is not sufficient to maintain balanced food chart. Medium developed areas is another important study unit where were 5.4% people are facing problem of Vitamin A deficiency followed by Boarder areas (4.29%) due to high income there are low number of people affected of Vitamin A deficiency. Only 4.02% Vitamin A deficiency are found in High developed areas in Malda district among them little number of people are night blind. In urban area, where are only 2.88% patients having Vitamin A deficiency. This is most important region, where most of the people are having good per capita income and Socio-economic conditions are better as compared to all regions in Malda district.

Vitamin B

Vitamin B mainly constitute number of Vitamin likely Vitamin B₁, B₃ and B₁₂ and before to beriberi, pellagra etc. diseases. Beriberi is a fatal disease that mainly affects the human digestive system, nervous system and badly affects the heart. Due to the lack of diet intake, Vitamin B₁ deficiency occurred among human population. The Vitamin B₁ is mainly found in wheat germ, legumes, meats, peanuts butter, nuts etc. The main symptoms of beriberi diseases are body weakness and pain, weight loss (gradually) fluctuation of heat rate, heart failure, brain damage etc. It is the causes of death. B₃ is another important Vitamin and deficiency of Vitamin B₃ heads to a disease called Pellagra (Smith, P, 2008). The Vitamin B₃ is found in all kinds of wheat product, fishes, meats, eggs, liver, dates, figs, kidney wheat germ etc. The main symptoms are diarrhea, dermatitis, dementia, and finally occurred death. Nearly 6.96% population among the patient are shared vitamin B deficiency. It is also varied from high developed region to socio-economically backward regions. The large proportion of Vitamin B deficiency patient are found in Santhal dominated areas in Malda district which is considered as one of the most backward region where were more than 13.5% patient are facing problem of various type of Vitamin A deficiency . The second largest number of Vitamin B deficiency patients are found in Flood

prone areas in the Malda district which is also socio-economically very deprived areas in Malda district where were nearly 9.79% patient are facing the problem of Vitamin B deficiency. Most of the household in Flood prone areas in the district are having less than Rs. 5000 income per month which is not satisfactory to maintain standard food menu. Another important region is Muslim dominated areas where were large numbers of Vitamin B deficiency population are found due to various related causes. About 9.02% patients are Vitamin B deficiency population. Nearly 7.8% patient are facing the problem of Vitamin B deficiency in Low developed areas followed by High developed areas (4.95%), Medium developed areas (4.50%) and Boarder areas (9.63%). only 1.28% are found in Urban areas where were district average is 6.76%.

Vitamin C

Scurvy is the important fatal diseases which affects blood vessels, skin, gums, wound healing, red blood cells, connective tissues etc. and it is caused due to deficiency of Vitamin C which lead to scurvy (Stine, N. H., et al. 2014). The main symptom of scurvy is bleeding under the skin and hemorrhage. Nearly 6.27% patients are facing the problem of Vitamin C deficiency due to lack of food intake. The highest number of Vitamin C deficiency and Scurvy affected people are found in Flood prone areas in the district which is more than 11.11% patient due to lack of Vitamin C oriented food intake. The second largest numbers of C deficiency patients are found in Santhal dominated areas which are 7.67% of the total patients. Medium developed areas also having high population of vitamin C deficiency population which is 6.8% and developed areas in Malda also have very close number of vitamin C deficiency patient (HDA) which is 6.80% due to lack of vitamin C oriented food intake. About 5.93% patients are feeling vitamin C related diseases in Muslim dominated areas followed by High developed areas (5.88%) and Boarder areas (2.72%). Only 2.24% patients are affected by Vitamin C deficiency in Urban areas in Malda District.

Anemia and Iron deficiency

Anemia is one of the most common of all nutritional diseases which is caused by iron deficiency and large numbers of people in the world are facing the problem of iron deficiency diseases. The most affected groups are women and children, more than 12.12% patient reported that they are

facing to problem of iron deficiency in Malda district. The most anemia affected areas in the district is Flood prone areas where more than 14.29% patient are reported that they are coping of anemia. Anemia affected population are equally distributed over the district. According to primary survey, nearly 13.3%, population in High developed areas is affected by anemia due to iron deficiency. The main function of iron in the formation of hemoglobin and when people having low amount of hemoglobin, they are called anemia affected. The main symptoms of anemia are weakness, pale skin, apathy, fatigue, difficulty breathing on exertion etc. During the childhood, iron deficiencies badly affect behavior and leaning capacity as well as children growth and development. The low numbers of anemia affected patients are found in Malda district compared to national average. Only 12.85% patients are facing the problem of iron deficiency in Low developed areas followed by Santhal dominated areas (12.58%), Muslim dominated areas (12.11%) and Medium developed areas (11.71%). The very low numbers of anemia affected patients are found in Boarder areas (10.88%) and Urban areas only 8.63% which is very low as compared to others region in the district due to high level of development.

Rickets

Rickets is occurred due to Vitamin D deficiency and it is the serious condition of human body caused by without adequate food sources of vitamin D. Lack of vitamin D among children causes rickets and adult rickets known as osteomalacia. Children rickets are characterized by insufficient amount of mineralization of bone, growth retardation and skeletal deformities such as bowed leg and adult rickets are characterized by weak muscles as well as weak bones and deficiency of vitamin D may lead to the thinning of bones seen in osteoporosis. About 6.60% patients among the total percentage of patient are affected by vitamin D deficiency. People are found in those areas where sunlight is not available because sunlight is the important sources of vitamin D and human body itself produced vitamin D with the help of sunlight. Highest number of rickets patient are found in Low developed areas which is 10.08% and second largest number of Vitamin D deficiency patient are found in Muslim dominated areas in Malda district. Most of the Socio-economically backward regions are having high number of Vitamin D deficiency. According to field report, 9.2% patients are affected by Vitamin D deficiency in Santhal dominated areas followed by Flood prone areas (8.73%) and Boarder areas

(5.14%). But the very low rickets affected patients are found in Urban areas which is only 1.92% followed by Medium developed areas (9.60%) and High developed areas (2.79%).

Tuberculosis (T.B.)

Food is one of the basic factors determining our health. Malnourished of an individual on account of their impaired immunity are more vulnerable to contact infections disease like tuberculosis. A good socio-economic system, which provides adequate and whole some food, good housing facilities and in calculates health awareness among its people is the best answer for tackling tuberculosis. Generally malnourished compromised patients contact tuberculosis and tuberculosis is turn causes wasting. So, Malnourishment makes people vulnerable to tuberculosis and in turn tuberculosis aggravates malnutrition and finally leads to severe wasting and death. Thus the various cycles are goon resulting in heavy morbidity and mortality (Ismail, M.).

Tuberculosis is the serious condition of people which is mainly occurred due to food deficiency. About 1.08% patients are still affected by tuberculosis in Malda district due to food related causes. The highest number of tuberculosis patients are found in Flood prone areas where were food insecurity is common problem during the Flood and due to poor economic condition huge percentage of population are not get sufficient amount of food for their daily requirement. According field report, 2.91% patients are affected by tuberculosis in Flood prone areas followed by Muslim dominated areas (1.03%), Low developed areas (1.01%), Santhal dominated areas (0.92%), Boarder areas to (0.91%) Medium developed areas (0.90%). The only 0.62% patient is found in High developed areas and in Urban areas having no Tuberculosis patients according to primary survey.

Cancer

Cancer is a major killer of adults ages 45 and older. There are various types of Cancer are found which affect the various parts of the body and affected cell type. According to a report, substances of Cancer probably enter the body through alimentary canal in food and beverages. Numbers of studies are found that specific types of fat to cause various cancers. High intake of dietary fat may promote cancer, but this could be due at least in part to the extra energy that fat provide. Obesity is led with various types Cancers likely Colorectal, Prostate, Uterine, Pancreatic

and Breast Cancers. Food also leads to protection against Cancer. Some important foods are fresh vegetables, fruits, vitamin C and E. According to Primary Survey, 4.84% patients are facing the problem of Cancer. The highest number of Cancer affected patient are found in High developed areas which is 6.8% followed by Santhal dominated areas (6.44%) due to various types meat consumptions, Flood prone areas (5.19%), Boarder areas (5.14%), LDA (4.79%) and Medium developed areas (4.20%). The low numbers of cancer affected patients are found among the Urban areas which is only 2.88% and Muslim dominated areas (3.35%).

Skin

Skin abnormalities, such as pigmentation and keratosis, have long been known to be caused by chronic ingestion of inorganic arsenic. A few studies have resulted in hypotheses that the prevalence of arsenic induced skin lesions and others arsenic caused diseases might be increased with malnutrition (National research council). In south western Taiwan, inhabitants were reported to have poor nutritional and low socio-economic status (Yang and Blackwell 1961). Their reported diet was adequate in caloric and high in carbohydrate but low in protein and extremely low in fat (Ismail, M.). Skin diseases is one of the most important diseases and vitamin E and helps prevent reproductive problems and promotes good skin health and vitamin K also promotes normal blood clotting by aiding in the manufacturing of fibrinogen and others proteins needed for clotting. Skin diseases among sample areas in Malda district are widely founded. According to field report, more than 23.23% patients are badly affected by skin related diseases which is the highest number of patients among sample diseases in the district. Highest numbers of skin affected patient are found in Low developed areas due to the various conditions which are more than 29.97% among the total patients. The second number of skin diseases are found in Boarder areas which is 28.10% followed by Santhal dominated areas and Muslim dominated areas both (24.23%) Flood prone areas (23.18%), Medium developed areas (20.72%) and High developed areas (18.58%). The low numbers of skin diseases affected patients are found in Urban areas which is 14.70%.

Respiratory

Respiration is the process by which nutrients reactions take place, energy is produced and stored, and carbon monoxide and wastes are given off. This process is absolutely central to basic cell functioning and thus the functioning of the body as a whole. They are unable to retain any air(Ismail, M.). According field information which is reported by local respondents, more than 6.78% patients are facing the problem of respiratory which is closely related to food deficiency. The highest numbers of respiratory diseases are found in Muslim dominated areas which are 9.02%, followed by Medium developed areas (9.0%), Boarder areas (8.76%) and High developed areas (7.12%). But respiratory diseases are relatively low in Urban areas which is 4.15% patients followed by Low developed areas (3.53%), Santhal dominated areas (6.13%) and Flood prone areas (6.61%).

Goiter

Iodine deficiency disorders are the most common in Central Asia and South East Asia and also found in Central and Eastern Europe. The millions of population are living with Iodine deficiency in above mention areas. According to estimate more than 50 million people in the world are affected by Iodine deficiency. About 35% gram salt is available in ocean water and it is the dependable source of salt in coastal areas but away from coastal areas Iodine in food is fully depend or largely reflected the amount in the soil. Due to the chronic Iodine deficiency, the thyroid gland enlarges as it attempts to trap more iodine and it gradually becomes a visible lump at the front of the neck known as a goiter. Important foods, likely sweet potato, millet, cassava, certain beans, and group of cabbage family vegetables, contain substances mainly known as goitrogens that to interfere with thyroid hormone synthesis. According to field survey, only 1.58%, patients are facing the problem of goiter in Malda district. There are also regional variations in goitre, and the most interesting thing is that high numbers of goitre-affected patients are found in socio-economically developed areas in the district due to low salt consumption. The report said that goitre patients are lived in medium-developed areas, followed by border areas (2.72%), high-developed areas (2.48%), low-developed areas (1.51%), and Santhal-dominated areas (1.23%). On the other hand, urban areas are only shared by 0.32% of goitre patients, followed by Muslim-dominated areas (0.52%), and flood-prone areas (0.73%).

Hypertension

Hypertension, commonly known as high blood pressure, is one of the most common problems among the high-income population in the world, as well as in developed countries. It plays a very crucial role in various associated diseases, likely coronary heart disease, stroke, kidney disease, and heart failure. But there are still not only specific causes of hypertension. It has been reported in a number of studies that salt intake and blood pressure in communities are closely related to hypertension. A study also found that a heavy amount of alcohol consumption is associated with hypertension in vegetarians, particularly those who are not consuming animal-based foods, likely meat, milk, and eggs, and have lower blood pressure as compared to the non-vegetarian population. The normal food habit also controls the blood pressure, likely fruits, vegetables, low-fat dairy products, poultry, small fish, nuts, and very low amounts of red meat, sugary foods, and beverages. About 6.92% of patients in Malda district are suffering from the problems of hypertension, which vary greatly from one area to another. The highest numbers of hypertension patients are found in urban areas, which are 25.88% of the total, followed by other economically developed areas, border areas (12.08%), high-developed areas (10.84%), and medium-developed areas (5.11%). The remaining areas in Malda district have very low numbers of hypertension patients. According to the primary survey, the lowest numbers of hypertension patients are found in Santhal-dominated areas; they are socio-economically backward, which is only 0.92% out of 100% of patients, followed by flood-prone areas (1.06%), Muslim-dominated areas (1.55%), and low-developed areas (1.76%).

Kidney problem

About 4.37% of patients are having kidney problems, according to their doctor reports in Malda district. The highest numbers of kidney problem-affected people are found in urban an area, which is 9.27% of the total of 100% patients, and the second largest numbers of kidney problems are faced by medium-developed areas, which is 6.91%, high-developed areas (6.17%), and border areas (6.04%). The very low numbers of kidney problem patients are found in flood-prone areas, only 0.79%, which is the recorded lowest number due to a lack of awareness, and most of them do not know their problems. Most people are facing a number of problems in backward areas, but they never consult with doctors. Nearly 1.23% of patients are having kidney problems

in Santhal-dominated areas, followed by low-developed areas (2.27%) and Muslim-dominated areas (3.61%).

Others disease

The relationship between diet and chronic diseases is complicated, not only because many diseases take years to develop but also because identifying a specific dietary cause is extremely difficult. Other diseases refer to a number of diseases, except those mentioned above, all kinds of diseases, and a number of people have been suffering for a long time but have no idea about their diseases (like fever, cough, various types of vitamin deficiency, weakness, etc.). About 12.48% of patients in Malda district are facing problems from a variety of diseases. The highest number of other types of diseases are found in urban areas, which is 25.88% of all patients out of the 100%, followed by medium-developed areas (17.72%), high-developed areas (16.41%), Muslim-dominated areas (10.31%), low-developed areas (8.82%), and the lowest number of other disease-affected populations are found in Santhal-dominated areas, which are 6.44% of all patients, followed by flood-prone areas (7.14%), and border areas (9.67%).

According to a field survey, more than 46.36% of people in the district are affected by various diseases, which is nearly half of the population. According to the field survey, the highest numbers of food deficiency diseases are found in Santhal-dominated areas in the district, which is 39.52%, followed by border areas (38.62%). Muslim-dominated areas also have a large number of various patients due to a lack of food availability, which is 36.85% of the total population, followed by medium-developed areas (35.09%), urban areas (34.06%), and high-developed areas (34.03%). A comparatively lower population of disease-affected areas is found in low-developed areas (31.94%) and flood-prone areas (32.01%).

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Discussion of regional food security status

Patterns of Food Consumption

Patterns of food Consumption is an important nutritional measurement scale, and it determines the level of socio-economic development. Food consumption has to be sustainable, and it has to be safe and healthy in amount and quality (Lucia A). According to the UNDP Human Development Report (1998), consumption that enhances human development must be shared equally (ensuring basic needs for all), strengthened (improving human capabilities and enriching the lives of people), encouraged by lively, creative individuals and communities, socially responsible (not compromising the well-being of others), and environmentally sustainable (Lucia A). The mass of food items mainly consists of only four types of elements: water and the three macronutrients carbohydrates, fats, and proteins (FAO, 2010; Voedingseentrum 1998a, 1998b; Whitney and Rolfes, 1999). Food items form the basis of food consumption patterns, defined as the consumption of specific food items and their combinations in dishes and meals. These patterns show large temporal and spatial differences, mainly caused by the availability of commodities, cultural aspects, and economic factors (Whitney and Rolfes, 1999).Table 40: Pattern of Food Consumption among Sample Households in Malda District, 2014

Pattern of Kcal Consumption in Percentages									
Study units	Cereals	Pulses	Vegetables	Fish	Milk	Meat	Eggs	Fruits	Others
High developed areas	69.03	2.44	3.65	3.09	1.11	1.12	2.44	2.06	16.15
Medium developed areas	76.48	3.89	5.55	2.17	1.22	0.13	3.60	1.08	6.05
Low developed areas	75.97	8.35	3.09	1.43	1.30	0.14	3.85	0.17	6.15
Muslim dominated areas	72.48	9.80	6.69	0.51	0.39	0.14	5.22	0.19	5.10
Santhal dominated areas	73.51	8.81	5.64	0.23	0.24	0.13	6.54	0.09	5.05
Urban areas	68.43	4.00	5.48	4.19	2.27	2.23	3.59	4.09	5.92
Boarder areas	76.96	7.60	4.18	0.23	0.14	0.09	5.44	0.04	5.54
Flood prone areas	74.89	8.62	5.26	0.20	0.25	0.12	6.67	0.07	4.13
District Total	72.08	4.28	5.72	2.72	2.22	1.85	3.52	2.18	5.43

Source: Field Survey, 2014

Food consumption pattern and economic growth: increasing afflunec and the use of natural resources (research report by P.W. Gerbens-Leenes, S. Nonhebel, and M.S. Kool).

Cereal Consumption

Cereal is the main staple food item that contributed the maximum percentage, which is the sum of rice, wheat, jowar, bajra, maize, barley, small millets, ragi, and others. Rice and wheat together contributed about 90% of the total cereal. Consumption of cereals at the household level, at the national as well as state level, is very high. According to the Institute of Medicine, children and adults should consume 45 to 65 percent of their calorie intake as carbohydrates and at least 130 gram of per day (online available September 19, 2015).

Daily Recommendations

About 45 to 65 percent of your calories should come from carbohydrates. This equates to about 900 to 1,300 calories from carbohydrates or about 225 to 325 gram of carbohydrates each day if you normally consume around 2,000 calories. Most adults should avoid dipping below 130 gram of carbohydrates per day, as this small amount is what you would need to support basic body functions. According to the Weight-Control Information Network, eating less than 130 gram of carbohydrates can cause ketosis, a buildup of ketones in your blood. As a result, your body produces high levels of uric acid, which places you at risk of developing gout. Gout causes painful swelling of joints and can lead to the formation of kidney stones (online, available on September 18, 2015). When you are sedentary, your body needs fewer carbohydrates, but when you are active, it needs more. Athletes should not dip below about 250 gram of carbohydrates a day and should strive to get about 50 to 60 percent of their daily calories from carbohydrates.

According to the primary survey, more than 72.08% of the energy out of the total comes from cereals in the sample region in Malda district. The highest percentages of cereal energy take place in border areas among the sample, which is more than 76.96%, and another region of medium development areas also consumes a very high amount of cereals, which is 76.48%. Out of the total food consumption, nearly 75% of the sample regions consumed more than 70% cereal-based energy. 75.97 percent of energy comes from cereals in low-developed areas, respectively, flood-prone areas (74.89%), Santhal-dominated areas (73.51%), Muslim-dominated areas (72.48%), and urban areas in the Malda district only consumed 68.43% of cereal energy and High-developed areas also consumed less cereal energy (69.03%) as compared to other regions.

Pulses

India covers 33% of the world's area under pulses and only 22% of production only. In India, more than 90% of the global cultivation area is under pigeon pea, 65% under chickpea, and 37% under lentil, with a corrosive share of production of 93%, 68%, and 32%, respectively. The average consumption of pulses was 27 g/day per person in rural India, whereas the study areas shared a very low amount of pulses per day per capita. According to the study, only 4.28% of the energy consumed is pulses, but it varies from 9.8% in Muslim-dominated areas to 2.44% in highly developed areas. This is a very interesting trend found in the case of pulse consumption, where highly developed areas consume fewer pulses as compared to low and backward areas. The highest percentage of pulse consumption shared among sample areas in Malda district is in sanitized areas (8.81%), followed by flood-prone areas (8.62%), border areas (7.60%), and very low amounts of pulse consumption in high-developed areas (2.44%), medium-developed areas (3.89%), and urban areas (4%). The recommended amount of daily pulse consumption is 40 gram per day per head.

Vegetables

The daily amount of vegetables for individuals depends on their age, gender, and level of physical activity. About 5.72% of the total kcal comes from vegetables among the sample areas in Malda district. According to RDA, it should be nearly 8% kcal. Higher kcal comes from vegetables and is found in Muslim-dominated areas (5.64% kcal), urban areas (5.48% kcal), flood-prone areas (5.26% kcal), medium-developed areas (5.55% kcal), border areas (4.18% kcal), and low-developed areas (3.09% kcal).

Fish

Fish is one of the most popular dishes among Bengali people, and West Bengal is the 4th largest fish consumer in terms of per capita among states in India. According to the latest report, average fish consumption in rural India is just 269 gram per month, compared to 238 gram per capita per month in urban areas. In West Bengal, eight households out of 10 in rural and urban areas consume fish. In terms of fish consumption, study areas represent a very bad picture because only 2.72% of kcal comes from fish among sampling areas in Malda district. The variation of high consumption among sample areas is of great concern; it is from 4.19% kcal to 0.20% kcal.

Mainly socio-economically advanced areas are consuming more fish among the sample areas in Malda district. The highest amount of fish consumption is in urban areas (4.19% kcal), followed by high-developed areas (3.09% kcal), medium-developed areas (2.17% kcal), low-developed areas (1.03% kcal), Muslim-dominated areas (0.51% kcal), Santhal-dominated areas (0.23% kcal), border areas (0.23% kcal), and flood-prone areas (0.20% kcal).

Milk and Milk Products (India, 290 g)

India is the leading milk producer country in the world, and per capita milk availability was 290 gram in India and 140 gram in West Bengal in but average milk and milk product consumption in terms of rupees: only Rs 97 are expended per head per month in urban areas, while in rural areas, Rs 56, only 1.22% kcal comes from milk and milk products in Malda district. The areas with the highest percentage of milk and milk products consumed are urban areas, which are 2.27% kcal, medium-developed areas (1.22% kcal), 1.30% kcal, Muslim-dominated areas (0.39% kcal), flood-prone areas (0.25% kcal), Santhal-dominated areas (0.24% kcal), and border areas (0.14% kcal).

Meats

The above table (40) shows the contrast in food habits across states. Basically, West Bengal consumed more meat, eggs, and fish than milk and milk products. According to the Planning Commission, average meat consumption in India as a whole is 5 kg per capita per year, and Kerala seems to be consuming four times this quantity, working out to about 20 kg per capita. Worldwide, the average corresponding is 43 kg. Only 1.85% of the kcal energy comes from meat among the sample areas in Malda district. The study indicates that meat consumption is very low due to the poor economic conditions of households. About 2.25% kcal comes from meat in urban areas in Malda district, followed by high-developed areas (1.12% kcal), Santhal-dominated areas (0.15% kcal), Muslim-dominated areas (0.14% kcal), low-developed areas (0.14% kcal), medium-developed areas (0.13% kcal), flood-prone areas (0.12% kcal), and border areas (0.09%).

Consumption of Eggs

Eggs are an important source of a balanced diet. It provides 3.52% of the total energy among the sample areas in Malda district. The high egg consumption areas in the district are Santhal-dominated areas (6.54% kcal), followed by flood-prone areas (6.67% kcal), border areas (5.54% kcal), Muslim-dominated areas (5.22% kcal), LDA (3.85% kcal), medium-developed areas (3.60% kcal), and border areas (3.59% kcal).

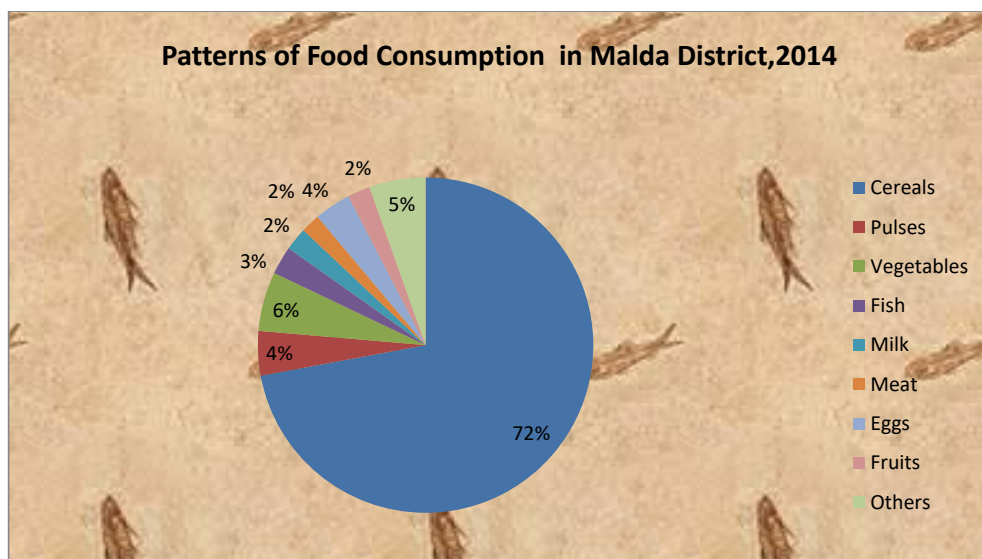


Fig.51

Fruits Consumption

Only 2.18% of the total energy comes from various fruits. The consumption of fruits is very low as compared to the recommended level (RDA). Only a few regions are remarkable for consumers of fruits, and in other regions, consumption levels are insignificant. According to the primary survey, the highest fruit consumer areas among the sample are high-developed areas (2.06% kcal), respectively, urban areas (4.09% kcal), medium-developed areas (1.08% kcal), Muslim-dominated areas (0.19% kcal), low-developed areas (0.17%), Santhal-dominated areas (0.09%), flood-prone areas (0.07% kcal), and border areas (0.04%).

Other food consumption

Other food mainly refers to fast food as well as various types of cereal-based food. Nearly 5.43% of Kcal comes from other foods, and the highest percentage of Kcal has been taken by high-developed areas, which is 16.15% Kcal, followed by low-developed areas (6.15% Kcal), medium-developed areas (6.05% Kcal), border areas (5.54% Kcal), Muslim-dominated areas (5.10% Kcal), Santhal-dominated areas (5.05% Kcal), and flood-prone areas (4.13% Kcal).

Average Caloric Consumption

The human requirement for a sufficient amount of food for an active and healthy life is not a problem in any particular country; it is almost a problem worldwide. India's first attempt was made in 1958 by ICMR through its Nutrition Advisory Committee and recommendations were made for Indian and it revised in 1968 and in 1978 again revised the Recommended Dietary Allowances (RDA) for Indians by another Expert Group of the ICMR. In 1985, the recommendations on human protein and energy requirements were again published in collaboration with the Expert Group of FAO, WHO, and the United Nations University (UNU). The latest revision by the joint FAO/WHO/UNU Expert Consultation considered human nutrient requirements again after 2000 in 2001: micronutrient requirements, energy in 2004, and protein in 2007. The requirements of various types of nutrients play a great role in living a healthy and active life. Humans need nutrients for different physiological groups of populations, which have also varied and are very essential to maintaining a well-balanced diet. Food components are derived from various foods, and the amount of each food is essential for individual physiological growth. ICMR recommends the Dietary Allowances (RDA) for Indians on the basis of weight and age. But the requirement of dietary allowances depends upon the age, body weight, and physiological and metabolic status of the individual (ICMR, 2009).

Per capita caloric consumption among sample areas in Malda district is 2183 kcal per capita per day. According to the standard level of caloric intake, it should be at least 2400 kcal per day per head. According to the field study, only urban areas among the sample are food secure in terms of caloric intake, and the average caloric intake is 2421 kcal per day per head. Except for the urban areas, all the dimensional regions in the study area are food insecure in terms of caloric intake. Another important region is high-developed areas, whose caloric intake is 2248 kcal per

day per capita, followed by Muslim-dominated areas at 2216 kcal per day per capita, medium-developed areas 2182 kcal, Santhal-dominated areas at 2151 kcal, border areas at 2147 kcal, low-developed areas 2137 kcal per day per capita, and flood-prone areas at 1996 kcal per day per capita.

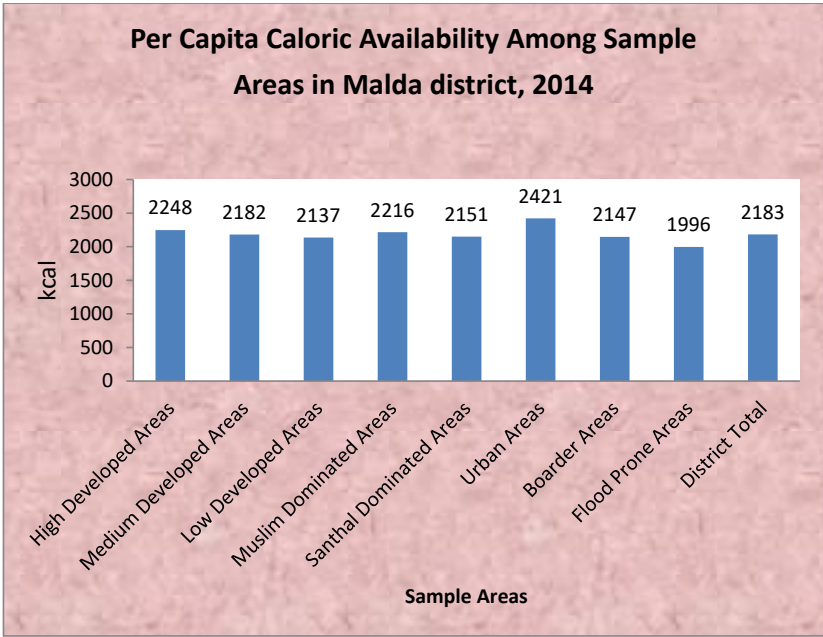


Fig.52

Regional Caloric Availability

Table No. 42 shows the household-wise caloric intake among the sample areas in Malda district. According to a field survey, only 47.17% of households are food secure, which gets 2400 kcal per day per head. A field study reported that the highest number of food-secure households is found in urban areas, which is more than 73.5% of households, followed by developed regions (55.5%), border areas (48.5%), Santhal-dominated areas (44.5%), medium-developed areas (43%), Muslim-dominated areas (37%), low-developed areas (34.5%), and flood-prone areas (33%). Basically, the socio-economic status of urban areas is very high compared to other regions due to better working facilities and the fact that most people engage in high-income activities, likely as servicemen, businessmen, etc. Another economically high-income region also

has more than 50% food-secured households due to high per capita income. The maximum numbers of people depend on non-primary activities, and the work participation rate is high. Female income is also high, which is very important for reducing the level of household food insecurity.

Table 42: Caloric Availability among Sample Households in Malda District, 2014

Study Units	Households in Percentages(Kcal)										
	Above 3000	2801-3000	2601-2800	2400-2600	secured	2399-2200	2199-2000	1999-1800	1799-1500	Below 1500	insecure
High developed areas	7	7.5	10	31	55.5	19	13	5	4.5	3	44.5
Medium developed areas	3.5	3.5	8.5	27.5	43	25.5	13.5	7.5	5.5	5	57
Low developed areas	2	5	4.5	23	34.5	25.5	20	7.5	6.5	6	65.5
Muslim dominated areas	3	4.5	7	22.5	37	28	16	7	6.5	5.5	63
Santhal dominated areas	2.5	5	7.5	29.5	44.5	20	15	10.5	5.5	4.5	55.5
Urban areas	7	11.5	15	40	73.5	14	8	3	1	0.5	26.5
Boarder areas	5.5	5	9.5	28.5	48.5	24	12.5	6	4.5	4.5	51.5
Flood prone areas	3	6	6	18	33	24	14	14.5	7.5	7	67
District Total	4.33	6.67	8.67	27.5	47.1	21.33	14.08	7.83	5.08	4.50	52.83

Source: Field Survey, 2014

In urban areas, out of 73.5% of food-secured households, only 40% consume 2400–2600 kcal per day per head, and 260–1800 kcal of caloric are only consumed by about 15% of households, followed by 280–1500 kcal (11.5%), and the remaining 7% consume more than 3000 kcal per day per head. More than 26.5% of households in urban areas in the district are facing food problems; among them, a small number of households belong to marginal groups. Nearly 14 households consumed close to the everyday recommended level of energy, which is between 2200 and 2399 kcal, followed by 8% of household members taking 2199–2000 kcal per day per head, 3% (1999–1800 kcal), 1% (1500–1799 kcal), and still 0.5 household members consumed less than 1500 kcal per day per head, which is unhealthy to live an active life. The food security condition of urban areas is not satisfactory due to the lack of responsibility for economic conditions; it also depends on the practice of food culture and the level of food consumption.

Other socio-economically strong regions in Malda district are highly developed regions, where only 55.5 households have food security. Out of them, only 31% of household members consume 2400–2600 kcal per day, which is the minimum amount of caloric for an active and healthy life in Indian climatic conditions, and 10% of household members get 260–1800 kcal per day per head, followed by 7.5% who consume 280–1000 kcal, and only 7% of household members consume more than 3000 kcal per day per head.

Medium-developed regions are basically agriculture-dependent economies, and socio-economic status is low as compared to urban and high-developed areas. Food security status is fully dependent on the purchasing power of people, which is directly determined by the level of per capita income. The level of calories is also very important in determining food security, which can change the direction of societies. According to the field survey, only 43% of households' members are enjoying sufficient amounts of caloric availability, and the remaining 57% of household's members are not getting the daily required amount of food for their active lives. Out of 43%, 27.5% of households are consuming the minimum level of recommended energy, which is 2400–2600 kcal per day per head, and 8.5% are consuming between 260–1800 kcal per day per head, followed by 3.5% at 280–1500 kcal and 3.5% at above 3000 kcal per day per head. Nearly 25.5% of households in MDA are consuming between 2200 and 2399 kcal per day, which is very close to the recommended level of food, and 13.5% are getting only 2000–2199 kcal, followed by 7.5% (1800–1999 kcal), 5.5% (1500–1799 kcal), and 5% households consume less than 1500 kcal per day per head.

According to the district HDI report, low-developed areas are very backward due to their low socio-economic status. Nearly 23% of households are consuming 2400–2600 kcal per day per head, and 4.5% of household members are getting in between 260–1800 kcal per day per head. Due to a lack of purchasing power, only 5% of household members consumed 280–1500 kcal, and 2% of household members consumed more than 3000 kcal per day per head. A huge number of LDA people are food insecure. Among them, 25.5% of household members are consuming foods close to the food security level, which is 2200–2399 kcal, followed by 20% of household members getting in between 2000–2199 kcal, 7.5% of household members (1800–1999 kcal), 6.5% of household members (1500–1799 kcal), and 6% of household members are consuming less than 1500 kcal per day per head.

Boarder areas refer to that zone, which includes international, national, and district boundaries. The food security condition is better as compared to other regions in the district. This region is mainly known as a political instability zone, and in spite of this, the region has nearly 50% secured households due to permanent economic stability. About 28.5% of households in border areas are consuming 2400–2600 kcal per day per head, followed by 9.5% of households that get in between 260–1800 kcal, 5% of households that consume 280–1000 kcal, and 5.5% of households that consume more than 3000 kcal per day per head. The largest number of households belong to food insecure conditions; 24% of households members get 2200–2399 kcal, followed by 12.5% of households members consuming 2000–2199 kcal, 6% of households members (1999–1800 kcal), 4.5% of households members (1500–1799 kcal), and 4.5% of households members consuming less than 1500 kcal per day per head.

Flood-prone areas are those areas where almost every year floods occur, and the economic conditions in this region are very low. Nearly 18% of household members consumed 2400–2600 kcal per day per head, and 6% of household members got in between 260–1800 kcal per day per head. Due to a lack of per capita income, only 6% of household members consumed 280–1500 kcal per day, and 3% of household members consumed more than 3000 kcal per day per head. A high number of FPA households are food insecure. Among them, 24% of household members consumed food close to the food security level, which is 2200–2399 kcal, followed by 14% of household members getting in between 2000–2199 kcal, 14.5% of household members (1800–1999 kcal), 7.5% of household members (1500–1799 kcal), and 7% of household members consumed less than 1500 kcal per day per head.

Muslim-dominated areas mainly refer to areas where more than 50% of the population is Muslim. Socio-economically, Muslims are the most backward community in West Bengal and also in Malda. Muslims are very backward, even though their food security status is low as compared to tribal areas in the district. Muslim-dominated areas are dependent on agriculture, and a very small number of people are engaged as businessmen as well as servicemen. According to the field study, 22.5% of household members consumed 2400–2600 kcal per day per head, 7% consumed between 260–1800 kcal, 4.5% consumed 280–1400 kcal, and only one household member consumed more than 3000 kcal per day per head. More than 63% of household members in Muslim-dominated areas find food insecure. About 28% of household

members consumed 2200–2399 kcal per day per head, followed by 16% of household members consumed between 2000 and 2199 kcal, 7% of household members consumed 1800–1999 kcal, 6.5% of household members consumed 1500–1799 kcal, and 5.5% of household members consumed below 1500 kcal.

Santhal is one of the most important tribes in Malda district, which contributed a remarkable percentage of the population. The Santhal are a traditional community, and they are still depending on nature-oriented activities like hunting, gathering, fishing, etc. due to the lack of natural resources and restrictions of the forest department, as well as awareness by the government and the development of education. They also adapt various types of activities. Food security status is satisfactory as compared to others. Nearly 29.5% of household members consumed 2400–2600 kcal, followed by 7.5% of household members (260–1800 kcal), 5% of household members (280–1500 kcal), and 2.5% of household members consumed more than 3000 kcal per day per head. Majority of households among Santhal tribes are food insecure, and 20% of households' members get near the recommended level of energy, followed by 15% of households consumed who consume 2000–2199 kcal, 10.5% of households members consume 1800–1999 kcal 5.5% households members consume 1500–1799 kcal, and 4.5% of households ' members con less than 1500 kcal per day per head.

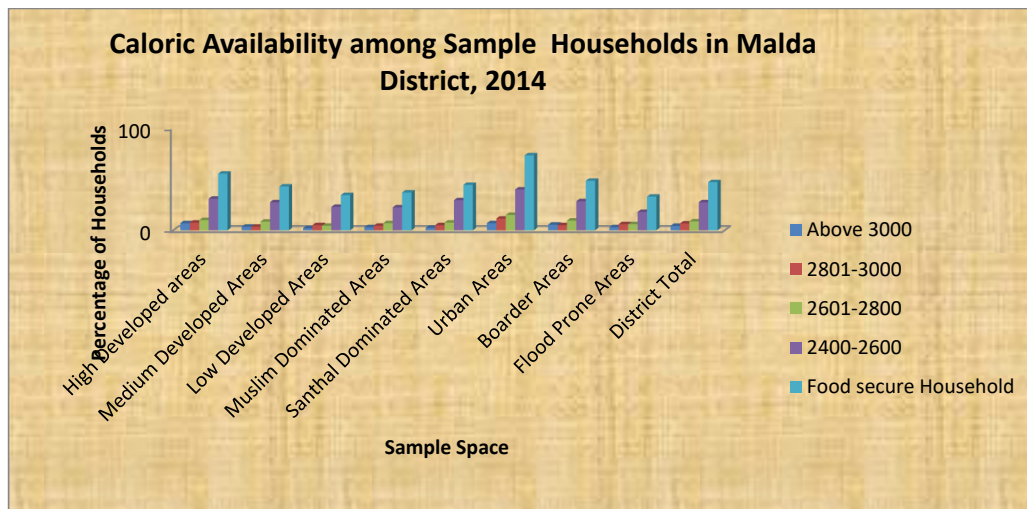


Fig.53

Spatial Patterns of Food Security Status

The Z-score test is very important and is useful for various calculations and statistical techniques to represent a good result and composite z-score value given the overall condition of the particular areas. Previous chapters calculated the individual status of sample areas, but the present chapter calculates the regional food security status with the help of various indexes as well as testing. Each region consists of four sample spaces, and all samples are taken from each category region. There is also a similar pattern of food security status. Some areas have very good status in terms of food availability, but the opposite status is depicted in terms of food accessibility and utilization.

Spatial Patterns of Food Availability Status

The spatial pattern of food availability comprises four components that have a great role in removing food insecurity and creating food-secured regions. The four determinants are: percentage of households consumed equal to or more than 2400 kcal per day per head; per capita land availability, which has a great role in removing food hunger and starvation; percentage of workers or productive population groups; and percentage of households having livestock ownership. The distribution of food available regions in Malda district has been divided into three categories, namely: a. high food available region; b. medium food available region; and c. low food available region.

High food-available regions are considered to be those regions where the z-score scale value is more than +0.200. The high food-secure regions are mainly urban areas, where the Z-score scale is +0.765, and highly developed areas, where the calculated value is +0.277. The medium food-available regions are those where the z-score scale value lies between 0.000 and +0.200. The medium food-secure regions are Santhal-dominated areas (+0.185) because of the maximum percentage of households having livestock's ownership and percentage of work participation; medium-developed areas (+0.060); Muslim-dominated areas (+0.0523); and border areas (+0.040). The low-type food-secure region is called one where the composite z-score value is less than 0.000 and flood-prone areas (-0.013) and low-developed areas (-0.105) belong to the low-food-secure available region.

Spatial Patterns of Food Accessibility Status

Food accessibility consists of determinants, which are all very important to measure the status of food security. Indicators of food security have a great deal of variation when one region has a strong food availability status and another region does not, but has a good food utilisation status. The whole district is broadly divided into three categories on the basis of different features. All the divided sample regions have been divided into three categories, namely

1. High-food-accessible region, b. medium-food-accessible region, and c. low-food-security-accessible region.

High food security accessible regions are called those where the z-score value is more than 0.200, and medium food security accessible regions are considered when the z-score value lies between 0.000 and +0.200. The regions with low food security are those where the calculated z-score value is less than 0.000. The regions with high food security accessibility are urban areas (+0.687) and border areas (+0.611). According to food availability status, border areas occupied the 6th position, and urban areas held the first position in both cases. The medium-food-accessible regions are found in highly developed areas (+0.169) and Muslim-dominated areas (0.169). The low food security accessible regions are Santhal-dominated areas (-0.200), medium-developed areas (-0.230), low-developed areas (-0.262), and flood-prone areas (-0.936).

Spatial Patterns of Food Utilizations Status

Food utilization is one of the important indicators to measure the status of food security. Food utilization comprises 11 determinants in this study. All the determinants have a significant role in promoting the food security status of regions. On the basis of utilization status, sample areas have been divided into three types: a. high food utilization areas; b. medium food utilization areas; and c. low food utilization areas.

The high food utilization areas are considered those areas where the calculated composite score value is more than +0.200 and the medium areas are 0.00 to +0.200, followed by the low food utilization areas (below 0.000). The high food utilization areas are urban areas (+0.910), high-developed areas (+0.676), Muslim-dominated areas (+0.601), and border areas (+0.277). The

medium food security utilization areas are only medium-developed areas (+0.144). Lastly, low food security utilization areas are low-developed areas (-0.664) and flood-prone areas (-1.226).

Overall Regional Food Security Status

Overall food security status means the combined result of three indicators, which cover 23 determinants' scores, is clearly given the region-wise food security status. According to the result, whole-dimensional status has been divided into three types and graded to identify the level of food security. The three grades are: high food security region, medium food security region, and low food security region.

The high food-secure regions are those regions where the calculated composite Z-score scale is more than +0.200, and the high food-secure regions are urban areas (+0.787), highly developed areas (+0.374), and border areas (+0.274). The medium-food-secure regions are those whose composite z-score value lies between +0.200 and -0.200. There is only one region that falls under this category, which is medium-developed areas (-0.009).

Table 46: Overall Regional Food security Status in Malda district, 2014

Study Units	Availability	Accessibility	Utilization	Composite score	Rank
High developed areas	0.277	0.169	0.676	0.374	2
Medium developed areas	0.060	-0.230	0.144	-0.009	5
Low developed areas	-0.105	-0.262	-0.460	-0.276	7
Muslim dominated areas	0.052	0.169	0.601	0.274	4
Santhal dominated areas	0.185	-0.201	-0.664	-0.227	6
Urban areas	0.765	0.687	0.910	0.787	1
Boarder areas	0.040	0.611	0.277	0.309	3
Flood prone areas	-0.013	-0.936	-1.226	-0.725	8

Sources: Calculated by Author

Lastly, low-food-secured regions are considered those areas that have a composite z score scale value less than -0.200. There are 37.5% of areas belonging to low food security regions, and their condition is very bad. The low food security regions are Santhal-dominated areas (-0.227), low-developed areas (-0.276), and flood-prone areas (-0.725). Table number 46 gives the values and indicates regional ranking as well as overall ranking.

Medical and biomarker indicators (MBI)

Medical and biomarker indicators are one of the important measurement methods for food security and are based on medical treatment. Three components can help prepare medical and biomarker indexes. According to the field report and household respondent responses, MBI has been prepared. According to MBI, low-developed areas have the worst conditions, and the maximum numbers of food insecure people are found. The MBI value for low-developed areas is 40.3%, where 0 is indicating the best value and 100 is indicating the worst value. Another important medically backward area is the border areas, where the maximum numbers of people are facing the problems of iron deficiency, iodine deficiency, and vitamin A deficiency. The MBI index value is 35.05%, which is the second largest value, followed by Santhal-dominated areas (MBI-34.9%), Muslim-dominated areas (34.54%), flood-prone areas (32.27%), medium-developed areas (29.43%), high-developed areas (25.08%), and urban areas (17.9%). The average MBI value in Malda district is 31.59%. The following table 47 shows the food security status rank, which is based on medical and biomarker indicators.

Table 47: Medical and Biomarker Index (MBI) for Study Area

Study Units	MBI Value	Rank
High developed areas	25.08	2
Medium developed areas	29.43	3
Low developed areas	40.3	8
Muslim dominated areas	34.54	5
Santhal dominated areas	34.97	6
Urban areas	17.9	1
Boarder areas	32.27	4
Flood prone areas	35.05	7
Malda District	31.59	-----

Sources: Calculated by Author

Anthropometric food Security Index (AFSI)

This is based on the food and nutritional status of the population. It is composed of four indicators of health conditions: (1) the percentage of the underweight population (PUP), (2) the percentage of wasting children (PWC), (3) the percentage of underweight children (PUC), and (4) the percentage of stunting children (PSE). In this index, the maximum value is 100 and the

minimum value is 0 (zero), where the maximum value indicates that all the populations are insecure and the 0 value indicates that all the populations are food secure.

Formula of AFSI = **(PUP + PUC + PWC + PSC)/4**

(PUP = Percentage of Underweight Population; PUC = Percentage of Underweight Children; PWC = Percentage of Wasting Children; and PSE = Percentage of Stunting Children)

Nutritional status is the most important indicator that can measure the level of food security. This index is fully calculated on the basis of a nutritional measurement of the population. All four components are closely related to children's nutrition and adult nutrition. According to the AFSI, urban areas in the district occupied the first position among the eight sample areas in the district. Muslim-dominated areas are shown a better picture and are holding second place due to genetic causes, and Muslim people are generally healthy and tall. High-developed areas occupy the third rank, whose value is 31.88, followed by medium-developed areas (33.45), border areas (33.45), low-developed areas (38.09), and Santhal-dominated areas. Again, the AFSI value shows that flood-prone areas are the most food-insecure, whereas the level of food security is very low as compared to other areas in the Malda district. According to the AFSI, flood-prone areas are in the 8th position, and their index value is 44.98, whereas their index value is only 29.75.

Table 48: AFSI (Anthropometric Food security index)

Areas	X1	X2	X3	X4	AFSI	Rank
High developed areas	33.87	40.93	23.45	29.28	31.88	3
Medium developed areas	33.46	41.79	29.45	29.11	33.45	4
Low developed areas	34.74	44.86	34.25	38.51	38.09	6
Muslim dominated areas	33.87	40.93	23.45	29.28	31.88	2
Santhal dominated areas	39.14	47.06	38.15	34.62	39.74	7
Urban areas	44.04	30.83	24.40	19.74	29.75	1
Boarder areas	35.36	45.46	30.90	27.70	34.85	5
Flood prone areas	44.31	50.68	40.45	44.48	44.98	8

Sources: Calculated by Author and developed by Ismail.M.2015

Global Hunger Index (GHI)

The global hunger index is important for measuring food security status. This index indicates the minimum value of the best situation and the maximum value of the worst situation. The lowest

value is zero (0), which means all kinds of components are good, and 100 indicates all kinds of components that are facing problems. According to the GHI value, urban areas in the district explain the best situation among the sample areas, which rank in first place and have a have a GHI score of 15.76. The flood-prone areas in the district represent the worst picture according to GHI, holding the 8th position among the 8th sample area in the district, whose GHI value is 32.58. Boarder areas are economically in a very strong position due to legal and export business as well as illegal business activities. Boarder areas are occupied in the in the second position among sample areas, followed by highly developed areas, which rank in the in the third position; Muslim-dominated areas hold the fourth position; medium-developed areas rank in the fifth position; and Santhal-dominated areas (27.13) are occupied in the in the sixth position among sample areas in the Malda district. Flood-prone areas are another important study area where there is no permanent economic structure due to the occurrence of floods. Floods every year wash away houses, crops, animals, household assets, and human life. So, the flood-prone areas are holding the last position (8th) among the sample areas in Malda district, and the GHI value is 32.58.

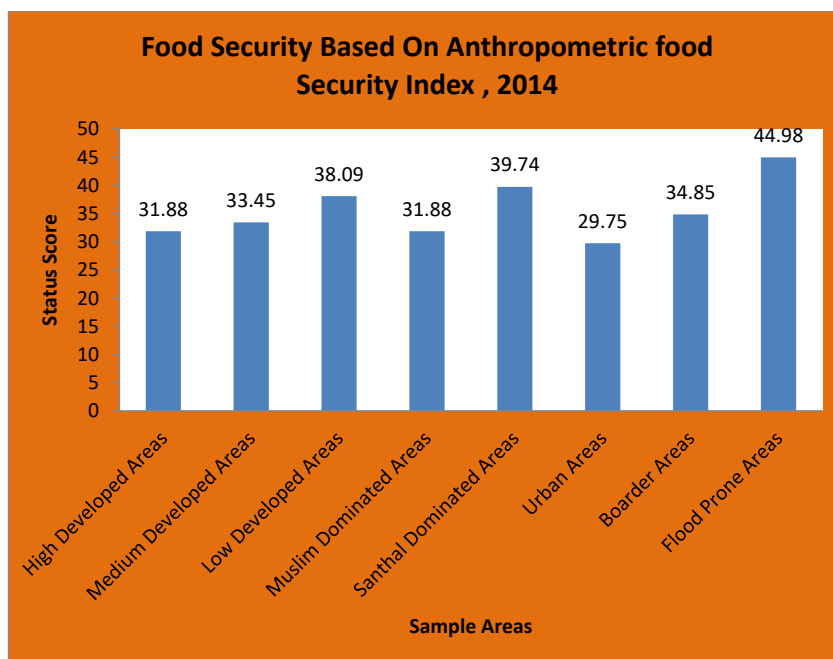
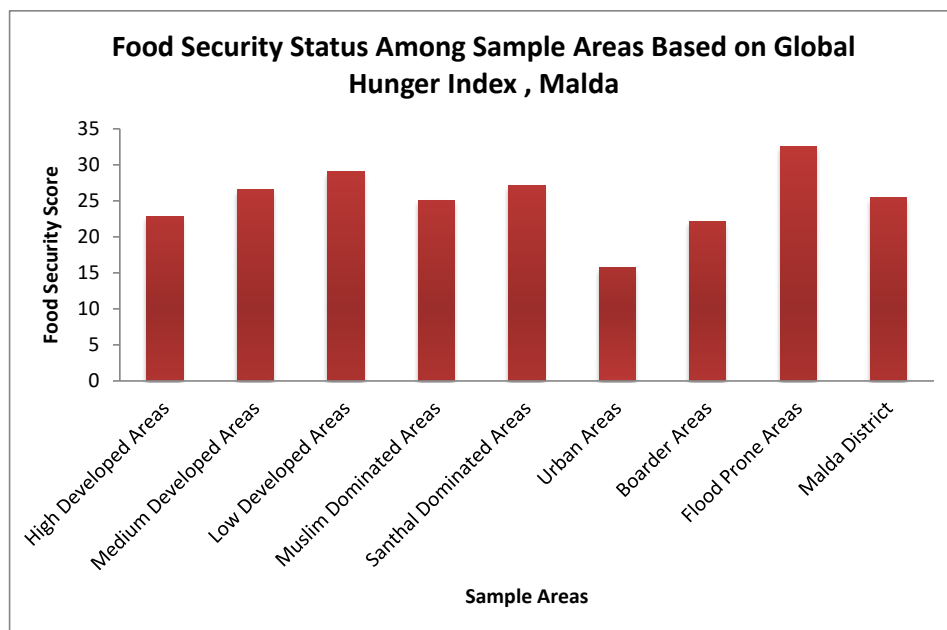


Table 49, The Global hunger index

Study Units	Mortality	Underweight population	Children underweight	GHI	Rank	
High developed areas	7.00	25.00	36.28	68.28	22.76	3
Medium developed areas	9.50	25.64	44.54	79.68	26.56	5
Low developed areas	14.50	23.18	49.64	87.32	29.11	7
Muslim dominated areas	11.50	17.94	45.52	74.96	24.99	4
Santhal dominated areas	10.25	26.09	45.05	81.39	27.13	6
Urban areas	4.75	11.14	31.40	47.29	15.76	1
Boarder areas	9.50	15.59	41.23	66.32	22.11	2
Flood prone areas	12.75	33.59	51.39	97.73	32.58	8
Malda District	9.97	22.28	43.96	76.21	25.40	-----

Sources: Calculated by Author



Regional food security analysis index (RFSAI)

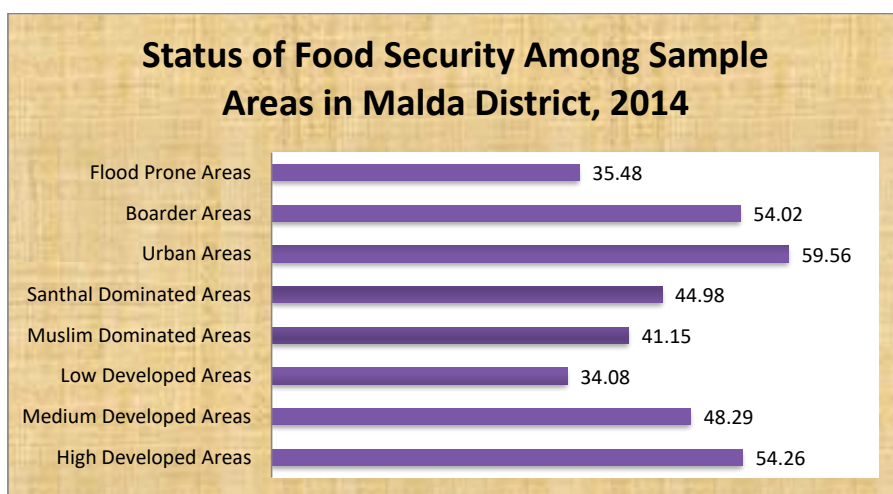
The regional food security analysis index is very important because it measures the level of food security status. This index has a clear result and measures the pattern of status. According to this index, the highest level of food security is found in urban areas, and the calculated score is 59.96, which is the highest among the 8th sample area in Malda district. High-developed areas mean

socio-economically forward areas occupied second place based on RFSAI out of 8 sample areas, whose score value is 54.02. According to RFSAI, the third position is occupied by the border areas, whose score value is also 54.02. The calculated scores indicate the level of food security and also indicate the regional disparities among sample areas in the district. The medium-type food security regions are found in medium-developed areas, which are in the 4th position with a score value of 48.29, followed by Santhal-dominated areas (44.98), which hold the 5th rank among the sample areas, and Muslim-dominated areas (41.15), which are ranked 6th. The low level of food security status is found in flood-prone areas, which hold the 7th position, and lastly, low-developed areas (34.08) occupy the 8th position out of the sample areas in Malda district.

Table 50: Regional food security analysis index (RFSAI) based on 28 determinants

Study units	Status of FSI	Rank
High developed areas	54.26	2
Medium developed areas	48.29	4
Low developed areas	34.08	8
Muslim dominated areas	41.15	6
Santhal dominated areas	44.98	5
Urban areas	59.56	1
Boarder areas	54.02	3
Flood prone areas	35.48	7

Calculated by Author and developed by Ismail.M.2015



Food security based on people perception

Table 23 shows the various perceptions and actual situations of households in Malda district. Purchasing power is fully dependent on the level of daily income or deposit of money. Most of the family is not economically viable; they depend on their daily income. Most of the family feels that they do not have sufficient extra money to buy more food for the next few days.

Table 23: Level of Purchasing Power among Sample Areas in Malda District, 2014

Do you feel that you worried whether your food would run out before you get money to buy more				
Study Areas	Often	Sometimes	Never	Don't Know
High developed areas	60	29	8	3
Medium developed areas	58.5	33.5	3.5	4.5
Low developed areas	81	15	2.5	1.5
Muslim dominated areas	72.5	21	3	3.5
Santhal dominated areas	61	22	16.5	0.5
Urban areas	45.5	38	10	6.5
Boarder areas	61	19	18.5	1.5
Flood prone areas	85.5	11	2	1.5
Malda District	66.33	23.50	7.33	2.83

Source: Field Survey, 2014

According to field survey, 66.33% households are worried whether his/her food would run out before he gets money to buy more, followed by sometimes (23.50%), do not give responses (2.83%) families and only 7.33% families never face that kind of situation. Above table is showing the various level of purchasing power among sample household in the district. According to primary survey, nearly 18.5% families in Boarder areas never facing that kinds of problems followed by Santhal dominated areas (16.5%), Urban areas (10%), High developed areas (8%), Medium developed areas (3.5%), LDA (2.5%), Muslim dominated areas (3%) and Flood prone areas (2%). The high proportion of food insecure household on the basis of particular question are mainly concentrated in FPA (85.5%) due to level of development followed by LDA (81%), Muslim dominated areas (72.5%), Boarder areas and SDA (61%), MDA (58.5%) and low numbers of household are found in Urban areas only 45.5% respectively. On the basis of people perception, high proportion of Urban areas (38%) households feel that their household sometimes worried about their purchasing capacity, nearly 33.5 % households in MDA are sometime worried followed by HDA (29%), SDA (22%), Muslim dominated areas (21%), Boarder areas (19%) and only in 11% are in FPA.

Availability of Healthy Meals

Food is essential for living being and balanced diet is essential for active and healthy life. According to field survey, more than 46.08% sample households in Malda district always feel that he/him could not afford to eat healthy food due to the lack of purchasing power followed by 24.0% (Table 24) families feel that sometimes do not get healthy meal followed by 2.08% not given answered and only 27.83% sample household always afford to eat healthy meals. Highest number of household that feel they are afford to eat healthy meals are found in Boarder areas which is 32.5% and High developed areas also 32.5% followed by Flood prone areas (31%), (29%), Urban areas (26%), Muslim dominated areas (25%), Medium developed areas (20%), and Santhal dominated areas (20%). Satisfactory level of population among sample areas in Malda district is representing sorrowful pictures. Primary report reportedly said that 51% Santhal dominated areas household are often feel that their family member could not afford to eat healthy meals followed by Flood prone areas (51%), Low developed areas (50.5%), Muslim dominated areas (47%), Medium developed areas and Urban areas both (42%) and High developed areas (39.5%).

Table 24: Do you feel that " you couldn't afford to eat healthy meals",

Study Units	Often	Sometimes	Never	Don't Know
High developed areas	39.5	27	32.5	1
Medium developed areas	42	36	20	2
Low developed areas	50.5	18.5	29	2
Muslim dominated areas	47	23	25	5
Santhal dominated areas	51	25	20	4
Urban areas	42	27	26	5
Boarder areas	40.5	21.5	32.5	4.5
Flood prone areas	51	18	31	0
Malda District	46.08	24.01	27.83	2.08

Source: Field Survey, 2014

About 36% of households in medium-developed areas are sometimes feeling that their households do not get to eat healthy meals, followed by high-developed areas and urban areas both (27%), Santhal-dominated areas (25%), Muslim-dominated areas (23%), border areas (21.5%), and flood-prone areas (18%) only.

Level of Food Availability

According to the NSS report, more than 10% of households in West Bengal do not get square meals and go to bed hungry. According to a field survey, 9.5% of household children do not get food for a whole day and often only half of the day due to a lack of purchasing power, while 90.5% of households have good purchasing power. The field report said that 13% (Table 25) of households in Santhal-dominated areas are not taking food for half a day due to a shortage of money, followed by Muslim-dominated areas (12%), urban areas (10.5%), flood-prone areas (8.5%), high-developed areas (7.5%), medium-developed areas (6%), and border areas (only 2% of households). Boarder areas 98% of households are never in shortage of food, followed by medium-developed areas (94%), high-developed areas (92.5%), flood-prone areas (91.5%), urban areas (89.5%), low-developed areas (88%), Muslim-dominated areas (88%), and Santhal-dominated areas (87%).

Buying Status of Expensive Food for their Children

According to the primary survey, more than 49.75% of households (Table 26) always feel that their households are not able to buy expensive food for their children due to the shortage of money, and 37.35% of households sometimes feel that their households are not able to buy expensive food for their children due to the shortage of money. About 8.33% of the sample households in the study area never feel that their households are unable to buy expensive food for their children due to a shortage of money, and 4.17% of the households are not given an answer about the matter. In flood-prone areas, 55% of households always feel that their household is unable to manage expensive food for children due to a lack of purchasing power, followed by high-developed areas (53%), LDA (51.5%), Muslim-dominated areas (50.5%), medium-developed areas (47.5%), and households that are always unable to manage expensive food for their children, followed by border areas (45.5%), Santhal-dominated areas (41.5%), high-developed areas (40%), Muslim-dominated areas (39%), flood-prone areas and low-developed areas both (33.5%), and urban areas (33%).

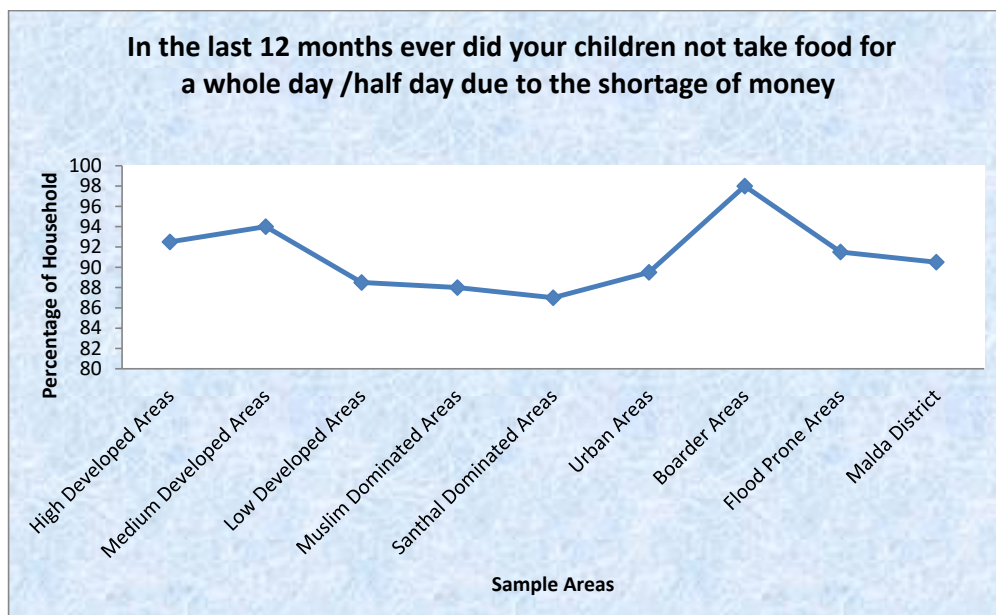


Fig.35

Nearly 18.5% of urban households never feel that they are unable to buy expensive food for their children, which is the highest among sample areas in Malda district, followed by Santhal-dominated areas and border areas both (11%), low-developed areas (7%), Muslim-dominated areas (65%), flood-prone areas (5%), high-developed areas (45%), and medium-developed areas (only 2%). More than 37.75% of households in the study area sometimes feel that they are not able to buy expensive food for their children. The highest proportion of such households are found in MDA, which is 48%, followed by BA (45.5%), SDA (41.5%), HDA (40%), Muslim-dominated areas (39%), LDA and FPA both (33.5%), and urban areas (33%).

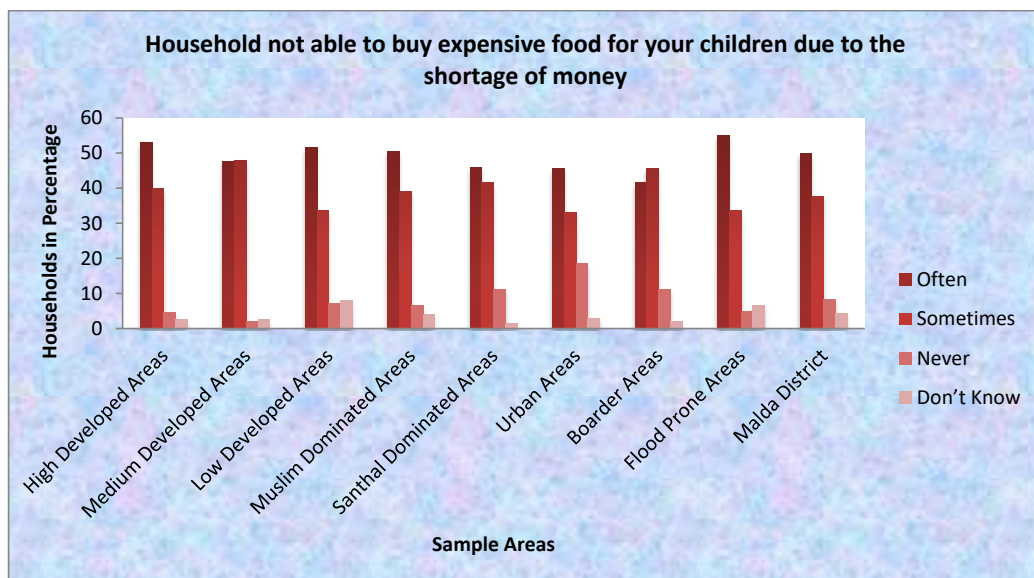


Fig.36

Causes for Shortages of Food

The above table shows the various reasons that are related to food security and the reasons why most households are unable to afford enough food and their underlying causes. According to the primary survey, 1.25% of households reportedly said that they were unable to afford enough food because their family members did not properly work for income, and 43.25% of households said that they did not have sufficient income to maintain their daily lives. More than 21.25% of households in the study area said that they are unable to manage enough food due to the fact that the fact that food costs are too high and their family income is not up to par. Nearly 12.83% of the sample households gave various reasons for being unable to manage a sufficient amount of food.

Not Working

Unemployment and not working are fully separated from each other. Most of the non-working groups of people in India are not doing any work, and they fully or parentally depend on other family members. The highest numbers of non-working groups of population are found in urban

areas in Malda district, which is 3.5%, followed by medium-developed areas (1.5%), flood-prone areas and Santhal-dominated areas (11%), Muslim-dominated areas (0.5%), and border areas (0.5%).

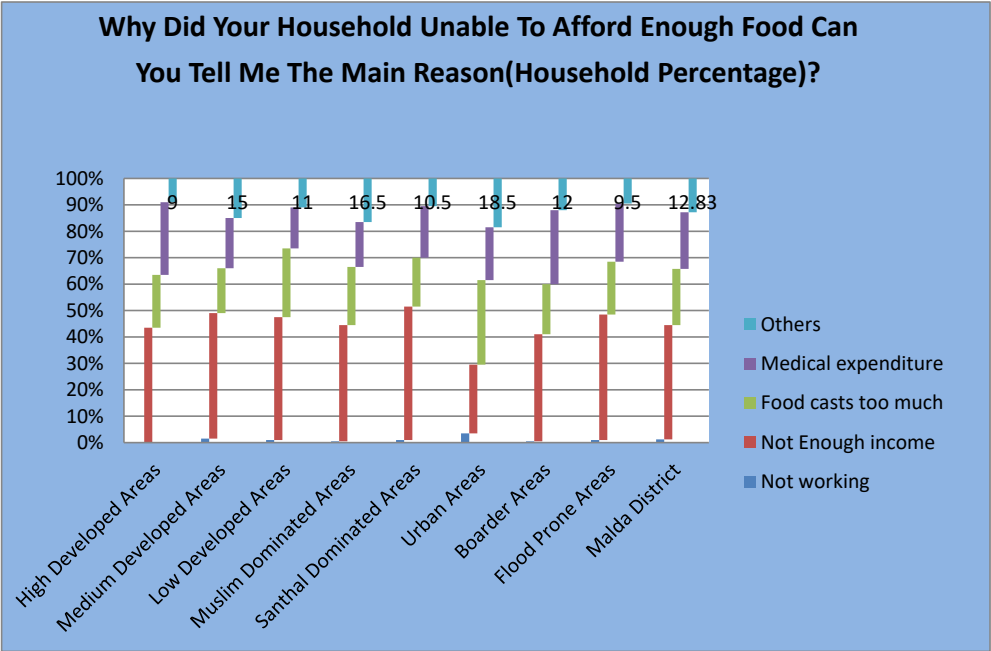


Fig.37

Not enough income

Nearly 43.25% of families reportedly said that their families do not have sufficient income to purchase enough food to manage their everyday family life. A higher percentage of such a population is found in Santhal-dominated areas, nearly 51%, followed by the second largest group in flood-prone areas and high-developed areas, both (47.5%), LDA (43.5%), Muslim-dominated areas (44%), border areas (40.5%), and urban areas (26%).

Food costs too much.

High prices and regularly rising prices of essential goods are important problems today. About 21.25% of households among the sample reportedly said that due to the high prices, they are not managing a sufficient amount of food. The highest number of affected households are found in urban areas, which is 32% due to the absence of agricultural production, followed by low-developed areas (26%), Muslim-dominated areas (22%), flood-prone areas and high-developed areas both (20%), border areas (19%), Santhal-dominated areas (18.5%), and medium-developed areas (17%).

Medical Expenditure

Food insecurity in older age populations is a clinically relevant problem with important implications for health care costs; however, few studies have examined the relationship between food insecurity and the health care cost burden in older adults. Due to the huge amount of medical expenditure, a remarkable number of families are not able to get a sufficient amount of food for their family members. The health care services in Malda, especially in rural areas, are prevailingly poor and expensive, and more significant in poverty-ridden areas. Food-insecure households were reported to spend as much as 21.42% of their households on medical expenses. The highest numbers of affected households are found in border areas in Malda, followed by high-developed areas (27.5%), flood-prone areas (22%), urban areas (20%), Santhal-dominated areas (19.5%), medium-developed areas (19%), Muslim-dominated areas (17%), and low-developed areas (15.5%).

Others Expenditure

Other expenditures mean miscellaneous expenditures for family. Due to the high lifestyle, other expenditures are also high; nearly 12.83% of households are not able to afford enough food. Higher percentages of other expenditure-affected households are found in urban areas (18.5%). household are facing problems, followed by Muslim-dominated areas, and 15% of households in medium-developed areas report that their households do not manage the amount of food required due to a high percentage of other expenditures, followed by border areas (12%),

low-developed areas (11%), Santhal-dominated areas (10.5%), flood-prone areas (9.5%), and high-developed areas (9%).

Household Unable to Afford Enough Food

India is the storehouse of poor people as well as malnourished populations. About 26% of the country's population is still living below the poverty line (BPL), and more than 50% of households are still food insecure in terms of caloric intake. The study is trying to find out the real situation of households food security status and asked various types of questions related to food security, which are mainly called the proxy indicators of food security. Nearly 17.42% of households among the sample respondent heads said that they borrow money when their household is unable to manage a sufficient amount of food for their family members. More than 23.45% of households search for work when their households fail to manage the required amount of food, and 14.92% of households sell household assets or other things when their households are not able to get the minimum food for their family members. Lastly, more than 44.42% of households reported various remedial measures when their household failed to get the minimum required food for their family members.

Borrow money

The word borrows means to take something and use it temporarily, or in another way, borrows implies taking something temporarily and returning it later. When households are unable to manage a sufficient amount of food during a shortage, 17.42% of households borrow money from their relatives and others. Nearly 24% of households in flood-prone areas borrow money during times of food shortages, followed by Muslim-dominated areas (21.5%), low-developed areas (21%), urban areas (17%), medium-developed areas (16.5%), high-developed areas (15%), Santhal-dominated areas (13.5%), and border areas (12.5%).

Search for work.

More than 30% of households in Santhal-dominated areas search for work when their households are unable to afford enough food. Another's larger percentage of households (27% in medium-developed areas) also search for work when households fail to afford sufficient food, followed

by high-developed areas and flood-prone areas (25%), border areas (24.5%), Muslim-dominated areas (20.5%), and urban areas (16%).

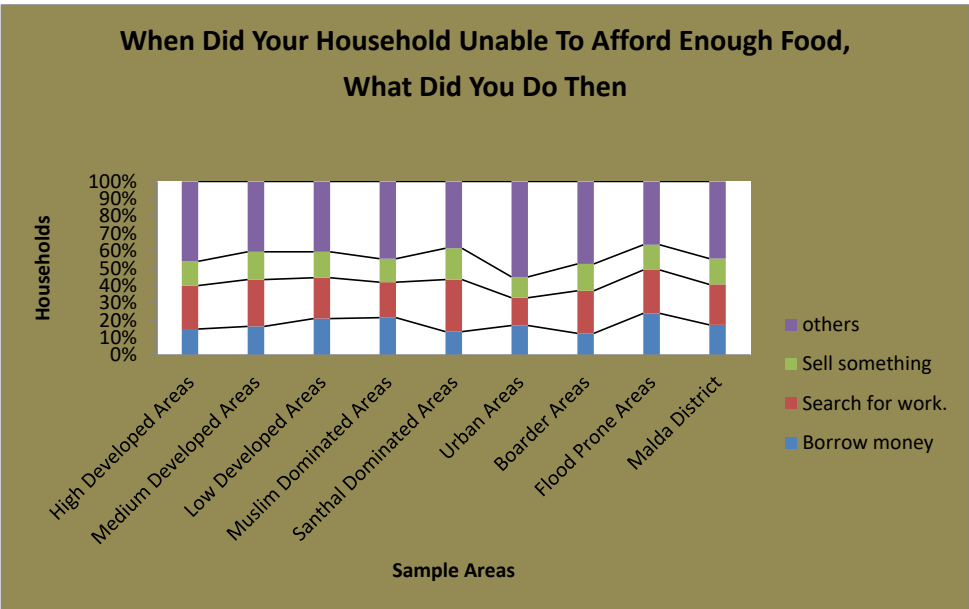


Fig.38

Sell Something

Nearly 18% of households in Santhal-dominated areas in Malda district sell something or household assets when their household is unable to manage the required amount of food for their household members, and 16% in medium-developed areas also sell their assets during the time of the food crisis, followed by border areas (15.5%), low-developed areas (15%), flood-prone areas (14.5%), high-developed areas (14%), Muslim-dominated areas (13.5%), and urban areas (12%).

Nearly 55% of households are in urban areas and are not given any specific remedial measures because most of the families are facing such a situation. Another larger number of households (47.5%) in border areas are not taking various remedial measures when their households fail to get the required amount of food, followed by high-developed areas (46%), Muslim-dominated

areas (44.5%), medium- and low-developed areas both (40.5%), Santhal-dominated areas (38.5%), and flood-prone areas (36%).

Feeling Always Insecure

Food security at the household level is not directly measured; it was necessary to use a proxy indicator that indirectly measured the phenomenon of household access to food. During the primary survey, some important questions were asked of the head of the family, which is essential for measuring socio-economic status as well as food security status. According to respondent's responses among sample households in the Malda district, 68.33% of households feel that kitchen food is available, and more than 31.67% (Table 32) of households among sample areas feel that there is no certainty of cooking food in the kitchen in the home. Maximum insecure households are found in flood-prone areas, which are 36% and 33.5% of households in Muslim-dominated areas, followed by medium-developed areas (32.5%), Santhal-dominated areas and urban areas (31%), high-developed areas (29.5%), and border areas (24.5%). About 75.5% of households in the border areas of Malda district have a sufficient amount of food in their kitchens for cooking, followed by low-developed areas (73%), high-developed areas (70.5%), Santhal-dominated areas and urban areas (69%), medium-developed areas (67.5%), Muslim-dominated areas (66.5%) and flood-prone areas (64%).

Basic Food Availability

A nearly similar question was again asked by household respondents in Malda district to identify the actual food security status among sample regions, and Table 30 vividly shows the particular question that has been asked household-wise and also shows a very vivid result. About 73.33% of household respondents in Malda district sometimes feel that even basic food, which is essential for survival, is not available for their family members. 12.58% of households always feel that even basic food is not available for their family members. Only 14.08% of household members feel that such a situation never arises in their household. The highest numbers of secure households are found in urban areas, which are more than 28.5% of households, followed by flood-prone areas (17.5%), low-developed areas (14.5%), medium-developed areas and border areas (11.5%), high-developed areas (11%), Muslim-dominated areas (8.5%), and only 7.5% of households in Santhal dominated areas.

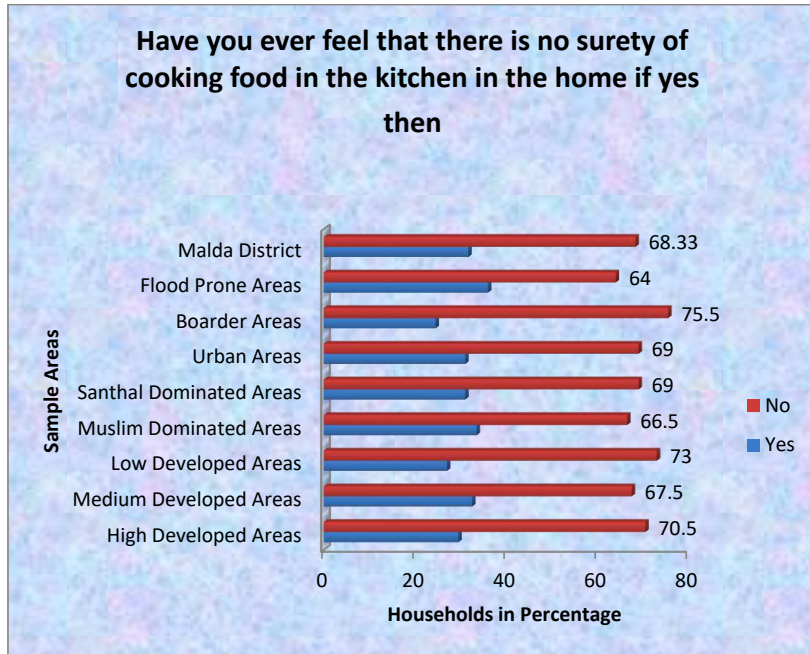


Fig.39

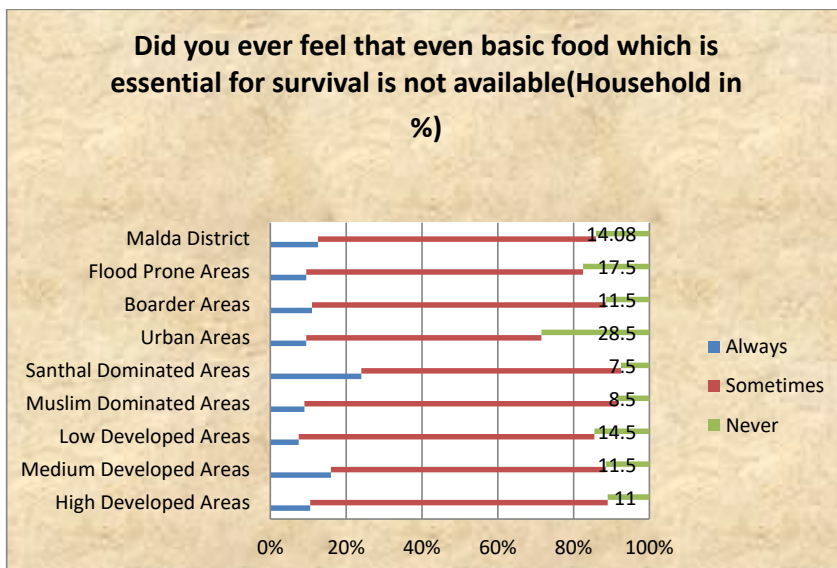


Fig.40

The highest numbers of sometimes insecure household are found in muslim dominated areas which is more than 82.5%, followed by High developed areas (78.5%), Low developed areas (78%), Boarder areas (77.5%), Flood prone areas (73%), Medium developed areas (72.5%), Santhal dominated areas (68.5%) and Urban areas (62%). About 24% household in Santhal dominated areas always feel that even basic food which is essential survival is not available followed by Medium developed areas (16%), Boarder areas (11%), High developed areas (10.8%), Urban areas and Flood prone areas (9.5%), Muslim dominated areas (9%) and Low developed areas (7.5%).

Health Condition Based on Perception

Table no. 31 is showing the health status based on people attitude and views .About the health , common question asked for all respondent member and find out very interesting relationship. According response only 4.25% respondent member said that their health is excellent as compared to others people of his/her ages and interestingly 34.58% respondents said that their health condition is good as compared to others people of his/her age. Whereas only 25.25 respondents are said that their health condition is average as compared others people of his/her age and more than 28.5% household head respondent reported that their health condition is average as compared to others people of his/he aged. But 7.42% household respondents are never compared with their health condition and they did not know about this.

Table 31: Compare to others people of your age, would you say your health condition is?

Study Units	Excellent	Good	Average	Poor	don't know
High developed areas	4	32.5	24.5	30	9
Medium developed areas	3	38	24.5	27.5	7
Low developed areas	3	37.5	25	23.5	11
Muslim dominated areas	4	35	24.5	28.5	8
Santhal dominated areas	3	35	28.5	25	8.5
Urban areas	6.5	29	28.5	28.5	7.5
Boarder areas	3	38.5	22.5	28.5	7.5
Flood prone areas	4.5	39	24	27	5.5
Malda District	4.25	34.58	25.25	28.5	7.42

Source: Field Survey, 2014

Urban areas (6.5% of the sample) have the highest number of people who feel that their health conditions are excellent as compared to their relatives as well as their age, followed by FPA

(4.5%), HDA and Muslim-dominated areas both (4%), MDA, LDA, SDA, and BA (3%). The highest number of people feels that their health condition is good as compared to others. People of your age are in FPA, which is 39%, and other areas are BA (38.5%), MDA (38%), LDA (37.5%), SDA, Muslim-dominated areas (35%), and HDA (32.5%). A remarkable number of people feel that their health conditions are average as compared to others of their age, and the highest number of people feel that in SDA and urban areas, both at 28.5%, followed by LDA (25%), HDA, MDA, and Muslim-dominated areas (24.5%), and FPA (24%). Poor health condition is one of the most important problems, and more than 28.5% of people in urban areas, BA, SDA, and Muslim-dominated areas feel that their health condition is poor compared to other people of their age. About 30 people in HDA also feel their health status is bad as compared to their age, followed by MDA (27.5%), FPA (27%), SDA (25%), and LDA (23.5%), respectively.

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Conclusion and Recommendation

Food and nutrition security has been a challenging issue for the planners and researchers not only in India but also all over the world and presently India has more than 31% poverty population which constitutes more than 22% in the world population. India has the highest number of hunger population in the world. But a huge variation is found from regions to regions in India. According to the social and economic dimensions, Malda has been divided into various regions and variation of food security status also varies from region to region. The food security status also varies among various communities due to their food habits. The food security status is depending on various factors which have great role to reduce the level of poverty of any households. Educational status is identified as one of the major determinants which play great role for ensuring food security status; higher educated households are more food secure as compared to low level of education. Work participations and types of working also here found role for food security, those house have daily workers are having food sufficiency.

Maximum numbers of the landless people are poor in Malda district. Even a little amount of land, can greatly reduce both insecurity and poverty. The incidence of hunger and poverty get reduced, as one is able to meet even part of their dietary energy requirement through growing their own food. Land is the very important aspect for food security. Food security is referring when people get adequate amount of food for healthy and active life. When people have sufficient income, people purchase all types of essential commodities from market. The highest low income group populations are found in Flood prone areas in the district (40% house).

The share of female income is having great significance for reduction of household poverty. Field Survey find 10.85percent incomes are shared by female (one of 100%). The study traces the close relationship between female income and food security. Average annual total expenditure was the highest for food secure households followed by insecure. The lower income (Hunger) households for their low level of income usually have to spend larger fraction of their income on food. Measurement of nutritional status of male population through body mass index is considered good way of measurement. About 60.7% male adult sampling population are have normal body mass index and 13.47% male adult are categorized as overweight their body mass

index lying in between 25.0 -29.9 and 5.09 % males member are considered as obese, those people body mass index is above 30 and large number of people are lived under weight. According to primary survey,10.7% adult are mild types of chronic energy deficiency whose body mass index is in between 17-18.4% and 6.13% male are moderate chronic energy deficiency and 3.89% male adult health condition is very measurable because their body mass index is less than 17 and they are considered as severe chronic energy deficiency population.

People are considered obese when their body mass index is above 29 . The highest number of obese adult male population are found in Urban areas nearly 13.40% and Boarder areas 6.74% followed by High developed areas (6.28%) Medium developed areas (4.00%) Flood prone areas (1.58%), Santhal dominated areas (1.78%) Low developed areas (1.06%) and Muslim dominated areas (0.54%). The higher number of over weight population are found in 19.07% in Urban areas and Medium developed areas (12%) followed by Santhal dominated areas (11.36%) men are over weight, nearly 10.67% men are over weight in Boarder areas followed by High developed areas (9.45%), Flood prone areas (5.79%) and Low developed areas (4.76%).

The result show that nearly 51% of adult rural population is normal and remaining 49% is suffering from some grade of chronic energy deficiency (CED).Nearly 68% male children are belongs to normal conditions for weight for height and 21% children are wasting followed by 11% children are severe wasting. In term of height for age female children nutritional status are better as compared to nations conditions.According field report, more than 66% female children are living under normal conditions

India is the store house of stunting population but compared to study areas condition is far better.Only 21% female children are stunting and 15% are severe stunting. Per Capita caloric consumption among sample areas in Malda district is 2183 Kcal per capita per day.According to standard level of caloric is very low, it should be atleast 2400 kcal per day per head. According to field survey,only 47.17% household are food secure which get 2400 kcal and above 2400 Kcal per day per head.Field study reported that highest number of food secure household are found in Urban areas which is more than 73.5% households.

Recommendations

South Asia is the mother land of food insecure population in the world and large proportions of the population in all the countries are living under poverty line. About 270 million populations in India still live below the poverty line and a report shows that 44 per cent of the populations of India earn less than US\$ 1/day. Nutritional status of children is very worst and it is the habitants of wasting and stunting population and also the child mortality rate is very high. Female literacy in South Asia is also very low and according to HDI, India occupied 127th position in report with a value of 0.595. Most of the agrarian region in India comprises of large number of poor populations and nearly 70 per cent of Indian poor populations are living within six states (Uttar Pradesh, Bihar, Madhya Pradesh, Maharashtra, West Bengal and Orissa). More than 50% population and children are living under very critical situation. So, there is need of special attention for removing the poverty situation and the following recommendations are made to fulfill the said purpose:

Local food system planning is important which depends on demand and transport systems. Food systems planning for local areas are where generally food is grown in the locality in which it is consumed. Food systems planning are important because they permit to supply to their own wellbeing through localized production. Under this programme includes demand of food, land use planning, infrastructure planning and transport planning because planning is done well and it can improve local food systems by preventing productive land being used for non-food users, reducing barriers improving access to food and allowing decisions about food to be made by those most affected. The *Santhal* dominated units, low developed units, Muslim dominated units and flood prone units have the higher proportion of households with a poor food Consumption and also had the higher prevalence of children that were underweight, and a high prevalence of acute and chronic malnutrition. The Muslim dominated, *Santhal* dominated units and flood prone units have a high proportion of uneducated-headed households and a higher proportion of households are living under BPL condition as compared to educated-headed households. These results advocate that a special programme is needed for the four areas in the district with an emphasis on improving access to improve food availability system, poverty alleviation, water and sanitation, supplementary food and employment opportunities /vocational training for 'dependent' households.

Rural Housing scheme is initiated for weaker section of societies but it is not popularized among weaker section. Under this scheme loan should be provided at zero interest among low-income group households for construction of houses. Large numbers of non-eligible beneficiaries are getting houses and amount of money is not sufficient for building safe and healthy houses. The amount of money should be increased and investigation process should be complete without interference of local governance.

Women Empowerment Programme through proper education: In maximum areas in Malda district, women do not have any decision making power, especially in family planning, basic household expenditure purposes, reproductive health, farming, education, even working and work place are determined by their fathers or husbands and they are bound to live within the four walls of a house. Proper education of women and empowerment of women can help them to participate in household decision-making, choosing smaller families, acquiring healthier economic condition, and rearing up healthier children in family. Their education thus provides them the information, resources and services and they need to play an effective role in meeting future economic, social, and agricultural and nutrition challenges. This type of programme should be immediately implemented by govt. in flood prone units, Muslim dominated units, *Santhal* dominated units and low developed units in the district.

The following programme should be more effectively implemented and coverage people and assistance should be increased: The program are Integrated Rural Development Programme/, Swarnajayanti Gram Swarozgar Yojana, Wage Employment Program, Jawahar Rozgar Yojana/ Jawahar Gram Samridhhi Yojana, Employment Assurance Scheme, Social Security Program, Public Distribution System, and Education Program. Under education following should be given more attention: Operation Blackboard, Restructuring and Reorganisation of Teacher Education, District Primary Education Programme (DPEP), Shiksha Karmi Project and Lok Jumbish Project of Rajasthan, Mahila Samakhya, Mid-Day Meal Scheme, Non-Formal Education (NFE) and EGS & AIE, Janshala (GoI-UN) Programme, Sarva Shiksha Abhiyan and Integrated Child Development Services.

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Appendices

Table

Dimensional Areas	Block	Sample Village	Mouza	Panchayat	Sample Size(HH)	Remarks
High Developed areas	Bamongola	Daulatpur	Daulatpur	Madnabati	50	
	Kaliachak-1	Maurabadi	Alipur	Alipur	50	
	Kaliachak-3	Godhantola	Kumbhira	Kumbhira	50	
	Chanchal-1	Sihipur	Sihipur	Chanchal	50	
	English Bazar	-	-	-	-	
Medium Developed Areas	Ratua-2	Raninagar	Raninagar	Sripur	50	
	Kaliachak-2	Jagirtola	Bangitola	Bangitola	50	
	Harischandrapur-1	Kauwamary	Dakshin	Harischandrapur	50	
	Old Malda	Jatradangha	Jatradangha	Jatradangha	50	
	Manikchak	---	---	---	---	
Low Developed Areas	Chanchal-2	Bishanpur	Laliabari	Dhangra	50	
				Bishonpur		
	Ratua-1	Mahanandatola	Gabindapur	Mahanandatola	50	
	Gajole	-----	-----	-----	-----	
	Habibpur	Aiho	Aiho	Aiho	50	
Muslim Dominated Areas	Harishchandrapur-2	Bhairabpur	Bhairabpur	Daulatnagar	50	
	Kaliachak-3	Godhantola	Kumbhira	Kumbhira	Same HH considered	Two regional features
	Kaliachak-2	Dulalganj	Dulalganje	Bangitola	50	
	Harishchandrapur-2	Bhairabpur	Bhairabpur	Daulatnagar	Same HH considered	Two regional features
	Ratua-2	Raninagar	Raninagar	Sripur	Same HH considered	Two regional features
Santhal Dominated Areas	Gajole	Chouradighi	Saharoll	Bairgachhi-II	50	
	Bamongola	Daulatpur	Daulatpur	Madnabati	Same HH considered	Two regional features
	Habibpur	Aiho	Aiho	Aiho	Same HH considered	Two regional features
Urban Areas	Bamongola	Nalagola	Daulatpur	Madnabati	50	
	Chanchal	Barogachchia	Chanchal	Chanchal	50	
	English Bazar	Haiderpur	English Bazar	English Bazar	50	
	Old Malda	Sahapur	Sahpur	Sahapur	50	
	Habibpur	Kendua	Kendua	Bulbulchandi	50	
Boarder Areas	Bamongola	Nalagola	Daulatpur	Madnabati	Same HH considered	Two regional features
	Habibpur	Aiho	Aiho	Aiho	Same HH considered	Two regional features
	Kaliachak-2	Shimultola	Jagannathpur	Laxmipur	50	
Flood Prone Areas	Harishchandrapur-1	Islampur	Tal Bhakuria	Islampur	50	
	Manikchak	Narayanpur	Manikchak	Manikchak	50	
	Manikchak	Shankartola	Kamalpur	Mathurapur	50	
	Ratua-1	Dewanwala	Kamalpur	Bilaimari	50	
	Ratua-1	Mahanandatola	Gabindapur	Mahanandatola	Same HH considered	Two regional

Cover 8 Areas	Cover 15 Blocks	Cover 24 Villages	Cover 22 mouza's	Cover 22 panchayats	Cover 2400 HH	features --
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Source: Computed by Authors

Table 1: Area Wise Distribution of Sex ratio among Sample Areas in Malda District, 2014

Sl No.	Study Units	Population	Sex Ratio	Male	Female
1	High developed areas	978	914	52.45	47.96
2	Medium developed areas	949	870	53.42	46.47
3	Low developed areas	1243	905	52.70	47.71
4	Muslim dominated areas	1058	847	54.25	45.94
5	Santhal dominated areas	825	918	52.00	47.76
6	Urban areas	919	859	53.54	46.14
7	Boarder areas	857	869	53.44	46.44
8	Flood prone areas	1181	941	51.57	48.52
9	Malda District	6016	892	52.84	47.16

Source: Field Survey, 2014

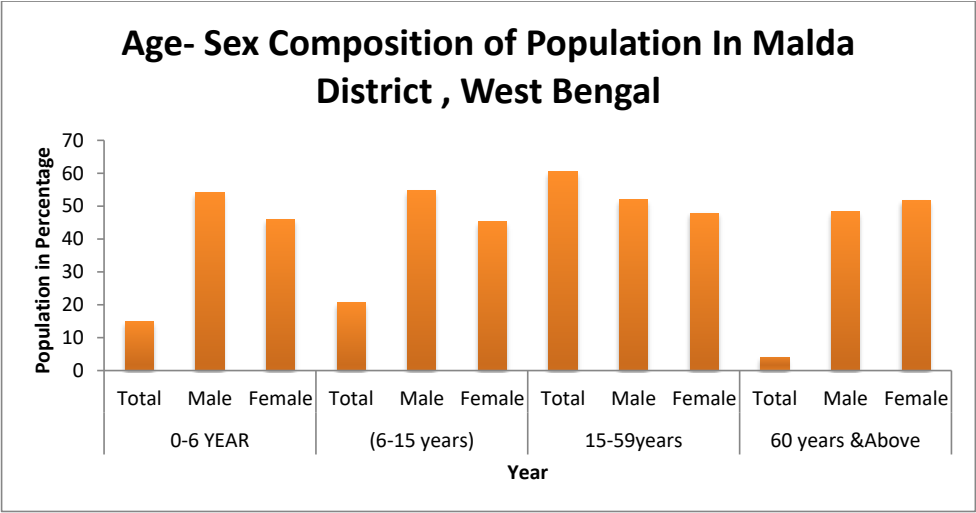


Fig. 2

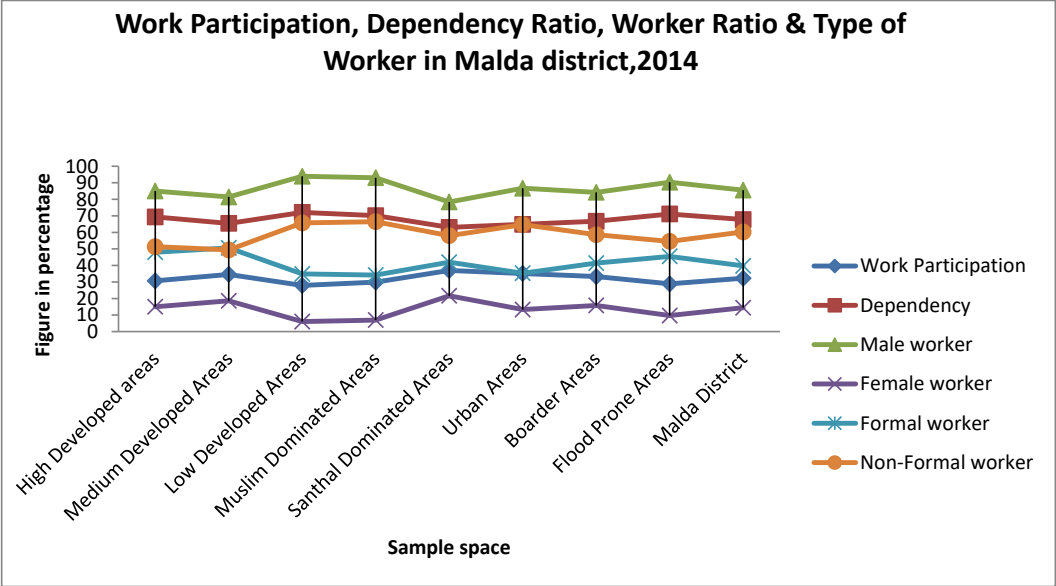


Fig. 5

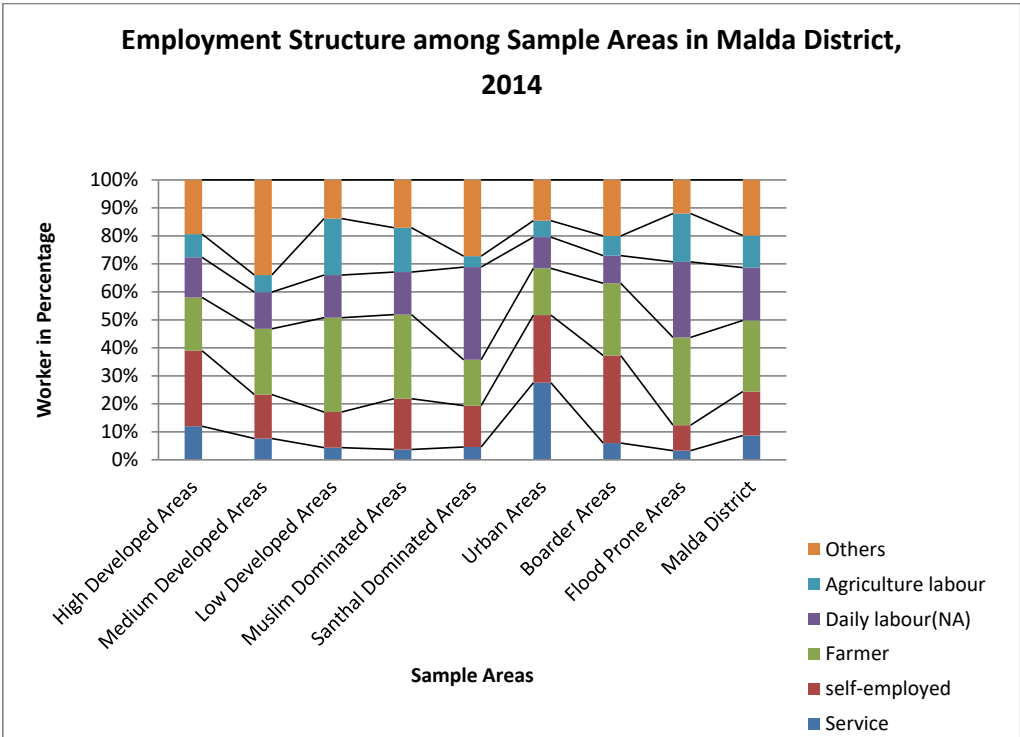


Fig.9

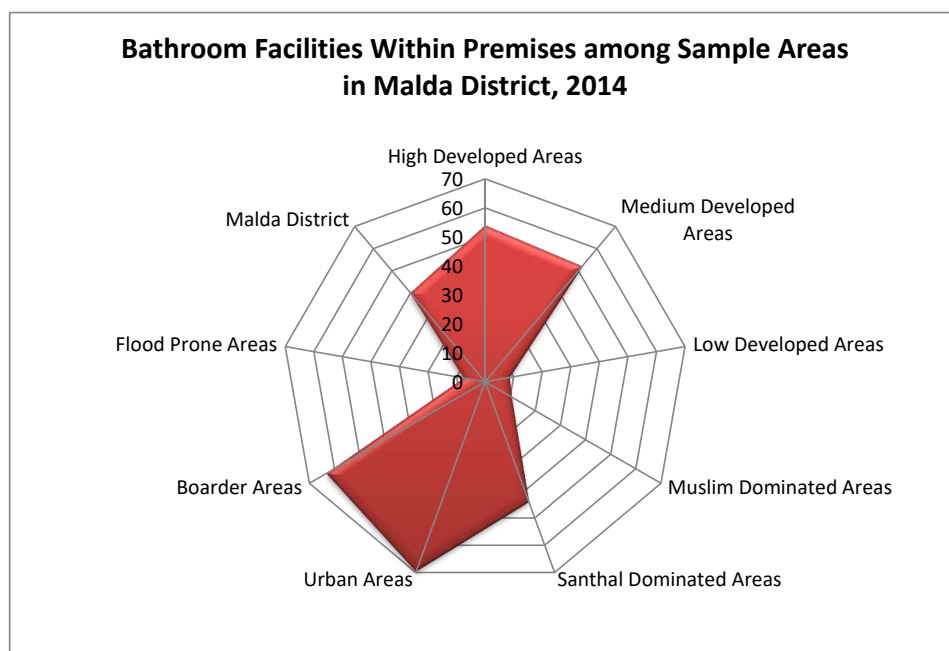


Fig.20

Table 13: Various sources of Drinking Water Facilities among Sample Areas in Malda District, 2014

Study Units	Source of drinking Water		
	Govt. Supply	Hand pump	Others
High developed areas	40	51	9
Medium developed areas	32.5	66.5	1
Low developed areas	0	97	3
Muslim dominated areas	0	100	0
Santhal dominated areas	41.5	36	22.5
Urban areas	64	33.5	2.5
Boarder areas	57	41.5	1.5
Flood prone areas	0	91	9
Malda District	26.83	64.83	7.50

Source: Field Survey, 2014

Table 14: Percentage of family members having Bank Account Number among sample Areas in Malda District, 2014

No of family member having Bank account				
Study Units	Total Population	Account Holder	Male	Female
High developed areas	978	28.53	64.87	35.13
Medium developed areas	949	29.93	58.45	41.90
Low developed areas	1243	27.67	62.50	37.50
Muslim dominated areas	1058	28.17	62.42	37.92
Santhal dominated areas	825	31.88	60.84	39.54
Urban areas	919	29.82	64.23	38.69
Boarder areas	857	41.54	60.11	39.89
Flood prone areas	1181	17.10	70.79	29.21
Malda District	6016	27.99	63.00	37.59

Source: Field Survey, 2014

Table 15: Household Assets among Sample Household in Malda District, 2014

Households infrastructure								
Study Units	TV	Motorcycl e	Bicycl e	Mobil e	Electricit y	Refrigerator s	Car	Washing Machine
High developed areas	62.5	29	66.5	87.5	75	20	2.5	2
Medium developed areas	54	20	66.5	89.5	79.5	15.5	3	0
Low developed areas	17.5	20	73.5	88.5	55.5	6	0	0
Muslim dominated areas	17	18	66	88	59	7.5	0	0
Santhal dominated areas	49	16	61	81.5	75	18	4	1.5
Urban areas	73.5	30	59	93.5	79.5	33.5	5	5.5
Boarder areas	66	27.5	65.5	95.5	94.5	27.5	5.5	1.5
Flood prone areas	10	19	66	79.5	24	2.5	0	0
	44.0						2.1	
Malda District	8	23	64.08	87.17	66.92	16.33	7	1.5

Source: Field Survey, 2014

Table16: Area wise Main sources of Energy for Cooking among Sample Areas in Malda District, 2014

Study Units	Source of energy for cooking in percentage			
	Wood	Cow Dung Cake	LPG	Others
High developed areas	17	21	61	1
Medium developed areas	34	11	52.5	2.5
Low developed areas	28	62	9	1
Muslim dominated areas	30.5	49.5	8.5	11.5
Santhal dominated areas	38.5	15.5	42.5	3.5
Urban areas	12	12	76	0
Boarder areas	15	29	55.5	0.5
Flood prone areas	41.5	52	6	0.5
Malda District	25.5	32.5	39	3

Source: Field Survey, 2014

Table 17: Main Sources of Lighting in Household among Sample Areas in Malda District, 2014

Study Units	Main source of lighting at home			
	Oil Lamp	Electricity	Both	Others
High developed areas	22.5	75	0	2.5
Medium developed areas	18.25	75	4.5	2.25
Low developed areas	43	49.5	5.5	2
Muslim dominated areas	40	44.25	10.5	5.25
Santhal dominated areas	25	75	0	0
Urban areas	20.5	75	2.25	2.25
Boarder areas	4.5	93.5	2	1
Flood prone areas	78.5	19	1.5	1
Malda District	32.7	63.6	3.4	0.3

Source: Field Survey, 2014

Table 21: Health Condition of Population among Sample Areas in Malda District, 2014

Study Units	Total Population	Health Condition	
		Total Patients	Patient in %
High developed areas	978	377	38.55
Medium developed areas	949	452	47.63
Low developed areas	1243	487	39.18
Muslim dominated areas	1058	459	43.38
Santhal dominated areas	825	425	51.52
Urban areas	919	442	48.10
Boarder areas	857	431	50.29
Flood prone areas	1181	450	38.10

Malda District	6016	2626	43.65
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Source: Field Survey, 2014

Table 22: Medical Facilities Provide to Female among Sample Areas in Malda District, 2014

Study Units	Medical facilities provide to female		Type of Medical facilities		
	Yes	No	Private	Govt.	Both
High developed areas	99.5	0.5	4.5	17.5	78
Medium developed areas	98.5	1.5	7.5	27	65.5
Low developed areas	100	0	9.5	19	71.5
Muslim dominated areas	98.5	1.5	9	18.5	72.5
Santhal dominated areas	100	0	4.5	20.5	75
Urban areas	94.5	5.5	10	21.5	68.5
Boarder areas	100	0	10	24	66
Flood prone areas	100	0	11	25	64
Malda District	98.75	1.25	8.42	21.25	70.33

Source: Field Survey, 2014

Table 37: Distribution of Nutritional Index through Weight-for-Age Among 0–14 Year’s Female Children in Malda District, 2014

Study Units	Weight-for-Age(underweight), Above 80% of the standard(Normal)				
	Normal	Mild	Moderate	Severe	Less than 50%
		(71-80%)	(61-70%)	(51-60%)	
High developed areas	54.13	20.44	9.67	8.71	7.04
Medium developed areas	52.63	16.29	8.83	13.46	8.80
Low developed areas	53.44	17.99	15.51	6.59	6.48
Muslim dominated areas	49.50	19.95	12.71	9.84	8.00
Santhal dominated areas	51.18	17.86	14.22	8.73	8.02
Urban areas	71.13	11.97	7.44	5.36	4.11
Boarder areas	50.21	20.08	10.59	10.22	8.90
Flood prone areas	48.38	20.29	13.56	10.42	7.36
District Total	52.33	18.8	11.88	9.32	7.67

Source: Field Survey, 2014

Table 39: Distribution of Nutritional Index through Weight for Height among Female Children in Malda District, 2014

Study Unit	Weight-for-height	Acute malnutrition (wasting)	
	Normal	Wasting	Severe Wasting
High developed areas	64.84	19.67	15.50
Medium developed areas	65.95	20.53	13.53
Low developed areas	50.30	27.24	22.46
Muslim dominated areas	56.37	26.36	17.28
Santhal dominated areas	62.55	19.68	17.77
Urban areas	78.51	17.38	4.11
Boarder areas	69.80	18.44	11.76
Flood prone areas	55.03	27.00	17.98
District Total	60.00	23.00	17.00

Source: Field Survey, 2014

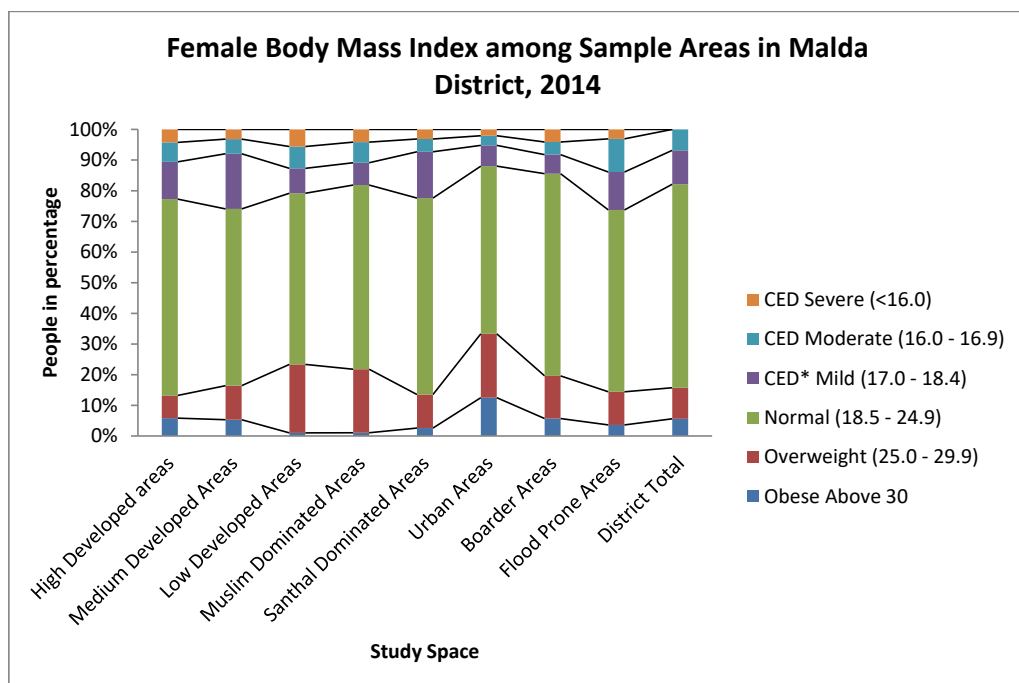


Fig.43

Table 35: Distribution of Nutritional Index through Height for Age Among 0–14 Year's Male Children in Malda District, 2014

Study Units	Normal	Stunting	Severe Stunting
High developed areas	77.97	13.79	8.25
Medium developed areas	67.75	22.30	9.95
Low developed areas	63.91	23.78	12.31
Muslim dominated areas	63.39	26.17	10.44
Santhal dominated areas	63.72	22.54	13.74
Urban areas	79.01	17.53	3.47
Boarder areas	68.19	21.05	10.77
Flood prone areas	58.75	23.23	18.03
District Total	67.24	21.32	11.44

Source: Field Survey, 2014

Table 36: Distribution of Nutritional Index through Weight-for-height among 0–14 Year's Male Children in Malda District, 2014

Weight for Height, Acute malnutrition (wasting)			
Study Units	Normal	Wasting	Severe Wasting
High developed areas	75.65	15.68	8.67
Medium developed areas	72.97	19.53	7.51
Low developed areas	63.17	20.45	16.37
Muslim dominated areas	63.39	25.98	10.63
Santhal dominated areas	66.33	20.17	13.51
Urban areas	81.38	13.91	4.72
Boarder areas	70.81	17.90	11.30
Flood prone areas	55.99	27.24	16.77
District Total	68.00	21.00	11.00

Source: Field Survey, 2014

Table 38: Distribution of Nutritional Index through Height for Age among Female Children in Malda District, 2014

Study Units	Normal	Height for Age Stunting	Severe Stunting
High developed areas	74.83	16.46	8.71
Medium developed areas	72.16	16.19	11.66
Low developed areas	66.90	19.25	13.85
Muslim dominated areas	65.05	21.44	13.51

Santhal dominated areas	59.86	23.09	17.05
Urban areas	71.25	21.73	7.02
Boarder areas	70.15	17.44	12.42
Flood prone areas	59.45	23.86	16.38
District Total	66.00	21.00	13.00

Source: Field Survey, 2014

Table 32: Distribution of Nutritional Male Population Body Mass Index among Sample Areas in Malda District, 2014

Study Units	Obese Above 30	Overweight (25.0 - 29.9)	Normal (18.5 - 24.9)	CED* Mild (17.0 - 18.4)	CED Moderate (16.0 - 16.9)	CED Severe (<16.0)
High developed areas	6.28	9.42	68.06	5.76	6.28	4.19
Medium developed areas	4.00	12.00	69.14	6.29	4.57	4.00
Low developed areas	1.06	4.76	64.02	14.29	11.64	4.23
Muslim dominated areas	0.54	6.45	75.27	9.14	5.38	3.23
Santhal dominated areas	1.70	11.36	56.82	8.52	3.98	17.61
Urban areas	13.40	19.07	57.22	5.15	3.61	1.55
Boarder areas	6.74	10.67	65.73	6.18	5.62	5.06
Flood prone areas	1.58	5.79	51.58	23.16	10.53	7.37
Total	5.09	13.47	60.71	10.71	6.13	3.89

Source: Field Survey, 2014

Table 33: Distribution of Nutritional Status through Female Body Mass Index among Sample Areas in Malda District, 2014

Study Units	Obese Above 30	Overweight (25.0 - 29.9)	Normal (18.5 - 24.9)	CED* Mild (17.0 - 18.4)	CED Moderate (16.0 - 16.9)	CED Severe (<16.0)
High developed areas	5.82	7.41	64.02	12.17	6.35	4.23
Medium developed areas	5.29	11.11	57.67	17.99	4.76	3.17
Low developed areas	1.02	22.34	55.84	8.12	7.11	5.58
Muslim dominated areas	1.04	20.73	60.10	7.25	6.74	4.15
Santhal dominated areas	2.60	10.94	64.06	15.10	4.17	3.13
Urban areas	12.50	20.83	54.69	6.77	3.13	2.08
Boarder areas	5.67	13.92	65.98	6.19	4.12	4.12
Flood prone areas	3.61	10.82	59.28	12.37	10.82	3.09
District Total	5.23	9.48	62.09	10.36	6.38	0.00

Source: Field Survey, 2014

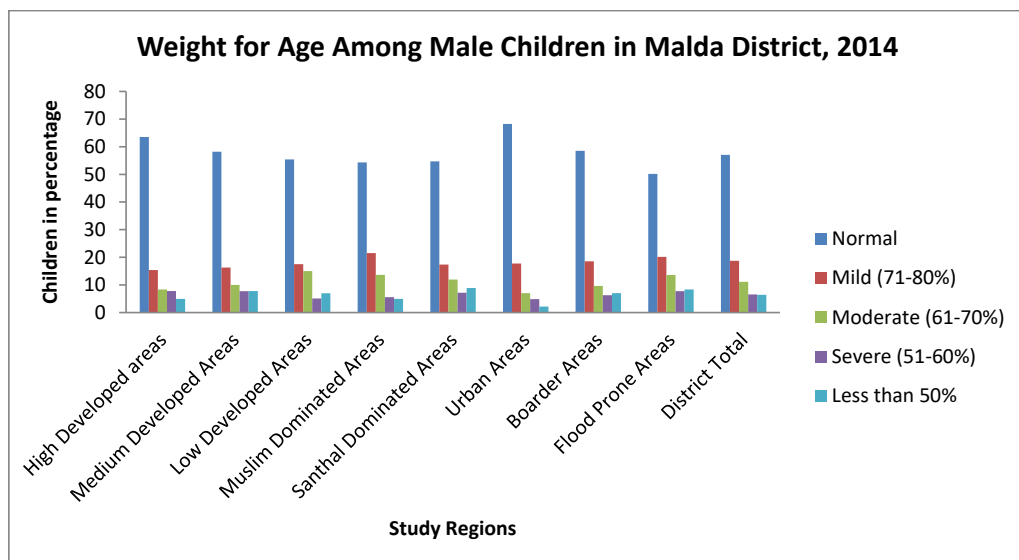


Fig.44

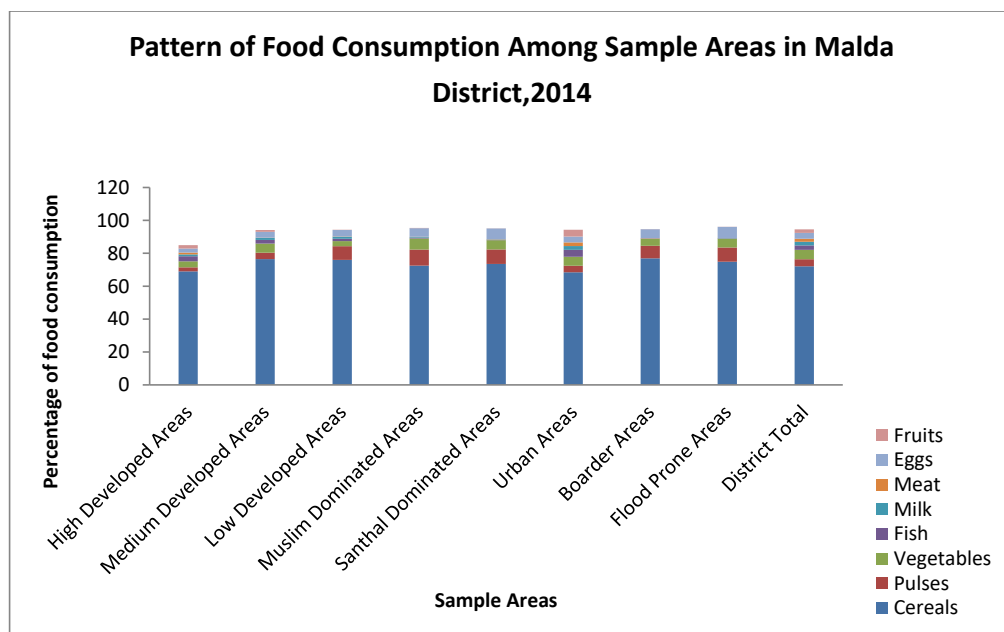


Fig.50

Table 41: Area Wise Caloric Consumption in Malda District,2014

Study Areas	Per capita kcal
High developed areas	2248
Medium developed areas	2182
Low developed areas	2137
Muslim dominated areas	2216
Santhal dominated areas	2151
Urban areas	2421
Boarder areas	2147
Flood prone areas	1996
District Total	2183

Source: Field Survey, 2014**Table 43: Spatial Patterns of Food Availability Status in Malda district, 2014**

	Rank					
Study Units	X1	X2	X3	X4	composite Z score	
High developed areas	0.671	0.665	0.462	-0.692	0.277	2
Medium developed areas	-0.397	0.560	0.426	-0.349	0.060	4
Low developed areas	-0.778	0.700	-1.118	0.775	-0.105	8
Muslim dominated areas	-0.702	0.715	-1.214	1.410	0.052	5
Santhal dominated areas	0.069	0.456	1.337	-1.122	0.185	3
Urban areas	2.044	0.555	0.980	-0.521	0.765	1
Boarder areas	0.137	0.623	0.189	-0.789	0.040	6
Flood prone areas	-1.045	0.755	-1.051	1.288	-0.013	7
Mean	46.700	0.629	61.075	46.150	****	***
Standard Deviation	13.110	0.100	3.432	20.460	****	***
Variance	171.877	0.010	11.779	418.594	****	***

Sources: Calculated by Author

Table44: Spatial Patterns of Food Accessibility status in Malda district, 2014

Study Units	X1	X2	X3	X4	X5	X6	X7	X8	composite Z score	Rank
High developed areas	0.568	0.587	-0.411	-0.338	0.645	0.135	0.887	0.724	0.169	3
Medium developed areas	0.189	-0.932	0.445	-0.076	1.210	0.258	1.421	1.424	-0.230	6
Low developed areas	-0.710	-0.791	1.678	-0.467	0.391	1.196	0.716	0.936	-0.262	7

Muslim dominated areas	0.568	0.587	-0.411	-0.338	0.645	0.135	0.887	0.724		0.169	4
Santhal dominated areas	-0.047	-0.402	-0.582	-0.402	0.110	0.075	1.250	1.111		-0.201	5
Urban areas	0.189	1.541	-1.678	1.680	1.509	2.153	0.737	0.840		0.687	1
Boarder areas	1.278	0.729	0.342	1.305	0.368	0.088	0.887	0.062		0.611	2
Flood prone areas	-2.035	-1.321	0.616	-1.364	1.458	0.906	0.032	1.051		-0.936	8
mean	53.00	47.69	59.50	61.83	34.51	0.01	27.31	33.16	****		
Standard deviation	10.563	14.147	14.604	11.728	3.276	0.604	5.849	3.468	****		
variance	111.57	200.13	213.28	137.55	10.72		34.21	12.02			
	1	8	6	4	9	0.365	0	7	****		

Sources: Calculated by Author

Table 45: Spatial Patterns of Food Utilization Status in Malda district, 2014

Study Units	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	X11	Compo site	Ra nk
High developed areas	0.76 1	0.32 1	1.06 9	0.30 8	0.836	0.821	0.08 7	1.17 7	0.782	0.950	0.49 9	0.676	2
Medium developed areas	0.85 1	0.17 5	0.16 7	0.33 0	0.024	0.046	1.01 5	0.63 8	0.009	0.048	0.25 9	0.144	5
Low developed areas	0.57 1	0.34 6	0.55 5	0.92 1	1.167	1.134	0.12 0	0.49 5	0.688	0.559	0.87 7	-0.460	6
Muslim dominated areas	0.76 1	0.32 1	1.06 9	0.30 8	0.836	0.821	0.08 7	1.17 7	0.782	0.129	0.49 9	0.601	3
Santhal dominated areas	0.39 1	0.71 9	1.14 2	0.40 3	0.165	0.304	1.94 6	1.25 5	0.160	0.444	0.37 2	-0.664	7
Urban areas	1.46 2	2.03 6	0.92 7	1.57 6	0.988	1.171	0.80 9	0.65 9	0.782	2.550	1.29 4	0.910	1
Boarder areas	0.43 6	0.44 9	0.05 1	0.51 8	0.402	0.341	0.94 6	1.02 0	0.575	0.408	0.94 1	0.277	4
Flood prone areas	1.52 0	1.33 4	1.48 8	1.71 5	1.753	1.669	0.77 5	0.72 4	2.082	0.149	1.72 3	-1.226	8
mean	62.6 54	57.1 82	69.4 38	68.4 13	61.37 5	53.75 0	91.6 25	54.5 62	79.25 0	49.43 8	44.8 13	****	****
Standard deviation	4.57 8	5.88 8	6.64 9	7.51 7	26.45 2	27.11 5	7.25 9	5.54 0	26.53 3	26.17 7	9.90 2	****	****
variance	20.9 59	34.6 72	44.2 05	56.5 03	699.6 96	735.2 14	52.6 96	30.6 86	704.0 00	685.2 46	98.0 58	****	****

Sources: Calculated by Author

Food Security Status Based On Medical and Biomarker Index Among Sample Areas in Malda District, 2014

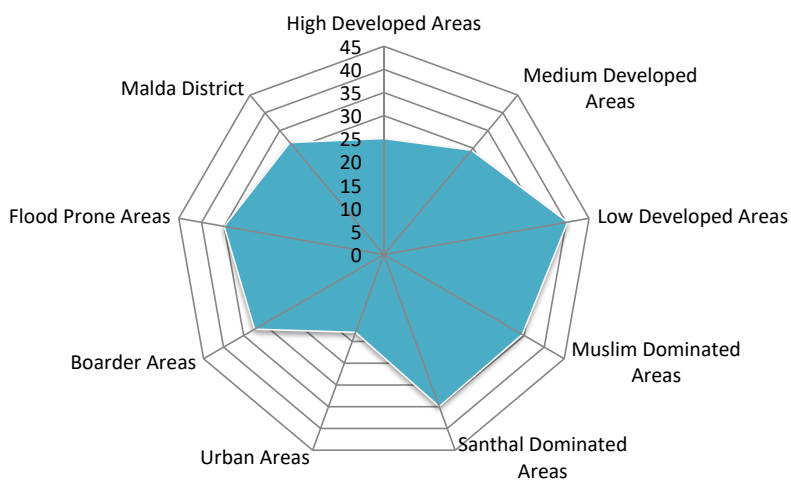


Table 51: List of variables are consider for calculation of Regional Food Security Analysis Index (RFSAI)

		Availability determinant
Variables	Explanation of variable	
X1	Percentage of household consumed 2400kcal & above per day per head	
X2	Per capita Land availability in Bigha	
X3	Percentage of productive group population (age group 15-59 years)	
X4	Percentage of household having Live stock	
		Accessibility (Determinants)
X5	Percentage of APL population	
X6	Percentage of household have more than rs.10000	
X7	Percentage of land ownership	
X8	Literacy rate	
X9	Percentage of expenditure non food purposes	
	Percentage of expenditure education	
	Percentage of expenditure housing	

	Percentage of expenditure health
	Percentage of expenditure clothes
X10	Percentage of consumption of high caloric food
	Percentage of pulses consumption of total caloric
	Percentage of milk & milk products consumption of total caloric
	Percentage of meats consumption of total caloric
	Percentage of Eggs consumption of total caloric
	Percentage of fruits consumption of total caloric
X11	Percentage of household able to buy expensive food
X12	Percentage of work participation rate
X13	Percentage of regular income workers(businessman, serviceman, industrial labourer etc.
X14	Percentage of bank account holder
X15	Percentage of higher educated population(graduate & above pass)
	Percentage of graduate pass
	Percentage of post graduate pass
	Percentage of others technical pass
X16	percentage of female worker
Utilization (determinants)	
X17	Percentage of adult normal body mass index
X18	Percentage of weight-for-age normal children
X19	Percentage of height-for-age normal children
X20	Percentage of weight-for-height normal children
X21	Percentage of household have toilet facilities
X22	Percentage of household have bathroom facilities
X23	Percentage of household have safe drinking water
X24	Percentage of cured population
X25	Percentage of electrified houses
X26	Percentage of household have LPG connection
X27	Percentage of household have modern infrastructure
	Percentage of household have TV
	Percentage of household have Motor cycle
	Percentage of household have Mobile
	Percentage of household haveRefrigerators
X28	Percentage of household have pucca houses

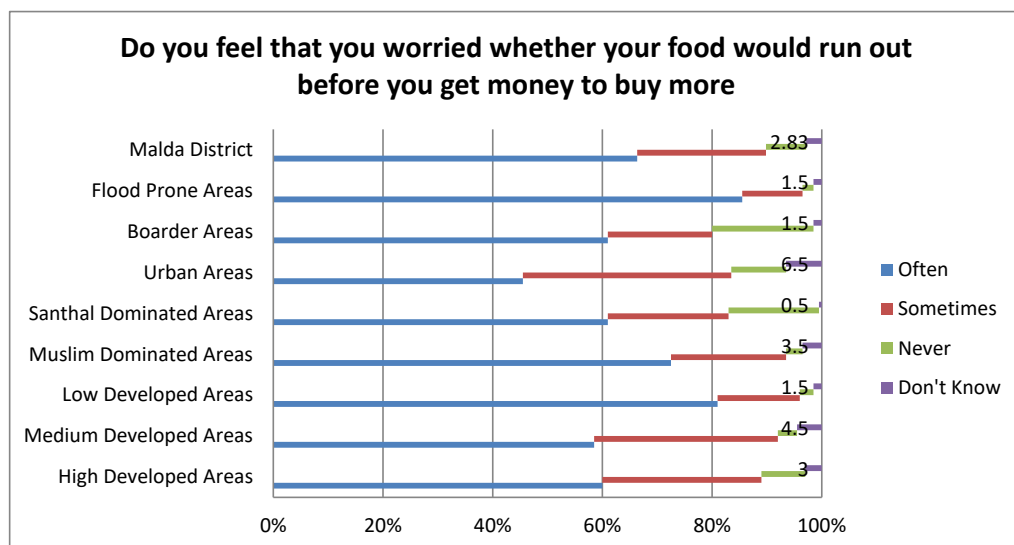


Fig.33

Table 25: in the last 12 months ever did your children not take food for a whole day /half day due to the shortage of money

Study Units	Yes in %	No in %
High developed areas	7.5	92.5
Medium developed areas	6	94
Low developed areas	11.5	88.5
Muslim dominated areas	12	88
Santhal dominated areas	13	87
Urban areas	10.5	89.5
Boarder areas	2	98
Flood prone areas	8.5	91.5
Malda District	9.5	90.5

Source: Field Survey, 2014

Table 26: Do you feel that, you are not able to buy expensive food for your children due to the shortage of money? Ever did this happen in the last 12 months.

	Often	Sometimes	Never	Don't Know
Study Units	%	%	%	%
High developed areas	53	40	4.5	2.5
Medium developed areas	47.5	48	2	2.5
Low developed areas	51.5	33.5	7	8
Muslim dominated areas	50.5	39	6.5	4
Santhal dominated areas	46	41.5	11	1.5

Urban areas	45.5	33	18.5	3
Boarder areas	41.5	45.5	11	2
Flood prone areas	55	33.5	5	6.5
Malda District	49.75	37.75	8.33	4.17

Source: Field Survey, 2014

Table 27: Why Did Your Household Unable To Afford Enough Food Can You Tell Me The Main Reason?

Study Units	Not working	Not Enough income	Food casts too much	Medical expenditure	Others
High developed areas	0	43.5	20	27.5	9
Medium developed areas	1.5	47.5	17	19	15
Low developed areas	1	46.5	26	15.5	11
Muslim dominated areas	0.5	44	22	17	16.5
Santhal dominated areas	1	50.5	18.5	19.5	10.5
Urban areas	3.5	26	32	20	18.5
Boarder areas	0.5	40.5	19	28	12
Flood prone areas	1	47.5	20	22	9.5
Malda District	1.25	43.25	21.25	21.42	12.83

Source: Field Survey, 2014

Table 28: When Did Your Household Unable To Afford Enough Food, What Did You Do Then

Study Units	Borrow money	Search for work.	Sell something	others
High developed areas	15	25	14	46
Medium developed areas	16.5	27	16	40.5
Low developed areas	21	23.5	15	40.5
Muslim dominated areas	21.5	20.5	13.5	44.5
Santhal dominated areas	13.5	30	18	38.5
Urban areas	17	16	12	55
Boarder areas	12.5	24.5	15.5	47.5
Flood prone areas	24	25	14.5	36.5
Malda District	17.42	23.25	14.92	44.42

Source: Field Survey, 2014

Table 29: Have you ever feel that there is no surety of cooking food in the kitchen in the home if yes then

Study Units	Yes	No
High developed areas	29.5	70.5
Medium developed areas	32.5	67.5
Low developed areas	27	73
Muslim dominated areas	33.5	66.5

Santhal dominated areas	31	69
Urban areas	31	69
Boarder areas	24.5	75.5
Flood prone areas	36	64
Malda District	31.67	68.33

Source: Field Survey, 2014

Table 30: Did you ever feel that even basic food which is essential for survival is not available?

Did you ever feel that even basic food which is essential for survival is not available?			
Study Units	Always	Sometimes	Never
High developed areas	10.5	78.5	11
Medium developed areas	16	72.5	11.5
Low developed areas	7.5	78	14.5
Muslim dominated areas	9	82.5	8.5
Santhal dominated areas	24	68.5	7.5
Urban areas	9.5	62	28.5
Boarder areas	11	77.5	11.5
Flood prone areas	9.5	73	17.5
Malda District	12.58	73.33	14.08

Source: Field Survey, 2014