

**A STUDY OF THE DETERMINANTS OF HOUSEHOLD
FOOD SECURITY AND THEIR IMPACT ON THE
NUTRITIONAL STATUS OF WOMEN IN THE SLUMS OF
GHAZIABAD CITY**

*Thesis submitted to Jawaharlal Nehru University in partial fulfilment of the
requirements for the award of the Degree of*

DOCTOR OF PHILOSOPHY

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DECLARATION

I hereby declare that this thesis entitled “**A STUDY OF THE DETERMINANTS OF HOUSEHOLD FOOD SECURITY AND THEIR IMPACT ON THE NUTRITIONAL STATUS OF WOMEN IN THE SLUMS OF GHAZIABAD CITY**”, submitted to Jawaharlal Nehru University in partial fulfillment of the requirements for the award of the degree of Doctor of Philosophy, is my original work. This thesis has not been previously submitted for the award of any other degree of this or any other university.

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CERTIFICATE

We recommend that the thesis be placed before the examiners for evaluation and consideration of the award of Degree of Doctor of Philosophy.

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Preface

The first chapter has given an overview of the historical perspective of food security. The conceptual framework of food and nutrition security is looked from the gender prospects. It entails with the clear understanding of the relationships between food security, nutrition and hunger. It is imperative to know how these definitions evolved over a period with the introduction of the new terminologies. The definition of food security changes as it is not just limited to food but nutrition sufficiency as well. Various dimensions of food security and basic concepts related to slums, household and nutritional status are also looked at. With the relevance of the study to the urban poor context, the challenges to achieve food sufficiency is also highlighted. Other information includes women and their excess to food with a brief discussion on the paradox of food insufficiency and obesity among women. This chapter further talks about the adapted conceptual framework and the significance of the study to set a background for the research questions and objectives.

The second chapter is digging into the extensive secondary review of the nutritional status of women across various states in India with the help of National Family Health Surveys. It also includes the data of calorie consumption, food composition and average intake by NSS (National Sample Survey). It further scrutinizes the South Asian Enigma, which questions the status of women and economic growth to combat malnutrition. The other part of this chapter encompasses the existing literature which identifies the determinants or the socio-cultural factors affecting the food consumption pattern in an urban poor. Ethical consideration, strength and limitations are also addressed in this section.

The third chapter deals with the methodology used in carrying out the study. It explains the theoretical influences and the nature of extensive research instruments used in great detail. It is also inclusive of the sampling frame, tool and technique used data collection.

The fourth chapter is dedicated to the history of slums which is based on the narratives of the key informants. It includes the quantitative findings based on the statistical analysis followed by discussion. It focuses on the interlinkages between the household food

security variables and their temporal relationship with the nutritional status of women in slums of Ghaziabad.

With the help of narratives from respondents, in-depth evidences are recorded in the form of explanatory variables. These variables are discussing the processes in achieving food sufficiency. The fifth chapter is the divergence of the fourth chapter, which includes the presentation of the cross-cutting themes. The thematic analysis is done to address their challenges and to have a closer look at the circumstances leading to food insecurity.

The sixth chapter is the synthesis of the quantitative and qualitative with respect to the conceptual framework. It helped in interpreting location as one of the major barrier to which affects food and non-food expenditure and thus household food security. It also encompasses socio ecological perspective on food security.

At the end, seventh chapter summarises implications of the study and way forward offering policy recommendations

List of Abbreviations

ANM	Auxiliary Nurse Midwifery
BMI	Body Mass Index
CED	Chronic Energy Deficiency
CFS	Committee on World Food Security
CFS	Committee on World Food Security
CHD	Chronic Heart Diseases
DUDA	Delhi Urban Development Agency
FAO	Food and Agriculture Organization
GDA	Ghaziabad Development Authority
ICMR	Indian Council of Medical Research
IFPRI	International Food Policy Research Institute
IFSP	Integrated Food Security Phase Classification
IFSPC	Integrated Food Security Phase Classification
INP	India Nutrition Profile
LE	Egyptian Pound
MCD	Municipal Corporation of Delhi
NFHS	National Family Health Survey
NFHS	National Family Health Survey
NGO	Non-Government Organization
NNMB	National Nutrition Monitoring Bureau

NPC	National Planning Committee
PCPD	Per Day Per Capita
RAY	Rajiv Awas Yojna
SLI	Standard of Living Index
Sq ft	Square foot
TPDS	Targeted Public Distribution System
UHRC	Urban Health Resouce Centre
UID	Unique Identification Number
UNICEF	United Nations International Children's Emergency Fund
WHO	World Health Organisation
NIN	National Institute of Nutrition
NRLM	National Rural Livelihood Mission
NULM	National Urban Livelihood Mission
MoHUPA	Ministry of Housing and Urban Poverty Alleviation
SUDA	State Urban Development Agency
SULM	State Urban Livelihood Mission

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CHAPTER 1

INTRODUCTION

1.1 Historical Perspective on Food Security

Prior to 18th century, famines were not widespread but the way people responded is important to know. Historically, famines recorded didn't occur because of the monsoon failures or food crisis. At the same time during this period there was no rapid communication, no railroads and no food aid given at all. Firstly, the farmers shared food buffers as insurances. The temple and king had obligation to provide food to hungry when needed. Secondly it was mobility, the people tend to move in times of failure of crop or when food was not available to places where land is available for farming, but over a period, land entitlement became more formalised and institutionalised. During colonial period these mobilised strategies got cut off completely. Therefore from the beginning access to land, water, manure and animals for fertiliser and plough, livestock and labour were the problems. Post independence, with the beginning of urbanisation and commercialisation market systems started because of which non producers got access to buying food.

Thus food security of farmers became dependent on the purchasing power which was not the case earlier, as farmers were the one who were most food secure. Farmers had safety net built in, especially the small farmers who could always eat whatever they produce during price rising whereas urbanites and the people without access to agricultural land did not, but the situation has flipped entirely and now farmers are the one who are most food insecure. The root cause of this problem started in 16th century with the formation of cities and market cash economy invention of Britishers. Problem of access has always been the issue so that the people who were not growing food get access to food.

The Indian economic growth have always lauded to encourage food security but despite the rise of the economy, hunger and malnutrition remains one of the major critical issues. The popular economist Amartya Sen stated that the earliest 20th century famine in Bengal was attributed to exchange entitlements. It was not how much money one has, but the

other resources besides having money such as having networks of obligation and social relations. Even in colonial period where kings and temples had moral obligation for providing support to people does not mean they did what they were supposed to. They also constituted exchange entitlements for example service relationship i.e., barber can get a share of crop in exchange of cash for providing service. Therefore it's the family, friends or patronage who allow access to resources and this understanding is still relevant. In today's time, the kings and the temples are comparable to the bureaucrats of India. Therefore, it is exchange entitlements which determine who gets the share of food and who does not. It is evident that the worst famine was during colonial period in 1876, large part of the South Asia got affected where rice is mostly grown. It witnessed five to seven million deaths. There were three main factors for colonial famine. Firstly, it was the environmental condition or scanty rainfall on which agricultural outcomes were dependent. Secondly, it was poverty which created inequality or exchange entitlements and thirdly, it was exports and no price control. All the three factors were seen as natural factors by the Britishers and they also stated that the markets have natural operating forces that should not be interfered. This created a disproportionate impact on landless and poor, wage earners who did not have farms and also on urban dwellers. There was not a single British officer who died during 1876. At that time also there was existence of hunger and abundance where natives used to take food from Baniya's (shop owners). The responses were same which included mobility to princely states which was not ruled by Britishers at that time. British government reported the existence of large number of people roaming around as the accurate measure of famine.

The traditional response to famine was storage. Britishers were reluctant to distribute food, they were attached to laissez-faire economics and stated that it will be intervening with the natural laws and people should earn food and food cannot be given to lazy people. British government started public work project but by that time people were already weak. Kitchens were set up but there was no change in supply, food was continuously shifted to the places where they had higher prices. The significant shift from staple food crops to the cash crops due to process of globalisation and improved transportation resulted in use of land for production of cash. (Saxena and Dasgupta, 2015).

1.1.1 Food consumption and food production

Malthusian ideas or rather ‘causes of food security’ is well known, for which he cited two main reasons. One was the high population growth and the other reason was the free market. He also highlighted the political and economic factors for achieving the food sovereignty, on which he commented that the nation should be self sufficient and should not be dependent on international trading.

Cullen S. Henderix considers Malthusian views exaggerates and thus states:

“Population growth and economic development contribute somewhat to price increases, but there are few structural, resource-based impediments to increasing aggregate agricultural production. The biggest near-term threats to food security are not dwindling agricultural inputs and agricultural trade, but rather the familiar problems of poverty and political barriers to market access” (S.Henderix, 2011,pp 1)

The uncertainties regarding fluctuating price of food and inflation has forced us to reflect over what Malthus had to say. ‘Food sovereignty’ should be at the forefront of the policy goals. However, the barriers created by the political and economic factors does not allow us to ensure an adequate food supply as they are the constraints on formulating a better International food systems to ensure nutrition for all (S.Henderix, 2011).

Contrary to the Malthusian ideas, Neo-Malthusian thoughts propounded by Ehrlich, 2009, states that humans will be unsuccessful in struggle against hunger. The author recognised some of the societal shifts which indicated slower growth in certain populations, shifts such as decreased fertility rate in developed nations and Green revolution which had a larger impact than expected.

The absolute number of people living without enough to eat in 2005 was 850 million as similar to the number reported in 1968. Quinn (1997) also questioned Malthus by saying that increase in food supply were responsible for population growth. Rasell Hopfenberg (2003) supported the same argument and examined the population numbers by using past food production numbers, which were similar to those estimated by FAO. However,

Africa was an exception wherein population sizes continued to increase despite declining food production on the continent, which ran contrary to the expected Malthusian model. 'According to World Bank in 2009 African nations such as Liberia (4.1 percent), Nigeria (3.49 percent) and Uganda (3.24 percent) experienced one of the highest population growth rates in the world with the grain production declined by twelve percent (World Bank, 2009)' (Maizonet-Guzman, 2008).

India produces larger than it consumes, in fact India exports sizable amount of cereal grain. Therefore, gross productivity is not the problem, even the famines history was not due to lack of productivity. If we look at the period of crisis and responses of the victims, and in-charges who dealt with is very useful to know how we have come to the situation where we are now. The politicians are sensitive to particular kinds of issues, they all seek one fit all model of thinking i.e., how to deal with agriculture & food insecurity issues across the world but local differences, local concerns and specific history makes a difference. Since 1947, there had been fundamental distinction in agriculture. Millets and rice production were more in south-east region whereas barley and grain crops were in northern part of the country where officially government intervention has taken place. There has been lots of diversity in organising agricultural production. Southern part of the country where rice is mostly grown and requires more irrigation facilities as compared to legumes, lentils, millets, sorghum which require less water for their production. So far, the attention has been given primarily to food staples i.e, wheat and rice whereas most nutritious protein rich food items like millets and pulses are neglected, which are also essential part of food security. Even the government is more interested in limited number of staple crops and ignored millets and sorghum, so the precursor to contemporary aggregation distress started as early as in 16th century which makes difficult to blame someone as we have long history to impose blame. The deep roots of food insecurity in South Asia lie in poverty and unequal access to resources. The lentil imports has increased not because of the farmers are not producing it but because of the government policies.

Food Security and poverty is not evenly distributed across the various regions in India. North India mainly has the highest level of inequality and poverty. Food insecurity and

natural resources difference in agricultural products has much to do with the history. Caste based discrimination is one of the hidden and crucial factor causing inequalities and food insecurity. The poor status of women in the history in terms of land rights, access to land, ownership, establishment exchange in colonial period and low caste especially in north is much lower as compared to the south. Tamil Nadu and Kerala are considered as best states in the world that have the lowest wasting and child malnutrition.

The series of Ashwin Parulkar studied the failure of existing food security programmes which were based on the investigation of the starved or who died due to starvation. Parulkar found that every deceased case due to starvation belonged to the low caste with few occupational and educational opportunities. So, to overcome this situation we have various government programmes i.e., access to free education, reserved slots in university seats and so forth. However, still in Northern parts of the country like Bihar mostly poor, least educated and highest level of inequality persist. People do not have ration cards, maternal and infant health care, despite of the existence of the programmes, there are schools but no teacher which gives us a reality check about how the policies work on ground. Food Security in fact varies within the single families. It depends on how food is distributed within a family. The food is served in hierarchal fashion. Woman who does the preparation eat leftovers as they have the lowest ranking within hierarchal family system.

The incidence of undernutrition is shockingly high i.e., stunting (forty percent are small for their age under three years of age whereas forty seven percent are underweight). According to International Food Policy Research Institute, India is still far behind in Global Hunger Index (2017) with the rank of 100th in the 119 countries, which contributes to more than 200 million are food insecure in the world. This is very striking in light of India's economic growth. Economic growth emerged from the market liberalisation started during 1990's leads to the growth numerically substantial but percentage wise it was small. Indian middle class is five percent (seems minute) of the population which is more than fifty million in number and it is quite a significant factor. New affluence has changed the face of India with the higher purchasing power. Food security is incredibly complex which is different for rural and urban group. Due to rapid

urbanisation, the population is shifting to urban areas. One of the significant problems that have emerged is both hunger and overfed problem. The recent transformation is due to increase in economic inequalities as a consequence of economic liberalisation with opening of Indian markets in 1990's. Due to this newly emerging and affluent and upper class is rising in surge of consumerism, opening of restaurants, and increased consumption of junk foods, soft drinks and meats.

Food systems have been very complicated which include natural factors like soil and rainfall. It is also mediated by agricultural and environmental factors & poverty by purchasing power. Social networks includes gender, caste is still important and all these factors are influenced by government policies. Ideology of free markets were loudly operated despite of the human consequences (Morrison, 2012).

1.2 Basic Concepts

1.2.1 Food Security

The conceptualisation of food security has changed gradually since 1940's in not only theory but also in practice. The roots of the term food security as well as nutrition security was found during the world war second. Around forty-four governments were agglomerated in United States to contemplate about the specific goals related to agriculture and food. They brought clarity in defining the terms like secure, adequate and, suitable in greater details to arrive at the comprehensive definition of food and nutrition security. The word secure is related to accessibility of food whereas the word adequate is referred to quantitative sufficiency of supply. The word suitable was later added to refers to the nutritive component of the food supply.

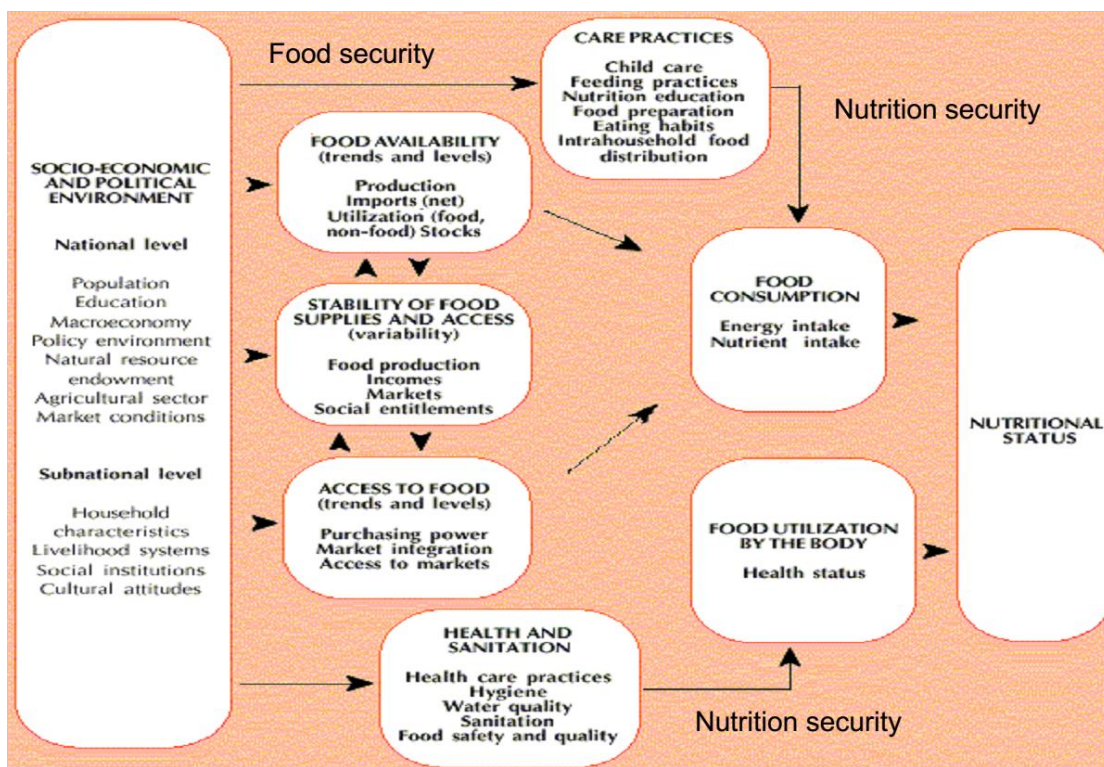
The definition of food security was developed from the prospects to ensure food supply. The significance of consumption and accessibility was then advanced to the entitlements. It was later realised that food-related issues are not only related to agriculture and production activities but are embedded in the structural and mechanism regulated by the economies and societies. The concept of scarcity was then replaced with the institutional failures which led to the suboptimal food distribution. To develop the better

understanding of the food security as a broader issue, multi-sectoral approach was introduced to tackle the food security (Devereux, 2001) (Pangaribowo et al., 2013).

“Food security exists when all people, at all times, have physical and economic access to sufficient safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life” (World Food Summit,1996).

Figure 1.1

Determinants of Food and Nutrition Security



Source: (FAO, 2008)

1.2.2 Constructing Framework

In a broader sense, the corporal and time-related determinants exist at national and subnational levels. The socio-economic and political environment influences these determinants. The *physical determinants* are related to availability, accessibility and utilization. Availability is seen from the production perspective and per capita availability whereas accessibility is related to purchase, efficient markets, and socioeconomic status.

Utilisation here is seen with the inclusion of hygiene and sanitation. As the food eaten in clean and safe environment foster ingestion and metabolism.

Another determinant is *temporal* which focus on the stability in achieving all the elements mentioned above. This may further fall into two types; Chronic or acute food shortage. Former is repetitive due to pre-harvest food shortages, seasonality or lack of caring during harvest, and another one is man-made or may occur during emergency like natural disasters. The later one is also termed as transitory food and nutrition security.

Adequate nutrition is significant for human well being and its attainment of a healthy nutritional status is equally essential for men and women. However women presumes more importance due to their reproductive, food procurement and economic role. The women health status is mostly addressed under the “ family welfare” umbrella. The hindrances embedded in the culture are often ignored which are the forerunners of women underprivileged status.

Women in fulfilling their reproductive role of mother lack the freedom to lead a healthy life. The repercussions that women’s malnutrition has for human development are numerous which seems to increase steadily. Maternal mortality, intrauterine growth retardation, child malnutrition and rising other chronic non-communicable diseases are the consequences of maternal malnutrition (Jose and Navaneetham, 2008). According to a Human Science research study, 2004, women have their managerial role at household and are mostly engaged in caring and feeding of children. The interventions are needed for the women to increase their productivity and subside time spend on food procurement will improve their food security. Therefore the specificity of gender while addressing household food security is crucial (Reddy and Moletsane, 2011).

Since the study is taking into the account of gender perspective, the four dimensions of the food security are:

1. *Availability*: The availability refers to the food procurement and trade which is responsible for the supply side. Unequal ownership, and access over livelihood assets hinders the women food security. Inequalities related to income and the

power attributed to shape up their own lives negatively affect women's future production potential and increases the food insecurity.

2. *Accessibility*: Household food insufficiency can only be reduced by improving the women access to efficient markets, increase in their income and thereby improved ability to make independent decisions in food expenditure and consumption. During the time of crises, women are the ones who affect the stability of their food security in numerous ways. Concerns about the differences in the risk and vulnerabilities between women and men have resulted in policy-oriented focus in achieving food security goals.
3. *Utilisation*: The utilisation aspects deals with the suitable nutrients which are required to maintain a healthy and active life. Women role in this dimension is the most important due to their participation in the cooking which may incorporate dietary diversity and intrahousehold distribution of their household.

The another dimension which is necessary to all the above comprises of the stability over time. Poor households may or may not achieve the food sufficiency but they lack stability due to economic shocks, food inflation, and unemployment and often suffers from transitory food insecurity (Mathur, 2011).

1.2.3 Economic versus Biological approach

The nutrition security is placed under the umbrella of food security is not justified. Food is just the tip of an iceberg in the broader context of achieving nutrition sufficiency. The food security may or may not be achieved at household level, but nutrition sufficiency entails individualistic approach. The rationale for achieving food security is based on the economic approach in which food is perceived as a commodity related to supply before reaching the individuals. Unlike the biological approach, where human body with different nutrient requirements is the starting point (Gross et al., 2000).

In India, where the food security is one of the major concern for poverty alleviation, inclusion of utilisation as one dimension implies nutrition security, which is more critical than just only food sufficiency. Undernutrition has serious implications at not only individual level but in the socio-economic development of the country as whole. The

information about the current understanding of the concept is quite ambiguous which are reflecting in the outcomes of nutritional status in India. Other indicators have emerged and used for the classification of food security crisis encompasses the diet diversity, food access and availability, availability of safe drinking water, crude mortality rate, coping strategies livelihood assets (IFSPC, FAO,2010).

Household Food Security: The inclusion of household to the food security extends it to the inclusion of family. It involves the access to the quantity as well as quality food for every member at the household throughout the year. The food procurement may be through the food purchase or self-produced by the households (FAO, 2011).

1.2.4 Nutrition Security

The term ‘Nutrition Security’ emerged with the inclusion of the nutritional importance of food. Unlike the food which only defined as the substance that people eat and drink. The nutritional aspects is not just the intake of food but the access to safe drinking water, health services and caring practices. Nutrition goes beyond hunger in which the nutritional value is focused, therefore “a person considered nutrition secure when one has a nutritionally adequate diet. The food consumed is biologically utilised such that adequate performance is maintained in growth, resisting or recovering from the disease, pregnancy, lactation and physical work” (Frankenberger et al.,1997).

The intergovernmental body was formed as the committee on world food security. It was set up in late 20th century to review and following up on the food security policies. It has been argued that the nutrition sufficiency can only be achieved when the nutritious diet is coupled with the healthy and safe environment (CFS 2012).

In 2009, Scaling up Nutrition framework was also formulated with the alliance of stakeholders from the state, funding agencies, research community, and development banks. This framework was set up to reduce hunger and undernutrition to achieve MDG one goal of halving poverty and hunger by the year 2015 but was not achieved.

1.2.5 Food Security and Nutrition

The terminology food and nutrition security has now been clubbed and its usage become the usual practice in the number of International agencies like IFPRI, UNICEF and FAO.

It was used initially in the CFS reform document to emphasise the complementarity of nutrition and its overlap with the food security. Now this is interpreted as a single goal of policy and is more widely used (Weingartner, 2010, pp 29-35).

1.2.6 Food Insecurity and Hunger

Food insecurity is often confused with hunger. Both are the responses to the food insufficiency but one is psychological whereas another one is physiological. Food insecurity is psychological response to the lack of availability or uncertainty of food. Hunger is supposed to be a physiological response as a consequence of food insecurity (Casey et al., 2006 cited in Clark, 2012). Food insecurity occurs “whenever the availability of nutritionally adequate and safe foods or the ability to acquire foods in socially acceptable ways is limited or uncertain”. Hunger is defined as “the uneasy or painful sensation caused by a lack of food and the recurrent and involuntary lack of access to food, which may produce malnutrition over time”. (Anderson 1990 cited in Liberal et al., 2014).

1.2.7 Nutritional Status

The status of health is transitory and the fluctuations can be seen with the varied intake and utilisation of the nutrients. Assessing these fluctuations or state of health concerning intake and absorption of nutrients is referred to as nutritional status.

Nutrition sufficiency is necessary for the good health and well being. When the body meets all the nutrient in adequate amount, the good nutritional status is said to be achieved. However if the nutrients provided in the diet are not adequate or utilised properly for long, it may lead to the imbalances in the body and may result serious health implications or may prove fatal. This condition is known as Malnutrition.

The predominant form of malnutrition in India is undernutrition (lack of one or more nutrients) where the overnutrition (excessive intake of nutrients) discourse is gaining importance and referred as double burden of malnutrition.

Measuring nutritional status of an individual or a group is known as nutritional assessment. Nutritional status can be assessed by the following three measures:

1. By measuring physical growth - Various indicators used are wasting, stunting, BMI, Anthropometric measurements like height, weight, mid-upper arm circumference, underweight, low birth weight
2. By determining dietary intake - 24 dietary recall method, diet history
3. By recognizing nutritional deficiency diseases i.e. anaemia, Vitamin A deficiency and Goitre

Undernutrition sets in due to the inadequate food which lead to the poor health. The important cause for chronic undernutrition is now has been diagnosed with the micronutrient insufficiency. Micronutrient sufficiency adds another dimension to the food security discourse. Inclusion of essential micronutrient in the PDS system seems to be a long-term goal, where distribution of sufficient calories seems to be a significant challenge at present.

1.2.8 Slum & Household: Definition

The census defines a slum as:

“A residential area where dwelling are unfit for human habitation because they are dilapidated, cramped, poorly ventilated unclean or any combination of these factors which are detrimental to safety and health”.

Ministry of housing and urban poverty alleviation set up the Sen committee(2010) which evolved the definition of slums. They also came up with the cut-off of counting a belt of dwellings as slum which should be 20 or not 60-70 households. The committee also indicated the gradual increase in the slum population which proved to be true in the present situation. According to the census 2011,“Over 65 million people live in slums, up from 52 million in 2001, though the slum population has grown slower than the average urban population over the last decade. However, Pronab Sen, chairman of Statistics Commission underlined other flaws in the procedure leading to an "under-count" of slums.”

Three types of slums are categorised: Notified, Recognized and Identified. With the relevance of the undertaken study the Notified slum is defined as

“All notified areas in a town or city notified as ‘Slum’ by State, Union territories Administration or Local Government under any Act including a ‘Slum Act’ may be considered as Notified slums” (Ministry of Home Affairs,GoI, 2011)

The slum definition as per the U.P. Slum Areas (Improvement & Clearance Act, 1962) is comprehensive. The number of unauthorised colonies and villages in the municipal area are also included in slums. Once the area is declared as a slum, it continues to be in the list even after being developed. The boundaries of slums are also not well demarcated.

In the Official Gazette, Slum area is defined as “in any respect unfit for human habitation; or are by reason of dilapidation, overcrowding, faulty arrangement and design of such buildings, narrowness or faulty arrangement of streets, lack of ventilation, light or sanitation facilities, or any combination of these factors, are detrimental to safety, health or morals”

1.2.8 Household

The keywords commonly used in the household definition “include the members of the household live in the same lodging and acknowledge a common household head. The second includes the criteria to eat commonly prepared food together. The third aspect is they must work together on at least one agricultural plot or in one revenue-generating activity”(Lori and Dillon, 2010)

The household definition which is adapted is as follows:

“A household is defined as people who normally lived together, slept under the same roof and share food from a common kitchen. “Normally” implies the temporary stay will always be included.”

1.3 Food Security in an Urban Poor Context

Food security, along with poverty eradication is one of the most significant elements of the millennium development goals. There are researchers which indicated that India is abundant in food grains including wheat and rice but lacks storage facilities. Along with the improving storage facilities there have been many schemes launched to enhance agriculture production to tackle the food security issue. However, nutrition security has

not been efficiently addressed which includes not just availability of food but a nutritious food to maintain a healthy and active lifestyle.

Due to tremendous opportunities in industrialised urban areas, there is rapid rural-urban migration which has led to stress on the socio-economic infrastructure in the cities. The slum and congested habitation have caused epidemics and other health hazards including infections. Frequent supply of unsafe and contaminated water poses the risk of severe health issues. Due to the unavailability of safe drinking water, the proper utilisation of food does not take place precisely in case necessary nutrients. Water security is often overlooked despite of the abundant literature on its relation to health. Safe and clean water is still unavailable to the poor households. Therefore, healthy living conditions should be added as a new dimension to food security.

In India, there have been many schemes launched to provide food grains to the poor. However, these schemes failed to reach the beneficiaries or primarily to the urban poor migrant population due to the selection criteria.

1.3.1 Socio-cultural factors affecting food consumption patterns in an urban poor context

People who migrate to the urban environment in search of their growth are usually unaware of the repercussions. They do not adjust well with the sudden change in the cultural, social and political environment. They are unconscious of the situations of living in an urban environment as compared to the familiarity of their niches in the rural setting. They have to entirely dependent on the food purchase instead their produce, which exposes them to the cheap unhealthy food option available in the vicinity which usually offer them limited healthy choices. In search of living in the urban settings, they are compelled to stay in slum dwellings.

The over aspiration of getting desirable work opportunities and other physical amenities including health and education in urban areas pull them to shift from rural areas. Their perception is repudiated as they fail to achieve the minimum living due to the pressing expenditure for their survival, as their income do not meet their needs. They are

struggling for social adjustment. In which slum dwellers make efforts to cope with norms, quality and demands to be accepted

They are often seen repaying their credits to meet household needs and sacrifice food for acquiring materialistic possessions to imitate the living standard in urban setting.

The conservative eating habits of the people in rural setting gets converted into the typical westernised diet when they shift into the city. The healthier options which were affordable in their niches seems to be expensive due to high cost of living. Therefore they try to emulate the eating patterns followed by rich which is high in fat and low in carbohydrate (Bourne et al., 1996 as cited in Puoane et al., 2006).

It has been learnt during the socialisation process that the consumption of protective foods is linked to the socio-economic status of the household. Increased consumption of high protein diet is recorded with the increase in the family income in the developed country like Zimbabwe. Though the increased frequency and quantity of meat consumption has been recorded in relation to income, but the quality of overall diet improved seems questionable. (Belk, 2000 as cited in Puoane et al., 2006).

Food insecurity in the household affects disproportionately. The elders in the family protect the children from the ramifications of the food insecurity until the situation is dreadful. In such cases the role of women gains importance to channelise the resources to fulfil the hunger of every member of the family. The literature reviewed also state the women centrality to the preparation, distribution, and production of food not only in the family but also in agricultural sector. They perform the role of managers while being the sufferers at various front. The disaggregated data of the various states on the women malnutrition involving chronic energy and micronutrient deficiency is well documented. The poor nutritional status of women gives a clear picture of the biased norms they experience in society. Therefore the adult women could be seen as the best source of imparting knowledge to study the household food security situations.

Accessibility and affordability of nutritious food and the food habits in particular region can also be attributed their nutritional status which need to be studied further. The study focus around the given food environment in which women are seen as provider to nurture

the family. Their nutritional status is of utmost importance. The drivers of food sufficiency or rather health goes beyond the individual level. If one has to seek health of women, the person-in-environment approach need to adhered to have a comprehensive view including gender-specific, political and socio-economic factors. Hence the study aims to have a holistic view by addressing these aspects in achieving nutrient sufficiency and thereby looking at the nutritional status of women. The study is exploring the risk and protective factors for achieving food sufficiency and food-related behavioural outcomes among women in urban slum households.

The increased availability of a wide spectrum of food items also seems to influence the consumption pattern to a larger extent. The food spectrum includes: i. *junk food* - ultraprocessed foods, ii. *Ready to use foods* - pre packaged meals, processed complementary foods, iii. *Processed foods* - fortified foods and mineral water and iv. *nutraceutical supplement* (Prasad, 2018). Packaged food does not require cooking and have limited shelf life. It includes items such as biscuits, soft drinks chips and may at times include cooked meals as well. 'Convenient food' or 'tertiary processed foods' includes packaged as well as the commercially prepared items which are often made through processing to optimise ease of consumption. Such food is usually ready to eat without further preparation. Convenient foods include ready to eat, bread, cheese, salted snacks, cake mix, etc. and companies like Pesico and Nestle has a significant contribution to this food spectrum. In his work Sanders cited a press released by Nestle in 2008, "Popularly positioned products (PPPs) aimed at lower income consumers in the developing world, will continue to grow strongly in 2008 and beyond. Nestlé PPPs, which mostly consist of dairy products, Nescafe and Maggi culinary products, grew by over 25% to reach around CHF 6 billion in sales in 2007. The overall market for such products in Asia, Africa and Latin America is estimated at over CHF 80 billion." (Sanders, 2017).

With the huge excess of cheap packaged food in India, a swift transition in nutritional, socio-economic and overall demographic profile is seen. Simultaneous occurring of overnutrition and undernutrition among the women in developing countries is now corresponding to the developed countries. The dual construction of severity is transpiring

into public health concerns especially among the poor population. To contribute to this, the present study also investigate the factors which causes obesity under food insufficiency.

1.3.2 Paradox of Food Insecurity and Obesity

India is experiencing an epidemiological and nutrition transition where the transmission of knowledge and norms from developed countries that had already experienced is shifting to less developed countries. Obesity is not just limited to higher socioeconomic group but is present in the low socio-economic groups as well.

The paradox of the occurrence of over and undernutrition revolves around the ability to spend for nutritive and healthy diet. Lack of purchasing power or inability to buy the nutrient dense food and over-consumption of cheap calorie sources may be seen as on of the reasons for the obesity in lower socioeconomic groups. Studies are conducted to examine the relationship between the price of food and its energy density. The choices are made by cost, convenience, taste and lesser extent to nutritive component and variety. Cost stands out the single most important factor especially among poor households, therefore the socio-economic status is directly linked to the food choices made. High energy density food items including fat, sugars and refine grains comes cheaper, highly palatable and convenient as compare to the low-density energy food items. The food items which are low on energy are also more nutrient dense. These include fresh vegetables, fruits and fish which is costly and unaffordable to poor. Therefore the energy density of food is inversely proportional to their energy cost (Drewnowski and Darmon, 2005). The propensity to spend money on energy dense food can be seen as a coping strategy to save money. However the limited freedom to choose food due to economic constraints may have severe physiological consequences.

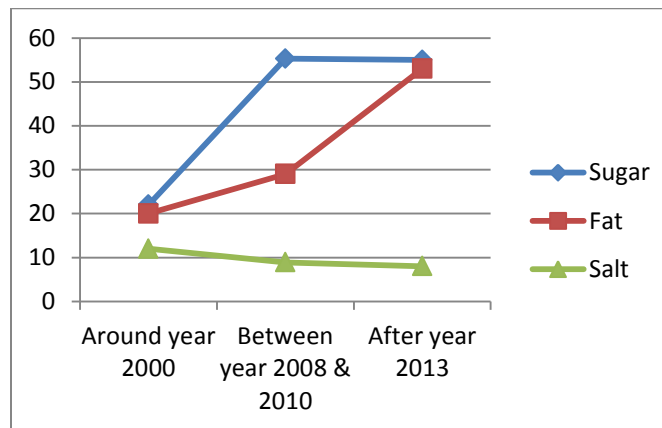
The increasing trends of per capita consumption of sugar, salt and fats are leading risk factors to NCDs in India. In an analysis conducted by Arora et al (2014) they examined market research reports and national and state level per capita consumption. The authors provided evidences reagarding the increased consumption of the salt, sugar and fats alongwith the increasing prevalence of the cardiometabolic risk factors and other NCDs. The relatively low market price and decreasing export of sugar was complimented by

high domestic purchase in India. “Market research companies (KPMG) reported that up to 55% was procured by bulk purchasers and consumed in confectioneries. Therefore, 11.7 million metric tons were available for household consumption.

This works out to 9.37 kg/year (25.7 g/day). Furthermore, 10% of total sugar produced was considered as levy sugar for the PDS.” The increasing trends in the consumption of salt, sugar and fat consumption is also seen. The NSS 2010 round reported per capita sugar consumption of 55.3g/day, salt consumption 8.9 g/person/day(>RDI (NIN), and fat (54g/day)(Figure 1. 2). An ICMR-INDIAB study also reported that per day consumption of salt was high in urban areas(7.6±3.3) was significantly higher than in the rural areas (6.8±3.5 g/day), p 164, (Arora *et al.*, 2014).

Figure 1.2

Nationwide trends in rising per capita consumption of sugar, salt and fats



Source: (Nss 66th Round, 2012)(Anjana *et al.*, 2011) as cited in (Arora *et al.*, 2014)

WHO approach is also foregrounded on the holistic view of addressing the rise of double burden. Eating practices can only be modified with the inclusion of constructional, corporeal, societal, and bureaucratic influences. These factors need to be involved while formulating the prevention strategies or its efficacious execution to deal with occurrence of obesity among the poor population.

1.3.3 Intra-household Authority and Consumption

This section highlights the critical issues related to women's position in the household and why women are so concerned with maintaining their family. Family as a unit itself creates structures constraining them. Mostly the household head is always the senior-most male. Rajni Palriwala as cited in (John, 2008) mentioned that all members of the family are expected to be submissive in terms of income pooling, expenditures and action are seen as affecting the social and political relations of the household. The presumption is that the head having the most complete knowledge regarding household matters decides in the interest of the unit, for the family good. The women who are responsible for household food securing activities of the household are under the triple authority of the senior women (mother in law), the husband, and head of the family. Sometimes children also pressure the mother and are quite demanding. Even in the nuclear family, in the absence of senior women and head of the household interlocking lines of authority still exist. The authority of the husband depends upon the age and kinship composition. Widowhood during youth and in old age, or absence of husband due to migration reduced the control of all these authoritative factors (John, 2008).

The dynamics of food consumption and control are the baseline for intrahousehold distribution and authority and ideally there are little inter-household variations. In practice, caste, religion ties with economic levels and migration (Rajni Palriwala as cited in John, 2008 p414-420). Together these aspects mediate intra-household tensions. The rights to consumption of women in different castes and classes are divided regarding the labour they provide to the household. Female work is valued lower than male work, and the requirements of women are presumed to be less than those of men. Gender, age and kinship hierarchies, seniority are the parameters within which the authority, consumption rights and the requirements of the various members of a household are played out. Work and income contribution were further delineators, themselves based on a sexual division of labour moderated by caste, class and source of income. Women are seen to have no legitimate needs outside common household needs, however as men can have individual expenses such as alcohol and tobacco (John, 2008).

1.4 Significance of the study

The women nutritional status is seen in relation to their household food security status. The role of women in ensuring food sufficiency at household is well documented but still they are often neglected. Pregnant and lactating women are considered important with a view of intergenerational effects on their children only. The most influential and challenging role played by them including caring practices and earning outside home often go unnoticed. A woman who is not pregnant and lactating is equally important. The study is therefore looking at an unconventional thought of considering women economic contribution as well as managerial role in the household. It is exploring the hardships of women in acquiring their status in and outside home.

As per the UHRC (2008), Around forty percent of the poor women are suffering from chronic energy deficiency with the low BMI $<18.5 \text{ kg/m}^2$. This disparity in the health status of women question the societal norms that are biased due to the gender hierarchy complexed with poverty. Women access to food cannot be seen in isolation to their position in the social realm. Consumption of nutritive food items in term of their access to market is dependent on their purchasing power and independent economic decision making. Therefore it is very important to study the socio-economic dimensions of women food security and its impact on their nutritional status.

If the trends are observed to compare urban versus rural poverty in the National Family Health Surveys in last two decades. The disparity in the reduction of the poverty is seen. Despite the significant reduction in the rural poverty, urban poverty has been static (Table 1.1) and it poses a severe implication on the overall health. Lack of housing, social problems and high level of morbidity are the major issues among the urban poor (Deaton, 2003) (Chattopadhydy & Guruswamy, 2011).

Table 1.1

Percent of poor population in Urban and Rural areas

	Urban	Rural
Household Population (NFHS 2)	18.5	52.0
Household Population (NFHS 3)	16.5	41.4

Source: NFHS II & NFHS III

Intra-urban poverty is examined by Chattopadhyay and Roy in 2005 (Chattopadhyay et al, 2011), in which they highlighted the dilemma of having to live in large overburdened cities which are unable to address social problems beyond a certain degree.”

The NFHS 2 and 3 data also indicate that in large cities the low standard of living has increased in number, whereas in small cities and town this proportion had come down (Table 1.2)

Table 1.2

Percentage of Population with low medium and high standard of living by place of residence in India

Place of residence	NFHS 2			NFHS 3		
	Low	Medium	High	Low	Medium	High
Large City	8.9	45.2	45.9	10.8	50.8	38.4
Small City	18.8	47.4	33.9	14.3	50.4	35.3
Town	23.9	45.8	30.3	23.0	50.2	26.8
Village	52.0	3.5	8.9	41.4	47.5	11.1

Source: NFHS II & NFHS III

The food insecurity is quite visible among the urban poor living in slums yet it is scarcely documented. The process of urbanization, industrialization & migration has resulted in increased slum population. As consequence, the slums are increasing in number with the shortfall in housing and severe dearth in the public utilities, overcrowding, and unhygienic conditions.

As the study is focused on the urban poor environment, it is important to know the circumstances in which they are living. The urban poor who are living in slums are mostly vulnerable due to the exclusionary attitude of the State towards the poor. The brutal physical and socio-economic environment leads to the lack of social networks and monetization of basic needs. These factors undermine the capacities of vulnerable in a different way to impact their wellbeing. Poor access to safe water and basic sanitation has considerable adverse effects on the physical and cognitive development of children, results in the range of gastrointestinal disorders in adults and makes it difficult for girls and women to maintain person and menstrual hygiene. Especially women who are living under such circumstances are particularly at risk for sexual violence. The lack of basic amenities is not only due to their inability to access but also due to the location of their settlements. They experience social exclusion at many levels that results in inequitable access to opportunities, services and basic human rights that affect their vulnerability to achieve food security. Therefore it is useful to think vulnerability as a process rather than a state or static characteristics.

The present study is also accounting the rational thought of Hippocrates. About twenty-four centuries ago, Hippocrates in his monograph provided the association between the physical environment and health. At that time, the physical environment was seen in the form of basic three elements including air, water and places. The social environment emphasized in his work seems to be forgotten. It is critical to consider that risky health behaviours are developed to survive in that environment. These risky behaviours are part of the social environment which generate particular pattern of health disorders. It is based on the understanding that the environment is built by the interaction between various individuals and their position in the social groups. These groups possess certain convictions, history, perceptions and actions (Sagar, 1994).

The consideration of the fact that certain behaviours are the outcomes due to specific environment in which people live. The societal factors also cannot not be neglected while studying the behaviours of the individuals. The macroscopic view of not just looking at the individual and household level but the community as whole is significant. Therefore to look at the physical amenities available in the neighbourhood is of the utmost importance. It is referred as the areas effects which further divulged into compositional, contextual and collective factors responsible for health (Dasgupta et al., 2010).

Food security conditions are related to nutrition, housing, working, and other living conditions. Similarly, the area effects are seen under the amalgamation of compositional, contextual and collective factors which contributes to the food intake, consumption, and expenditure discourse.

As far as the statistics is concerned and if the percapita consumption and expenditure is studied at national level. The literature reviewed identify the consistent mention of the well established poverty line calorie norms about the consumption and expenditure. The studies shows the increase in the incidence of calorie deficiency and thus conclude that under-nutrition and food insecurity has increased in India. It concludes that the overall average calorie deficiency has increased in both urban and rural sectors because the calorie intakes of the uppermost decile (rich) have declined because of decrease in the percapita consumption of cereals and diet diversification (Suryanarayana and Gandhi, 2009) The individuals in rich urban setting prefer to buy low-calorie food which is costlier which in turn leads to the increased need of protein and fat in their diets. For example; Increased consumption of diet products (empty calories) in high socioeconomic group is seen just for the sake of reducing calories. These empty calories demands the increased intake of protein, vitamin and minerals. They shift their diet from calorie dense (fat and sugar) food to nutrient-dense foods (fruits and vegetables). Considering calories intake or energy is irrelevant on the major determinant of physical capability and health. It is quite complexed to conclude, on the basis of available literature & information, the relationship among expenditure/consumption, calorie shift and nutritional outcomes. Hence, alternative options are required for analysing the outcome or nutritional status across the different sections (Deaton and Dreze, 2009).

Deaton and Dreze further examined the change in calorie consumption with the per capita total expenditure, they figured that there has been no real increase in the per capita food expenditure after 50th round. The estimates of real food expenditure are constructed by dividing food expenditure per capita by a price index of food, here the food components of the CPIAL and CPIIW. “The monthly ratios of food to general price indexes for the rural (CPIAL) and urban (CPIIW) sectors. All four indexes, CPIAL food, CPIAL general, CPIIW food, and CPIIW general have been scaled to be 100 in 1993-94, and are shown as ratios of food to general within sectors. In urban India, there was a slow secular increase in the relative price of food, by less than 5% from 1983 until the late 1990s, followed by a more pronounced decline by more than 10% until the end of the period. The decline in calorie consumption therefore cannot be attributed attributed to any increase in the relative price of food”.

Table 1.3

Mean per capita consumption of calories and food expenditure

NSS Rounds	Mean per capita consumption of Calories(K cal/day)		Per capita expenditure food expenditure 50 th Round	
	Rural	Urban	Rural	Urban
1983(NSS 38 th Round)	2221	2089	167.5	237.3
1993-94(NSS 50 th Round)	2153	2071	181.5	247.7
1999-2000(NSS 55 th Round)	2149	2156	184.3	252.5
2004-05 (NSS 61 st Round)	2047	2020	184.1	243.7

Source NSS data as cited in (Deaton and Dreze, 2009)

A marked difference in the estimates of calorie consumption in the rural and urban India as per the rural and urban calorie norms (Table 1.3) was shown by the Deaton and

Dreze,2009. These profile on calorie intake and deprivation uncover the minute influence on the nutrition indicators. The reason could be either the indemnifying changes in diets and related health parameters. These disaggregated analysis gives rough measure and cannot be taken at face value. The numbers are only suggestive rather than definitive. This is mainly because of the different questions were asked over the several rounds. For instance the question of food adequacy. In 1993-94 respondents were asked whether everyone in household got two square meals a day, while in 1999-2000, the question was whether everyone in the household got enough food every day. Beside this some translational issues also lead to variation in the type of data collected in other NSS rounds.

Table 1.4

Percentages of population living in households with per capita calorie consumption below 2100 urban and 2400 rural

Year	Round	Rural	Urban	All India
1983	38	66.1	60.5	63.8
1987-88	43	65.9	57.1	64.9
1993-94	50	71.1	58.1	67.8
1999-2000	55	74.2	58.2	70.1
2004-05	61	79.8	63.9	75.8

Source Nss data computed in (Deaton and Dreze, 2009)

In general these are mean-based estimates of consumer expenditure, calorie intake and summary measures of population under of calorie deprivation (Table 1.4). However, it is significant to account the disaggregated profiles of such changes and their implications (NSS data cited in Deaton and Dreze, 2009).

By mere consideration of the calorie consumption and studying its relationship with the nutritional status at the individual level is not justified. The recommended dietary allowances and calorie recommendations were made for different kinds of work

(sedentary, moderate and heavy). Different kinds of work were identified and the calorie cost computed (for example, carry loads, dig a well or climb stairs) and then multiplied by the number of minutes or hours for which that work was done. However, there is no way of knowing what damage was done to the body when people did heavy work and consumed only cereals for calories without other nutrients like vitamins, minerals from milk, eggs, vegetables and fruits. Only one parameter is known i.e. the calorie cost of that work. There is no direct information on the diversity of foods needed for work. There is indirect information on the different aspects such as some B-complex vitamins needed for 1,000 calories. Some of the studies were done on emaciated individuals. The calories needed for the underweight body to put on weight even as one carried out heavy work was nobody's concern especially for the individuals engaged in strenuous activities (Deaton and Dreze, 2009)

NFHS data does not capture the calorie intake and physical activity level undertaken by the individuals. These two indicators hugely impact the nutritional status.

Most of the studies are focusing either on household food security or the consumption pattern and nutritional status, but the nutritional status is not being assessed in relation to household food security condition. This study is not only looking for the amount of calories consumed but also the dietary diversification with the help of Food Consumption Score (FCS).

The gendered factors including power and resources acquisition play its role in a larger context of Indian society. There is a lacuna in addressing the women issues related to their food sufficiency and nutritional status. Despite the rich literature on food security discourse, there are little evidence-based and qualitative researches addressing the political, socio-economic factors which lead to gender inequalities.

CHAPTER 2

REVIEW OF LITERATURE

Literature review is done keeping the broad research questions in mind and identifying the various determinants of household food security. Out of all only few of determinants are emphasised and discussed by their repetition in the recent literature and their relevance to the nutritional status.

2.1 Urbanisation

Cities are considered as a source of inclusive economic growth. Urban areas have both ‘statutory town’ (cantonment board and municipal corporation) and ‘census towns’ with the “criteria of minimum population of 5000 and 75% of male main workers engaged in non-agricultural activities, and population density of 400 persons per sq. Km”. According to the census of India 2011, the urban population is 37.7 crore (31.16%). Thus, during the period ranging from 1901-2011, India’s urban population increased by more than 20 percentage points. Historically there has been almost three times growth since 1901 when India’s urban population was only 10.8% of its total population (Sharma, 2017).

Access to safe drinking is elusive and raising some fundamental issues because of the increased and unorganised population growth in the slums. “One of the Millennium Development Goals was to reduce the proportion of people without access to safe drinking water by half by 2015” but this major goal could not be achieved. In urban India, the water scarcity exists in different ways and proportions in different cities: e.g. in ten towns of Rajasthan water is supplied only once in three days. The people are supplied with less water. Eighty percent of the rural and urban domestic needs are served by groundwater. Due to lack of water supply people ought to have their submersible even in slums. However, India’s per capita water availability is declining sharply and it expected to further decline. Water scarcity has often lead to quarrels and riots among common people in slums and undeveloped colonies where population density is very high but water taps/tankers/hand pumps available are quite less (Sharma, 2017). Ghaziabad city is an example of unforeseen increased urban population due to the establishments of large

number of industries in the last several decades. A large amount of ponds are vanished and encroached in the formation of the small industries.

2.1.1 Ghaziabad: An Industrial hub in North India

Ghaziabad is the most polluted city and one of the oldest industrial belts in the NCR region, Ghaziabad houses 356 polluting units according to official records (Abraham, 2018).

As per the census 2011, Ghaziabad is the 9th largest urban agglomeration in India where people search for better housing options matching their budgets and living standards. Due to its easy connectivity to national capital, it has attracted large number of people from rural areas. Ghaziabad is one among the top ten districts (Northern Uttar Pradesh) which is responsible for highest out-migrants to Delhi (National Capital Region Planning Board, 2008).

A civil society organization involved in the working condition of the migrants explored the major labour chowks of Ghaziabad. It is the place where migrant workers assemble to seek employment. They stated the urgent need for sensitisation amongst migrant workers on their health issues. The mobile labour population should be aware about their entitlements under the government schemes. Migration and occupation should be explicitly accounted about health concerns. The strenuous physical labour in the informal sectors hampers the family life, households, and social relations. Therefore it is important to see their labour not only as a financial gain but also having long-term implication for their health and wellbeing.(Chakraborty, 2015)

Migration predominantly from rural to urban areas contributes hugely in population growth in cities or an increase in urban population. In and our migration process is understood with the ‘push’ and ‘pull’ factors.

Pull factors due to cities include mainly the new and better opportunities for livelihood in both organized (public and private) and unorganized sectors. Better opportunities for both school and higher education of children, more housing amenities (cinema, clubs, theatres), more government offices and public utilities, more and better transport facilities are the other attractive features.

On the other, hand push factors in villages are primarily due to lack of livelihood opportunities (agriculture having underemployment or ‘disguised employment’ (as Gunnar Myrdal termed it), lack of educational and health facilities, lack of transportation and communication facilities various restriction by regressive customs especially on the women.

Life in the slum is highly distressed where people struggle each day to get minimum living. Ghaziabad’s slum like all over in India is the abode of a huge population, which has a significant contribution to the society, yet they are isolated. Ghaziabad slum’s population primarily comprise of the migrant industrial workers. They do not have access to the bare minimum needs including safe drinking water, toilets facility and housing.

2.1.2 Informal survivalism

The environment in which the urban poor live reflects informal survivalism. The lack of infrastructure, services and employment opportunities makes their life challenging. According to the Planning Commission poverty estimates (2011-2012), “13.7 percent of the urban population lives below the poverty line” the monthly per capital expenditure for the poverty line being Rs. 1000 for urban areas. The poverty estimates have declined in both urban and rural areas but the rate of decline is markedly slower in urban areas. Income and expenditure related inequalities are evident within the urban areas.i.e, marked difference in the monthly per capita expenditure. Due to uncertainties in employment, they are vulnerable to economic shocks which lead to the unavailability of affordable housing or have unhygienic living conditions. These factors affect the ability to fulfill basic needs of shelter and security, and food and water, therefore they are compelled to endorse in defensive expenditure.¹ For example the poor may have to pay for essential amenities such as subsidized food, water and toilets that may otherwise be widely available and affordable for the non-urban poor through public systems such as PDS. In the presence of mixed slum communities, the urban social networks are perceived as unreliable due to lack of social supports unlike the rural areas that are believed to have

¹ Defensive expenditure; these are the expenditures that seek to minimize potential damage to oneself. A defensive expenditure occurs when one spend money on something that does not increase welfare, or is necessary to avoid a decrease in well-being.

more dependable social networks (Khanna, 2014). The mechanisms that leads to the instability of the food supply are significant. These mechanisms are further studied by addressing the challenges faced by the slum dwellers in achieving food security.

2.1.3 Urban poor challenges to food & Nutrition Security

There are many factors which influence the insufficient access or insufficient availability of food by household and individuals i.e., socio-economic and political environment, trade, lack of control over natural resources, poor human resource, gender, education, health condition, natural disasters and governance.(Mwaniki, 2006)

India has a well-defined poverty line estimation mechanism under the former nodal agency which is the Planning Commission. The poverty estimation process involved groups of experts. However, these estimation was revised several times due to the new expert group appointed by Planning commission.

The Poverty line was set up with the estimation of minimum standard of living which comprise of the goods and services commonly used by the people. People with less income or who are unable to afford the minimum standard of living in urban and rural areas were considered living below the poverty line. Additionally, the incidence of poverty is measured by the poverty ratio, which is the ratio of number of poor to the total population expressed as a percentage. It is also known as head-count ratio.

The methodology for estimating poverty has since evolved (table 2.1) beginning with Working group of 1946 to the Rangarajan committee in 2014.

Table 2.1

Poverty estimation timeline

Year of Constitution	Poverty Estimation criteria
National Planning Committee (1946)	The development policy objective was formulated by the committee to ensure adequate living standard of the masses. The goal was defined in per adult terms of nutrition involving a balance diet of 2400 to 2800 calories, clothing (30 yards per capita per annum) and housing (100 sq.ft per capita).
Dandekar and Rath (1971)	After the first two year plans, a working group set up by the government which defined a national minimum of Rs 20 per capita per month and Rs 25 for urban areas at 1960/61 prices. It included minimum energy requirements for an active and healthy life, minimal clothing and shelter. They attempted to define the income/consumer expenditure norm for poverty with reference to average daily per capita calorie intake norm of 2250 kcal for both urban and rural areas. It did not included expenditure on health and education. The primary focus was removal of the poverty and to ensure every citizen with minimum income within a reasonable period of time. The minimum income was thought be revised with the economic progress.
YK Alagh Committee (1979)	The government set up a task force on which defined the poor as those whose per capita consumption expenditure lies below the midpoint of the mpce class having a daily calorie intake 2400 in rural areas and 2100 in urban areas. There are norms for the total population worked out as a population weighted average of age-gender-activity specific calorie allowances recommended by the Nutrition Expert Group. The poverty lines in terms of the calorie norms were made with reference

	to NSS data for the year 1973-74.
Lakadwala (1993)	The criteria suggested by the committee was based on the calorie intake on consumption expenditure. The committee recommended for state-specific poverty lines.
Tendulkar (2004-05)	The committee estimated poverty by using basic requirement of the poor such as housing, clothing, shelter, education, sanitation, travel expense and health etc., to make poverty estimation realistic. The committee suggested to do away with the calorie-based criteria. The committee also suggested to have a uniform poverty line across rural and urban India. The Tendulkar committee stipulated a benchmark daily per capita expenditure of RS 27 and RS 33 in rural and urban areas, respectively, and arrived at a cut-off of about 22% of the population below poverty line
2012	The Rangarajan Committee goes back to the idea of Lakdawala committee method of calculating Rural and Urban Poverty Separately. The Rangarajan group took the view that the consumption basket should contain a food component that satisfied certain minimum nutrition requirements, as well as consumption expenditure on essential non-food item groups (education, clothing, conveyance and house rent) besides a residual set of behaviorally determined non-food expenditure.

Source (Suryanarayana and Gandhi, 2009), (Arora H, 2017)

Table 2.2

Poverty Estimation by the Committees

	Rural	Urban	All India ratio (Head count ratio)
Lakdawala (1993)	28.3	25.7	27.5
Tendulkar(2004-05)	25.7	13.7	21.9
Rangrajan (2012)	30.9	26.4	29.5

Source (Arora H, 2017)

Hence, it is evident that how the poverty estimation changed to include a broader understanding of poverty by including calorie norms and other non-food items instead of considering only food, shelter, and clothing.

In table 2.2 the difference in the head count ratio is due to the variation in the questions, sampling time, reference period and method of analysis (table 2.2). Beside this, it has been found that per capita expenditure has increased since the mid 1970's. Additionally, the per capita calorie intake has declined in both rural and urban India. The incidence of Calorie deficiency has also increased over time, and deprivation measures based on nutrition intake indicators are weakly associated with those on health, education outcome indicators.(Suryanarayana and Gandhi, 2009).

The poverty line cannot ward off this complex reality. By considering only calorie intake, the broad picture of deprivation is missed. The interconnection between nutrition, energy intake and expenditure should be studied in the gambit of poverty or what it means to be poor.

“Poverty is not just a calorie line but is related to chronic food insecurity, hunger, under-nutrition, a high burden of ill health, high mortality and enormous suffering”(Banerji, 1982 as cited in Sagar, 2006)

Scanlan suggested that the concept of food insecurity is beyond the availability of food and emphasised the various dimensions of Food Insecurity such as population, ecology, environment, technology, infrastructure, politics, poverty, inequality and power. It is essential to understand Food shortage, Food poverty, and Food deprivation which are

responsible for creating the complex that pushes a person towards experiences of food insecurity at societal, household or even individual level. *Food Shortage* focuses on the availability of food through different sources. *Food Poverty* connects more to the issue of distribution, inequality and barriers in accessing food. Scanlan focused on the sociology of food insecurity while suggesting income, productive resources, conflict, ethnicity, gender, Government provisioning and other entitlements constructing barriers to command food. *Food deprivation* is defined as inability to access to food that meets the nutritional requirement. *Food stability* has been described as a necessity to provide safeguard against shocks and vulnerability that can instigate the experiences of food insecurity through shortage, poverty and deprivation. Thereby identifying food insecurity as macro-structural phenomena linked to cultural, political and socio-economic dynamics.(Scanlan, 2009)

The collective outcome of food shortage, food poverty and food deprivation is hunger ,guided by the entitlement and household's capability to acquire food available out of own production, exchange or transfer and through social or governmental provisions made available.(Millman, 1990).NSS survey reveals that in 2000-2001 the proportion of income spent on food remains as high as 56 percent in rural areas. Studies have shown a close association between agriculture productivity growth and poverty reduction. It was found that one percent improvement in yield decreases population lying below the poverty line by 0.91 percent (Gustafson, 2004 as cited in Swaminathan *et al.*, 2004).The agricultural activities surely help rural household but in the case of urban poor, they have limited opportunity to engage themselves in the agricultural activities.

In a study conducted by (Mukherjee, 2011), huge disparity was found among the overall urban food security. The author formulated a composite urban food security index for the year 2005 (table 2.3) on the basis of six other indices address the comprehensiveness at macro level. The various indices shown in table are important to examine to understand the degree of vulnerability among the urban population.

Table 2.3

Composition of over all urban food security Index, 2005

Dimension-index	Indicators	Data Source
Food Affordability Index	Percentage of households reporting food grains (rice + wheat) consumptions from PDS (2004-05)	NSSO, 61st Round, 2004-05
	Average per day calorie intake (Kcal) (2004-05)	..
Livelihood Access Index	Percentage of population below poverty level (2004-05)	NSSO, 61st Round and Planning Commission, 2005
	Percentage of casual labour in principal and subsidiary works (2004-05)	NSSO, 61st Round, 2004-05
	Percentage of urban illiteracy (2004-05)	..
Housing Index	Average household size (2004)	SRS, 2004
	Percentage of households living in a <i>kachha</i> houses (2005-06)	NFHS-3, 2005-06
	Percentage of households living in a <i>semi-pucca</i> houses (2005-06)	..
Gender Discrimination Index	sex-ratio (number of women per 1,000 men) (2005-06)	..
	Average daily male-female wage differential in casual works (2004-05)	NSSO, 61st Round, 2004-05
Sanitation & Health Index	Percentage of households with proper drainage (2004)	SRS, 2004
	Percentage of households with garbage disposal facilities (2004)	SRS, 2004
	Percentage of households with no toilet or poor toilet (2004)	SRS, 2004
	Percentage of households with not-improved drinking water (2005-06)	NFHS-3, 2005-06
Nutritional Outcome Index	Infant mortality rate (2006)	SRS, 2007
	Percentage of underweight children (below 3 years) (2005-06)	NFHS-3, 2005-06
	Percentage of ever-married women (15-49) suffering from anaemia (2005-06)	NFHS-3, 2005-06

The table 2.4 illustrates the positions of the various states in overall urban food insecurity. Gender bias has been included in constructing the composite index because women face more food insecurity at household level. ‘It has been found that urban areas in Punjab come out as the least food insecure in India, followed by Kerala and Tamil Nadu. On the other hand, urban populations in Orissa are found to be the most food insecure, followed by Bihar and Madhya Pradesh. Urban areas in Maharashtra, Haryana and Jharkhand are medium food insecure considering the relative positions of these states among total 17 major states’ p 14.

Table 2.4

Composite Index of Urban Food Security, 2005

Major States	Food Affordability Index	Livelihood Access Index	Housing index	Gender Discrimination Index	Sanitation and Health Index	Nutritional Outcome Index	URBAN FOOD INSECURITY INDEX 2005	RANK
Andhra Pradesh	0.606	0.482	0.256	0.468	0.228	0.531	0.428	4
Assam	0.763	0.221	0.482	0.580	0.617	0.689	0.559	12
Bihar	0.706	0.702	0.751	0.300	0.438	0.921	0.637	16
Chhattisgarh	0.653	0.627	0.516	0.464	0.635	0.659	0.592	14
Gujarat	0.768	0.252	0.108	0.715	0.142	0.595	0.430	5
Haryana	0.811	0.229	0.179	0.768	0.230	0.700	0.486	9
Jharkhand	0.464	0.575	0.268	0.480	0.563	0.642	0.499	10
Karnataka	0.615	0.465	0.223	0.554	0.281	0.458	0.433	6
Kerala	0.518	0.391	0.094	0.500	0.750	0.011	0.377	2
Madhya Pradesh	0.751	0.580	0.518	0.579	0.461	0.805	0.616	15
Maharashtra	0.894	0.399	0.112	0.676	0.245	0.386	0.452	8
Orissa	0.724	0.721	0.605	0.565	0.718	0.679	0.669	17
Punjab	0.765	0.131	0.050	0.833	0.118	0.265	0.360	1
Rajasthan	0.772	0.507	0.253	0.633	0.333	0.537	0.506	11
Tamil Nadu	0.412	0.324	0.205	0.483	0.404	0.460	0.381	3
Uttar Pradesh	0.741	0.629	0.542	0.618	0.244	0.676	0.575	13
West Bengal	0.792	0.352	0.101	0.604	0.324	0.473	0.441	7
India	0.692	0.446	0.310	0.578	0.396	0.558	0.496	-
Minimum	0.412	0.131	0.050	0.128	0.118	0.011	0.360	-
Maximum	0.894	0.721	0.751	0.833	0.750	0.921	0.669	-
Standard Deviation	0.130	0.179	0.214	0.128	0.199	0.212	0.096	-

Source (Mukherjee, 2011)

The states with the better food security conditions were well off, regarding livelihood conditions, better housing, increased awareness and utilisation of sanitation in health. The states which performed poor in household security were highly vulnerable and had drawbacks related to the physical attributes including housing and unhygienic conditions. It was found that the number of members in the household and livelihood conditions are the major factors in determining the nutrition security or maintaining a healthy nutritional status. The author also emphasised the need to have a broader understanding of the drivers which lead to the food secure/insecure conditions in the urban poor context.

Brockerhoff, 2000 cited in (Mukherjee, 2011) supported the same thought that larger the number of family members, more will be the vulnerability. These households are more impoverished and characterised with poor living conditions. Engle, 2000 cited in suggested the role of women to reduce the disparities among the households. They need to be educated, self-sufficient and should take part in economic activities (Mukherjee, 2011).

In an ethnographic study that address the similarity of the experiences across culture while adopting coping strategies. It was found that the household food security not only involves the undernutrition and hunger but also the household cognisance of the issues with the quality and quantity of food available, uncertainty of the affordability and experiences of going hungry (Carlson et al., 1999). The poor households have limited capacity to avail the specifically nutritionally adequate and safe foods due to food insufficiency and if it persist for longer duration, hunger is likely to set in (Coates et al., 2006).

Poverty limits the household's access to nutritious food, and it also impacts nutrition sufficiency. The limited capacity to afford nutritionally adequate food confers to the capability approach that is primarily well established by the economist Amartya Sen in the 1980's. Burchi and DeMuro reviewed the different approaches in analysing food security in the broader area of well-being and development. While assessing the nutritional capabilities the authors cite Dreze and Sen (1989) and goes beyond the access dimension to the utilisation of food. As it is not the quantity of food consumed but the interrelationship between the intake an nutritional status which is governed by various factors, like health care, drinking water, sanitation, education, and intra household food distribution. Capabilities take into account institutional and environmental factors which are beyond the human control. Therefore, the availability and accessibility to nutritious food is coupled with the capabilities which leads to actual utilisation.

“India committed to halving hunger by 2015 at 1996 world food summit in Rome, Italy (United Nation's food & Agricultural organisation 1996)”. India keeps on setting goals to

reduce poverty and hunger and postpone them, it has been suggested to change the Policy approach by focusing on the evidence base researches at local level to understand the drivers of Household Food Security (Agarwal et al., 2009).

At present such understanding is insufficient, there are only fewer Indian studies which are either based on computing the prevalence of household food security of urban poor or based on the food consumption pattern. None of the study focused on the interlinkage between nutritional status of women and household food security, Therefore, to look for the relationship between the two, food insecurity is assessed through Household Food Security Scale and nutrition insecurity assessed through a diet survey and anthropometric assessment.

2.2 Transition in Food consumption pattern

The consideration of food security from the viewpoint of food culture does not seem to have received the attention it deserves. Food consumption patterns or food habits are an essential part of people's culture is also an important factor related to the overall food security situation of developing countries. Since the very beginning, humans have been interacting with their environment and obtaining sustenance from it. There was a diversity of food items suitable for man available in the ecological niches. Moreover, out of this large array, different groups selected items for their food using trial and error and constant questioning of the abundance of nature. Out of the similar environment two different, isolate groups would thus derive entirely different sets of food. Therefore the consumption of food is intertwined with cultural habits and values. In early periods, access to food was probably the most important aspect in daily life, as food came from surrounding environment. The people chose food items by their perception which are often governed by socially acquired beliefs regarding different food items. Poor people modify themselves and fit in the food availability. Food is crucial, therefore whenever social interactions are developed, people start sharing food and help each other in time of insufficiency.

In order to study food consumption trends both globally and different regions of the world, Kearney (2010) stated that nutrition transition has occurred due to the increasing

importation of foods from developed nations. ‘Modifications in food supply have also altered radically the food environment and the choices that consumers may make. Reductions in the price of unhealthy foods, typically those that are calorie-rich, nutrient-poor and high in saturated fats and salt, compared with healthy foods, increased desirability and availability of unhealthy foods’ (Kearney, 2010, p 2803).

The food consumption has been changed due to the system of cultural exchange under the global economic system where the colonisers began to adopt the local foods and many indigenous people tried to imitate the colonial eating habits. The indigenous food items of Europe, like bread, cheese, sausage, wine, etc. and those of the colonies like spices, tea, coffee, cocoa, etc. began to introduce into food consumption habits. Due to this the local varieties of vegetables are vanishing from the markets, or are eaten only by the very poor especially where the cultural penetration has gone the deepest. The new habit of consumption is costlier than the local ones but they are absorbed because they are fashionable. They can endanger the local food security situation. This cultural penetration can be seen in the form of Macdonaldisation through transnational corporation and globalization. Likewise the infant feeding formulas have been propagated instead of Breastfeeding. Coca-Cola or Kentucky fried chicken (prepared finger licking good’’) have spread in many developing countries. As a result there have been increased instances of malnutrition caused by switching from breastfeeding to infant formulas or cases of children preceding a meal to buy a costlier coca cola have also been documented. Apart from the high consumption of meat and other livestock products, use of frozen foods and packaged products involving high energy has increased. The promotion of semi and fully prepared food has separated the consumers from food sources so that they can no longer imagine what is required for food production which leads to the decline in knowledge about the food they eat (Rana, 1999).

Vepa (2004) examined the influence of globalisation on urban dietary pattern and its impact on the income, employment, and market forces. She identified that globalization is the main cause of the expanding market for ready to eat foods and processed foods. Beside the direct consumption of the popular global brands, the consumption of cheaper substitutes have increased the overall consumption of processed food. She addressed the

increasing consumption of processed food which she observed was not limited to higher sections alone but had caveats for urban poor as well. The food processing industry is also synergistic and the urban food consumption pattern are inclined towards cereal and sugar based products and not towards meat, fish, poultry, milk and vegetables. (Vepa, 2004).

(Amit Sengupta, 2015) opines on the controversy of the safety concerns of a Swiss transnational company. Rise in the ultra-processed food is one of the risk factors for increasing the Non-Communicable Diseases (NCDs) including diabetes and heart diseases. The foreign or multinational companies whose headquarters are mostly in the US and Europe are involved in food and beverages and are the major drivers of causing this epidemic. It has been argued by a Brazilian nutritionist that all the ultra-processed manufacturing corporation are now gradually replacing conventional diet and eating patterns around the world.

They are targeted due to their lack of awareness and compulsion to buy cheap food. Implications of these processes are seen in the increasing obesity among the poorer households.

“The sales of what Nestle calls its line of “popularly positioned products” have annual growth rates of 25%, and the market for these products in Asia, Africa, and Latin America is now estimated to be approaching 90 billion US dollars”.

An upsurge in the ready to eat food or highly processed food has led to the prevalence of obesity in the hardworking labourer class. The food consumption pattern basically reflects the culture and food availability.

Archana (2012) studied the consumption pattern and nutritional status of the women labourers in the coastal regions of Karnataka. She opines that urban women have better access to variety of food items available in the markets. The structured interview schedules was administered to study the food purchasing pattern, frequency of consumption of different food items, and anthropometric measurements. The nutritional status was assessed in relation to the type of payment. ‘Majority of the participants (79%) was daily wagers and 21% were on monthly payment. Among the non-vegetarian foods (82%), sea foods predominated and consumed daily. Fruit consumption was high

(69.4%), curd and greens were mandatory items for lunch and dinner. Type of payment and type of diet (vegetarians/ non vegetarians) was found to have an influence on nutritional status of women, 68.5 and 72% of daily wage and on monthly pay had body mass index in normal range, and 14.7% of daily wagers had chronic energy deficiency while 24% monthly payment were overweight. Conversely, 22.5% of non-vegetarian women had chronic energy deficiency and 57.2% women had normal body mass index against 81.8% of vegetarian women. Occurrence of obesity was less; however, 84% of all the participants regardless of payment and diet type had waist hip ratio > 0.91 indicating prevalence of central obesity.'

The author suggested creating awareness and making woman self-sufficient in modifying their food behaviour and lifestyle pattern within their friendly environment. Besides this, the technological developments have changed the lifestyle pattern and elevated the social status of women. She finds that the despite of the hardworking labourer job, prevalence of central obesity was common phenomenon in majority of the selected women regardless of their dietary practices (Prabhat and Begum, 2012).

Food consumption pattern is also dependent on the availability of the efficient market. The role of markets and purchasing behaviour is associated with each other, therefore it is important to study the impact of markets in greater details.

2.3 Impact of Market on the status of Household food security

The urban population is more dependent on markets on the contrary to their rural counterparts; they cannot avail the natural resources to provide for housing, energy, and water. It has been found that the food solely contributes around 80 percent in the total household budget in urban poor households (Tabatabai 1993 cited in Maxwell et al., 2000).

In an study conducted by (Agrawal et al. (2013), they examined the effects of sedentary lifestyle and dietary habits on body mass index change among adult women in India. It was a follow up study of the women subjects initially interviewed in NFHS 1998-99 aged 15 to 49 years in Delhi. The women were interviewed again after four years in 2003. The change in the mean BMI was found due to their dietary habits. The daily consumption of

fried foods, sweets, junk foods such as soft drinks and ice creams and consumption of fast foods from the restaurant at least once a month showed a higher increase in the mean BMI level of the women in comparison to those who consume these food items less frequently. The monthly oil consumption of more than 500 grams also showed a positive association with the significant increase in mean BMI (Agrawal et al., 2013).

They opine that the urban poor try to consume the food associated with the wealthy class in order to get adjusted into the urban environment. However, this is often attributed as their behaviour or their faulty eating practices. Availability of unhealthy cheap market products also take advantages of the poor by offering them fast foods and other packaged foods (often copied from the established brands). The rise of unregulated small-scale food industries is seen to serve the demands of migrant poor population. The rise of this sector is often justified to serve poor section, which is causing more harm to them instead of satiating their hunger. The presence of such inefficient food markets is one of the causes leading to obesity in the poor household.

Ruel et al (1998), reviewed the urban challenges to food and nutrition security and suggested urban food systems as an important factor to consider while planning urban food and nutrition programs and policies. The reviewed studies on urban markets and food mechanism are based on the spatial aspects and are often descriptive. They focused on the market actors and food distribution schemes as according to them there was very limited studies done on urban food systems. The authors also pointed out the areas where further research is needed. They considered the food availability in the market and accessibility at the household level. Food adequacy was defined into three components; i. nutritional need should be satisfied both in terms of energy and all essential nutrients; ii. food consumed should be safe and palatable; iii. types of food commonly available should be acceptable within the prevailing food culture. Income, food prices and access to home production were identified as the major determinants of food availability.

Oshaug, 1994 as cited in (Ruel *et al.*, 1998) opines on the cultural acceptability of the markets. He defined the availability of food with multiple perspectives. The supply from the markets should not only provide the quantity(enough calories) but the quality(taste and texture) food. It should also cater to the nutritional needs and be safe regarding the

adulteration and contaminants free. At the household level, behaviour influenced by cultural factors and knowledge also effects the food demand and distribution within the household (Ruel *et al.*, 1998).

From the findings of Agrawal *et al* (2013), Ruel *et al* (1998), and Oshaug (1994), It can be stated that the efficient markets are one of the most influential factors affecting the cost of food. Families in poor urban household get their food from markets, PDS, from their production and from the neighbour household through social networks. Household purchasing pattern is dependent on its ability such as whether the families buy in bulk or small quantities. The mechanism can be built by the urban food processing and distribution systems to reduce the food prices to increase urban poor food security.

In a review conducted by Ruel *et al* (1998), IFPRI, USA) on urban challenges to food and nutrition security. It was found that the purchasing pattern of the urban dwellers is governed by the time constraints and on the wages earned. When wages are earned daily and spent daily, it enables them to buy their food in small quantities from neighbourhood shops rather than central markets. The small shops are compromised regarding storage and quantity of the food items. The tiny quantities in which food is often sold in this sector make food more accessible to the poor, who may have very little to spend and cannot afford the cheaper bulk purchases possible from supermarkets, as often supermarkets do not provide the option to buy food items in small quantities. (Kennedy and Reardon 1994; Drakakis-Smith 1992 as cited in Ruel *et al.*, 1998). In a report generated by Gordon Prain (2010) on the effects of the global financial crisis on the food security of poor urban households with five case studies in Rosario (Argentina), Bogota (Colombia), Accra (Ghana), Kitwe (Zambia) and Colombo (Sri Lanka). It was found that the food in urban poor settings are bought daily from local shops and street vendors in small quantities, which is typically more expensive. For instance a 2 kg box of *ghee aka clarified butter* costs 20 LE (Egyptian pound) approximately 80 INR , while a small 80 gram pack costs 1 LE , or 20 percent more (Prain G, 2010 as cited in Tacoli, 2017)

In Indian supermarkets also where prices are lower, they are not usually located near urban low income settlements. As a study in Madurai elucidates, residents of low-income settlements who rely on daily wages can afford significantly lower quality of

food and smaller quantities than their neighbors who earn weekly wages and can buy food in bulk (Frayne B et al 2014 as cited in Tacoli, 2017). Additionally, they also rely mainly on local shops for their daily purchases because, although prices are higher, most of them offer credit facilities (*ibid.*). Therefore it would not be wrong to say that consumption patterns also get influenced by the location of market.

Street foods can also be a significant source of food for many urban dwellers, both regarding energy intake and food expenditure (Children in the Tropics 1994). Smaller and poorer families tend to spend more on street foods than other households. (Maxwell et al., 1998) finds higher street food expenditures among the poorest groups. Households in the poorest expenditure quintile spent an average of 39 percent of their total food budget on foods purchased away from home, compared to 26 percent of the top quintile, a finding confirmed by Tinker in cities of Bangladesh and the Philippines. Also, small families in urban areas of Thailand spent 58 percent of their food expenditures on street foods, compared to 36 percent of families with eight members or more (Tinker, 1997)(Ruel et al., 1998).

2.4 Household Consumption & Expenditure on food

With an increase in the prices, the low-income households feel disabled and adopt the subsisting mechanism while resorting to consume less or buying cheaper food items. The intrahousehold food distribution takes into the account of the family members. The food acquisition is dependent on the earning power or working pattern of the household members. The children are given the prime importance and are usually prevented from the acute hunger. Two meal pattern was seen among the adults whereas the children ate more frequently. This review established that the eating sequence was based on the working pattern and cultural beliefs.

Pradhan *et al* (2013) conducted a study to explore food acquisition and intra household consumption pattern in low and middle income urban households in Delhi. Specifically, the study objective was to explore food acquisition system and intra-household consumption patterns in low and middle income (LMI) urban households in Delhi. The food expenditure has also been examined across the various food groups. It was found

that half of the households spent at least two-thirds of their income on food. The major expenditure were on vegetables (twenty-two percent), milk (sixteen percent) and cereal related products (fifteen-percent). The major factors which affects the expenditure encompasses the purchasing capacity, food prices, food preferences and seasonality. The study also suggested to consider women in formulating food policies as they possess the crucial role as a food provider. The women percieve their role in intra family food acquisition and feeding role as part of their self-worth, family social status and prestige (Pradhan *et al.*, 2013). Though the study did not address any gender bias in intra-household distribution, as the households usually take care of the individual requirements and no special food was made for anyone in the family. The intra-household food distribution system is rather based on the working pattern. “For example, if one household had a stable but subsistence monthly income and another depended on irregular but larger daily wages, the first reflected a stable food acquisition strategy than the second. The urban poor with irregular income could not plan a food budget for a month; ironically, they also could not make full use of the government's food distribution policies and programmes (Khare RS, 1984 as cited in Pradhan et al, 2013, p 393).

In a Malaysian study on rural households, the indicators related to income and expenditure were studied to assess the nutritional outcomes of the food insecurity. The prevalence of food insecurity was less as compared to the high percentage of food security. Among two hundred of the total rural household, nearly forty-two percent were food secure and fourteen percent were food insecure. On the other hand, the studies in urban low-income household revealed the overall food insecurity which was then fifty eight percent. Differences in the type of income and expenditures among the rural and urban settings were seen as a major reason for the variations in the food insecurity. The urban households tend to have fixed income and a high standard of living and the unexpected pressing non-food expenditure makes urban households more prone to food insufficiency. On the contrary rural households have variable income and have propensity to keep themselves food secured. Other reasons attributed to food sufficiency in rural households are less non-food expenses (self-produce of vegetables and cattle rearing) and low standard of living. For more in-depth understanding of the processes which has led to the attainment of food security was explored. There was no difference in the

education level of the food secure and insecure households but by total expenditure between the two, later one had ninety percent as compared to seventy percent in food secure households (Zalilah and Khor, 2004).

It was argued that the households capacity to develop economic control over the non-food expenditure through socialisation with the neighbourhood is beneficial. It promotes women to manage income and food resource efficiently and thus it is better utilised by the other household members. (Rose 1999, cited in Zalilah and Khor, 2004) informed to capture the economic changes are important than income base indicators. Income is variable and it can only address the temporary periods of food sufficiency or insufficiency. Income does not give the exact picture of the economic changes. For instance the total expenditure of many household exceeds the total monthly income due to reserves of money and borrowing money from others. Among all the households, the major chunk of expenditure was into food, education, transportation and other utilities. The food insecure households spent a higher percentage of their proportion of income (ninety percent) on these items as compared to food secure (eighty four percent). These differences were largely due to the larger household size as well. More percentages of obese women (more than fifty percent) were found in the food insecure household as compare to the food secure household (nine percent). Zalilah and khor, 2004 also hypothesized the uncertainties of acquiring food affects the psychological as well as physical well being. It talked about the perpetual cycle of temporary food restriction and abundancy, which is the leading cause of obesity in poor and insecure households. The gradual weight gain in women is due to intermittent episodes of binge eating and starvation. This further leaves the questions for understanding the paradox of food insufficiency, obesity and poverty (Zalilah and Khor, 2004).

2.4.1 Socioeconomic status and access to food

The primary concern of food insecurity in India is the purchasing power of the deprived population in rural agrigarian population as well as urban population working in informal sector which is entangled with the inefficacious functioning of the TPDS and lacking policies to support measures of security.

The literature on food security has always been linked to ‘agrarian distress’ and lack of availability and low absorption food in rural areas. The issues related to food insecurity in urban areas cannot be looked into isolation from the situation that occurs in rural India too. Non-food items such as inadequate sanitation facilities affect the absorption and assimilation of food, access to clean drinking water and inadequate housing. In a broader sense, there is no one set of measures that will promote food security and alleviate poverty in India. The rigid hierarchical socio-economic structures prevail in our country. Therefore, growth needs to be self-sufficient to make a difference (Chakravarty and Dand, 2005).

It has been found that the food consumption pattern not only influenced by purchasing power but also its associations between education and household income. This argument is based on the assumption that who are educated eat wisely, they are more likely to buy food items that are comparatively high in fibre and low in sugar, fat and salt and vice versa. There are various concerns by the consumer before buying any food. One may be the enough dietary knowledge due to educational attainment in high income household and another concern is cost driven which is in the case of low-income households.

This further suggests the socio-economic health inequalities also exist in diet-related diseases. The main focus should be on the health promotion initiatives addressing health inequalities imparting awareness to improve the diets of the poor (Turrell and Kavanagh, 2006).

In a study conducted by Vemula S. R. *et al* (2014) to study the urban supermarket shoppers or consumers knowledge of nutritional content of packaged foods in Delhi and Hydrerabad, ‘about 45 % reported that they buy pre-packaged foods once weekly and about a fifth buy them every day. Taste, quality, convenience and ease of use are the main reasons for buying pre-packaged foods. Although 90 % of consumers across the age groups read food labels, the majority (81 %) looked only for the manufacturing date or expiry/best before date. Of those who read labels, only a third checked nutrition information and ingredients. Nutrient information on labels was not often read because most consumers either lacked nutrition knowledge or found the information too technical to understand. About 60 % read quality symbols. The study found a positive association

between education level and checking various aspects of food labels. Women and girls concerned about 'fat' and 'sugar' intake read the nutrition facts panel'(Vemula *et al.*, 2014).

The education level and socioeconomic status are often taken as proxy indicators to assess the nutritional status. The maternal education and nutritional status play a very important role in the improved Nutritional status of their children. A study was undertaken in Kailali district of Nepal to find out the linkages between Household food insecurity and nutritional status of children aged 6 to 23 months. There was no significant association was found between the household insecurity and measures of undernutrition. The lower household socio economic status was associated with the both household food security and childhood stunting, anaemia and underweight. Other variables which were identified to have inverse relationship with the child nutritional status indicators were maternal education, height and haemoglobin concentration. It was argued that the improving Household food security may be necessary but not sufficient enough to the nutritional status of young children. The multifaceted approach to improve overall socioeconomic status, and well being of the family, maternal education, and awareness about the IYCF practices are needed. It will probably be more effective in improving the nutritional status of children aged 6 to 23 months (Osei et al., 2010)

2.4.2 Seasonality

The food security also gets influenced by the seasonal dimension. The National Nutrition policy (1993), addressed the complexity of the agricultural system which combines modern agricultural techniques with entire dependence on monsoon. The market prices of items shoots up which goes beyond the purchasing power of the poor and leads to transitory food insecurity. All these have a composite effect on the availability of food at the household which results in differential intake by men, women and children during lean season. The report also mentioned the impact of the nature (drought or flood) on the livelihood and food resource (Ministry of Human Resource Development, 1993).

The urban-rural connections often remain a part of livelihood strategies of urban dwellers. Seasonality affects urban incomes in different ways. During rainy season, the work of rickshaw pullers, construction workers and street vendors ceases. The

transportation facilities in rural areas make it more difficult to get products to the cities, which results in higher prices. In addition to this, work opportunities shrink in rural areas during rainy season and people migrate temporarily to the towns and cities. This competition for jobs between urban and rural residents adds another dimension to seasonal influence (Garrett, 2000 & Frankenberger et al 2000 as cited in Cohen and Garrett, 2009).

2.4.3 Importance of absorption and utilisation of food

Headey states that the cause of Food insecurity is not only the poor physical and economic access to food but proper utilisation and absorption of the food consumed is equally important. Therefore not merely access and consumption but adequate care such as food storage, preparation, feeding practices, breastfeeding, health services, water and sanitation facility is required to ensure escape from food insecurity due to poor absorption of the nutrients despite of dietary intake is adequate in quantity and quality (Headey, 2013).

2.5 Significance of well-balanced diet-“Count Nutrients not calories”

The quality of diet cannot be judged with the sufficient calories in it. Setting up of poverty lines by standard calories is based on the assumption that merely calories intake suffices the quality of diet. Due to different body requirement and change in the food environment. A diet of a person cannot be categorised to have a nutritious diet if he/she is consuming adequate calories.

Evidence-based scientific studies like the identification the micronutrient deficiency (scurvy and beriberi) in the history are the proof that some foods are the only source of energy and are lacking in essential micronutrients (J Carpenter, 2003).

There are studies which mention that the diet of the poor is inadequate in energy, protein, iron and vitamins but the calorie intakes of the middle and poor income groups are sufficient but micronutrient deficiencies persist (Qadeer and P Priyadarshi, 2005). The public distribution system in India is also responsible for the increased calorie consumption only. Food-based interventions to draw on local resources and move beyond

cereals to protein and micro-nutrients would be helpful. It will not only promote food security but nutrient security as well.

In a study conducted by Agarwal, S. and Sethi, V. (2013) to examine the nutritional disparities in Urban India the authors included a wealth quartile analysis of the urban subset of Demographic Health Survey-3 reveal the intra-urban nutrition disparities. The urban sample was divided into the quartiles as per wealth index and the lowest quartile taken as representatives of the urban poor estimates by the Planning Commission, 2011. The quartile was made from the NFHS 3 data into broad category of poorest urban quartile, second lowest urban quartile, and rich urban quartile and richest urban quartile. The lowest urban quartile was considered as 'urban poor' (22.6%) and other three wealth index quartile were combined and considered rest of urban population. 'Mild anaemia did not vary markedly across quartiles (36-29%) and affected nearly one-third of urban population in all segments. However, proportion of women belonging to the poorest urban quartile with moderate/severe anaemia (20%) was 1.4 times higher compared to the rest of the urban population (13.7%). Prevalence of moderate/severe anaemia in pregnancy and lactation in the poorest urban quartile was also 1.3 times higher compared to the rest of the urban population. Night blindness or difficulty in seeing at dusk, a result of chronic vitamin A deficiency, was reported by 7% women in the poorest urban quartile, which was 2.9 times higher than the rest of the urban population (2.4%). Nearly one-fourth (24.5%) of households in the poorest urban quartile consumed salt with no iodine content, which was 2.8 times higher compared to the rest of the urban population (8.7%)' (Agarwal and Sethi, 2013).

The idea of quality diet in low socioeconomic group is of great significant due to their existence in poor environment. Food intake that is adequate in ideal conditions is consequently be inadequate in poor environment, because the poor usually live in such conditions. Overcrowding at such places also affects the bodily requirements and increase the susceptibility to non-communicable diseases. Moreover, consumption of contaminated water or unhygienic conditions affects the absorptive capacity of the gut. This lead to the reoccurrence of the gastrointestinal disorders. In such cases, the amount

of food does not get absorbed fully and if this situation persist for longer duration, person may lose weight over time and thus suffer from malnutrition.

2.6 Role of adequate nutrition in improving Health Status

Zurbrigg work on hunger and epidemic mortality also strengthens the Mckeown understanding of health. The author cites McKeown (1976) and Fogel (1992), who found that the mortality decline to infectious diseases began long before the intervention of modern medicines through improved nutrition and sanitation. However, at the end of 19th century, human resistance increased to infectious diseases through improvements in Nutrition was the underlying factor in transformation of health. Studying trends in malarial mortality in Punjab in late nineteenth century, it was found that the decline was started in early 20th century in the absence of preventive and therapeutic measures. The per capita availability of quinone was also low. The reason explained for malarial deaths was the occurrence of rainfall and soaring food grain prices. However, the change was observed in the incidences and severity of famine and epidemic hunger due to state intervention. Various steps were taken to control famine. The prevalence and incidences of diseases were not reduced but the deaths due diseases induced by starvation reduced by lowering the lethality of diseases. (Zurbrigg, 1992)

2.7 Relationship between household food Security and Nutritional Status of Women

India has achieved victory in tackling the emergency situations like drought and floods with the history of recurring famines, but it is struggling to lower down the high incidences of Malnutrition. The high prevalence of chronic food insecurity is the cause of undernutrition. Due to the undernourishment in half of the population, specifically in the vulnerable groups (women and children) from the lower half of the expenditure class, the overall improvement in nutritional status has also been very slow. It has been observed that the consumption expenditure on food is slowing down even in the households with chronic under-nourishment.

Despite of the reduced income poverty due to economic growth, the chronic food insecurity persist. The poor population have been exposed to market uncertainties. The other important causing factors includes the occurrence of gastrointestinal and respiratory

infections and lack of awareness or faulty child feeding and weaning practices. All these factors contribute to the low absorption of nutrients.

As a consequence to which range of programmed need to be targeted exclusively to poor.

These should include

“ (i) eliminating transient food insecurity on account of inadequate access to food in periods of crises. (ii) reducing chronic food insecurity by enhancing their capabilities to participate in the growth process. (iii) reducing malnutrition among pre-school children and women and (iv) improving basic services (safe drinking water, healthcare etc.) to the poor”.

The economic growth alone cant have the strong impact on the nutritional status in near future however it offers good amount of opportunities for efficient public intervention. These interventions should have the ability to provide food enabling environment until all the individuals are adequately fed and achieve good health (Radhakrishna and Reddy, 2000).

The relationship between Household food security and nutritional status was explore in a Guatemala study. The subjects included for this study were the women of reproductive age and children under five years of age. The household characteristics and the various attributes related to the women were also considered. National Maternal-Infant health survey 2008-09 of Guatemala revealed that almost two third of the households were not consuming some foods in the past six months due to unaffordability. These food items mainly included high biological value like animal protein sources (beef and chicken). Instead their diet was lacking in rich nutrients. In congruence with the such consumption other factors were related to the access of the health services, sewage and electricity in rural poor set up. The results of the given circumstances was reflected in level of malnutrition among women and children. Around forty-three percent of the women were of short stature and obese respectively. Almost thirty percent of the pregnant women were identified to had anaemia. The prevalence of stunting(60%) among children was quite high as compared to wasting (1%). Food security association was also found with the haemoglobin concentration of the women of reproductive age.

With the computation of height for age and weight for Z scores, a significant association was found between the food security variable and nutritional status among women and

children. Hence food sufficiency is one of the major factor in achieving a healthy nutritional status. There was no difference found in the prevalence of obesity and underweight with relation to the education levels and socioeconomic status. The occurrence of obesity is penetrating across the different groups in Guatemala. The prevalence of overweight and obesity was forty-three percent. This detailed study also second the significance of women and girls education for the nutritional well being of the children which has already been the goal of various developmental programmes.

The study of Guatemala was criticised on the temporal aspects. The standard scales used for assessing the household food security only capture the condition in the previous month and the outcomes that are presented as findings stem over a longer period. Therefore assuming it as proxy for longer period poses it to the subjectivity. It is impossible to establish a temporal relationship and thus causality between food security and nutritional status in the cross-sectional design of the study. Other confounding factors like the contribution of seasonality in wasting also cant be addressed due to brevity of time. There are longitudinal studies which are suitable to clarify and address the temporal nature of this relationship. Several other variables of interest to influence the nutritional status were not used in the analysis were the infant feeding practices and iron, folic acid supplementation among women (Chaparro, 2012).

The nutritional outcomes (overnutrition) of food insecurity among women in developed countries seem to be replicated in less developing countries which are growing through sudden statistic and nutritional transition. Increasing prevalence of obesity in lower social economic group is posing a risk of double burden of malnutrition in India. There is an urgent need to investigate the implications of restricted access to food and its association with the obesity (Zalilah and Khor, 2004).

Another study in Brazil tried to justify this paradox. The relationship between food insufficiency and nutritional status among the children under the age of five was assessed. After controlling all the socio-economic and statistical factors such as all the factors related to income, location, household members and ethnicity of women, It was found that food insecurity was negatively related to nutritional status(height for age index at all ages).However this relationship was strongly linked to the monthly income and the

location of the household. There have been studies in high income countries which reported that the children living with food insecurity showed more consumption of energy, sugar and less consumption of fruits, meat and milk products (Matheson, D. M. *et al.* (2002); Oh, S. Y. *et al.* (2003), as cited in Dos Santos and Gigante (2013). Similarly, a nationally representative sample studying food consumption showed that Brazilian children, who are living in a country which is going through the transition process, showed a higher intake of fat and a lower intake of fruits, vegetables and meat (Bortolini, G. A. (2012), as cited in Dos Santos and Gigante (2013).

The food eating habits of the Brazilian children was comparable to the developed countries. The difference in the relationship of the food insecurity and obesity among the Brazil and developed countries is that, the occurrence of obesity in high-income countries across all social class was an older phenomenon but the Brazil has started showing the increase incidences of obesity in low socio-economic class as well. Reports from the developed countries stated that children living with food insufficiency consumed high sources of energy, fat and sugar and less consumption of protective foods like fruits, vegetables, meat and dairy products (Dos Santos and Gigante, 2013).

2.8 Nutrition transition: Calorie decline and Non Communicable diseases

The dietary shift has mixed effects on nutritional outcomes. Dietary diversification is considered as one of the reasons for calorie deprivation. It is also attributed to the increase in the prevalence of non-communicable diseases. When calorie intake is reduced, protein and fat intake, consumption of animal, milk and milk products is increased and consumption of pulses and legumes have fallen sharply with diet diversification. It is well known that excess fat intake has the potential for aggravating the risk of non-communicable diseases. Concerns have been raised regarding the increasing trends of non-communicable diseases India. It has not been limited to the affluent population but indicating underdiagnosis among the poor. Marked differences have been found in the estimation of NCD's prevalence while using the standardised criteria versus self-reported diagnoses criteria(vellakkai et al., 2013)(Subramanian et al., 2013).

The high occurrence of diet-related NCDs in poor population who are still facing hunger and food insecurity is leading to an emergency situation. There is an increase in the unguarded low socio income groups to Chronic heart diseases. Literature gives a vague picture of the risk factors of non-communicable disease among men and women. Some researches argued that age-adjusted NCD's is not a big issue. A positive association exists between socioeconomic status and cardiovascular diseases. Other risk factors include high levels of BMI, overweight, serum total cholesterol and triglycerides in men. On the contrary, one study indicated the negative association between socioeconomic ingredient for hypertension and diabetes among women (Reddy et al., 2007).

In another study to examine the relationship amongst household food security, food supplies, school-age children's dietary intakes and BMI. The Hispanic children and their mothers were interviewed under the school obesity prevention program. Nutrition principle research methods were applied including anthropometric measurements and 24 dietary recall for assessing the dietary intake. Food insecurity was found to be negatively associated with the children BMI and food supplies but not with the children dietary intakes. However children in food insecure household had significant decreased energy intakes and meat consumption. The age and sex-adjusted BMI of the food insecure household was low somewhat normal and children in food secure household were at the risk of becoming overweight. The low BMI was attributed to short-term or periodic restriction of food. Campbell and Desjardin model of food management strategies was corroborated. In which mother sacrifice her intake to fulfil the child dietary needs. Household food insecurity was seen to be associated with mother's report of resentment, feeling of being an insufficient parent and fear of losing protection of their children (Matheson et al., 2002).

2.8.1 Calorie decline

Researchers have called it as the "calorie consumption puzzle". Despite in the increase in the income and real expenditure, average calorie decline is seen over time (Chandrasekhar and Ghosh, 2003 cited in Basu et al., 2012). They justify this riddle with the 'food budget squeeze' which means the expenditure in food gets reduced due to the non-food expenditure. The choice of spending on food is compromised due to unexpected

and ever-changing non-food expenditure. The transitional changes in housing, healthcare, transportation and education does not confirm a gradual rise in calories. The other arguments were made regarding the decline in the physical activities due to mechanisation, improved epidemiological environment and increase in the relative price of the food. Diet diversification has also resulted in the consumption of more expensive which are low on calories. The increasing culture of eating lead to under-reporting of calories as well. Many people voluntarily prefer luxury over food leading to the contribution in calorie decline.

Increased mechanisation of agriculture in rural areas is also considered as a reason for the decreased calorie needs but this factor need to carefully examined. With the advancement in the mechanisation, the poor agricultural workers are left with no work and are pushed below poverty line and thus find challenging to afford adequate food for themselves. (Verma, 2005 as cited in Qadeer et al, 2016) illustrated this by giving an example of green revolution technology, which increased work through multiple cropping that lead to labour intensification or changed labour. This labour deployed in non farm work or migrated. Therefore agricultural labourer's work was niether reduced physically or did not reduce in terms of working hour. In India due to large number of agricultural workers and peasants, they alone are sufficient to put down the average calorie consumption. In the midst of finding explanations for the calorie decline, It has been also claimed that in India, the section of agricultural workers and marginal peasants alone could pull the average calorie consumption down (Bajpai and Bhasker, 2014).

According to the NSS data, the overall percapita calories and protein has declined in last two decade, though it does not capture the intrahousehold food distribution. Impact of intrahousehold expenditure will help to know the quality as well as the quantity of diet consumed by every member of the family. It is well established in repeated NHFS data since 1990 's that women and girls receive poorer quality and less food not only in the poor households but also in the marginally above the poverty line(GoI, 2007).

Table 2.5**Calorie and Protein Intake**

	Calorie(K cal/day)		Protein(gm./day)	
	Rural	Urban	Rural	Urban
1972-1973(NSS 27 th Round)	2266	2107	62	56
1983(NSS 38 th Round)	2221	2089	62.0	57.0
1993-94(NSS 50 th Round)	2153	2071	60.2	57.2
1999-2000(NSS 55 th Round)	2149	2156	59.1	58.5
2004-05 (NSS 61 st Round)	2047	2020	57.0	57.0
2009-10(NSS 66 th Round) Type 1	2020	1946	55	53.5
2009-10(NSS 66 th Round) Type 2	2147	2123	59.3	58.8
2011-12(NSS 68 th Round) Type 1	2099	2058	56.5	55.7
2011-12(NSS 68 th Round) Type 2	2233	2206	60.7	60.3

Source: NSS report No. 560, Nutritional Intake of India

Diet diversification as a reason for calorie decline is justified about the economic development. The change in the economic status can be better guided with the two most important aspects to study the change in the consumption pattern as well as food expenditure

“Bennett’s law states that as there is economic growth, the proportion of calories in the diet derived from cheaper foods e.g. cereals, roots and tubers declines, while the share of calories from costlier foods like vegetables, fruits, milk and meat increases. However, the consumption of higher value foods should be seen as higher per capita expenditure on food and not a reduction in calories consume”.

“The Engel’s law states that in a society the proportion of expenditure on food is higher for the poor than that for the rich, while at aggregate level poorer countries spend a larger proportion of their GDP on food than the wealthier ones”.

For instance, the United States, the proportion of food expenditure is 10%, while it can be as high as 50% for impoverished countries. Major chunk of poor household income goes in the maintenance or the food.

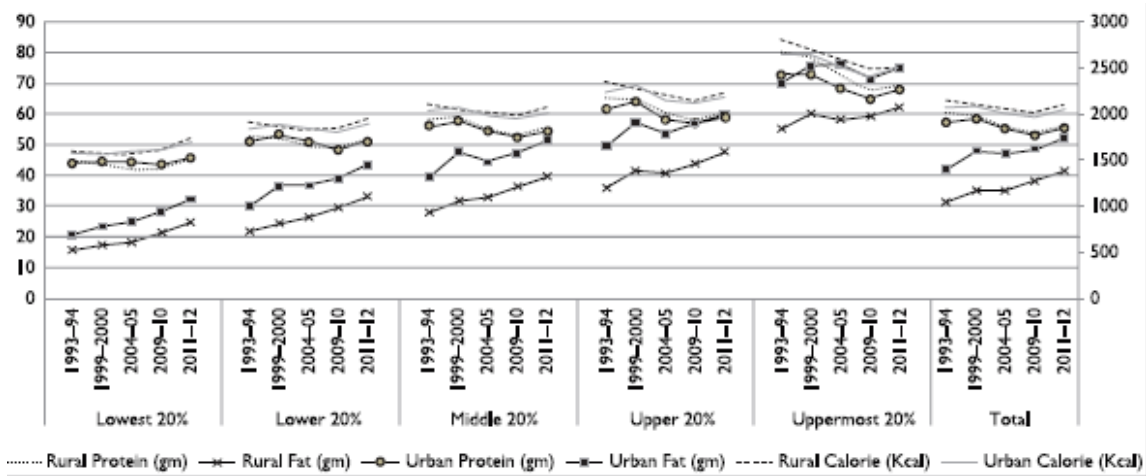
Lack of adequate nutrition could also be due to the other factors besides income. Researches are done to study the choice of spending on food. It is well documented that poor people will channelize money towards the basic satisfaction of food along with the need of housing and clothing whereas the well-off sections tend to diversify their diet followed by satiating their hunger and other necessities. Therefore the public provisioning of the education, health, or social services allows to divert substantial portion of their income for such expenditure of necessity (Bajpai and Bhasker, 2014).

Diet diversification has been considered the key to ensure micronutrients, and has been a focus for poor countries, assuming their diet is rich in cereals as part of their staple foods. Measurement of dietary diversity is based on the number of servings of specific foods ideally over three days. Such studies have shown a direct relationship between dietary diversification and nutrient adequacy (Ruel (2002), as cited in Qadeer, Ghosh and Madhavan (2016). Food diversification is also measured through food diversification index, which is based on the relative proportions of different food items or the share of expenditure on these food items. Qadeer, *et al* (2016) argued that the besides diversity the index does not measure the absolute quantities, and therefore interpreting it as an enhancing adequacy is not valid. It was further argued that the diet diversification may reduce the quantity (concentration of nutrients) but it does not reduce the total calorie intake. The authors conducted an analysis on the basis of the MPCE quintiles and showed that the quantities consumed of the six food groups varied in different MPCE quintiles, all MPCE categories consumed them. It means that the variety of food groups has not increased but the diversification within each group may have. The steady decline in the consumption of cereal, pulses, vegetables, and stagnating consumption of milk, fish/meat and increasing deprivation of calorie and protein showed the overall decline in food consumption (NSS data between 1993-04 and 2009-10, as cited in Qadeer, Ghosh and Madhavan (2016).

A comprehensive analysis of food consumption data of NSS rounds (1993-2010) was done by Qadeer *et al.* (2016) in order to estimate the food consumption by different social sections of the India. According to the NSS rounds the trend of calorie decline is attributed to decrease in human energy requirements, which has happened due to increasing prosperity, declining morbidity, technological advancements, reduced hard manual labour. The authors questioned these interpretations as NSS 2011-12 data showed a noticeable increase in calorie intake (table 2.5). The authors state that improved technological advancements has benefitted only the topmost MPCE quintiles until 2009-2010 which appear to explain calorie decline. On the contrary, the reduced calorie intake does not apply to those who perform the same physical labour as before. As rural migrants shift to urban areas seeking work in unorganised sectors, such as construction, manufacturing goods, trade, hoteliering, transport and the service sectors (Bhalla, 2003 as cited in Qadeer *et al.* (2016)) the working conditions remains hectic and labour intensive. There it was argued that the lowering in activities is limited to service sectors including IT professional, politicians and bureaucrats, which falls under the top MPCE quintiles. The second lowest quintile shows the reduction in the calories during the period 1993–1994 and 2009–2010 by 60 and 40 kcal per capita per day for rural and urban areas respectively (fig 2.1), from the initial levels of only 1,912 and 1,849 kcal. ‘The initial levels were far below the new reduced norms of calorie adequacy, yet they declined further. The persistence of low intakes less than 1,800 kcal per capita per day in one-third of the population; 63 per cent and 59 per cent of the population consuming less than 2,200 and 2,100 kcal per capita per day in rural and urban areas respectively and the expansion of underfed groups across all MPCE quintiles reflects the seriousness of the problem’(Qadeer *et al.*, 2016).

Fig 2.1

**Per capita per day Counsumption of Protien, Fat and Calorie by MPCE quartiles
(Calorie measured in secondary axis)**



Source: Qadeer et al. 2016 calculations from unit level data, NSS various rounds

2.9 Levels of malnutrition among women

While more than one-third of women suffer from CED, around twenty-four percent are overweight and obese. Chronic energy deficiency is presumed to be the dominant form of malnutrition in rural India. Opposite to this is the increasing prevalence of overweight and obesity which is gradually emerging as a problem of urban India. Table 2.6 shows the level of malnutrition. Pregnant women and who gave birth within the two months before survey were excluded.

Table 2.6**Levels of malnutrition among women (15-49 years) in India during 2005-06**

		Urban(%)	All India(%)
Body Mass Index	Chronic energy deficiency	25.0	35.6
	Overweight or obese	23.5	12.6
Anaemia	Any Anaemia	50.09	55.3
	Moderate and severe	15.1	16.8
CED and anaemia	Both	14.3	21.6
	Either	47.1	47.5
	Neither	38.6	30.9

Source: NFHS 3

Table 2.7 shows the eight cities for which separate estimates of nutrition are available from NFHS-3 (Chennai, Delhi, Hyderabad, Indore, Kolkata, Meerut, Mumbai, and Nagpur) which clarifies that the prevalence of undernutrition and over-nutrition among women and men ranges widely. Among the eight cities, the proportion of adults who are too thin ranges from 14 percent of women and 15 percent of men in Delhi to 31 percent of women and 35 percent of men in Nagpur. The proportion of men who are overweight or obese is lowest in Nagpur (13 percent) and highest in Hyderabad (25 percent). Overweight or obesity among women ranges from 19 percent in Nagpur to 39 percent in Chennai. In general, both women and men are more likely to be too thin in slums than in non-slum areas, but the differences are small in some cities. In every city, women and men are less likely to be overweight or obese if they live in slum areas than in non-slum areas. Even in slum areas, overweight and obesity are major problems. In slum areas in Chennai, Hyderabad, Kolkata, Meerut, and Mumbai, at least one-quarter of women are overweight or obese (Arnold *et al.*, 2009, pp 45-48).

Table 2.7**Nutritional Status of Women and Men 15-49 Years by City and Slum/Non-slum Area**

City/Area	Percent of women		Percent of men	
	Too thin	Overweight/obese	Too thin	Overweight/obese
Delhi	14	27	15	18
Slum	21	20	22	11
Non-slum	13	29	13	20
Chennai	16	39	23	23
Slum	18	34	27	18
Non-slum	15	41	22	25
Hyderabad	31	33	22	25
Slum	21	31	25	22
Non-slum	21	34	21	25
Indore	25	22	21	14
Slum	33	19	26	9
Non-slum	23	23	20	15
Kolkata	16	30	20	18
Slum	21	25	23	15
Non-slum	14	32	19	20
Meerut	20	30	23	19
Slum	22	25	26	16
Non-slum	19	34	21	21
Mumbai	22	27	25	18
Slum	23	25	26	16
Non-slum	21	30	23	21
Nagpur	31	19	35	13
Slum	36	14	41	10
Non-slum	28	23	31	16

Source: NFHS 3

The prevalence of anaemia is widespread and differentials in anaemia are more modest than they were in the case of poor nutritional status. Anaemia in women and men is highest in Kolkata and lowest in Indore. The differences in the prevalence of anaemia between slum and non-slum areas are small and inconsistent in direction. Anaemia is

actually less prevalent in slum areas than in non-slum areas for women and men in Kolkata, Meerut, and Mumbai, and for women in Nagpur (table 2.8)

Table 2.8

Anaemia among Women and Men 15-49 Years by City and Slum/Non-slum Area

City/Area	Percent of women anaemic	Percent of men anaemic	City/Area	Percent of women anaemic	Percent of men anaemic
Delhi	44	18	Kolkata	55	20
Slum	48	22	Slum	52	17
Non Slum	44	17	Non Slum	57	22
Chennai	51	13	Meerut	45	13
Slum	51	15	Slum	40	12
Non Slum	51	13	Non Slum	48	14
Hyderabad	50	12	Mumbai	47	12
Slum	55	13	Slum	46	11
Non Slum	49	12	Non Slum	48	13
Indore	40	11	Nagpur	51	16
Slum	43	12	Slum	49	17
Non Slum	40	10	Non Slum	52	16

Source: NFHS 3

The diet of women and men in India is largely vegetarian in nature, as large percentages of women (64.6%) and men (59%) do not eat fish, chicken/meat on a regular basis (that is, either weekly or daily) (table 2.8). Lower still are the proportions of women and men consuming fruits (60% and 53%, respectively). By contrast, substantially large proportions of women and men eat pulses/beans (90% and 91%, respectively) and leafy vegetables (93% and 94%, respectively) on a regular basis. Consumption of milk appears in between 55% of women and 67% of men consume milk/curd regularly.

Table 2.9**Consumption of Food Items among Women and Men in India (2005-06, %)**

Food items	Never	Occa*	Weekly	Daily	Never	Occa*	weekly	Daily	Never	Occa*	weekly	Daily
Milk/curd	11.4	33.2	15.6	39.8	7.0	25.8	20.5	46.7	60.7	58.3	55.3	51.3
Pulses/beans	0.9	9.6	36.8	52.7	0.9	8.4	38.6	52.1	60.9	56.2	55.7	54.8
Leafy vegetables	0.3	6.8	28.7	64.2	0.4	6.0	34.5	59.1	48.1	51.6	55.6	55.6
Fruits	3.5	56.5	27.2	12.7	2.6	50.0	34.4	13.1	63.6	57.7	52.8	47.3
Fish, Chicken/meat	32.6	32.0	28.5	6.8	23.9	35.1	34.1	6.9	51.0	59.0	57.5	50.1
Milk/curd and fruits	1.6	64.9	23.4	10.1	1.0	57.7	31.2	10.1	66.5	57.4	52.3	47.4
Milk/curd and fish, chicken/meat	2.6	51.8	25.4	20.2	0.9	50.1	30.9	18.1	54.3	58.1	54.9	48.8
Fruits and fish, chicken/meat	1.1	67.3	25.2	6.4	0.6	63.8	30.4	5.2	57.3	57.5	51.8	46.0
Milk/curd, fruits and fish, chicken/meat	0.4	72.9	21.5	5.2	0.1	69.2	26.6	4.0	58.4	57.1	51.3	46.2

*Occa refer to occasionally

Source: Computed from NFHS-3 unit-level data

The absence of gender gap in CED does not imply that there is no bias or discrimination against women. Despite the presence of gender gap in the intake of nutrients, physiological or reproductive factors tend to play an important role for the higher incidence of anaemia among women. They are partly responsible for the higher incidence of anaemia among women from all wealth groups in India. However, they are complemented by an iron-deficient diet (largely vegetarian, cereal based and less-diversified) and poor absorption of iron from such iron-deficient diet. To follow a balanced, diversified diet is a desirable option, but it is not feasible for the poor women, among whom the incidence of anaemia is the highest. The fortification of commonly eaten, less-expensive staple foods appears to be an effective option.

About over 75% and 70% of women from bottom two quintiles do not consume fruits regularly. By contrast, 45% and 58% of women from top two quintiles consume fruits regularly. Thus, though it is desirable and necessary, it is much beyond the reach of poor women to consume these food items on a regular basis (table 2.10).

Table 2.10**Consumption of Selected Food Items by Women across Wealth Groups (%)**

Wealth Group	Women who consume				Women Anaemic			
	Never	Occasionally	weekly	Daily	Never	Occasionally	weekly	Daily
Milk/curd								
Lowest	18.4	43.8	15.8	22.0	65.4	61.8	59.3	58.0
Second	14.1	39.7	16.6	29.6	63.2	60.2	56.8	53.9
Middle	11.8	35.7	16.5	36.0	59.9	58.2	55.9	53.5
Fourth	9.0	29.1	16.1	45.8	56.4	56.4	52.8	50.5
Highest	6.0	22.1	13.5	58.4	53.5	52.9	52.5	47.9
Fruits								
Lowest	6.9	68.7	20.3	4.0	65.7	61.5	59.4	58.3
Second	4.8	65.9	23.5	5.8	64.7	59.7	54.0	53.1
Middle	3.4	60.3	26.7	9.6	65.0	58.1	53.9	48.6
Fourth	2.2	53.2	29.9	14.7	61.8	55.3	52.1	46.2
Highest	1.2	40.8	32.9	25.1	51.1	53.5	49.1	45.0

Source: Computed from NFHS-3 unit-level data

The fact behind such generic pattern is a stark socio-economic inequity and unequally large levels of CED among women and men from poor households and disadvantaged social groups in India. Added to these are the twin facts: a.) 77% of women with CED and 73% of men with CED in India live in villages, and b.) CED has gone up, though marginally, among poor women between 1998-99 and 2005-06, which were a period of higher rates of economic growth in India. Hence, addressing the huge socio economic inequity in under-nutrition is as important as addressing the higher incidence of iron deficiency anaemia among women. These factors call for progressive public policies rather than merely hoping economic growth trickles down and does wonders (Jose, 2011).

India not only has a large number of malnourished women but it also has one of the highest proportions of malnourished women among the developing countries. The reasons for this are multiple and complex. Seemingly, the discriminatory practices associated with the rigid social norms, the excessive demands made on the time, and

energies of women join hands with the usual determinants in blighting women's nutrition. However, one of the usual determinants, namely poverty, seems equally important. Poverty is not only one of the basic causes or of malnutrition, but malnutrition itself is considered an outcome as well as a manifestation of poverty. If so, then, the higher rates of economic growth during the past 10 years or more coupled with a reasonable reduction in poverty, especially during 1999-2000 and 2004-05, should have seen a decline in women's malnutrition, but reduction in poverty did not decline effect the level of malnutrition.

If trends are studied, (Table 2.11) for the nutritional status of women in Ghaziabad and Uttar Pradesh. More percentage of women were found to be overweight in comparison to underweight. The NFHS data also conferred the rising concerns of the decline of underweight women and rise in the category of overweight women population in the last decade.

Table 2.11

Nutritional status of women by Body Mass Index for Age

BMI for age (15-59 years) kg/m ²			BMI Age group (18-49 years)	
	Uttar Pradesh (2014)	Ghaziabad (2014)	NFHS 3 (2005-06)	NFHS 4 (2015-16)
<18.5 (Underweight)	8.4	9.4	35.5	22.9
>25 (overweight)	13.2	23.5	12.6	20.7

Source: (CAB Report, 2014) Annual Health survey and NHFS Data

On the contrary to this, in one of the study where the association between slum residence and women nutritional status was examined with the help of NFHS 3 data. It was found that the undernourishment in women was more prevalent in slum area as compared to non slum area. More number of women were undernourished who were falling under below poverty line and did not own a house. These differences were primarily found in the nutritional status between the non-notified and notified slum as well due to differences in the physical amenities. Therefore to reduce the malnutrition, cities should be made slum free (Swaminathan and Mukherji, 2012).

2.10 Role of women in addressing Food Insecurity

There is abundant literature available highlighting the women contribution regarding hard laborious work on agricultural as well as managerial responsibility in acquiring food. Their constant struggle against household insecurity is of great significance. For achieving the food sufficiency, household construction and allocation of resources to have greater influence on the food security of individual members in the household especially children and women. Women play a competent role in harmonising these processes. Agricultural historians are conscious of the inherited knowledge of the art and science of farming. During ancient times, when men used to go out for hunting in search of food, women were the one who used to collect seeds from the native flora and cultivated them, which was then utilised as food, fuel and fodder for cattle feed as well (Swaminathan, 1990).

The participation rate of rural women were higher than the urban women, a huge gap was also identified in the ratio of female employment in urban and rural areas (table 2.12). In comparison to the rural-urban disparity of employment among men the disparity among women participation work ratio was also quite.

Table 2.12

Urban and Rural WPR(Work Participation Ratio)

Round	Urban	Rural	Urban	Rural
43 rd	15.2	32.3	50.6	53.9
50 th	15.5	32.8	52.1	55.3
55 th	13.9	29.9	51.8	53.1
61 st	16.6	32.7	54.9	54.6
66 th	13.8	26.1	54.3	54.7
68 th	14.7	24.8	54.6	54.3

Source: Employment and Unemployment Survey of NSS Rounds

Table 2.13

Type of Employment of Female workers

Rounds	Urban Females			Rural Females		
	R.E	S.E	C.E	R.E	S.E	C.E
43 rd	27.5	47.1	25.4	3.7	60.8	35.5
50 th	28.4	45.8	25.8	2.7	58.6	38.7
55 th	33.3	45.3	21.4	3.1	57.3	39.6
61 st	35.6	47.7	16.7	3.7	63.7	32.6
66 th	39.3	41.1	19.6	4.4	55.7	39.9
68 th	42.8	42.8	14.3	5.6	59.3	35.1

Source: Employment and Unemployment Survey of NSS Rounds

PS: Principal Status, SS: Subsidiary Status, RE: Regular Employment, SE: Self-Employment and CE: Casual Employment.

Like in rural setting, the story of women hardship in urban setting is not different. The women in urban areas are struggling in unorganized sectors equally as they are working in rural areas. They work as labourers, maids and contributing equally to not just feed their children only but also to achieve financial security. An empirical study on women and children in Urban slums of Delhi was conducted by Singh S et al, 2014, states the influence of seasonality on working condition of women that affects their nutritional status (Singh *et al.*, 2014)

Table 2.13 shows a continuous rise in the regular employment since the 43rd round. It has increased from 27.5 percent in the 43rd round to 42.8 percent in the 68th round. This increase is a positive development since regular employment means better working conditions and higher incomes. Self-employment of urban females has also witnessed an increase during 61st round, however, after remaining more or less constant for the last two rounds it has declined significantly. On the other hand, casual employment of urban females has continuously declined from 25.7 percent in the 43rd round to 14.3 percent in 68th round, except for a marginal increase in the 61st round in comparison to the earlier round. Overall, the decline in casual employment and increase in regular employment of urban females is ensuring a development (Sharma and Saha, 2015).

Table 2.14 shows the huge disparity not only in men and women wages but also between the rural and urban wages. Other issues include lesser number of days of work for females, and receiving less than the minimum stipulated wages (Srivastava & Srivastava, 2009; NCEUS, 2007, as cited in Sharma and Saha, 2015).

In contrast to females, the wage disparities in case of males are less striking. Therefore, female workers are in a worse-off position in terms of wage earnings in comparison to the male workers. In the category of female workers, rural females are relatively worse off. This suggest an urgent need to improve the average earnings of rural women as well and reduce these disparities (Sharma and Saha, 2015).

Table 2.14

Average wage of Rural and Urban Female(1993-94 to 2011-12)

Rounds	Rural	Urban	Rural	Urban
50 th	34.89	62.31	58.48	78.12
55 th	114.01	140.26	127.32	169.71
61 st	85.53	153.19	144.93	203.28
66 th	155.87	308.79	249.15	377.16
68 th	201.56	366.15	322.28	469.87

Source: Employment and Unemployment Survey of NSS Rounds

There are number of researchers which are explaining the role of women in household food security activities. It is called as buffering hypothesis, in which adults try to limit their intake so that their children food intake does not get suffered (Headley, 2008 cited in Smith, 2012).

Other researchers also second this thought by stating that women are involved in the managerial activities of food. They are more prone to get affected by the implications of the food insecurity as they limit their intake to protect their children from hunger. Olson also relates food security with the high body index of women (Olson, 1999)(Townsend *et al.*, 2001)(Smith, 2012).

It has been highlighted repeatedly that considering women could be judicious to provide information on the household food security. Hence it is the best practice to document

Household food security from women perspectives as they play central role in securing food sufficiency (Nord & Brickel 2002, Adams et al,2003 cited in Agarwal et al., 2009).

2.10.1 Hidden contribution of Women

The idea of this section of the chapter is to address the different dimensions of women's work in India and the fallacies in the mindset is exposed. The entanglement of the issues is well documented and the women organisations keeps on emphasising on women work and their economic contribution to society. It has been argued that women work in private sphere cannot be acknowledged as they are neither producers, nor capable of hard physical labour work. In today's world when the women are emerging as breadwinners, their economic status is linked to their family economic status.

Likewise in agricultural production, the landowner are the men farmers and women are designated as labour who perform the tedious manual jobs. The generalisation of male breadwinner and head of the household models should be challenged. There is an urgent need to recognise, organise and claim women rights. These are the two responses cutting across the boundaries of caste-class and region, a pointer to the complex nature of women's work.

“I work all the time, all the days...there is no escape from the grind of work’ (a woman's answer to the question “what do you do”?) and “My wife does not work. She is at home” (a man answer to the question “what does your wife do?”) (Shramshakti, 1988).

The quote above still hold relevance in the present time. Women run households, actively involved in the child-rearing, they take care of the aged and the sick. Their work is not only limited to home but are working on farms, in factories, but most of the times their timeless contribution remains invisible. In fact, women's work sustains society.

Women work is often underrated and their efforts for the betterment or survival is considered as the natural outcome or modesty of women in performing their gendered role including caring and nurturing.

The discourse on the nature of women's work emerges at specific intervals. There was a marked difference in pre and post-independence period in acknowledging the economic value of work performed by women. The report made by the National Planning

Committee emphasised on the independent economic means for women but it was lost in the struggle for independence. Post Independence, another historic report entitled “Towards Equality” by NPC highlighted the neglect of women’s contribution to economic activities especially in unorganised sector (Shramshakti : Report of the National Commission on Self Employed Women and Women in the Informal Sector., 1988).

The eighties witnessed the increased sensitivity to women’s issues among scholars and activists which had some impact on the government. This led to the formulation of National Commission for self Employed women and women in the Informal sector was appointed by Government. This commission conducted an extensive outreach work and in their report called shramshakti, they recognised women as workers.

The census data also fail to address this complexity of issues. It does not capture the accurate rate of women’s work participation. Due to the diversity in India, collecting and measuring data at National level is quite challenging. Enormous population, and regional disparities, social norms and junction of caste, class with gender makes it difficult to conclude. Like in case of Haryana and Punjab, it shows low female participation as compare to the West Bengal and Bihar where poverty is high. Similarly a third ranking state regarding per capita income could be due the highest female participation rate. The performance of any state regarding measuring any specific indicator cant be in isolation with the composition of the state itself.

Apart from the inconclusive census data, NSS data also document the men and women participation rates. During 1991, the census presented the remarkable increase in the women participation rate because of the influence from the women groups and concerned scholars to show more sensitivity towards the nature of women’s work in census (Desai and Thakkar, 2001, pp 19-42).

2.10.2 Women and their multiple nature of work

Role of women in the income generation remains invisible especially in the agricultural and unorganised sector. People are getting sensitised toward the acknowledgement of the multiple nature of the women’s work. The adoption of the term ‘Homemaker’ with ‘Housewife’ is an indication of their role in making ‘Home’.

Women have the double burden of work as much as their counterparts to get recognised. It is not only about the uneducated women but equivalent educated women because high qualifications does not guarantee satisfying jobs. Women are overburdened with the work outside and inside home while facing a conflicting role under stressful situations. It is difficult to meet both the challenges at the same time when a woman has small children to feed and to take care of. In these cases elder female sibling is considered to take care of the younger ones at the cost of her education or career.

More number of girls children are forced to drop out school, who are supposed to work either supporting mother's work as domestic help workers or just by facilitating mother's work by undertaking her domestic responsibilities.

Duality of women work is recorded in which one work is paid and for another in which payment is not made. There are subtle differences between economic and non-economic activities. The paid work is supposed to be done by men, whereas the women unpaid work including activities inside and outside homes, manual work in the agriculture falls out of the definition of work because it is unpaid. By virtue of the work definition, the activities performed for pay or profit; there are many activities that remain outside the domain of work. Consequently the unaccounted women work poses an adverse effect on the status of women, government policies and perspectives of people. In urban context, there are numerous invisible activities performed by women. Some are enlisted as follows:

(i) Household managerial activities stemming from fetching water, fuel, repair of dwellings; (ii) As domestic help, wage and salaried employment; (iii) Self-employment outside the household for profit.

There are difficulties in capturing the statistical data of women work. Due to the cultural fabrication of women's work, lack of clarity in measuring work in the family, agriculture and unorganised sector, inhibitions from the society and most important and dominant model of framing men as head of family and considering it superior while pushing house related activities to inferior category.

Around ninety-six percent of women working in the informal sector for invariable time at low wages and without any legal protection against exploitation. The social status us

attached to the possession of different resources in urban and rural settings. Acquisition of land deserves a significant importance and is attached to social status and bureaucratic power in the village, likewise in urban areas own house and availability of the resources are the primary determinant of social status. In most of the cases, where the male head of the household are compelled to move out in other state for work, the wives in the absence of economic security push themselves in the insecure unorganized sector.

2.10.3 Men migration affecting women

Other issues are related to poor urban setting is the unavailability of the public provisions like, education, housing and health, no investment for safe and drinkable water, sanitation and roads in slums. The economic changes accelerate the migration which affects the women more than men. Though men are still consider as the earning hand, women have to abide the major implications. The most deprived families have to be dependent on the women's economic productivity as the men earnings are not complementary to fulfil the household needs. Women are also supposed to be considerate to spend major part of their income for the education and physical needs of the children. On the contrary men have been also found to spend their money in tobacco and alcohol which lead to negative health(*Shramshakti*,1988).

Male migration from rural to the urban areas in search of employment opportunities also affect the women in particular ways. Women get seperated from the elders in the family and have to take care of the children single-handedly beside their work outside home. Husband's migration does not provide autonomy to the women who are left to care of home but sometimes it offers more space for decision making to women. Due to lack of education and limited skills they hardly get jobs in the formal sector. They usually find themselves in the manual labour jobs like maids, construction labourer, and fruits and vegetable selling. They tend to take work which is available as they have run their households. Women in urban poor setting are seemingly increasing in the home based jobs related to food procurement even for industrial use (*Shramshakti*, 1988).

These jobs mainly include manual work with the preparation of chapati, papad, grinding spices, pickles, rolling bidis and food packets. They are also found be engaged in the garment factories doing backstage work including cutting, stitching, lace making and

embroidery. Manufacturers give women specific tasks in a specified time limit and don't regularise their wages. Women are not only given jobs by small manufacturers but also by big business houses and multinational companies. It has been also suggested, despite of being unskilled, they pick up or acquire skills of the required work swiftly.

In the process of urbanisation, these small-scale industries are opening new avenues of exploiting women's labour. There have been some case studies recorded with Shramshakti (Planning Commission report, 1988) which illustrated that the women are concentrated in the occupations with low and uncertain earnings.

Women work environment was found to be extremely distressed with no facilities of light, improper ventilation, inadequate space for toilets. Small manufacturing units offer limited infrastructure for the women workers. They have to work with no protection from the extreme weather situations. Women construction labourers sometimes have to carry heavy loads during pregnancy or just after their childbirth, which leads to the increase in the maternal morbidity and other health concerns related to miscarriages and menstrual disorders (Shramshakti, 1988).

Though it is interesting to know that women in the informal sector made inevitable efforts to mobilize themselves and improve their condition of work. Some women initiatives are the examples who have performed very well. For instance, the Self-Employed Women Association (SEWA)'s first cooperative, it is a credit society formulated through the joint effort of around four thousand women, which grew into a cooperative bank with forty thousand members with colossal capital.

2.10.4 Significance of women bargaining power in household expenditure

Women bargaining power requires special mention in acquiring food sufficiency at household level. It is an important driver which upholds the women status in the family. The status of women decides her economic decision making power in managing the household expenditures. It is also presumed that the patriarchal dominance can only be negated by strengthening women's bargaining abilities (Doss, 1996).

The earnings are budgeted for food depends on the preferences of the decision makers within the household. A woman's control over the income increases the spending on food

and basic needs. Food and income could have limited impact on child nutrition if women lack decision making power. However if women's participation in work increases their decision making power in the household (Kadiyala et al., 2014 as cited in Komatsu et al., 2018). The increases in women's status are associated with better outcomes of child nutritional status (Smith et., 2003 as cited in Komatsu et al., 2018)

2.11 The Status of women and their access to food

The National Nutrition Policy (1993) also addressed the importance of improving economic status of women. The women employment not only help household financially but also improves household nutrition. They are the eventual supplier of nutrition to households both through the purchase as well as preparation of food for consumption.

Evolution in the women's status and well being proves to be a positive effects on the children's well being. Several pathways have been discussed in the literature to achieve children well being. These include, economic empowerment, maternal education, intrahousehold decision making power, and community level enhancement.

The association between the education of the mother and better education, health and nutrition outcomes for child is evident. Economically independent women not only improves the status of the household, but also encourages a secure future for the children. Moreover women possesses the better ability to translate into better outcomes by advocating the interests of their children as compared to men. At community level, active role of women is demanding for providing child health-related services.

It is well-known fact that women in India tend to have less decision making power and thus have lower status. Various theories and concepts was put forward to highlight the women status as a conundrum in tackling issues of undernutrition. Comparisons were made between South Asia and Sub Sahara Africa to rationalise the importance of women status.

2.11.1 Gender Inequality and South Asian Enigma of Undernutrition

The prevalence rates of underweight in children and low body mass index (BMI) in adult women are considerably higher in South Asia in comparison to Sub Sahara Africa (table

2.15). At the same time, a number of factors generally assumed to be strongly associated with the nutritional conditions in a country or region, South Asia fares better than Sub Sahara Africa. For instance, Under five and maternal mortality rates in South Asia are on average almost half of those of Sub Sahara Africa, while literacy rates or other educational indicators are considerably better in most South Asian countries. As regards overall per capita income, South Asia and Sub-Saharan Africa are at comparable levels, while per capita kcal availability is higher in South Asia. From a health or nutritional point of view, South Asia has a poorer record than Sub Sahara Africa in the prevalence of anaemia in women. The reductions in child malnutrition in South Asia require promotion of equal freedoms, opportunities, and rights for women including the right to participate in decision making both within and outside the home. Such factors may also result in a reduced incidence of low birth weight, improve access for women to basic services, and increase control over their fertility". Essential is a shift from welfare to a human rights approach to the issue of malnutrition, with an emphasis on community empowerment (Ramalingaswami, V. *et al.* 1997).

Since 1990's, despite of the comparable levels of per capita income, the considerable amount of differences was in the nutrition outcomes between South Asia and Sub-Saharan Africa.

South Asia per capita kilocal availability is high as compare to Sub Sahara Africa but the nutritional indicators revealed a better a picture in the later. The high prevalence of underweight under five years of age, anaemia and low body mass index in the adult women in South Asian countries are deep-rooted in the soil of inequality.

There is a need to reposition the welfare approach to human rights approach to the issue of malnutrition with a focus on the scaling up of women empowerment. It requires upliftment of women including the right to participate in decision making in both within and outside the home. Offering equal freedom and opportunity to women will lead better health, education, improved access to basic services; and increasing control over fertility (Ramalingaswami V, U and J, 1997, pp 11-22). The limited women's ability to avail the resources for their own and their children affects their intake and thus nutrition. The low

birth weight and improper child feeding are judged by the caring capacity of mothers, which are in turn is driven by the status of women in the household and society as whole.

Table 2.15

The South Asian Enigma: Nutritional Status of women and Children under five year of age

	Wom en BMI< 18.5 ^{b)} (%)	Under- fives weight- for age<2sd ^{c)} (%)	Per capita income ^{d)} (USD)	Per capita kcal per day ^{e)}	Literacy ^{d)}	Under five mortality ^{d)}	Matern al Mortali ty ^{d)}	Anaemia prevalenc e in women ^{f)}
Sub Sahara Africa ^{a)}	14.4	30.7	601	2195	62	168	921	41
South Asia	34.1	48.5	594	2403	82	92	564	60
East Asia & Pacific	16.4	11.5	1416	2921	99	37	117	49
Middle East and North Africa	6.2	14.7	1972	3006	88	55	183	44
Latin America & Caribbean	5.4	9.1	3575	2824	97	31	194	23

a)Definitions of regions may somewhat vary by data-souce; b)Data from DHS (2007), for each region population weighted average, based on those countries for which DHS-results are available; c) Data from world Bank, 20006a, result for Sub Sahara Africa is a population weighted average for 36 countries, results for other regions directly from World Bank,2006a; d) Data from world bank, 2006a; e)Data from FAO, 2003a, 1997/1999; f) Data from Stoltfus, 2003

Source: (Nube, 2009)

The disparity in the consumption within the household can be seen as an implication regarding women accessibility to food in a paper reviewed by Anuradha Seth, HDR, (1998) to study the extent of disparity in intrahousehold food consumption pattern. It also examines the theoretical literature on decision making power. The emperical evidence on disparities on intrahousehold food counsumption was also shown. Various studies were

reviewed from the countries including India, Pakistan, Bangladesh, Nepal and Phillipines. Out of all, six studies showed pro-male bias in food allocation. This disparity was due the unequal distribution of food within household, unequal nature of food requirements and unequal nature of perceived requirements by age, sex and gender (Seth, 1998).

The distribution of food in the household is not based on the requirement but the acquired economic positions. The male head or the breadwinner get sufficient food first, the children get the next share, and women take whatever remains. In most cases boys are given preference over girls in the distribution of food. Additionally, during scarcity the dietary intake of women and children are likely to be affected adversely. The quantity of food intake is also a debatable issue as it is considered that women eat less, but then also they do not get adequate food as per their requirement.

The NHFS data also revealed higher malnutrition among girls as compared to boys. There are studies which are based on the weight for age indicator to estimate the undernourishment in few villages of West Bengal and a bias was found in favour of boys was found. It was concluded that the lower nourishment of girls may not be directly related to their food intake but from the neglect of health care of girls (Sen, 2001 cited in Dev and Sharma, 2010, pp 28).

As far as the nutritional requirements are concerned, it is fact that the calorie requirement are less for women as compare to men but the other nutrient requirements are same and more important for women (Table 2.16).

Table 2.16**Nutritional Requirement for Indian Adults, ICMR (2010)**

	Women			Men		
	Sedentary	Moderate	Heavy	Sedentary	Moderate	Heavy
Energy (Kcal/d)	1900	2230	2850	2320	2730	3490
Calcium (mg/day)	600			600		
Iron (mg/day)	21			17		
Retinol (μ g/day)	600			600		
Carotene (μ g/d)	4800			4800		
Thiamine (mg/day)	1.0	1.1	1.4	1.2	1.4	1.7
Riboflavin (mg/day)	1.1	1.3	1.7	1.4	1.6	2.1
Niacin (mg/day)	12	14	16	16	18	21
Vit. B6 (mg/day)	2			2		
Vit C (mg/day)	40			40		
Dietary Folate (μ g/d)	200			200		
Vit. B12(μ g/d)	1			1		

Source: Recommended Dietary Allowances, ICMR, 2010

Another dimension which was highlighted for household food sufficiency is maternal nutrition, and mother's education. Adequate nutrition during pregnancy because of its impact on the birth weight.

Child rearing and caring practices are hampered by the lack of women's education. Children are not given enough food in the first two years. There have been studies which connects inadequate breastfeeding and supplementary feeding habits with the mother's low education as well. It emphasizes the need to increase the awareness of women which can only be achieved by giving equal opportunity of freedom in seeking education and employment (Dev and Sharma, 2010).

The social status of women can only be improved by the recognition of women's work. It involves unpaid work within and outside households and not just the women's reproductive role including breastfeeding and nurturing. Most of the government policies are now focusing on the community participation, awareness without indemnifying their

time, labour and skills. Then only women's right to security with civil and political rights will seem too be coherent the economic and social rights

The women vulnerabilities are never taken into account while providing social protection schemes. For example, In 2010, a pilot scheme was offered maternity benefits in fifty-two districts across the country. Imposition on the two-child norm and age limit of 19 years is indifferent to the social condition of the women. In India where women have no authority over their marriage and fertility. Intra-household gender inequalities should be well understood before targeting social protection at families or household level. There is no structured mechanism which can address that the entitlements would be distributed equally within the household. The huge lacuna in the legalities of women ownership on papers like bank account, property ownerships and electricity connections also prevent them from availing their citizenship rights or entitlements. The multiple vulnerabilities faced by women can only be tackled by countering the patriarchal norm that inhibits the women's progress. The uniform assistance is required to fulfil the right to social security and protection (Mehta, 2013).

2.12 Inequalities and caste discrimination

Researchers have raised concerns to abolish the "hunger amidst plenty". The discrimination of various kinds regarding the right to food against tribal families, women and children, especially the female children. Refusal of the legislated entitlements are epitomized while discriminating against Dalits. Access to food and food-related programs by caste is widespread in varying degrees across India "whose society is largely driven by duties than by rights" (Dohramann and Thorat, 2007).

Food insecurity is linked to the caste discrimination. Beside gender inequalities, caste discrimination add to the hidden issues in India. Constant vigilance by the government, stakeholders to safeguard the Right to food. Food security and caste discrimination is an interrelated issue. Despite the existing legal framework, which clarify the issues of food security, the conditions does not ameliorate regarding the accessibility to the most vulnerable who are secluded by their caste.

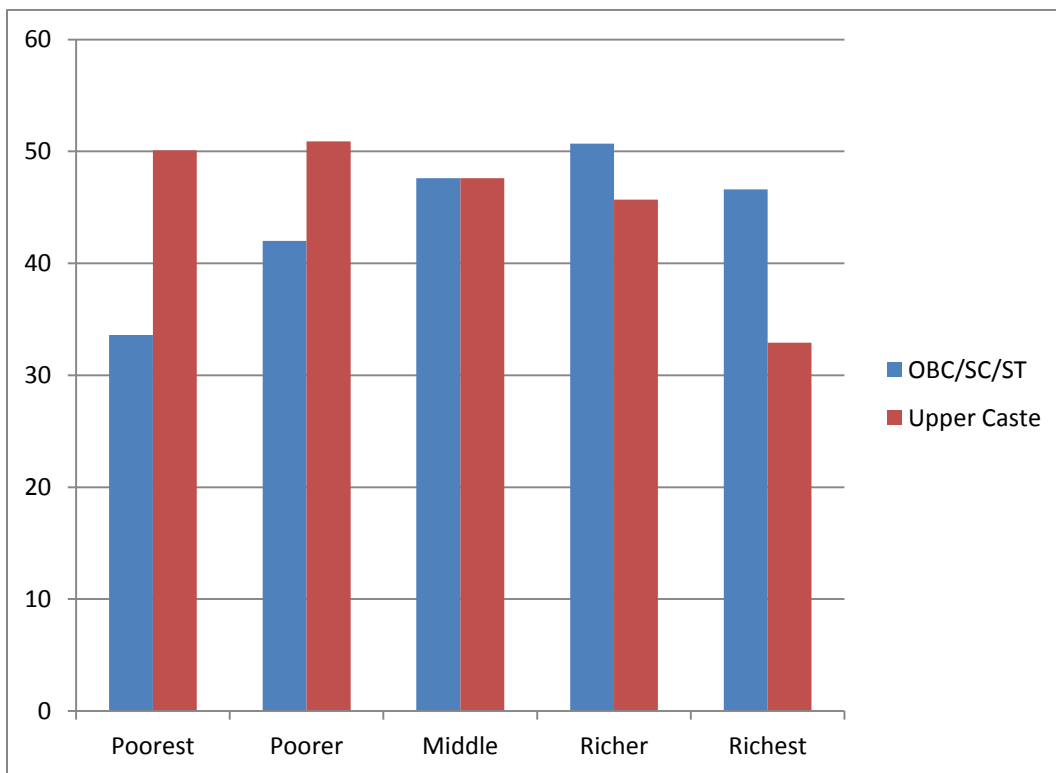
Caste discrimination was seen at interstate variation in the data for food security programmes like Mid-day meal and PDS. The higher access and participation of Dalits in MMS and PDS correspond with lower incidence of exclusion and caste discrimination.

Andhra Pradesh, which has the highest percentage of Dalit cooks, dalit organisers and MMS held in dalit localities, simultaneously has the lowest percentage of reported caste discrimination in the MMS. Conversely, Rajasthan, which has the lowest percentage of dalit cooks and organisers and MMS held in dalit colonies, simultaneously has the highest rate of reported caste discrimination. A similar pattern stands out in the PDS data. In Andhra Pradesh, where dalit ownership of PDS shops is high and where greater proportions of PDS shops are accessibly located in dalit localities, levels of reported caste discrimination are lower. While direct causality cannot be proven, quantitative and qualitative evidence from the field suggests that these data trends are indeed interlinked. Qualitative data from the study indicate that the state government's willingness to engage with civil society initiatives in implementing its programmes, combined with sustained mass action by people's movements and dalit NGOs, may be the key elements (Thorat and Lee, 2005).

Caste based discrimination is not only seen in the distribution but also seen in the consumption patten of specific food items. As per the NFHS data, as shown in figure 2.2, meat and meat products are eaten less frequently by the upper caste when they become richer and opposite trends are seen in ST/SC/OBC's. This also question the linkage of food to the social status and taboos related to caste.

Figure 2.2

Percentage of people who eat non vegetarian food at least once a week by caste and class



Source: NFHS 4 (2015-16)

The discrimination not only prevails in access to food but also in the access of healthcare services. The NFHS data also recorded the inequalities in access to health. Dalit women faces exclusion due to their caste identity besides the issues of availability and efficiency. They bear the burden of the humility and insulting behaviour of the service delivery personnel. Around fifty-six Dalits women are anaemic, seventy-two percent of the Dalits women continue to have their deliveries at home (Table 2.17). Women health continue to be a cause of concern despite of the enough network of primary health care centres in India (National Family Health Survey 3)

Table 2.17**Inequalities: Women access to Health**

Indicators	SC	ST	OBC	Others
Anemia	56.00	64.9	50.7	47.6
Antenatal checkup	61.80	56.9	65.2	72.1
Tetanus vaccination	74.2	61.3	76.8	80.0
Delivery at home	72.1	81.80	62.00	59.00
Assistance during delivery				
(a) TBA (Dai)	37.7	44.4	34.9	31.4
(b) Public Health service	36.00	23.00	44.9	48.9
Postpartum check-up	17.0	14.1	15.6	18.30

Source: NFHS 2006

The available literature has foster the broader understanding of the issues related to food insufficiency. There are whole lot of factors that are interconnected and have specific role in the desired outcomes. The research methodology was adapted while considering the relative importance of the factors studied in this chapter.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Introduction

Research is systematic process of collecting and analysing the information to increase understanding of the phenomena about which oneself is concerned or interested. It is a branch of knowledge which carefully inquires into particular phenomena. It gathers new knowledge or data from primary as well as secondary sources. It is the expansion of fundamental knowledge and hence requires a continuous monitoring. (Garg, 2002, pp 12-17, 23-24). This chapter discusses the conceptual framework, theoretical approaches and research methodology in greater detail.

3.2 Conceptual Framework

3.2.1 Urbanisation and challenges faced by urban poor

Food Security is one of the significant challenges in India today. The country's food security programme includes Public Distribution System, which has prioritised access to food but is not sensitive to nutrition security. The attention is given to staples like wheat and rice whereas pulses production is declining. The changes in the availability and the intake of the cereal and pulse have serious implications for the nutrition security of the country. In the context of urban poor markets where PDS is the cheaper option for hunger, it only offers calories from staples, which keeps away from the diversified diet. Nutrition security has not been efficiently addressed which includes not just availability of food but also a nutritious food to maintain a healthy and active lifestyle. PDS scheme was launched to provide food grains to the poor. However, these schemes failed to reach the beneficiaries or primarily to the urban poor migrant population due to the exclusion criteria of unavailability of permanent residential proof.

Moreover, in a fast growing nation like India, formation of unplanned cities due to rapid urbanisation is also posing a severe threat to the food sufficiency of the poor. Migrants who seek their shelter in urban areas become more vulnerable as compared to their counterparts in rural areas. Due to tremendous opportunities in industrialised urban areas,

rapid rural-urban migration has led to stress on the socio-economic infrastructure in the cities. The inadequate living conditions in the urban slum may be seen because of inadequacy of planning. The slum and congested habitation have proved to cause epidemics and poses risks for health hazards including various infections. Frequent supply of unsafe and contaminated water poses the risk of severe health issues. Due to the unavailability of safe drinking water, the proper utilisation of food does not take place precisely in case of necessary nutrients. Water security is often overlooked despite of the abundant literature on its relation to health. Safe and clean water is still unavailable to the poor households. Therefore, healthy living conditions should be added as a new dimension to food security.

The environment in which the urban poor live not only hinders the capability of achieving food sufficiency and but also affects health in multiple ways. Pull factors due to cities mainly include the new and better opportunities for livelihood in both organized (public and private) and unorganized sectors. However, the poverty estimates have declined in both urban and rural areas. If the trends are observed to compare urban versus rural poverty in the National Family Health Surveys in last two decades. The disparity in the reduction of the poverty is seen. Despite the significant reduction in the rural poverty, urban poverty has been static and it poses a severe implication on the overall health. Lack of housing, social problems and high level of morbidity are the major issues among the urban poor (Deaton, 2003) (Chattopadhydy & Guruswamy, 2011). The lack of infrastructure, services and employment opportunities under informal sector makes their life challenging. The literature reviewed identifies the income and expenditure related inequalities within the urban areas.

Additionally, the final report and recommendation of technical resource group for National Urban Health Mission points out the uncertainties in employment. It makes urban poor vulnerable to economic shocks, which lead to the unaffordability of proper housing and stay in unhygienic living condition (Khanna, 2014). This further affects the ability to fulfill basic needs of shelter and security, food and water, thus their expenditure entails basic survival needs and hence defensive expenditure. Urban poor dwellers resort to Informal survivalism to combat their livelihood issues. The poor may have to pay for

essential amenities such as subsidized food, water and toilets that may otherwise be widely available and affordable for the urban non-poor through public systems such as PDS. Due to migration from different region the slum located in the cities, the inhabitants are from different religion, language and caste. In the presence of such mixed slum communities, the urban social networks are perceived as unreliable due to lack of social supports unlike the rural areas that are believed to have more dependable social networks (Khanna, 2014). The mechanisms that lead to the instability of the food supply are significant. Only a few literatures mentioned these mechanisms on how to address the challenges faced by the slum dwellers in achieving food security.

People who migrate to the urban environment in search of their livelihood are usually unaware of the repercussions. They do not adjust well to the sudden change in the cultural, social and political environment. They are usually unaware of the difficult situations of living in an unfamiliar urban environment as compared to the familiarity of their niches in the rural setting. They have to be entirely dependent on the food purchase instead their produce, which exposes them to a huge variety of street food and cheaper packaged food option available in the nearby local market. The small grocery shops in the slums usually offer them limited healthy choices. In search of livelihood in the urban settings, they are compelled to stay in slum dwellings. They often seen repaying their credits to meet household needs and sacrifice food for acquiring materialistic possessions to imitate the living standard in urban setting. The survival needs of getting desirable work opportunities and other physical amenities including health and education in urban areas pull them to shift from rural areas. Their perception is repudiated as they fail to achieve the minimum living due to the pressing expenditure for their survival, as their income do not meet their basic needs of food and shelter. They have to struggle for social adjustment, which affects their wellbeing. Slum dwellers make efforts to cope with norms, quality and demands to be accepted.

Food insecurity in the household affects disproportionately. The elders in the family protect the children from the ramifications of the food insecurity until the situation is dreadful. In such cases the role of women gains importance to channelize the resources to fulfil the hunger of every member of the family. The literature reviewed also states the

women centrality to the preparation, distribution, and production of food not only in the family but also in agricultural sector. They perform the role of managers while being the sufferers at various fronts. Therefore, the adult woman is seen as the best source to study the household food security situations. The prevalence of undernutrition and over nutrition among women and men ranges widely. The disaggregated data on the women malnutrition involving chronic energy and micronutrient deficiency is well documented in NFHS 3 data, which shows more than one-third of women suffer from CED, around twenty-four percent are overweight and obese. Chronic energy deficiency is presumed to be the dominant form of malnutrition in rural India. Opposite to this is the increasing prevalence of overweight and obesity, which is gradually emerging as a problem of urban India. Table 2.6 shows the level of malnutrition. But the challenges faced by women are rarely explored. The poor nutritional status of women gives a clear picture of the biased norms they experience in society. At present such understanding is insufficient, there are only fewer Indian studies which are either based on computing the prevalence of household food security of urban poor or based on the food consumption pattern. In an Indian context, only few studies are focused on the interlinkages between nutritional status of women and household food security. Therefore, to look for the relationship between the two, food insecurity is assessed through Household Food Security Scale and nutrition insecurity assessed through a diet survey and anthropometric assessment.

3.2.2 Women as a provider

Accessibility and affordability of nutritious food and the food habits in particular region can also be attributed their nutritional status, which need to be studied further. The study focuses around the given food environment in which women are seen as providers to nurture the family. Their nutritional status is of utmost importance. The drivers of food sufficiency or rather health goes beyond the individual level. There are many factors which lead to the insufficient access or insufficient availability of food by household and individuals i.e, socio-economic and political environment, trade, lack of control over natural resources, poor human resource, gender, education, health condition, natural disasters and governance (Mwaniki, 2006). If one has to assess health of women, the person-in-environment approach need to adhere to have a comprehensive view including gender-specific, political and socio-economic factors. Hence, the study aims to have a

holistic view by addressing these aspects in achieving nutrient sufficiency and thereby looking at the nutritional status of women. Furthermore, the study aims to explore the factors affecting the diet in terms of adequacy and diversity in a holistic manner. The study also highlights the factor affecting the food choices among women in urban slum households.

It has been observed during the socialization process, the consumption of protective foods is linked to the socio-economic status of the household. Increased consumption of high protein diet has been recorded along with the increase in the family income in the developed countries (Belk, 2000 as cited in Puoane et al., 2006). It is important to note that the increase in socio economic status may not ensure the diet quality or diversity. Due to migration of rural people into the city, the traditional eating habits of the people shift to cheaper food options that are widely available on the streets. The healthier options which were affordable in their niches seem to be expensive due to high cost of living. Therefore, they try to emulate the eating patterns followed by rich which is high in fat and low in carbohydrate (Bourne et al., 1996 as cited in Puoane et al., 2006). The study explored the mechanism adopted by the poor to adjust with the changes in their food environment.

3.2.3 Increased accessibility of cheap and unhealthy food items

The increased availability of a wide spectrum of food items also seems to influence the consumption pattern. The food spectrum includes: i. *Junk food* - ultraprocessed foods, ii. *Ready to use foods* - pre-packaged meals, processed complementary foods, iii. *Processed foods* - fortified foods and mineral water and iv. *Nutraceutical supplement* (Prasad, 2018). Packaged food does not require cooking and have limited shelf life. It includes items such as biscuits, soft drinks, chips and may at times include cooked meals as well. ‘Convenient food’ or ‘tertiary processed food’ includes packaged as well as the commercially prepared items which are often made through processing to optimise ease of consumption. Such food is usually ready to eat without further preparation. Convenient foods include ready to eat, bread, cheese, salted snacks, cake mix, etc. and companies like PepsiCo and Nestle have a significant contribution to this food spectrum. In his work on the role of food systems in South Africa, Sanders cited a press released by Nestle in 2008,

“Popularly positioned products (PPPs) aimed at lower income consumers in the developing world, will continue to grow strongly in 2008 and beyond. Nestlé PPPs, which mostly consist of dairy products, Nescafe and Maggi culinary products, grew by over 25% to reach around CHF 6 billion in sales in 2007. The overall market for such products in Asia, Africa and Latin America is estimated at over CHF 80 billion.” (Sanders, 2017).

3.2.4 Nutrition transition causing double burden of malnutrition

On one hand, there is unaffordable food and undernutrition among women, simultaneously on the other, there is a rising trend of obesity in urban poor women. Lower socio economic population is also experiencing an epidemiological and nutrition transition where the transmission of knowledge and norms from developed countries that had already experienced this, is shifting to less developed countries. Obesity is not just limited to higher socioeconomic group but is also present in the lower socio-economic groups. With the huge assess of cheap packaged food in urban poor markets, a swift transition in nutritional, socio-economic and overall demographic profile is observed. Simultaneous occurrence of over nutrition and undernutrition among the women is on the rise in developing countries. The dual construction of severity is transpiring into public health concerns especially among the poor population. To contribute to this severity, the present study seeks answers to the missing link that causes obesity due to food insufficiency.

The reviewed literature in the Indian context is also silent on the linkages between the poverty and obesity. The paradox of the occurrence of over and undernutrition revolves around the ability to spend for nutritive and healthy diet. Lack of purchasing power or inability to buy the nutrient dense food and over-consumption of cheap calorie sources may be seen as one of the reasons for the obesity in lower socioeconomic groups. Studies are conducted to examine the relationship between the price of food and its energy density. The choices are made by cost, convenience, taste and lesser extent to nutritive component and variety. Cost stands out the single most important factor especially among poor households, therefore the socio-economic status is directly linked to the food choices made. High energy density food items including fat, sugars and refine grains

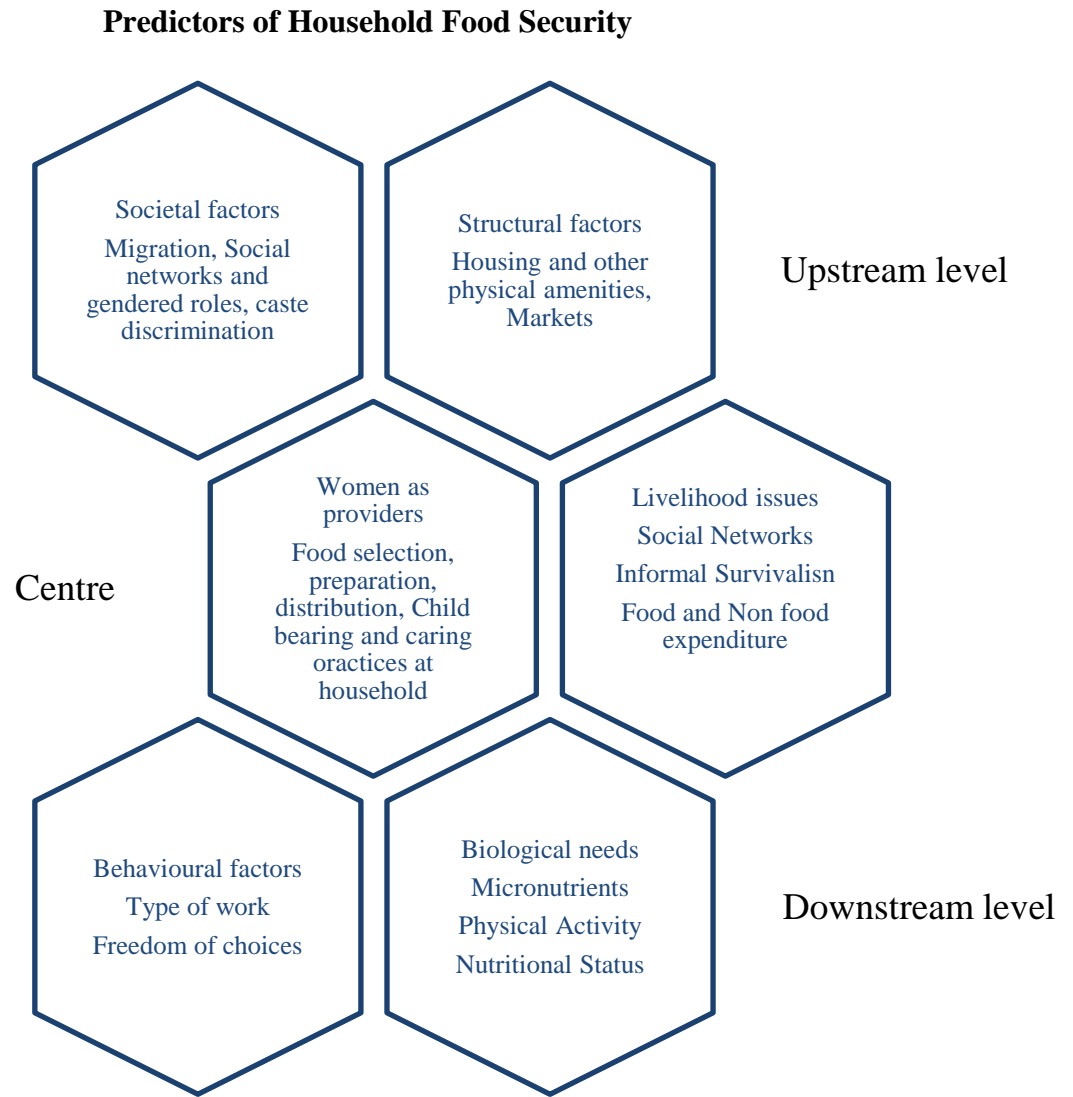
come cheaper, highly palatable and convenient as compared to the low-density energy food items. The food items which are low on energy are also more nutrient dense. These include fresh vegetables, fruits and fish which is costly and unaffordable to the poor (Drewnowski and Darmon, 2005). Inductive approach has been adopted by the researcher to make a framework, which was built with the help of available literature in the early phase of the study (table 3.1) The study is done while keeping centrality of women to food security, nutrition and their livelihood issues. The role of women should be seen in the ambit of their biological, behavioural, societal, and structural factors related to household food security. The three different levels are categorised on the basis of macro to micro view of the determinants of household food security.

Table 3.1 Data Sources for conceptual framework

Factors affecting Household food security		Data Sources
Societal factors	Migration, Social networks	(Corvalan, Cox and Osorio, 2017),(Khanna, 2014), (Morrison, 2012), (Bowling, 2001)
Structural factors	Housing and other physical amenities and markets	(Agrawal <i>et al.</i> , 2013), (Chattopadhyay <i>et al.</i> , 2011), (Dasgupta <i>et al.</i> , 2010), (National Capital Region Planning Board, 2008), Ministry of housing and urban poverty alleviation(2010),(Deaton, 2003), (Maxwell <i>et al.</i> , 2000), (Krieger and Higgins, 2002), (Billings and Howard, 1998), (Rana, 1999), (Ruel <i>et al.</i> , 1998),
Women as providers	Food selection, preparation and distribution.	(Komatsu, Malapit and Theis, 2018), (Prabhat and Begum, 2012) (Desai and Thakkar, 2001), (Shramshakti, 1988), (Doss, 1996).
Livelihood Issues	Informal Survivalism. Food and Non food Expenditure	(Khanna, 2014), Planning Commission, GoI(2011-12), (NSSO, Ministry of Statistics & Programme Implementation, 2009)
Behavioural factors	Type of work and freedom of choices	(Singh S <i>et al.</i> , 2014)(Prabhat and Begum, 2012), (Puoane <i>et al.</i> , 2006), (Yen and Kaplan, 1999), (Sagar, 1994),
Biological needs	Micronutrients, physical activity and nutritional status	(Varadharajan k <i>et al.</i> , 2013),(Recommended Dietary Allowances, ICMR, 2010). (Qadeer & Priyadarshi, 2005), (Osei A <i>et al.</i> , 2010), (NFHS 1998-99,2004-05,2015-16).

Figure 3.1

Diagrammatic representation of the conceptual framework



3.3 Rationale of the study

This research primarily begins with the identification of the unaddressed drivers of food insufficiency in urban poor context. It involves the understanding of these issues with the application of rigorous research methods. The present study not only accounts for the conventional thinking of focusing on food unavailability but also on the various drivers that foster food sufficiency. Besides using the standard measure of household food security, it also involves the assessment of the nutritional aspects of the food security.

The extensive nature of the various instruments used makes it a unique and a comprehensive study.

This research is based on the issues of food insufficiency in the context of urban poor. It involves the mixed methods approach with the usage of various instruments. Complex factors which influence the food consumption in urban poor are investigated in an holistic framework. The study encompasses the social environment in which person variables are accounted to improve the accuracy of the behaviours and the observations. However, the same results can't be achieved if the research is based on the behaviour of human beings in specific time, place and with different sample. This research is based on the value critical system based approach which addresses the dynamic interaction between the each phase of research and as whole (Ratcliffe and Gonzalez-Del-Valle, 1988). Each phase of the study is inter-related to each other where the quantitative findings in the first phase are well understood only after the detailed study of the dynamics of the two slums. To understand the processes, various characteristics of the two slums are studied on the basis of contextual, compositional, and collective factors in the second phase, that is represented in qualitative section (Macintyre, Ellaway and Cummins, 2002).

This study is significant due to its nutritional point of view. The household food insecurity is compared with the nutritional status of women. It is not only looking for the amount of calories consumed but also the dietary diversification with the help of Food Consumption Score (FCS).

There is a lacuna in the existing literature on women issues related to their food sufficiency and nutritional status. There is a need to understand how the gendered factors such as power and resources acquisition play a role in broader context of Indian society. Despite abundant literature being available on the food security discourse, there is little evidence-based and mixed method research addressing the political, cultural and socio-economic factors that lead to gender inequalities in access to food. Therefore, adult women from two different slums were selected as the study participants within the age group of 15 to 49 years. They are the one who are fully aware of the household food insecurity conditions. Based on above vital points, primary research questions have been framed. The study has also explored the factors governing women food consumption in

slums. It also states the prevalence of double burden of malnutrition which coexists along with the food insufficiency. The study further dwells on the coping mechanisms adapted by women dealing with the food insecurity.

3.4 Research Methodology

3.4.1. Research Questions

The problem is defined keeping in mind the various factors that are highlighted in the previous section. The study aims to examine the determinants of household food security, which involve the interplay of elements to food insecurity concerning dynamics of food purchasing power, income expenditure, cultural, socio-economical and livelihood conditions among the urban poor women. It also explores the factors governing the actual consumption of food and not only its physical and economic availability.

The adult woman from each household was selected as the study participant within the age group of 15 to 49 years irrespective of their marital status (married, unmarried, divorced or widowed). Based on the above key points, primary research questions have been framed as below:

1. What are the determinants of household food security?
 - a. What are the challenges faced by women in acquiring household food security?
2. How are these determinants interconnected and influencing each other?
3. What are the interlinkages amongst the food secure households in relation to nutritional security?
 - a. Do women suffer from acute/chronic food insecurity in slum areas?
 - b. Does food insufficiency and obesity co-exist ?
 - c. Are there any linkages between food scarcity and obesity?
4. What are the factors that govern consumption patterns of women within the selected slums?
 - a. How migration affects the nutritional status and overall well-being of the women?

5. How the location of a slum affects the employment opportunities, market accessibility and food/non-food expenditure of the households?
6. Is there any homogeneity in experiences of food availability throughout the years among the households?
7. What are the coping strategies adopted by households to attain food security?
 - a. Are these strategies same for all the households?

3.4.2 Objectives

Broad objective:

- To study the determinants of Household Food Security and their impact on the nutritional status of women in the slums of Ghaziabad city

Specific objectives:

1. To assess the nutritional status of women relative to their dietary intake, physical activities, anthropometric measurements and household food secure/insecure conditions
2. To study the pattern of food consumption, quality and diversity amongst women in the selected households in slums of Ghaziabad
3. To study the influence of spatial differences vis a vis the two slums on food and non-food expenditure of the selected urban poor households

3.5.1 Mixed Methods

The study has adapted the mixed methods approach using sequential Dominant-Less Dominant design²(QUANT →qual). In this method, the quantitative approach precedes the qualitative approach in understanding the phenomena. This approach helped in data corroboration and made the study comprehensive. The present study is an example of an explanatory sequential analysis in which qualitative data is used to explain patterns observed in a quantitative dataset (Guest et al. 2008).

² It refers to the predominant quantitative study followed by the qualitative study. The uppercase represent the dominant role and lower case means the less dominant method in the study. The arrow denotes the method occur in sequence.

The only limitation for such an approach is that it might not guarantee a successful evaluation due to its subjectivity. However, it enhances the depth and relevance of the findings of the study. (Padgett, 2012, pp 48-52).

In this study, both quantitative and qualitative methods were adopted at different stages of research process. Byrne (1998) and Ragin (1997), as cited in Olsen (2008) argue that one should not only look at the cases but also the histories and their contexts, like for household, their culture and cities should be studied rather than just making a universalistic statement of the phenomena. Likewise in the present study , household is contextualised as a single unit from the perspective of its history and socio-cultural entity. It would dwell on the topic of enquiry in great depth with wide range of data (Sayer (1992), as cited in Olsen (2008).

The quantitative data collected narrowed down the research to the numerical data and its analysis. It is based on the measurement of quantity. The interest revolves around to find out the association between the two or more different nature of variables(an independent variable versus a dependent or outcome variable). In the present study , the quantitative data gathered helped to understand the contextual and compositional factors involving community characteristics, type of employment, household food security status, physical activity level and dietary intake. These data were substantiated and corroborated by the qualitative data by providing the indepth understanding and narratives of the participants. It also brought out the interlinkages of the existence of obesity amongst food insecure households. Since, qualitative data essentially collects diverse experiences and views for better understanding of the subject of enquiry of a study (Puoane et al., 2006), in this study also, it helped in capturing the narratives of the genesis of the slum , diversified experiences and perception of the women on transition of food consumption pattern, their coping strategies and intra-household food dynamics.

Research based on the consumption, eating habits and unpaid care work of women has proved to be a rich ground for mixed methods. The consumption habits are either determined by assets one may acquire, or by displaying expenditure to show their social status that is well discussed in literature. (Edgell et al 1996 & Warde 1999 as cited in Olsen, 2008). Further, mixed method approach helps in easy and organised integration

of both qualitative and quantitative forms of evidence (Dixon-Woods et al., 2004). Wright, 1995 cited in (Punnett and Shenkar, 2004,pp 49-52) states that “By combining qualitative methods to quantitative methods, the resulting research will be much more meaningful and will have a greater probability of being valid, of actually measuring what it purports to measure”.

This study involves the realist approach with retrodution, which implies finding out what might have caused the observation in the previously obtained data. The quantitative data is also triangulated with the help of the qualitative data. With the use of mixed methods, the study addresses the political, cultural and socio-economic factors which leads to gender inequalities in access to food.

3.5.2 Cross-Sectional Design

The study was designed to gain in depth understanding of the predictors of household food security which needs a flexible approach by using inductive over the deductive method. In order to achieve this, descriptive research is done to address the complexity of the issues. Descriptive research methodology is mainly concerned with the nature and degree of existing situations or conditions. It is mostly a fact-finding approach related mainly to the present and abstracting generalisation by the cross-sectional study of current situation. It collects data or information based on empirical observation and research. The undertaken descriptive research aims to portray accurately the characteristics of the two selected slums to understand the influencing factors in household food security.

Various predictors of food insufficiency are studied while focusing on the livelihood issues. Studying on livelihood issues brings out the circumstances in which there is lack of freedom of choices. The primary focus is on the withdrawal of the boundaries of the environment, in which the problems, opportunities and situation are likely to stay (Webb, 1994). As part of the research, the women who are involved in cooking and are aware of the household food security situation were interviewed by the researcher while doing household primary survey. The review of literature, discussion with experts, prior interviews with the female households and the experience gained by the researcher

helped to develop the interview schedule. It helped to understand the issues related to the food insecurity.

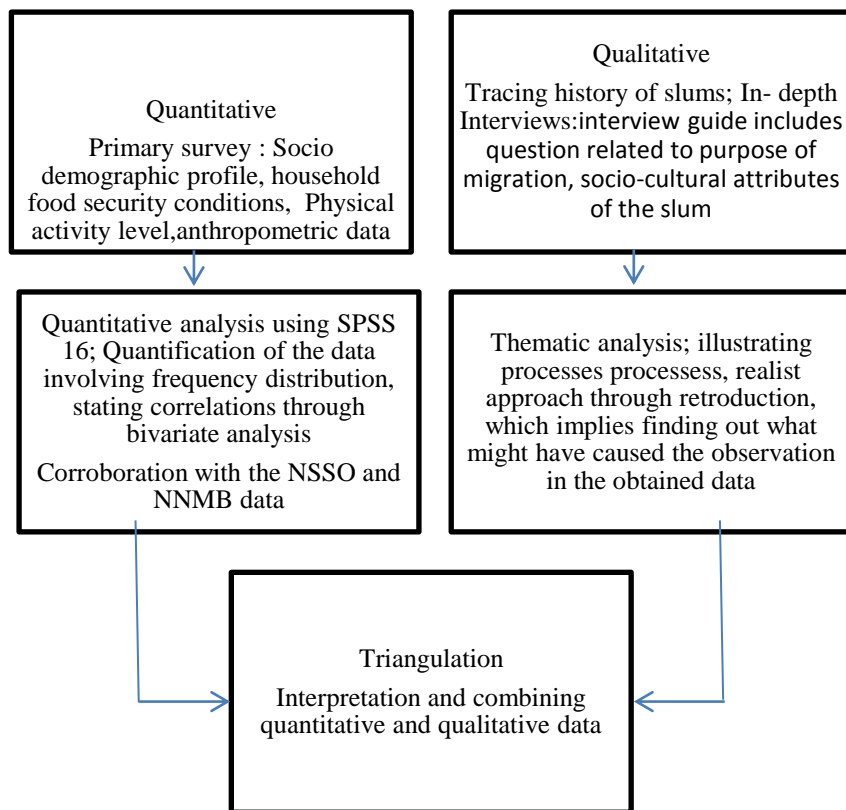
The study is cross sectional due to the nature of the investigation. The major proportion of the data collection is based on the empirical evidences and the data was collected at a particular point of time. The study is descriptive as it discusses the characteristics of the selected communities and infers the eventual causes of the studied phenomenon. The physical features of the two selected communities and processes of livelihood are considered to influence the food and non food expenditure, nutritional status and thus household food security.

3.5.3 Triangulation

This is mixed method approach which involves triangulation. It not only used to validate data but also used to broaden one's understanding. This method supports interdisciplinary research rather than being bounded to one discipline. It includes diverse viewpoints and provides clarity to a given topic. The usage of primary survey data along with indepth interviews made this process profound. The study involves the integration of qualitative insights with the interpretation of the quantitative survey data.

Figure 3.2

Mixed method approach



3.6 Study Area Profile

The locale of the study were the two identified slums in Ghaziabad of Uttar Pradesh. Though the issue of urbanisation and huge influx of migrants is not new but in case of Ghaziabad, its impact on food security challenges is unexplored. Moreover, the researcher belongs to Ghaziabad and was aware of the socio-economic and political situation of the district.

Ghaziabad is situated about 2.5 Km. away from the Hindon River. It is bordered with the district of Meerut on north, Bulandshahar on the south and on the south-west by Delhi and the East by the district Hapur. Owing to its location, adjacent to the National capital,

Delhi, over the years, Ghaziabad city has experienced rapid development and urbanisation. The main economy of Ghaziabad is industry and agriculture. Among the important crops produced are sugarcane, cereals, pulses, and oil-seeds. Ghaziabad is primarily an industrial city where women in slums are mostly engaged in cottage industries, such as silk and handloom weaving and also engaged as agricultural labourers. Ghaziabad is the most polluted city and one of the oldest industrial belts in the NCR region, Ghaziabad houses 356 polluting units according to official records (Abraham, 2018). As per the census 2011, Ghaziabad is the 9th largest urban agglomeration in India where people search for better housing options matching their budgets and living standards. Due to its easy connectivity to national capital, it has attracted large number of people from rural areas. Ghaziabad is one among the top ten districts (Northern Uttar Pradesh) which is responsible for highest out-migrants to Delhi (National Capital Region Planning Board, 2008).

In every District town, there is office of District Urban Development Authority (DUDA) under the District Magistrate, where slum are identified and schemes are prepared by norms and standard given for development. Ghaziabad District Slum Population is shown in table 3.2. The study is focused on the determinants of Household Food Security in an urban slums. To serve this purpose a sample frame of two slums is chosen. Following procedure is being adapted for sampling.

Table 3.2

Ghaziabad: Total slum and City Population

Total number of Slums	79
Total City Population	16,36,068
Total Slum Population	4,08,448

Source: State Urban Development Authority (2014)

3.6.1 Selection of slums

A list of 79 notified slums from the GDA for the DUDA area of Ghaziabad as on 2014 was collected by the researcher. Out of 79, two notified slums namely Deendayalpur and Bhuapur were selected for the present study. These two slums were selected purposively to understand the area effects considering their size, location, and the nature of occupation of the women.

3.6.1 a) Deendayalpur, Nandgram

Deendayalpur, Nandgram was one the slum selected for the present study. It was selected as it is a notified and relocated colony. It was selected as the demographic profile and house-list of this slum was easily accessible and available to the researcher as it is part of the re-development under Rajiv Avas Yojna in the year 2013. Moreover, it was selected considering it being the largest slum out of the 79 listed slums. This helped in capturing a wider dimension and heterogeneity in the issues faced by its populace in terms of lack of basic structural facilities like roads, waste disposal, proper sewerage system and drinking water supply. Also due to its geographical position in the heart of the city and the growing of locality in and around the slum, the women of this particular slum have greater access to a wide citywide network providing greater job opportunities.

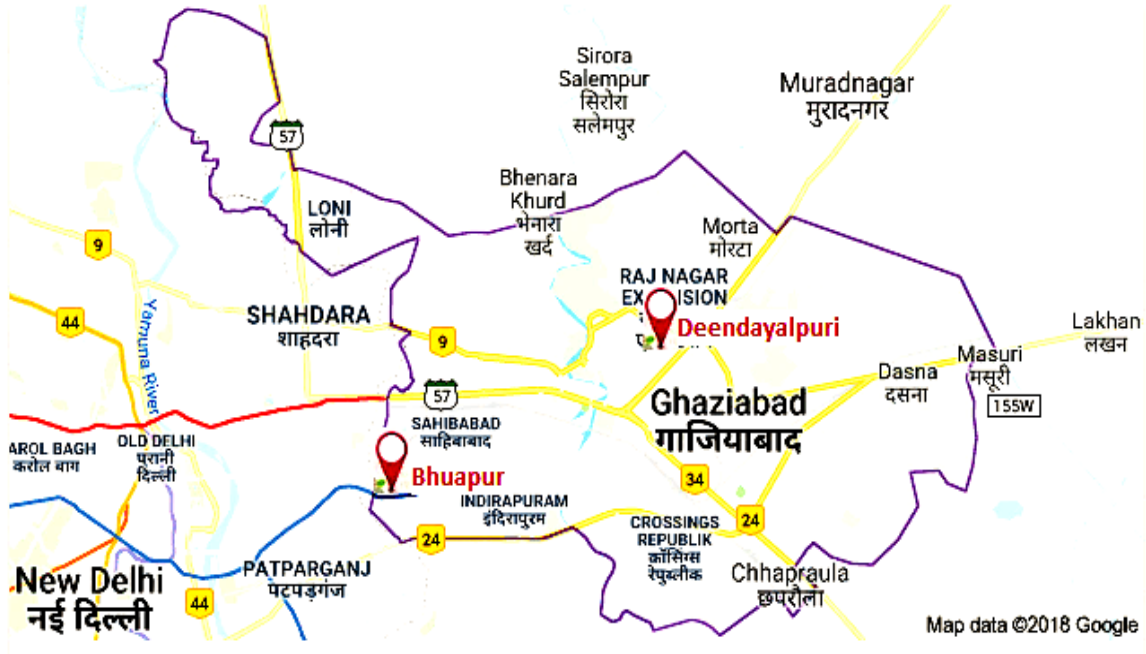
3.6.1 b) Bhuapur, Kaushambi

Bhuapur was selected as it is a notified colony and located at the out-skirts of the Ghaziabad city. Also, the chances of inter-state migrants population can be captured as it is located at Delhi and Uttar Pradesh border which helped in capturing the heterogeneity in population. As shared by PHIA, local NGO working in the area, women of this particular slum are engaged more in the informal sector such as small business like bindi and envelope making unlike other slums due to its location at the out-skirts. (Phia foundation, *Annual report, 2015*)

Therefore one slum was selected on the outskirts and the other was selected in the city. The differences in contextual, collective factors and consumption pattern were studied. To explore various interlinked factors, the study mainly involved two slums namely Deendayalpur, Nandgram and Bhuapur situated on the outskirts of Ghaziabad.

Figure 3.3

Location Map for the selected slums in Ghaziabad



3.6.2 Selection of the Households

Table 3.3

Sample Size Calculation

Selected Slums	No. of households as per the Slum population(SUDA)	Sample size taken from both the slum
Deendayalपुरी	2723	$2723/4123*100=66 \sim 65$
Bhuapur	1400	$1400/4123*100=33.9 \sim 35$
No. of households	4123	114

Due to extensive nature of the instrument to be applied to the collection of field data and with limited time to ensure maximum coverage of the field reality, a sample size of 114 households has been systematically chosen from the field area in the first phase(table 3.3). Keeping these vital facts under consideration, the sample size has been considered adequate for the study.

3.7 Sampling

The sample size represents the entire population. It is a unit in which the group of people is selected to provide information to the researcher. In this study, the data collected comprises of various quantitative tools. The total number of selected sample households was chosen proportionate to the population of the two slums. It has been suggested that household food insecurity is best recorded in adult women as young children are protected from the consequences of household food insecurity during scarcity. The importance of considering women as an active participant in achieving the food sufficiency has been put forward by several researchers (Olson, 1999) (Townsend et al., 2001)(Nord and Bickel, 1995)(Adams et al., 2003). Therefore, selecting an adult woman per household seemed appropriate.

3.7.1 Selection of the Participants

3.7.1 a) Quantitative sampling

One woman from each of the 114 selected households between the age of 15 to 49 years was selected in the present study irrespective of their marital status (Married, unmarried, divorced or widowed) (table 3.2). Their enormous contribution in achieving the food sufficiency of the household is of greater significance. They are the food producers, processors, distributors, feeders and child bearers.

3.7.1 b) Qualitative sampling

The second phase of data collection was carried out with two categories of participants (table 3.4), one involving the key informants (community elders) and another group was women from the selected households. Convenient sampling was used to select the respondents.

Five community elders were selected as key informants. They were selected due to their long duration of stay in the slum. It was known that these elders have been residing in those slums for about 25 years.

22 in-depth interviews were conducted with selected women using two interview guide, one for key informants asking history and evolution of the slum and one for women from the slum seeking information regarding their struggle and hardship to remain food secure. The first interview guide for community elders mainly includes question-related to purpose of migration, socio-cultural attributes of the slum and existence of SHG'S and political representatives. The second interview guide for women was mainly focused on triggers of food hardship including, coping strategies, intrahousehold food dynamics, transition in food consumption pattern, work performed by women and their eating habits. The purpose of this qualitative part of study was to provide essential insights into the struggle of the slum dwellers faced while purchasing food during a shortfall in resources.

Table 3.4**Selection of Participants**

	Deendayalpuri	Bhuapur
1) First phase (Quantitative) Total no. of household(n=114)	73	41
Tools administered	Semi structured Interview Schedule USDA household food security scale Modified Standard of living Index	
No of women participants	73	41
Tools administered	Dietary Assessment Anthropometry Food Consumption Score Satyanarayana method	
2) Second phase (Qualitative) Total no of participants(n=27)		
Tool administered	Two separate Interview guide for In-depth Interviews for women and elderly	
Key Informants (Elderly)	3	2
Women participants	9	13

Table 3.5

Process of Data Collection

First phase of Data collection	Second Phase of Data Collection
<ul style="list-style-type: none"> • Semi-Structured Interview schedule: Information was gathered on socioeconomic and demographic profile of the selected urban slum households (N=114). • 24-hour dietary recall and Food Consumption Score method • Anthropometric measurements • Satyanarayana method for measuring energy expenditure • U.S. Household Food Security Survey Module: Six-Item Short Form Economic Research Service, USDA(2012) • Modified Standard of Living Index is adapted from District Household level Survey and Macro 2006 	<ul style="list-style-type: none"> • In-depth interviews were conducted using two different interview guidelines for community elders and women(n=27) • Community elders; capturing history of vulnerability and evolution of the slum. The interview guide includes question related to purpose of migration, socio-cultural attributes of the slum and existence of SHG’S and political representatives. • Women; seeking information regarding their struggle and hardship to remain food secure. It focused on triggers of food hardships including, coping strategies, intrahousehold food dynamics, transition in food consumption pattern and type of work performed by them.

3.7.1 c) Time Frame

The data collection took a total period of five months in two seasons. In January –March 2016(winter season), a detailed household (HH) and dietary survey was conducted in Deendayal puri slum. This was supplemented with a 24 dietary recall (DR) on three consecutive days of one woman of reproductive age (18-59 years) per household. The same procedure was followed in Bhuapur slum in May-June 2016(summer season). It included the interview of the individuals in the community and observation is also a major part of this study. Few In-depth Interviews were also conducted in December 2017 to supplement the data obtained in the first phase (table 3.3).

A mixed method is adapted for data collection. Separate tools were administered for collection of quantitative and qualitative data of the study. The data was collected through primary and secondary sources. As shown in table 3.5, the primary data was collected through field survey (quantitative) and in depth interviews (qualitative), whereas secondary data is collected through official records from the concerned departments. The study is supported through interviewing key respondents to gain information on behaviour, attitudes and responses adopted by the slum dwellers on food insecurity.

3.8 Data Sources and Research Tools

The researcher under this study collected both primary as well as secondary data.

Primary data was collected through the semi-structured interview schedule, various indices including household food security, standard of living index and anthropometric measurements. One interview guide was also prepared to carry out indepth interview which included the qualitative enquiries.

Secondary source of data involed the government reports like NFHS, NSSO and NNMB data. Various libraries were also visited including Nutrition foundation of India, Institute of Home economics and Lady Irwin College. Literature from journals, books and newspapers is deeply studied that is based on the food security discourse.

3.8.1 Tools of Data collection

Eight different sets of tools were administered to collect data at the household level. The various research instruments were used for the study which includes principle nutrition research methods, standard tools or scale for measurement and are enlisted as follows (Appendix):

- 3.8.1 a) Semi-Structured Interview schedule
- 3.8.2 b) Dietary Assesment: 24-hour dietary recall and Food Frequency Questionnaire
- 3.8.1 c) Anthropometric measurements precisely height and weight to calculate BMI
- 3.8.2 d) Food Consumption Score
- 3.8.3 e) Satyanarayana method for measuring energy expenditure
- 3.8.4 f) Household Food Security Survey Module: Six-Item Short Form Economic Research Service, USDA(2012)
- 3.8.5 g) Modified Standard of Living Index (International Institute of Population Sciences and ORC Macro, 2002-04)
- 3.8.6 h) Interview guides for In-dept Interviews

3.8.1 a) Semi-Structured Interview schedule

The questions were presented to the respondents in a face to-face as oral-verbal stimuli and the researcher note down their oral-verbal responses. In these methods, the data are collected by presenting stimuli to the respondents in the form of questions for eliciting response. Schedule is an instrument which is used by interviewer and filled by him in face to face situation with the respondent.

A pretested semi-structured interview scheduled was formulated to gather information in the on demographic & baseline information includes type, size and family composition, educational qualification, food habits, participation of women in economic activities, electricity sources of water and toilet facilities. It also included the component of the food consumption and expenditure in an urban households (n=114).

2. Dietary Assesment: Information on the food preparations consumed during previous 24 hours and ingredients used were obtained from the respondents and these were then translated into raw weights. On the basis of raw amounts, daily intake of foods from

various food groups such as cereals, pulses, green leafy vegetables, roots and tubers, vegetables, fruits, flesh foods, , fats and oils and sugar by each respondent's family are determined. The nutritive values is further calculated by *Diet cal software*³.

3.8.1 b) 24 Dietary Recall method

This method was adopted due to the lack of variation in day to day diet. It is easy and quick to administer, less expensive regarding time and equipment required. This technique is useful for covering a large sample size and illiterate subjects.

24 hour recall was used as a method for conducting dietary survey of women. It is a recollective technique where the interviewer question the respondents to name along with approximate amounts the food items eaten during the previous day at each meal and between meals. Quantities are stated in household are usually in units such as a glass of milk, two slices of bread,. The steps involved are; a)The female head or the one who serve or invariably cooks and serves food to the family members is asked about the types of food preparation made at breakfast, lunch, afternoon tea time and dinner. b) An account of the raw ingredients used for each of the preparation is obtained. c) Information on the total cooked amount of each preparation is noted regarding standard cups. d) For Packaged food items, the ingredients were seen and noted as per the serving size and consumption by the respondents. The list of packaged food were added in the 'Dietcal software' to achieve highest precision.

A three day 24 dietary recall was administered for one woman per household. Selected women were asked to remember their food intake in detail during the past 24 hours. Women were asked to recall each meal and explain the food items consumed with ingredients used, method of preparation based on the recipe. A food recall package was also used to substantiate the portion sizes that included standard utensils, measuring cups, spoons, glasses. Standardisation for household measure such as bowl, glasses and plates was done by using weighing scale.

³ The nutrient intake data from the dietary recall method was entered into the validated software 'Dietcal' version 3.0(Profound Tech Solution;<http://dietcal.in/>), DietCal is a tool for dietary assessment and planning and it is based on Indian Data (NIN, ICMR).

Food Frequency Questionnaire(FFQ): The respondents were asked to report the frequency of consumption. The respondents were also asked to report the frequency of consumption of various food items whether daily, once a week, once a fortnight, once a month, occasionally or never. This method is used to supplement the 24 hour diet recall which is considered as the gold standard. FFQ is a limited checklist of foods items with a frequency response segment for women to report how often each item was consumed over a specified period. Semi-quantitative FFQ used to collect portion size information as standardized portions or as a choice of portion sizes. It includes various advantages that is it indicate the usual intake and preferred for computing intake for nutrients with very high day-to-day variability. Processing this type of questionnaire is significantly less expensive than diet recalls. The limitations of this method and diet recalls is same that both are retrospective and relies upon the respondent's memory. It is less sensitive to measures of absolute intake for specific nutrients and arbitrary groupings of foods may not correspond to the perception of the respondent. The local favourite food items were included for the minority groups that are significant contributors of nutrients to prevent skewing of the data. The FFQ was modified as per the Indian population with special consideration on the food consumption pattern of an urban poor population

Nutrient adequacy ratio: Mean daily intake of these nutrient by the women were compared with their respective Recommended Dietary Allowance (2010) to calculate the Nutrient adequacy ratio (NAR). The adequacy of nutrient intake by each participant was computed in terms of the nutrient adequacy ratio (NAR) (Malhotra and Passi, 2007). NAR is calculated as women's nutrient intake per day/RDA of the respective nutrient. The nutrient intakes of women in the two clusters were then compared.

3.8.1 c) Anthropometric Measurements

Anthropometric measurements of individuals are used as simple indicators of nutritional status and predictors of subsequent ill health, functional impairment and mortality. Measurement of height and weight can be used as a direct measure of body composition and therefore as measures of nutritional status.

Height: A stature meter with a minimum count of 0.1 cm was used to measure the height of women. For measuring height, the respondent woman was made to stand straight after

removing the footwear and headwear on level ground against the wall where the stature meter is fixed. The subject knees were fully extended and the heels, calves, buttock, trunk and shoulder were made to touch the wall and head was made to point directly forward. The measure was then pulled down till the head of the standing subject and height was recorded.

Weight: Women were weighed by the use of the digital platform weighing machine with the minimum and maximum count of 0.5 kg and 130 kg respectively. For taking weight of the subjects, the weighing machine was placed on the level ground and adjusted to zero. The respondent woman with minimum of clothing was made to stand erect on the weighing machine and the weight was recorded to the nearest graduation when the subject was really and reasonably still and the needle was stationary (Jelliffe, 1966,pp 50-62).

Body Mass Index: Body mass index is also known as Quetelet index. Using the height and body weight measurements, the Body Mass Index was calculated using the formula. Body Mass Index (BMI) = Weight in kilogram/ (height in meter)²

3.8.1 d) Food Composition Score

The FCS is considered as a proxy indicator of current food security. FCS is a composite score based on dietary frequency, food frequency and relative nutrition importance of different food groups.

Dietary diversity included in the study is the number of individual foods or food groups consumed over the past seven days. *Food frequency* is the number of days (in the past seven days) that a household has consumed a specific food item. Household food consumption is the consumption pattern of households over the past seven days (FCS module, World Food Programme, 2008). Calculation of FCS is done using the following steps; a) Using standard seven day food frequency data, group all the food items into nine specific food groups. b) Sum all the consumption frequencies of food items of the same group, and recode the value of each group above seven as seven. c) value obtained was multiplied for each food group by its weight and create new weighted food group scores. d) Sum the weighed food group scores, thus, creating the food consumption score (FCS).

The most diversified and best consumption with maximal FCS at 112 means that all food groups are eaten seven days a week. e) Using the appropriate thresholds, the variable food consumption score was recorded, from a continuous variable to a categorical variable, to calculate the percentage of households of poor, borderline and acceptable food consumption.

The score for each food group is calculated by multiplying the number of days the commodity was consumed and its relative weight (FCS Module, World Food Programme, 2008).

3.8.1 e) Satyanarayana Method for calculating energy expenditure

This method has been devised by Satyanarayana (1989). In this method, variation due to body weight and intensity of physical activity is used for the estimation of energy expenditure of an individual. Using this method, the energy required for an entire day can be calculated using codes (1-9) also called as the Satyanarayana code. Energy cost of nine groups of activities (codes) has been included in this method.

3.8.1 f) USDA Household Food Security Scale

The HH food security was assessed using a six-item measuring scale comprising a subset of eighteen items. (Economic Research Service, USDA, 2012). The questions are based on the affordability of food. The sum of only positive responses to the six questions in the Household Food Security Scale-Short forms provided the households raw score on the scale. It differentiates three categories of food security. Food secure, Food insecure without hunger and Food insecure with hunger (Revised by USDA, 2012) (Economic Research Service, 2012). The questions were asked in Hindi and women participants were asked to share their experience of household food securing activities (Blumberg et al, 2007).

3.8.1 g) Standard of Living Index

The socio-economic status of households was assessed using modified District Level Household Survey Standard of Living Index (SLI) District Level Household Survey-2. The index was calculated by adding up the score, which are based upon the relative weight of ownership of the specific household assets. Resources listed in this module comprises facility availing water, types of house, electricity facilities, fuel for cooking,

toilet facilities and ownership of items: fan, radio/transistor, sewing machine, television, bicycle, motorcycle. The standard scale is modified with the exclusion of some resources which were found to be none existent in the urban poor environment (International Institute of Population Sciences and ORC Macro, 2002-04)

3.8.1 h) Interview Guide for In-depth Interviews

In-depth interviews were conducted to study and examine the history and development, community profile of the slum in general and gender gap in nutrition, challenges low-income families face and their coping strategies to remain food secure in specific. The qualitative approach helped in determining how low-income people perceive their food security situation based on their interpretations. This method also have enabled to collect diverse experiences and dynamics for the better understanding of the living conditions in slums.

It encompasses indepth interviews with a small number of respondents to explore their perspectives on a particular idea or situation. The purpose of key informant interviews was to collect information from community elders or residents who are living there since last thirty years. These elder members are selected because they have experienced the evolution of the community. These community elders, with their particular knowledge and understanding, could provide the history of slums, nature of problems and give recommendations and solutions. In-depth interviews were conducted using two interview guide one for key informants asking history and evolution of the slum and one for women from the slum seeking information regarding their struggle and hardship to remain food secure. The first interview guide mainly included the question related to purpose of migration, socio-cultural attributes of the slum and existence of SHGs and political representatives. The second interview guide for women was mainly focused on triggers of food hardship including, coping strategies, intrahousehold food dynamics, transition in food consumption pattern, work performed by women and their eating habits.

3.9 Analysis of the Data

The data was collected in two forms, in the first phase the data was recorded in the written forms and in the second phase in depth interviews were audio recorded in hindi. The analysis is divided into two parts:

3.9.1 Quantitative analysis

It involved analysis of the quantitative data by using statistical software (SPSS 16). The quantitative data was obtained in the primary survey. Frequency distribution, cross tabulation, bivariate analysis and odds ratio were obtained. The findings from the statistical analysis are presented in the form of tables and graphs. The monthly per capita expenditure and percentage share of food expenditure is shown by dividing the expenditures into deciles to identify the gradient in the expenditure pattern. The average monthly food and non-food expenditure is compared in the selected slums. The overall status of household food security conditions of both the slums is tabulated to look upon the real situation in terms of selected variables. The categorizations are being made on the basis of the Body Mass Index, physical activity, Food Consumption Score and Household food security status. To examine the relationships, cross tabulation is also done between the household food security condition and education, SLI, BMI, and type of work. These selected variables only show the temporal relationships and do not ensure the causal relationships. Stacked column graph is used to show the expenditure on various food groups, which highlights the food items contributing highest in expenditure. It also provides information on the affordability and frequency of consuming specific food groups. The nutritive intake profile of the two slums is also discussed by calculating average percent adequacy at the end.

3.9.2 Qualitative

After the quantitative analysis, thematic analysis was done for the qualitative data. The in depth interviews were recorded in hindi and transcribed with the verbatim in english. Codes were formed using open, axial and selective coding and then were subsequently organized into themes. Twenty-seven slum dwellers including key informants and women were interviewed in total. These interviews were elucidated based on the themes and sub-themes that emerged from the thematic analysis from their responses. Various themes were used to depict the critical issues; however the respondents divulged other useful voluntary information which explained the contextual aspects or the reason behind the given responses. The researcher has tried to represent the community attributes under four sections: 1) Housing and other Physical amenities (Contextual factors), 2) Economic and Industrial base (Compositional factors), 3) Social and cultural attributes of the

Neighborhood (Collective factors) and 4) Food and Non-food expenditure (Economic factors). The qualitative approach used in the study facilitated the researcher to establish the linkages between the opportunities available in the socio-physical environment and the outcomes of food security.

3.9.3 Triangulation

Triangulation approach is used to join the synthesis of qualitative and quantitative evidences. It mainly involves the integration of qualitative insights with the interpretation of the quantitative survey data.

3.10 Ethical Consideration

The deliberation of ethics in research is momentous (Padgett, 2012). It is crucial for this particular research which involves the interaction with active participants of the community. The research methods for gathering relevant data for the research include in-depth interviews, group discussions, oral histories, survey and observation of the participant behaviour. The approval was taken from Institutional Ethics Review Board at Jawaharlal Nehru University before data collection in the meeting held on dated Nov 24th 2015. The approval for ethical clearance was given on Jan 5th 2016.

The literate respondents were given an informed consent form for them to sign. The primary objective and purpose of the study was verbally explained to all respondents. A consent form was generated to take permission from each respondent participating in household level data collection. The respondents who were unable to read or write were asked for their thumb impressions on the consent form in the presence of a witness who was literate and an acquaintance to the respondent. The participants were ensured that the research is a part of the doctoral study and they were briefed on the purpose of the study and usage of data, followed by the signatures on the consent form. The participants consent for their participation and their identity was kept confidential.

In this study, data was collected through household based one to one interviews using a semi-structured interview schedule. Before the data collection, the research participants were well informed that their responses are significant only to the researcher's understanding of food insecurity among slum dwellers. It was informed that the study

does not authorise them to any financial grant. The slum comprises the lower socioeconomic group which is highly vulnerable. The data collection included the discussion on food consumption, income & food expenditure which is sensitive topic; therefore it was kept in mind to not hurt any sentiment of the participants. The interviews were conducted in the afternoon as women were usually free to talk during this time. In fewer cases, male members of the households were also not giving consent to their wives to interact. In such cases, taking consent from the women participants was the tedious part of the study. However, only the willing participants were enrolled as the subjects in the study. During data collection, the possibilities were open for inclusion and exclusion of subjects for the study.

Wherever the human participants are involved in the research, the participants, their opinions and interactions may adversely harm them in some unintended way. It is the responsibility of the researcher that such possibility should be removed. The participants need to be ensured that their participation does not cause any psychological, financial and social harm. Socially responsible research implies taking the larger structural context into consideration and needs holistic understanding while interpreting and understanding the data. The inclusion of broader socio-economic and cultural perspective of the community and people's life are equally important. The qualitative research does not mean to present a one-sided explanation but to present the complete portrayal of the research study.

3.11 Strengths and limitations of the study

The undertaken study was one of the fewer slum-based studies in assessing household food insecurity about the nutritional status of women. Although the study has some constraints that recommends its findings should be interpreted carefully.

There is evidence that HFSS can be used for close observation of food insecurity and can measure the energy deficiency accurately but it is not accurate for nutrient intake sufficiency(Dastgiri et al., 2007).Therefore, nutrition insecurity is assessed through a diet survey and nutritional status of women is also being assessed with the help of anthropometric measurement to look for an association with the perceived food insecurity. There are some constraints related to brevity, cost and respondent burden

related to anthropometrical assessment, 24 dietary recall, Household Food Security Scale and food frequency questionnaire. Being a trained nutritionist, it was easier for the researcher to collect data on dietary intake and anthropometric measurements. The study also encompasses place effects which entails influence of neighbourhood but it does not tell about the appropriate time interval between environmental exposures and any direct effects on food security conditions.

CHAPTER 4

RELATIONSHIP BETWEEN HOUSEHOLD FOOD SECURITY AND NUTRITIONAL STATUS

Results and Discussion

4.1 Introduction

This Chapter is based on a historical account of the slum dwellings and the cluster-wise information on the socio-economic and demographic profile and findings of the statistical analysis. The findings from the statistical analysis are presented in the form of tables and graphs. The monthly per capita expenditure and percentage share of food expenditure is shown by dividing the expenditures into deciles to identify the gradient in the expenditure pattern. The average monthly food and nonfood expenditure is compared in the selected slums. The overall status of both the slum is tabulated to look upon the real situation in terms of selected variables. The categorizations are being made to on the basis of the Body Mass Index, physical activity, Food Consumption Score and Household food security Status. To examine the relationships, cross tabulations is also done between the household food security condition and education, SLI, BMI, and type of work. These selected variables only shows the temporal relationships and do not ensure the causal relationships. Stacked column graph is used to show the expenditure on various food groups, which highlights the food items contributing highest in expenditure. It also provides information on the affordability and frequency of consuming specific food groups. The nutritive intake profile of the two slums is also discussed by calculating average percent adequacy at the end.

4.2 Slum dwellings in the city of Ghaziabad : A Historical Account

The history of a slum was traced from the elderly community of the selected two clusters who have been residing there for at least 25 years. These narratives depict the story of how and why the poor and their sufferings have been excluded and to large extent. It was the phase during which, lands in villages were seized for development projects, industrialization and people were alienated from their land. Other different social and

cultural factors such as unemployment, caste discrimination and post marriage migration of women also played a significant role. It forced the people from villages to migrate towards the cities in search for work to sustain their livelihood. In cities, they usually settle either in slums in the heart of the city or the suburban areas at the periphery of the city, which provides them affordable housing. This is the reason why they are not integrated into the development processes of the urban economic and social systems. They are left at the periphery where they struggle to earn their livelihood, either through daily wages or petty businesses. In addition to the miserable living conditions without any social security or safety net, they are required to compete with the already established class in the cities, a kind of competition where the disadvantaged always lose the battle of survival and struggle with unemployment. At such a juncture, the only option they are left with is to commodify their labour at a much lesser value that ultimately leads to insufficient spending on food and other basic amenities. The narratives below gives vignettes of the distressed socio-economic conditions in the slum and witnesses the agony which is hard to write here and impossible to understand. This chapter on the historical account of slums in the selected two clusters comprises of five in-depth interactions with selected elders from the community, these key informants were selected because of the number of years of residence. It was known that these elders have been residing in those slums for about 25 years.

Deendayalpuri slum has its origin in the 1990's when the 'jhuggi's'⁴ were demolished and the lands were given to the destitute families at an affordable cost. This mainly involved the homeless who left their village due to some problems in their family or who came in search of jobs. These lands were mostly allocated to migrants from Bihar and Banjara community from the state of Rajasthan, who are also commonly known as 'the wanderers'. These residents were asked to pay money in instalments to claim the land. Since many of them were struggling to even reach ends meet, it became a double burden for them to pay such an amount and hence most of them ended up receiving notices from the government up to Rs. 18,000. Left with little or no choice, they ended up selling these lands at a rate of about Rs. 10 lakhs to both pay off their debts and support their

⁴ Jhuggi a slum dwelling typically made of mud and corrugated iron.

livelihood. Therefore, Deendayalpuri is a relocated slum with an approximate 2723 households which was built under the slum clearance act (1996-97). In which 250 sq. ft. of land was given to the poor people who had jhuggi's on the main road. Presently, this slum is under Rajiv Awas Yojna (2012-13) where the affordable houses are yet to be allocated. The dominating caste is Jatav's who comes under the category of Scheduled Caste. This slum is well connected to the city and the main highway. Quite a few numbers of women from this slum go to work in the apartments at Raj agar Extension. In some cases, some women working in these apartments are earning more than their husbands. This particular slum though it has access to facilities like government schools and hospitals but in terms of living conditions, the place is extremely unhygienic specifically due to improper infrastructure, poor sanitation and inadequate sewerage and drainage system. The location of this slum provides access to the residents to participate and compete in the fast growing city network.

The slum comprises 2723 households. The main occupation includes construction labourer, Rickshaw pullers, auto driver and painter. The caste wise percentages are OBC (16.79%) SC (81.07%) and others (2.14 %). There are many other sub-castes but an area specific division was not observed. One of the key informants elucidated the existence of another caste. (State Development Authority, 2015).

On the other hand, Bhuapur slum was founded ten years ago, and it is still growing. It is located on the outskirts of Ghaziabad where a large number of ragpicker families reside, who were engaged in collecting and segregating urban waste from surrounding households. An estimated 1400 households (5,000 people approx.) resides in the slum. The community is made up of mainly migrants populations from Bihar and West Bengal (inter-state migration), unlike Deendayalpuri which mainly comprise of intrastate migrants. Migrants who have spent half of their life here in this slum had no financial or social support from the state government. Pavement dwellings are also a common sight in this slum.

Mass influx of migrants has been witnessed in last ten years from Bihar and West Bengal in search of work. The overcrowding and increasing number of jhuggi's is mainly because of this huge influx of migrants. People find it easier to settle in suburbs because

of three main reasons that includes; housing prices, which is low as compared to town as Bhuapur, is located at the border of Delhi and Ghaziabad, distant from the main city. Second reason includes the presence of family, friends or other people from the same ethnic background. The third reason is the availability of job opportunities and educational facilities for their children.

One of the respondents succinctly narrated a turn of event in which a huge number of people shifted to Bhuapur from Hasanpur village in east Delhi. According to him, there were very few kaccha houses and rest of the land was covered with forest. He recounted an incident about the first Patwari (Village Accountant)⁵ who distributed the land illegally and divided it among his partners. The native residents have constructed most of the houses in this slum but few sold them. There is a vast influence of a community (Pal Samaj) comprising of dominating caste (Gujars and Gadhariya) who are believed to have acquired majority of the land. Unlike Deendayalpuri, the concept of Pradhan exists in this slum.

Basic amenities such as housing, electricity, water supply, health and sanitation are non-existent in this community. The prime focus of families in this slum is on acquiring minimum basic needs. Most of them survives on hand to mouth basis. The families live a perilous existence amongst all the trash, the smell, the dirt and often the dangers that lurk within the garbage. They live in congested conditions which encourages the spread of infectious diseases with poor sanitation and drinking water facilities. The rented buildings are unfit for living and create overcrowding. For instance, in one building, there are ten rooms rented to ten families/tenants each comprising of four to five members and using only one common toilet. The community also lacks basic facilities like schools, banks and PHC's. Apart from poverty, there are many other factors that hinders access to basic survival needs in these slums. Families are living in poverty, suffers from social exclusion, and exploitation on several fronts.

⁵ The Village Accountant is an administrative government position found in rural parts of the Indian sub-continent.

4.3 Sample Characteristics

The ratio of males to females in the study population was 0.53. The mean household size was 4.9. The mean age of the reproductive age of women was 34.8(\pm SD 8.9). Around eighty percent of the total population of the sample were migrants and among them twenty percent were inter-state whereas sixty percent were intrastate migrants. Forty seven percent of the total sampled household did not have a ration card.

Table 4.1

Cluster-wise Social-economic and demographic profile of the sampled households in the selected slums of Ghaziabad, India (n=114)

Variable	Category	N=73 (%)	
		Cluster 1	Cluster 2
House Ownership	Own	78.1	31.7
	Rented	28.9	68.3
Migrants		75.3	90.2
	Inter-state	13.7	31.7
	Intrastate	61.6	58.5
Occupation of the household head	Casual worker	44.9	56.4
	Unemployed	1.4	-
	Self-employed	30.4	7.7
	Regular Wages	23.2	35.9
Occupation of the household head female(Key subjects)	Casual worker	8.2	7.3
	Housewife	71.2	75.6
	Self-employed	8.2	4.9
	Regular Wages	12.3	12.2

Table 4.2

Cluster-wise Social-economic and demographic profile of the sampled households in the selected slums of Ghaziabad, India (n=114) (contd.)

Variable	Category	N=73 (%) Cluster 1	N=41 (%) Cluster 2
Literacy level of women (18-59 years) (key subjects)	Illiterate	50.7	36.6
	Schooling(primary, middle, high)	42.5	56.9
	Graduate	5.5	-
	Post graduate	1.4	7.3
Family Monthly Income (In rupees)	0-10000	74	64.3
	11000-20000	17.8	19.0
	21000-30000	6.8	7.1
	30000+	1.4	9.5
Separate toilet facility at household	Yes	98.6	73.2
Types of drinking facility availed	Boring	94.5	17.1
	Gov. tap/Hand pump	4.1	34.1
	Boring and Hand pump	1.4	26.8
	Bisleri	0	22.0
Household holding PDS Ration Card	Yes	56.2	41.5

As mentioned in table 4.1, where the socio-economic and demographic characteristics of both the cluster are compared, cluster 1 seems to be having better livelihood as compared

to cluster 2. In cluster 1, majority of the families were staying in own house(seventy eight percent) whereas in cluster 2, only thirty one percent families were having house ownership. In both the slums majority of the families were migrants including ninety percent in cluster 2 and seventy five percent in cluster 1.

As the type of employment is concerned, more number of casual workers were in the cluster 2(fifty-six percent) as compared to cluster 1(forty-four percent). However, the income status is much better in cluster 2 as compared to 1; the families who were earning above 30000 were nine percent in cluster 2 and one percent in cluster 1. Most of the female were housewives (seventy-two percent). The female head of the household included casual work and self-employed (seven percent each) regular wages (twelve percent). The women who were on regular wages were working as labourers, maids and factory workers; self-employed included tailor, shopkeepers and vendors whereas casual workers included mainly labourers and seasonal vendors. Out of 114 respondents only forty-five percent were illiterate. (As mentioned in table 4.2). The occupations of the head of the household were mostly include rickshaw pulling, daily labour, domestic servant, carpentry, mechanic, electrician and vendors. The Cluster 1 had better toilet facility (ninety-eight percent) whereas only one percent did not have separate toilet facility in their household but it is appalling to know that, in cluster 2, twenty-six percent did not have separate toilet for their own. The cluster 1 also had a better drinking water facility, majority (ninety-four percent) of them were using shared submersible pump whereas only seventeen percent were using boring or underground water in cluster 2. Around twenty-two percent were also buying bisleri water bottles for drinking as their defensive expenditure⁶. More than half (fifty-six percent) of the household in cluster 1 were having ration card whereas fifty eight percent of the household in cluster 2 didn't have Ration Card.

⁶ Defensive expenditures are expenditures that seek to minimise potential damage to oneself. People in urban poor slums were willing to pay for drinking water despite of the unaffordability of food. They buy drinking water as a preventive measure.

Table 4.3**Average Monthly per capita expenditure (MPCE) across deciles and percentage share of food expenditure in both the selected clusters(N=114)**

Decile classes of MPCE(Rs.)	Average MPCE(Rs.)	Decile Classes of MPCE on food(Rs.)	Average MPCE on food (Rs.)	% share of food in household ex	Decile Classes of MPCE on Non-food (Rs.)	Average MPCE on Non-food(Rs.)
<775	432.23	<343	233.936	54.1	<241.5	153.66
775-1230	1016.30	343-430	383.21	37.7	241.5-356	304.42
1230-1500	1412.94	430-479	458.70	32.4	356-498	427.81
1500-1666	1644.44	479-530	507.86	30.8	498-630	547.00
1666-2000	1959.52	530-638	604.80	30.8	630-728	686.43
2000-2500	2465.55	638-719	699.00	28.3	728-830	769.61
2500-2760	2708.00	719-860	792.19	26.9	830-1141	980.67
2760-3783	3396.00	860-969	914.621	26.9	1141-1473	1338.93
3783-5800	4510.00	969-1223	1088.8	24.1	1473-2385	1844.01
>5800	8480.00	>1223	1621.5	19.1	>2385	6545.00
All classes	2748.80	All classes	729.55	26.5	All classes	1384.21

4.4 Average Monthly Per Capita Expenditure (MPCE) across deciles and percentage share of food expenditure in both the selected clusters

In the selected clusters, the share of food was fifty-four percent for its bottom ten percent population and nineteen percent of top ten percent population. The average monthly per capita expenditure was 2748.8 rupees whereas the monthly per capita expenditure on food and nonfood was 729.5 rupees and 1384.21 rupees respectively. It was seen that with the increase in the total monthly per capita expenditure the shared percentage of expenditure on food decreases. (Table 4.3)

4.5 Average Monthly Per Capita Expenditure MPCE across deciles and percentage share of food expenditure in the selected cluster 1 and Cluster 2 each

In the cluster 1(table 4.4), the MPCE across deciles and percentage share of food expenditure is shown. The share of food was forty-three percent for its bottom 10 percent population and twenty-eight percent of top 10 percent population. With the increase in the total monthly per capita expenditure the percentage share of expenditure on food decreases except in the 7th decile.

Table 4.4

Average Monthly per capita expenditure (MPCE) across deciles and percentage share of food expenditure of cluster 1(n=73)

Decile classes of MPCE(Rs.)	Average MPCE(Rs.)	Decile Classes of MPCE on food(Rs.)	Average MPCE on food (Rs.)	% share of food in household ex	Decile Classes of MPCE on Non-food (Rs.)	Average MPCE on Non-food(Rs.)
<766	490.62	<335	211.64	43.1	<212	132.3
758-1210	1065.07	335-406	372.74	34.9	212-310	270.91
1210-1500	1399.47	406-475	455.65	32.5	310-403	358.86
1500-1666	1600.00	475-525	505.11	31.5	403-499	452.14
1666-2000	1836.73	525-600	576.36	31.3	499-594	538.00
2000-2373	2291.66	600-700	673.79	29.4	594-713	673.80
2373-2500	2490.00	700-834	765.41	30.7	713-778	757.30
2500-3333	3128.00	834-938	887.97	28.3	778-1022	904.44
3333-4273	3850.00	938-1152	1007.61	26.1	1022-1374	1195.72
>4273	6931.00	>1152	1577.08	22.7	>1374	1638.72
All Classes	2447.94	All classes	700.08	28.5	All Classes	692.11

Table 4.5

Average Monthly per capita expenditure (MPCE) across deciles and percentage of food expenditure in cluster 2(n=41)

Decile classes of MPCE(Rs.)	Average MPCE(Rs.)	Decile Classes of MPCE on food(Rs.)	Average MPCE on food (Rs.)	% share of food in household ex	Decile Classes of MPCE on Non-food (Rs.)	Average MPCE on Non-food(Rs.)
<833	585.28	<350	270.84	46.2	<442.8	272.00
833-1428	1204.76	350-450	422.50	35.0	442-650	571.25
1428-1500	1500.00	450-500	477.00	31.8	650-750	709.79
1500-1800	1204.76	500-583	542.70	45.0	750-883	819.42
1800-2500	1500.00	583-720	684.16	45.6	883-1325	1157.14
2500-3333	1683.33	720-820	794.21	47.1	1325-1600	1481.60
3333-4000	2250.00	820-900	865.83	38.4	1600-2333	2104.58
4000-5333	3216.66	900-1114	996.07	30.9	2333-2700	2499.50
5333-6666	4000.00	1114-1400	1266.66	31.6	2700-4360	3600.62
>6666	4944.44	>1400	1625.00	32.8	>4360	13535.00
All classes	3365.743	All classes	782.02	23.2	All classes	2616.486

In the cluster 2(table 4.5), the share of food was forty-six percent for its bottom 10% population and thirty-two percent of top 10 % population. It is precisely seen that with the increase in the total monthly per capita expenditure, percentage share of expenditure on food decreases.

Table 4.6

Average Monthly Food and Non Food Expenditure in both the slums

	Slum 1	Slum 2
Location of the slum	In the city	At periphery
Total food expenditure average	4023.15(36.2)	3256.09(22.8)
Total nonfood expenditure	3291.027(29.6)	9863.17(69.3)
Transportation cost	728.0(6.5)	2021(14.2)
Water and electricity cost	11630.4)	678.35(4.76)

The average monthly total food expenditure was less in Bhuapur (Rs. 2356) as compared to Deendayalpuri (Rs. 4023) (Table 2). The huge difference was found between the total average nonfood expenditure of the two slums: Deendayalpuri; Rs. 3291, Bhuapur; Rs.9863. This difference is seen due to the various factors attributed to the selected slums that are discussed in detail in the next chapter.

Table 4.7**Categorization on the basis of the Body Mass Index, physical activity, Food Consumption Score (N=114)**

Variable	Category	%
BMI	<18.5(underweight)	7.9
	18.5-24.9(Normal weight)	51.8
	25.0-29.9(overweight)	27.2
	30.0-34.9(class I obesity)	7.0
	35-39.99(Class II obesity)	3.5
	>40(Class III)	2.6
Physical activity status	Sedentary	44.7
	Moderate	35.1
	Heavy	20.2
Food Consumption Pattern	Status	
0-26	Poor Food Consumption	2.7
29-42	Borderline Food Consumption	81.1
>42	Acceptable Food Consumption	16.2

In table 4.7, around twenty-seven percent of women were overweight and ten percent were obese whereas only eight percent were underweight. These findings are corroborating well with some of the statistics of nutritional status of women in Ghaziabad (CAB report, 2014). In which the women BMI is computed for age (18-59 years). Around 9.4 % were underweight, 23.3 % were overweight and 5.4 % were falling under the category of class 1 obesity and above (CAB Report, 2014). Most of the women had a sedentary lifestyle (forty-five percent) whereas thirty-five and twenty percent were moderate and heavy workers. Almost eighty-one percent of the women were found to have borderline food consumption score and only three percent were falling in the category of poor food consumption score. The poor and the borderline food consumption score identify the calorie deficits among the households. This finding seems to corroborate NFHS 4 data where no significant change was observed since last decade

(NHFS 3, 2005-06). The eating habits of women are not healthy. The survey uncovered the fact that more than half of the women do not consume fruits even once a week. Only one-third of the women consume protective foods like meat, fish, and eggs weekly and only very few consume these food items on daily basis. Food consumption pattern are also biases in terms of gender as India is primarily non-vegetarian but women largely follows vegetarian diet.

Table 4.8

Household Food Security Status among the selected slums

Sr.no	Household Food Security Status	Deendayalpur N=73	Bhuapur N=41
1	Food Insecure with Hunger	35	51
2	Food Insecure without Hunger	35	41
3	Food Secure	27	7.3

As shown in the table 4.8, the huge difference in the household food security status can be attributed to type of migration, holding ration cards, availability of safe drinking water, toilet facilities, house ownerships, and type of work.

4.6 Categorization on the basis of the Body Mass Index, Physical activity, Food Consumption Score (n=114)

Out of the total 114 households twenty percent were highly insecure (food insecure with hunger); whereas thirty-eight percent were low food insecure (Food insecure without hunger) and only forty-two percent were food secured.

Table 4.9 is based on the characteristics of the food secure versus insecure households, it can be stated that sixty percent of the food secure household encompasses literate female heads (graduate) whereas thirty-seven percent female were illiterate. Around ninety percent food secure households were belonging to the high standard of living index although seventy percent were from food insecure household with hunger; the majority of the households were falling in the category of high standard of living because of the

added weight to basic resources. The standard of living index lack a direct measure of living standards and has its limitation(Wagstaff et al., 2008). The type of work of the female household also influences the household food security status. Most of the women were not working as they are mostly comprised of housewives. Thirteen percent of the insecure household with hunger was belonging to the self-employed and casual women workers each whereas only nine percent households had the women who were on regular wages. Among the food secure households, only eight percent were self-employed and casual women workers each and twelve percent household had women were on regular wages.

Table 4.9

Selected Characteristics of insecure versus secure households

Household Food Security Status(% within household)	Categories	Food Insecure households with hunger(n=23)	Food Insecure household without hunger(n=43)	Food Secure Households (n=48)
Education	Post Graduate and above	-	7	2.1
	Graduate	43.5	44.2	60.4
	Illiterate	56.5	48.8	37.5
Standard of living index	High	69.6	83.7	89.6
	Medium	26.1	16.3	10.4
	Low	4.3	-	-
Body Mass Index	<18.5	4.3	11.6	6.2
	18.5-24.9	47.8	44.2	60.4
	25 and above	47.8	44.2	33.3
Type of occupation (women)	Self employed	13.0	2.3	8.3
	Regular wages	8.7	14.0	12.5
	Casual worker	13.0	4.7	8.3
	Housewives	65.2	79.1	70.8

*The primary education and illiterate category is clubbed together for those who were unable to read and write in any language.

Table 4.10**Selected characteristics of food secure versus food insecure households (Odds Ratio)**

Independent Variable	Food Secured Household	Food Insecure Household	Adjusted OR*	Unadjusted OR
Education				
Illiterate	42.9	56.5	.554(.158-1.94)	1.733(.88-4.36)
Literate	57.1	43.5		
SLI				
High	88.6	69.6	.000(.000-.)	.000(.000-.)
Medium	13.2	26.1	.000(.000-.)	.000(.000-.)
Low	-	4.3		
MPEF(Food)**				
>890	60.4	8.7	.023(.004-.138)	.039(.008-.183)
580-890	19.8	17.4	.196(.46-.83)	(.066-.838)
<580	19.8	73.9		

*Adjusted for literacy level of women head, standard of Living Index, and monthly per capita expenditure on food.**The MPCE categories are made on the basis of NSSO survey, 2008 as the food and nonfood expenditure data corroborates with Uttar Pradesh. These results are with reference to event (outcome) as food insecure household= 1(Value)

In the adjusted multivariate model, illiteracy level of female head of household, standard of living index and monthly per capita expenditure on food did not emerge as significant predictors of household food insecurity as revealed through their Odds Ratio (OR) and Confidence Interval (C.I.)(Table 4.10) However the illiterate women were more likely to be food insecure (OR 1.73 C.I. 0.88–4.36).

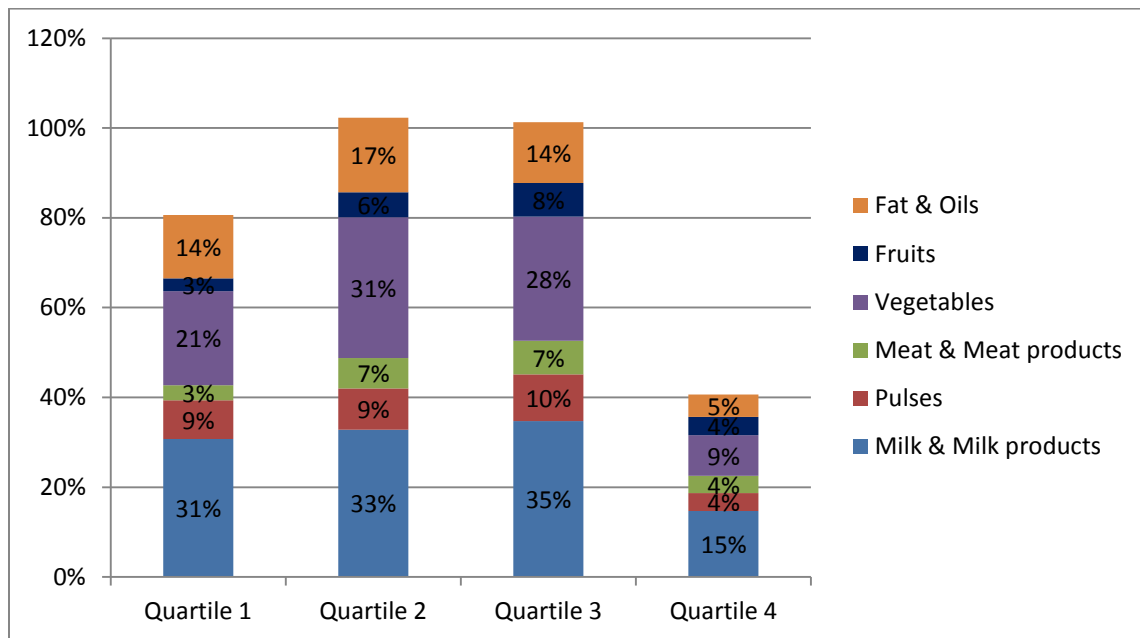
4.7 Expenditure on various food groups relative to monthly per capita income expenditure on food quartiles

As per the figure 4.1, the percentage contribution of all the food groups is seen among the four quartile of monthly per capita expenditure on food. The first (spend lowest) which spends on an average 458 rupees contributes eighty-one percent expenditure on food out of their total monthly per capita income whereas the forth quartile (spends highest) which

spends an average of 2300 rupees contributes only forty-one percent on food expenditure out of their total monthly per capita income. However the data may varies as the expenditure on cereal is not considered because pattern of buying cereal varies, as in most of the cases people tends to store the cereals for a year and also take it from fair price shop.

Figure 4.1

Average monthly per capita expenditure on various food groups on the basis of MPCE on food quartiles



4.8 Relationship between Household Food Insecurity, Nutritional Status and Food Consumption Score among selected clusters

For understanding the factors affecting Food insecurity, different variables were identified such as Household Food Security Score, Per capita income, Body Mass Index, total food expenditure and a number of family members. (Table 4.11, 4.12) The results of Pearson correlation among these factor reflected there was a negative correlation

between household food insecurity and food consumption score ($r = -.207, -.306$). The correlation value ($0.07, 0.052 > p = 0.05$) indicates that there is no statistical significance between the food consumption Score and household food insecurity score for both the clusters.

The total number of the family was negatively correlated with Household Food Insecurity ($r = -0.279, -0.235$) and it is statistically significant for both the clusters ($0.01, 0.14 < p = 0.05$). It has been found that the food insecurity is strongly associated with overcrowding or the number of family members (Gulliford et al., 2005). There have been a study which states that increasing household size means more mouths to feed, increased expenditure on food, and thus reduced levels of consumptions on quantity, quality, and variety. (Anarfi JK and hiadeke C, 2006 as cited in Codjoe et al., 2016)

The Body Mass Index of the women was positively correlated ($r = 0.11, -0.24$) to Household Food Insecurity and it was not statistically significant for both the clusters. ($0.35, 0.11 > p = 0.05$). This indicates the more number of obese women in the household with food insecurity. Therefore, this study also indicated that food insecurity affects the nutritional status of women. This finding confirms the theory of the perpetual cycle of temporary food restriction and abundance, which is the leading cause of obesity in poor and insecure households. The gradual weight gain in women is due to intermittent episodes of binge eating and starvation. This factor is posing a certain clarity on the paradox of food insufficiency, obesity and poverty (Zalilah and Khor, 2004).

The paradox of the occurrence of over and undernutrition revolves around the ability to spend for nutritive and healthy diet. Lack of purchasing power or inability to buy the nutrient dense food and over-consumption of cheap calorie sources may be seen as one of the reasons for the obesity in lower socioeconomic groups. Another explanation given for this paradox is the excess availability of the cheap unhealthy food items in the urban poor environment. The food items that are high in fat and sugar are relatively cheaper. The food items that are low on energy are also more nutrient dense. These include fresh vegetables, fruits and fish which is costly and unaffordable to poor. This argument has been put forward by comparing the cost of healthy versus unhealthy food item (Drewnowski and Darmon, 2005).

The household income was negatively correlated to household food insecurity($r=-0.068,-.098$) but it was not statistically significant for both the clusters ($0.56, 0.54 > p=0.05$). Studies in other countries have also found food insecurity to be strongly associated with low income and household capacity to save money.(Tingay et al., 2003)(Nolan et al., 2006).

There was a negative correlation between total food expenditure and household food Insecurity. ($r=-.279,-.235$)Hence the household becomes more food secure with increasing expenditure on food. This relationship was statistically significant ($0.017 < p=0.05$) in the case of cluster 1 but statistically insignificant in case of cluster 2 ($0.14 > p=0.05$), which shows that the income generation opportunities is crucial for tackling the problem of food insecurity. Therefore the study indicated that the income affects that food insecurity and thus affects the nutritional status of women.

Table 4.11

Correlates of Household Food Insecurity for cluster 1

<i>Cluster 1(n=73)</i>		HFS	FCS_	TFM	BMI_	INC_	TFE
HFS	Pearson Correlation	1	-.207	.063	.110	-.068	-.279*
	Sig. (2-tailed)		.079	.598	.355	.569	.017
FCS	Pearson Correlation	-.207	1	-.302**	.070	.137	.071
	Sig. (2-tailed)	.079		.009	.554	.249	.549
TFM	Pearson Correlation	.063	-.302**	1	-.029	-.095	.065
	Sig. (2-tailed)	.598	.009		.809	.425	.585
BMI	Pearson Correlation	.110	.070	-.029	1	.151	-.083
	Sig. (2-tailed)	.355	.554	.809		.203	.485
INC	Pearson Correlation	-.068	.137	-.095	.151	1	.260*
	Sig. (2-tailed)	.569	.249	.425	.203		.026
TFE	Pearson Correlation	-.279*	.071	.065	-.083	.260*	1
	Sig. (2-tailed)	.017	.549	.585	.485	.026	

*Correlation is significant at the 0.05 level (2-tailed), **Correlation is significant at the 0.01 level (2-tailed). HFS-Household food Insecurity, FCS-Food Consumption Score,

TFM-Total Family Member, BMI-Body Mass Index, INC –Total Family Income, TFE- Total Food Expenditure

Table 4.12

Correlates of Household Food Insecurity for cluster 2

Cluster 2 (n=41)		HFS	FCS_	TFM	BMI_	INC_	TFE
HFS	Pearson Correlation	1	-.306	.505**	.249	-.098	-.235
	Sig. (2-tailed)		.052	.001	.117	.542	.140
FCS	Pearson Correlation	-.306	1	-.123	-.353*	.515**	.101
	Sig. (2-tailed)	.052		.445	.023	.001	.528
TFM	Pearson Correlation	.505**	-.123	1	.146	-.073	-.072
	Sig. (2-tailed)	.001	.445		.363	.652	.656
BMI	Pearson Correlation	.249	-.353*	.146	1	.067	.098
	Sig. (2-tailed)	.117	.023	.363		.677	.544
INC	Pearson Correlation	-.098	.515**	-.073	.067	1	.367*
	Sig. (2-tailed)	.542	.001	.652	.677		.018
TFE	Pearson Correlation	-.235	.101	-.072	.098	.367*	1
	Sig. (2-tailed)	.140	.528	.656	.544	.018	

*Correlation is significant at the 0.05 level (2-tailed), **Correlation is significant at the 0.01 level (2-tailed). HFS-Household food Insecurity, FCS-Food Consumption Score, TFM-Total Family Member, BMI-Body Mass Index, INC –Total Family Income, TFE- Total Food Expenditure

4.9 Cluster-wise categorization on the basis of the average percent adequacy of all the nutrients

The 24 dietary recall method was carried out for three consecutive days to do a nutritional assessment. The nutrient intake data from the dietary recall method was entered into the validated software ‘Dietcal’ version 3.0(Profound Tech Solution;<http://dietcal.in/>), which is based on values from the Nutritive value of Indian foods(Sesikeran, 2010). “Nutrient intake data(as represented by mean)were then

compared with the Recommended dietary allowances (RDA) for Indians for an adult woman as per their lifestyles (A Report of the Expert Group of the Indian Council of Medical Research, 2009). The adequacy of nutrient intake by each participant was computed in terms of the nutrient adequacy ratio (NAR) (Malhotra and Passi, 2007). Cut-offs for NAR were considered as 'inadequate' when the ratio was less than 0.66; 'fairly adequate' when the ratio was 0.66 to <1.00; and 'adequate' when the ratio was ≥ 1.00 . NAR (Nutrient adequacy ratio) is calculated as participant's nutrient intake per day/RDA of the respective nutrient." The nutrient intakes in the two groups were then compared between the groups. The percent adequacy is calculated by the mean nutrient intake expressed as a percentage of the RDA, i.e., mean intake of nutrient /RDA of nutrient.

In Table 4.13, the percent adequacy of daily nutrient intake of macronutrients and micronutrients is shown. The study shows that the women can meet macronutrients largely still. In case of energy, recommendation for sedentary lifestyle while considering majority of the women were housewives. The percent adequacy was found to be more than RDA, which suggests that the findings are aligned to the more percentages of obese women with micronutrient deficiency.

However, the percent adequacy was below 60% for Vit B12, Vit A and riboflavin in the case of both the cluster whereas for fat it was more than 100 % (table above). It can be stated that the women are likely to be at risk of obesity and some micronutrient deficiency. This outcome also reflects a shift from traditional dietary patterns toward a more Western diet consisting of energy-dense foods high in fat, sugar, and salt. This data corresponds well with the National Sample survey in which the pattern of consumption of selected food items of the urban population (kg/month/ per was assessed (Vepa, 2004).

Table 4.13**Nutrient Intake in terms of average percent adequacy for both the clusters**

		Cluster 1(n=71)	Cluster 2 (n=43)
Nutrient	RDA(NIN-ICMR)*	%Adequacy(Mean)*	%Adequacy(Mean)*
Energy(Kcal)Sedentary	1900	76.83	81.45
Moderate	2230	70.74	68.74
Heavy	2850	64.60	60.23
Fat(g)Sedentary	20	205.91	188.69
Moderate	25	183.34	157.91
Heavy	30	129.16	141.6
Protein(g)	55	83.41	89.58
Calcium(mg)	600	75.82	73.98
Iron(mg)	25	85.01	74.41
Folic Acid(µg)	200	78.22	85.91
Vitamin B12	1	28.66	30.26
Vitamin A(µg)	1	13.64	16.01
Thiamine(mg)	1.1	122.05	127.84
Riboflavin(mg)	1.3	56.95	63.30
Niacin(mg)	14	85.88	90.66
Vitamin C(mg)	40	189.72	73.98
Zinc(mg)	10	58.06	67.73

*Recommended Dietary Allowances by National Institute of Nutrition, Indian Council of Medical Research (2010)(Sesikeran, 2010)

4.10 Nutrient Adequacy Ratio

The Nutrient adequacy ratio was also calculated for both the clusters. It has been found that, In Cluster 1, The NAR for Calcium, Vitamin B12 was inadequate in more than 50% of the study participants whereas 95.9% of the participants were consuming an adequate amount of fat. The consumption of more fat and absence of diversified, nutrient dense diet may consider as the cause of overweight and obesity but a simultaneous failure to meet micronutrient requirement(Varadharajan, Thomas and Kurpad, 2013). Table 4.14

and 4.15 shows the data obtained while calculating Nutrient adequacy ratio in cluster 1 and 2

In cluster 2, The NAR for energy, Calcium, iron, Vitamin B1, Vit A, riboflavin and zinc was inadequate in more than 50% of the study participants whereas none of the individuals was consuming inadequate fat and 97.6% of the participants were consuming more than adequate amount of fat. Micronutrient insufficiency may also co-exist in obese and overweight individual as indicated by findings. Although the present study could not confer it with the biochemical assessment but involved micronutrient intake assessment.

Table 4.14

Nutrient adequacy ratio of the women in cluster 1

Nutrients	Mean	SD	Median	NAR(n=73)		
				Inadequate	Fairly adequate	Adequate
Energy	1498.42	457.07	1444.45	47.9	38.4	13.7
Protien	45.87	17.20	42.23	34.2	41.1	24.7
Fat	41.99	16.10	40.66	-	4.1	95.9
Calcium	454.89	264.83	392.58	53.4	23.3	23.3
Iron	15.03	6.60	13.54	50.7	34.2	15.1
Folic Acid	156.43	93.76	141.32	42.5	38.4	19.2
Vitamin B12	0.294	0.465	0.14	89.0	4.1	6.8
Vitamin A	82.98	102.66	53	98.6	-	1.4
Thiamine	1.342	0.450	1.24	4.1	24.7	71.2
Riboflavin	0.74	0.347	0.621	67.1	26.0	6.8
Niacin	12.03	4.33	11.43	28.8	39.7	31.5
Vitamin C	75.88	55.07	66.73	53.4	23.3	23.3
Zinc	5.80	2.06	5.41	28.8	39.7	31.5

Table 4.15**Nutrient adequacy ratio of the women in cluster 2**

Nutrients	Mean	SD	Median	NAR	Fairly adequate	Adequate
				(n=41)(%)		
				Inadequate		
Energy	1583.56	405.47	1512.8	51.2	41.5	7.3
Protein	49.26	15.91	48.93	29.3	34.1	36.6
Fat	41.74	12.63	40.48	-	2.4	97.6
Calcium	443.88	241.65	346.06	58.5	22.0	19.5
Iron	15.62	7.50	13.78	53.7	36.6	9.8
Folic Acid	171.82	81.39	158.58	36.6	31.7	31.7
Vitamin B12	0.3025	0.33	0.16	87.8	9.8	2.4
Vitamin A	96.03	84.55	61.83	97.6	2.4	-
Thiamine	1.40	0.44	1.17	-	31.7	68.3
Riboflavin	0.82	0.30	0.77	58.5	31.7	9.8
Niacin	12.69	3.83	12.13	24.4	31.7	43.9
Vitamin C	91.26	60.48	69.96	2.4	17.1	80.5
Zinc	6.77	2.02	6.39	53.7	43.9	2.4

Figure 4.2

Frequency of consumption of various food groups per week by the women in Cluster 1

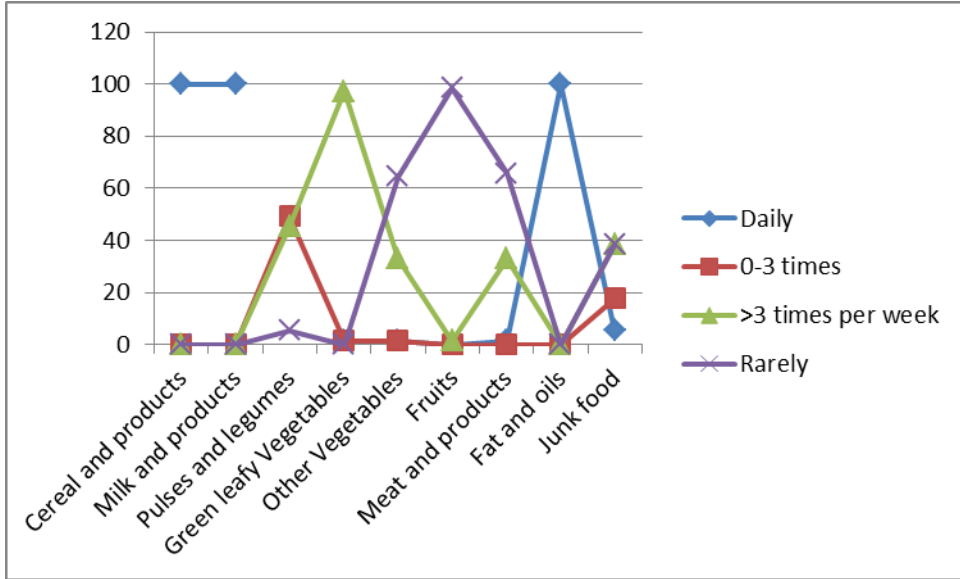
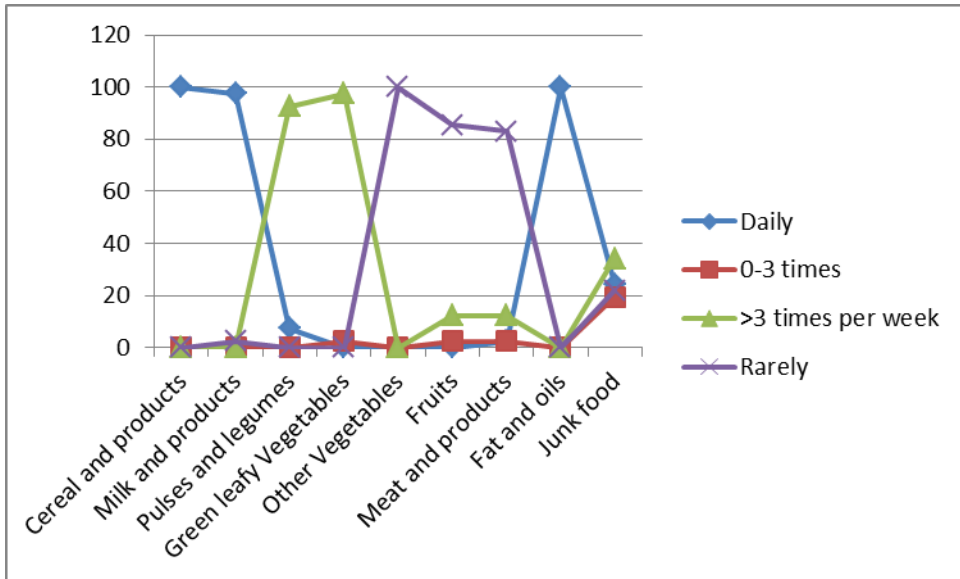


Figure 4.3

Frequency of consumption of various food groups per week by the women in Cluster 2



4.11 Frequency of consumption of different food groups in both the clusters

As per the figure 4.2 and 4.3, there was daily consumption of Cereal and cereal products in 100 % population of both the clusters as it is a staple food. Likewise, milk and milk products are consumed daily in 100% population in cluster 1 and ninety-seven percent in cluster 2, though it is consumed by the women in the form of tea mostly. The frequency of fat consumption was recorded daily by all the women as it is used as a cooking medium. Forty-Nine percent of the sample households in cluster 1 were consuming pulses up to three times whereas in cluster 2, Ninety-two percent were consuming pulses more than three times. Almost ninety-three percent of the women in both the clusters were consuming green leafy vegetables. Other vegetables are consumed rarely by majority of the women in cluster 1 whereas only thirty-three percent of the women were consuming it more than three times. As far as fruit consumption is concerned, majority of the women consume fruits rarely i.e., ninety-eight percent and eighty percent in cluster 1 and 2 respectively. The meat and meat products consumption was also very less. Only thirty-two percent in cluster 1 and twelve percent in cluster 2 were consuming meat products more than three times per week.

4.12 Miscellaneous Information

4.12.1 Family Composition

Majority of the sampled household had up to two children (Sixty percent) whereas only eleven percent had more than five children.

4.12.2 Landholding and agricultural produce

Sixty-eight percent of the families were not holding land whereas thirty-one percent were having their land. Among which thirty percent were carrying up to 10 beegha⁷ and fifty-seven percent were holding up to 50 beegha. Even some household were having their agriculture produce among which only thirteen percent had sufficient agriculture produce for themselves whereas eighty-six percent did not have sufficient agriculture produce for themselves

⁷ 1 Beegha =27000 Sq ft.

4.12.3 Food purchasing pattern

Majority of the households (seventy-five percent) buy rations from the market excluding rice and wheat as twenty-one percent households were still relying on the PDS shops but the quantity which they were getting was insufficient. There was no milk production in majority of the households and all were buying the packets milk except few households.

4.12.4 Reasons for migration

The two slums which were studied mainly included migrant population. Majority of the families migrated in search of employment (Sixty-three percent). Others migrated because of the other reasons i.e, own house or parenteral property(ten percent), better education(eight percent) and rivalry(two percent)

4.12.5 Average food and non-food expenditure

The average monthly total expenditure for various food items was calculated in the total sampled household. The average monthly expenditure for milk was Rs 1115, pulse(Rs 354), meat (Rs 203.42), vegetables (Rs 950), fruits (Rs 198), fats and oil (Rs 453). Non-food items include cooking fuel (Rs 629.86), education for children (Rs 2824), Medical expenses (Rs 623.46), rent and transportation (Rs 1203). Around ninety-seven percent had access to electricity and fifty-six percent of the household owned a vehicle including bicycle and motorcycle. In case of inadequate income, seventy percent admits nonfood items get affected the most, whereas nine percent said food intake and diet gets affected.

4.12.6 Unfulfilled Wishes

Seventy-eight percent women said there are necessities which they cannot afford. There were many things which the women said they wish to buy but can't afford mainly includes basic household resources like bed, vehicle, Refrigerator (forty seven percent). Twenty six percent want their own house and want to save money for their daughter's marriage. Only Four percent said they can't afford education. Fifty one percent informed that their family income is not sufficient to meet their consumption needs and in case of shortage of money, eighty percent of them borrow from the relatives, neighbours, employers and seek financial help from married daughters whereas twenty percent told they cut down on meals and adjust accordingly as per their earnings

4.12.7 Awareness about the entitlements

Fifty-five percent were not aware of the prices of the commodities at Fair Price shops whereas fifty-five percent did not take the entire entitlement and eighty-two percent said the quantity of wheat they get is not sufficient.

4.12.8 Intrahousehold consumption

On asking whether the family member eat together, seventy-six percent of the families eat together. Fifty percent of the family eats together one time whereas twenty-one percent of the families never eat together. On asking women whether they get enough quantity for themselves, eighty-six percent get enough amount of food whereas eight percent did not get adequate amount for themselves. On asking about the factors affecting their consumption pattern, Eighty percent said financial issues are responsible for the poor consumption pattern whereas ten percent stated that due to unawareness and lack of knowledge they lack balanced diet. Five percent said their ill health does not allow them to eat properly. Some also said its due to non- proximity of markets they only have few choices.

4.12.9 Demands from the state

On asking about the demands from government or their support, Forty percent of the women responded that they wanted increased employment opportunities and increase in income whereas twenty-seven wanted loan for education, building own house, daughter's marriage and for starting own business. Seventeen percent did not ask for any support from government. Some of the respondents also asked for government housing (Seven percent). On asking about the satisfaction level about the food consumption pattern, sixty-three percent found it was satisfactory whereas twenty-eight percent said its good and eight percent said its poor.

4.12.10 Awareness about importance of balanced diet

On asking how your food is affecting you; sixty percent stated they cannot afford fruits for themselves due to increased prices. Twenty percent said lack of balanced diet is the main reason for compromised immunity and illness whereas nineteen percent said consumption of contaminated water is mainly responsible for illness. Majority of the

women (Ninety-seven percent) respondent believed that a well-balanced diet improves the work efficiency and earning.

4.12.11 Hospital stay in last five year

On asking if any family member got admitted in hospital in last five years, fifty-four percent reported hospital stay in Deendayalpuri whereas it was fifty percent in Bhuapur.

All the information gathered in this chapter is the collection of quantifiable measurements, which has helped to infer that there is a huge difference in the opportunities available in both the clusters. These differences limit the capabilities of the households in Bhuapur in particular. Thus, it advocates inspecting into the history of these two clusters to seek explanations of the phenomenon.

4.13 Discussion

The huge difference was found in the socio-demographic composition of the selected two slums. These differences mainly include the number of house ownerships, types of employment and the availability of drinking water facilities. This huge difference in the household food security status can be attributed to type of migration, PDS, safe drinking water, toilet facilities, house ownerships, and type of work.

These differences are further investigated by dwelling into the community dynamics.

With the increase in the total monthly per capita expenditure the percentage share of food expenditure decreases, therefore Engel's law is still a good food for thought.

The nutrition insecurity is assessed through a diet survey and with the help of anthropometric measurement to look for an association with the perceived food insecurity. Food insecurity and obesity coexists in the same individual. More percentages of women were found to be obese in food insecure households.

If both the slum are considered together, the food consumption score, the poor and the borderline food consumption score identify the calorie deficits among the households. The cluster in the city shows lesser number of women with micronutrient deficiencies as compared to slum located on the outskirts. The majority of the women diet was rich in fat

and was lacking in the various micronutrients. Therefore, they are likely to suffer from micronutrient deficiencies.

Among the food secure households only 8.3 % were self-employed and casual workers each and 12.5 % were regular wage earners. It can be stated that regular wage earners were in better condition as household food security is concerned, whereas seasonal and self-employment often tends to increase the risk of transitory food insecurity. The major problem with the unemployed is to get assured job for 365 days of the year. Urban women are the major sufferers who usually seek jobs in the unorganised sector. To conclude, a notable association of income with food insecurity point out the need to ameliorate especially urban poor women with employment creation programmes, skill upgrading, training and connections with potential employers. Therefore there are many factors which affect the household food security conditions and thus affect the nutritional status, i.e., locality, number of family members, food and non-food expenditure, and type of employment. However, the sufficient attention should be given to the challenges of generating efficient and stable income for women as a prerequisite for ensuring food security and nutritional status among the women in urban slums.

CHAPTER 5

NARRATIVES FROM THE PARTICIPANTS:THEMATIC ANALYSIS

5.1 Introduction

Despite the abundant literature on food security there are little empirical researches which identify the relationship between household food security, consumption pattern and their social setting. Various important findings transpired from the study. First a huge fraction of urban slum dwellers were food insecure. Out of the total 114 households 20.1 % were highly insecure (food insecure with hunger); whereas 37.7% were low food insecure (Food insecure without hunger) and only 42.1% were food secured. Second, drivers of household food insufficiency are directly or indirectly related to economic situations, type or pattern of employment, pressing non- food expenditures. Lastly, the study is bringing out the association between household food security and multiple deprivations caused due to location.

The study is also carrying out the temporal relationship between nutritonal status and the household food security as the household food security scale is integrated with anthropometric assessments of women. However, all the food secure households may not necessarily be nutritionally insufficient. The data showed that most of the women had normal weight (fifty-one percent), twenty-seven percent were overweight, 13% were obese and only eight percent were underweight. The percentage of obese women (thirteen percent) correlates well with the third National Family Health Survey showing the nutritional status of women in India.

It is likely that the increase in income or household socioeconomic condition would reduce the household food insecurity but addressing the immediate social environment in which people live may also be of benefit. While considering the spatial differences, it can be inferred that a habitat and social factors shape individual decisions which are based on the available resources in the vicinity. This chapter travels through the processes of

outcomes discussed in the previous chapter. In order to corroborate, the key issues are highlighted with the help of explanatory variables.

After the quantitative analysis, the qualitative research methods were used for supplementing the finding of the first phase. In-depth interviews of twenty-seven participants were conducted using two interview guide one for key informants asking history and evolution of the slum and one for women from the slum seeking information regarding their struggle and hardship to remain food secure. The first interview guide mainly includes question-related to purpose of migration, socio-cultural attributes of the slum and existence of SHG'S and political representatives. The second interview guide for women was mainly focused on triggers of food hardship including, coping strategies, intrahousehold food dynamics, transition in food consumption pattern, work performed by women and their eating habits. The purpose of this qualitative part of study was to provide essential insights into the struggle of the slum dwellers face while purchasing food in the face of a shortfall in resources.

Twenty-seven slum dwellers including key informants and women interviewed in total. During the interview, only five key informants gave their consent to reveal their identities. Remaining twenty-two interviews are being elucidated based on the themes and sub-themes emerged from the thematic analysis of their responses during in-depth interview. The narratives are used to depict the critical issues; however the respondents divulged other useful voluntary information which explained the contextual aspects or the reason behind the given responses. The researcher has tried to represent the community attributes (Table 5) under four sections: 1) Housing and other Physical amenities (Contextual factors), 2) Economic and Industrial base (Compositional factors), 3) Social and cultural attributes of the Neighborhood (Collective factors) and 4) Food and Nonfood expenditure (Economic factors).

	Contextual factors	Compositional factors	Collective factors	Economic factors
In the City	<ul style="list-style-type: none"> well connected to the city (Slum is relocated and still under Rajiv Awas Yojna) Poor hygiene and sanitation; Inadequate sewerage and drainage system Access to efficient City markets Increased Number of house ownership Availability of government schools, hospitals and accessible employment which enhance the capacity to afford a quality diet Sufficient ration shops but the occurrence of technical issues related to Aadhaar linkage and corruption 	<ul style="list-style-type: none"> Male heads were involved in rickshaw pulling, daily labor, domestic servant, carpentry, mechanic, electrician and vendors. Women had jobs like maid servants, labourers, vendors in the nearby posh areas owing to the slum's proximity to the city Sufficient employment opportunities regular wages jobs like maid servants, labourers, vendors in the nearby posh areas owing to the slum's proximity to the city Due to economic independence, women have high purchasing and bargaining power within the household over income 	<ul style="list-style-type: none"> High Intra state migrant population Collective efficacy/Abundant Social networks foster a sense of belonging, attachment and advocacy. For ex-shared submersible connections Presence of SHG's women follow the two meal pattern per day because of time poverty Caste wise segregation was not evident but a cluster was found on basis of religion belonging to Safi's(Muslim) and the dominating caste is Jatav(Harijans) 	<ul style="list-style-type: none"> Saving money for education, marriages and own house(ability to fulfill basic needs of shelter, security, food and water Major expenditure comprises of paying rent, education, transportation and then food The consumption of copycat foods was more in Deendayalpur due to more number of time constrained working women as well the huge availability of street foods. (increased fat and sugar intake) Spending less on non-food and more on food
At periphery	<ul style="list-style-type: none"> Isolated due its location and chicken and fish market border it with all the dirt and foul smell Extremely unhygienic conditions with improper and inadequate lavatories. Access to compromised (in terms of quality as well as quality) small grocery shops Decreased number of house owner ships (unavailability of id proofs) Temporary squatters are often destroyed, due to which migrant resorts to become pavement dwellers Only two ration shops for approx. 1400 households where more than half of the people did not have a ration card Lack of school, hospitals and employment the people tend to spend on the basic needs like transportation, education and health which further worsens their capability to afford a quality diet 	<ul style="list-style-type: none"> Male head were engaged as factory workers, rag pickers, junk dealers, vegetable sellers, cleaner in the apartments and malls Only few women were found to be self-employed with small earning in stitching, envelope, pickles and bindi making women had limited decision-making and bargaining power within the household over income, Lack of access to employment on regular basis (vulnerable to economic shocks) Menial jobs like envelope making, rag and waste picking Presence of a an illegal paper making factory which creates air and noise pollution but also aggravates the dirt and blockage in the drainage system 	<ul style="list-style-type: none"> High Interstate migrant population People on wages who earn and spent daily tend to buy their food in small quantities and loose packaging from neighborhood shops rather than central market, lack of Social Networks-SHG's Women follow the same two meal pattern per day. It was not due to purposeful dietary discrimination, but rather to culturally patterned sex roles involving to serve other family members. Engage into perilous coping mechanisms, including high levels of debt Caste discrimination was evident due to existence of a dominating political group. i.e., concept of Pradhan 	<ul style="list-style-type: none"> Major expenditure is for basic amenities such as housing rent, non- subsidized food, water and toilets that may otherwise be available for the non-urban poor Women are forced to quit their jobs which leave them to survive on whatever little money they have. Increased food prices at the periphery leads to undiversified diet as women were mostly consuming rice and potato Spending more on food and less on non-food

Table 5.1

Community attributes: Spatial differences imposes multiple deprivations in the selected two slums

5.2 Thematic Analysis

People in slums lives with silent sufferings and unheard agony. It is difficult to elaborate on such distressed situation in which the people that I have interviewed are living in. The women participants brought light on the superficial world in which we people are living. Human distress is real and very much existent in today's world. Who are these people who are living in such agony and pain and why?

The migrants living condition at the periphery are abysmal. They live in congested housing due to unaffordability of renting house in heart of the city. The chicken meat and fish market border it with all the dirt and foul smell. These informal settlements include extremely unhygienic conditions with improper lavatories. Some families chose to stay for seasonal employment and then move back to the village as they often get threats from the government officials to destroy their temporary settlements. GDA (Ghaziabad Development Authority) evicts the temporary settlements time to time and poor migrants again create their squatters and this process seems endless. However a government resettled colony is somewhat in a better position in fewer aspects such as sanitation, housing structure, water supply. The attempt has been made to compile the information gathered under nine themes and sub-themes.

5.2.1 Compulsive Voluntary Migration

The migration is engendered by the disparity in economic and social development between urban and rural areas. The fundamental cause of migration is the disparity in incomes, employment, and social wellbeing, caste discrimination and social immobility in villages. Economic factors were the primary reason for migration to the selected slums along with social factors including incidences of robbery and other crimes in the village. Two respondents epitomised the instances of how dacoits robbed them and left with no other option but to leave village. Men who are young often leave their ancestral home and migrate from rural areas for their survival due to lack of employment opportunities and they struggle for their living, once they get any source of sustained income they try to shift their families. Most of them either start working as a factory worker or daily wage labourer. One of the migrants chose to be vegetable vendor because h

found it is manageable and sustainable. Some farmers migrated due to lack of water for irrigating their farm land and agriculture become no more profitable. Other reasons for migration included family feud over ancestral property led to small landholding per head. Better education for their children and numerous employment opportunities also encouraged them to head towards cities. They look up for better life in urban areas but they are exploited on several fronts.

Bhuapur slum was built in a natural course with the influx of mostly interstate migrants in last ten years. The interviewed subjects were mainly from Begusarai (Bihar), Bengal, Aalampur, Barabanki and Jhansi (Uttar Pradesh). The migrants choose Bhuapur in Ghaziabad as their preference because it adjoins to Delhi and Noida, centres of lot of developmental activities. It opens availability of employment opportunities and education. However, illiterate and poor men find fewer chances for making a satisfactory living and yet smaller options for getting improving their status. One of the reasons for the decreased number of house ownership in Bhuapur is the presence of more number of Interstate migrants. Their involvement in the seasonal employment put down their desire to own house. Moreover they are unable to monetise funds due to lack of social networks and continue struggling for their survival.

The case of Deendayalpuri is completely different. The residents of the jhuggi's were enforced and relocated to make a regularized colony. It is called as slum colony and comprises mostly of intrastate migrants. Two hundred fifty square feet land was given to each family who were majorly believed to be migrated from Rajasthan and Bihar. Some of these beneficiaries then have sold their land in want of money or some rented it out to other tenants. Most of the residents in this colony are into stable jobs and also have secured small businesses.

5.2.2 Unlivable conditions in temporary settlements

5.2.2 a) Housing

At the simplest level, an ideal home is a place where family members are living together and feel safe and store their goods, valuables in a safe manner. The way housing structures have been evolved in slum communities, they lack of access to basic services like sanitation, drinking water, social security, ample ventilation and light so that in can

be a livable place. As these communities are growing at the periphery of the cities, essential services like schools, health facilities, banks and recreation which are very much concentrated in the heart of the city are out of their reach. Lack of affordable housing has also been linked to inadequate nutrition, especially among children.

One of the main reasons of the increased number of house ownership in Deendayalpur could be the resettlement by the government in a manner to establish it as a regulated slum colony. It mainly comprise of pucca houses unlike the abundance of temporary squatters in Bhuapur.

In Bhuapur, the condition of pavement dwellers and homeless is more deplorable because they do not have cooking facilities which led to poor nutrition of their children. The condition of the houses was somewhat similar to typical housing structures in typical slums of India. Major part of their earning was spent on paying rent of their houses. Rising rents and expensive housing forces low-income tenants to spend more of their economic resources to obtain shelter, while leaving small proportion of money for other inevitable needs such as food. (Ellaway, et al 2000 as cited in Krieger & Higgins, 2002). On the contrary housing conditions in Deendayalpur is better as it is a regularized colony with no temporary settlements. Due to the increased number of house ownership they are likely to channelize their funds towards food instead of paying rent.

5.2.2 b) Corruption in Housing Poor

Different levels of Corruption were seen in both the slums. One was related to the illegal building constructions by landlords for keeping tenants whereas another was related to the allocation of government housing to poor.

State officials often become the part of the local political leader and invest in maintaining and enhancing their social positions(Harriss-White, 2004). Bhuapur slum is dominated by Pal Samaj (group of a shepherd caste) and Gujars; they are involved in making illegal constructions to seek business from tenants. The Pal Samaj was found to be the major group which had vested interests in the state officials to sustain their social position. People in these illegal building are living under crowded conditions.

The beneficiaries especially the poor, access the local government through agents, fixers and political brokers. They are trusted by the poor due to their proven capacities to get things done for neighbours (Corvalan, Cox and Osorio, 2017). One of the respondents from Deendayalpur mentioned about the corruption in providing housing to poor. The allocation was in the political hands and they had some brokers. Some property-dealing people also pitched in at that time to gain their profits and helped the beneficiaries in selling their lands. There are 252 government flats worth Rs 50,000 are built under RAY and they are supposed to be given in the lucky draw for those poor people who have invested the money. There has been a collection of almost 27000 applications. The rest of the money will be taken in instalments. The undeserving people who have already paid the full money will get it for sure. For instance, one official from the Nagar Nigam had already invested Rs 2.5 lakh in it. He will surely get five flats. Later he will sell the same flats at a higher cost. These poor never get the benefits because of the brokers who mediate between the poor and the government officials. According to him, majority of the women are involved as brokers, they have support from the police. Whenever there are any arguments or altercations they take the decisions in their favours.

5.2.3 Neighborhood Effects

These factors include environmental and social dimensions of the surrounding. Due to overcrowding and lack of proper sewerage system, the reoccurrence of gastrointestinal, respiratory disorders, jaundice and diarrhoea is quite common due to the consumption of poor quality water and unhygienic conditions including water logging and choked sewerage. More than fifty percent of the respondents from each slum sought medical treatment and admitted in the hospitals in last year. Despite complaining numerous times, none of the officials takes responsibility to look into the extremely unhygienic condition in the slum. The undrinkable government water supply of water adds to the miserable conditions. As a defensive mechanism people in Bhuapur ought to buy bisleri water bottles in bulk.

During the rainy season the water gets flooded in front of the building which restricts mobility. Apart from that, many illegal factories are flourishing in this area flouting all environmental and pollution norms. For example, there is one cardboard making factory

in Bhuapur. The toxic gases and other pollutants discharged by this factory causing many health problems short breathe, cough etc. As per residents, it is operating by illegal means in a small dilapidated building and not only it adding to air and noise pollution but also blocking the drainage system by disposing waste in drainages. One of the respondents claimed that,

The factory is under a group of people from Gujar community which is dominant caste and people are afraid to complain about them. They usually do not take up the responsibility to clean this dumping yard in front of the factory causing many problems. My doctor always suspects this reason that I am falling sick is because of unhygienic and unclean environment. However, I usually hide the actual reality from him. I am constrained to live here.

Despite spending long years together in Bhuapur, residents of this community have not developed trust among themselves. The primary reason for this phenomenon can be most of them having migrated from the different states of the country so there is lack of bonding. Especially women have raised concern that they find it difficult to mingle up when other person is speaking different language or of a different culture especially with the families from South India.

Living conditions in Deendayal are somewhat same. Blocked sewers and mounds of garbage is a usual sight in Deendayalpuri. However, on the other side, there is cohesion and unity in the community members because most of them belong to one part of the country and have a common culture and language. To ensure the safe supply of water, they have developed a coping mechanism. Having high percentage of mutual submersible pump connections is an indication that people are living with congruence. There have been studies on exploring collective efficacy where a combination of trust, collective bonding leads to informal social control in the community. These collective efforts help in reducing violence also. (Sampson et al., 1997 as cited in Krieger & Higgins, 2002). In this community, some women leaders were also seen helping other women to get issue their identity cards/proofs.

5.2.3 a) Employment Opportunities

The huge difference was found in the number of cases of self-employed and daily wages workers. The potential opportunity for these two categories was lacking in Bhuapur due to social isolation. The social networks which are often formed based on caste, class and

gender were found to be lacking in Bhuapur. In Deendayalpuri, people not only seemed to be monetizing their basic needs as a collective group but also encourages a sense of affinity, solidarity and endorsement.

5.2.3 b) Rental Businesses

The landowners in the Bhuapur slum together are seeking profits in the long run by providing housing to the increasing population of migrants. Some of the buildings were identified in which one room was allotted for a family of 4-7 members and only one toilet was shared by almost 10-12 families. The multi-floor buildings are raised which comprised of almost 30 rooms. Decent Housing reduces the level of infectious and chronic illnesses, injuries and death particularly among the poorest people. Every family pays Rs 3000 as a rent per room. If an extra guest stays for more than week, the owner starts badgering for extra rent. A single landowner was keeping 4-5 tenant families. Most of the landowners do not prefer to stay with the tenants in the same community as they find the surrounding is unfit for living. Besides the landowners housing structures, some jhuggi's were also seen which were either built on the disputed land or under the construction sites which were mainly of those who working on that site only.

Overcrowding and inadequate ventilation are linked to the respiratory diseases pathogenesis (Krieger and Higgins, 2002). Epidemiological studies have also entrenched associations between moist and mouldy housing and persistent health issues like headaches, fever, nausea and vomiting (Billings and Howard, 1998).

In Deendayalpuri, people were paying rent but for better housing with the separate space for kitchen and separate toilets.

5.2.3 d) Civic Amenities and other social Facilities

There are specific sites reserved for construction of marriage hall, government school and hospital. However, as claimed by residents of Bhuapur, the corruption is so rampant that progress of work is not even up to scratch. According to them, corporator from ruling party is involved in corruption and does not look into demands of people. Unlike Bhuapur, condition of these civic amenities and social facilities is much better in Deendayalpuri. It has marriage/community hall, skill development training centres, government schools, colleges and hospitals in its vicinity.

5.2.3 c) Healthcare facilities and health-related issues

There is no government hospital in Bhuapur; only two respondent mentioned about one government dispensary by MCD. Immunization services are also nonexistent in the community and community health workers and Anganwadi workers seldom visit the community. As mentioned by five respondents, one government doctor which is meant to serve Steel Authority of India Limited (SAIL) employees also operates thrice a week from an apartment nearby. He provides free treatment and medicines to the poor people from this community. The most prevailing health related problems are fever, common cold, cough and gastrointestinal infections. Apart from this, there are many private clinics flourishing in this locality which according to residents provide health services at high cost and exploit the poor. Due to nonexistent public health services, usually people end up going to private clinics.

Only one respondent said that she is seeking treatment from one government hospital in Delhi under Central Government Health Service (CGHS) scheme because her husband is a government employee.

They believed that people should raise their voice together as one voice against Parshad will not make any difference but still they never unite.

As summed up by one respondent, "Private clinics exploit people by charging high amount for even simple treatment procedures like dressing. While in government hospitals, dressing costs Rs 20, it cost Rs 70 in private clinics. They prescribe more medicines and never give medicine dose through injection. Recently I was suffering through cough and cold and my doctor prescribed so many medicines that tolled me for 300 rupees. If someone in the family is suffering through serious illness, we always end up in borrowing money at higher interest rate. Let me tell you about my daughter who died of jaundice. When she fall sick, we took her to first to Meenakshi Hospital and then after to Yashoda Hospital (Private Hospitals). Both of these hospitals were quoting so high prices that we couldn't afford to pay the fees. Finally we decided to take her back to village for a treatment where she died on the day of dushherra(a Hindu festival).

The people in Deendayalpuri do have hospitals and dispensaries in their vicinity. There is one government hospital and another one is a charity hospital which primarily provides health services to people from Deendayalpuri. However, most of the community members prefer to go charity hospital instead of government hospital. The popular conception in the community is that doctors in government hospital give an expired medicine which doesn't cure the disease. As claimed by the respondents, the government

hospital is always crowded and chaotic where nobody pay attention, most of people prefer to visit a charity hospitals which instead provide more effective treatment and immediate relief.

5.2.3 e) Water and Sanitation

In the Bhuapur slum, one toilet is shared by ten families on average which is deficient. So most of the people end up in going for open defecation, which is likely to contribute to the spread of diseases like cholera within communities. Most of the people find drinking water provided by Municipal Corporation unfit for consumption and hence end up buying packaged water. It cost 25 rupees per 20 lit bottle. Average household manage to utilize one bottle for three days but in summer season, demand for drinking water increases so lot of money is spent in it. A wife of a junk dealer stated

We are paying 4000 rupees rent for our house. My husband's job is to collect rag from nearby factories. I along with my children help him in sorting out scrap that he has collected and we sell it in the local market. We were sharing one toilets for number of families which was insufficient and unhygienic for my daughters. So we built one temporary toilet for our daughter but landlord got so furious that he demolished that toilet and now my daughters are forced to use common toilet. The water supply from the Municipal Corporation is limited and irregular. Water supply last for only two hours and the taste of water is terrible. It taste salty so we are compelled to buy packaged drinking water.

In Deendayalpuri, the condition of water supply and sanitation is much better because of the community participation. Here, residents have collectively dug the tube well and have installed submersible pump to fetch the water. Some of the residents are actively involved in maintaining hygiene and cleanliness in the community. Few years back, the condition of Deendayalpuri was like that of Bhuapur with mounds of garbage and blocked sewerages. Due to blocking of sewer lines, drainage water used flow on the streets and it was hard for any person to walk on the streets. One of the respondents who had actively participated in cleanliness drive at that time told, "All of the community members decided to lay sewer line so that drainage water can dispose off properly. All of the community members gave their labour to this act and now it is clean everywhere.

5.2.3 f) Education

There is a one government school within the Bhuapur which provides education till seventh standard. After finishing seventh standard, students have to travel daily to

Ghazipur (Delhi) for further education. There are three schools in which one was government and two private schools in Ghazipur. There is a gender bias in the community in terms of spending on education. It was very much evident in the community because male children sent to private schools while schooling of girl children is done in government schools. As one has to travel for further education, girls are usually abstained from continuing secondary education. Almost all the children in the community are first generational learner. Male children barely could finish education of higher secondary education after which they are forced to quit their education. Unaffordable higher education and financial crisis their family shatter their dreams of pursuing further education. Ultimately they end up in working as a daily wagger, pity job in some local industry or providing helping hand in their pity family business. As husband-wife duo is outdoor economic wage worker, female children of in the house are enforced to take care of household chores. Their involvement in drudgery is the reason that girl's literacy rate was very less. Most of the elder daughters have stopped schooling after the seventh standard because they have to take care of their younger siblings. Here cultural context plays very important role where only daughters are expected to help the mother with household chores. This is a complex phenomenon and the range of reasons contributes to this like patriarchal society, crimes against women, sexual abuse and eve teasing, caste discrimination. Like private clinics, even private schools are flourishing in these areas making education unaffordable and inaccessible. The private schools in Bhuapur charges fees of 300 rupees per month. Somewhat same is the fate of the male children because they are also often needed to quit their education and do some pity work due to lack of job opportunities and financial crisis.

The case of Deendayalpuri is entirely different. Despite being well connected to the city and having Government girl's college, the status of the girl's education is somewhat same to that Bhuapur. There are ranges of reasons like seven respondents apparently feel that it is unsafe environment outside house for the girls. Few girls have been found to quit education because they have to take care of younger siblings, prolonged disease or failure in examination. Seven respondents mentioned that it is not safe for the girls to move out for study. In some cases elder girl child fell sick and stopped studying whereas some got

failed and some had to take care of the younger siblings. Manav Vikas Parishad, a local NGO in this community is trying to address this problem by organising vocational training course for girls at free of cost. As a result of this, many girls were engaged into petty businesses like tailoring, cooking and so forth. Due to the availability of government girls college, the girls are more educated but again they are more encouraged to take up skill development to earn money rather than going for higher education. In Muslim families also, the elder daughters were only learning *udru* as non-formal education at Mosque.

Working women mostly tend to save their money for education and proper food for children but Some of them stated that they do not want to send their children to school as they believe in having a bank balance and owning a house.

According to one women respondent (in charge of an NGO), Education is not the priority for forty percent of them in many families eldest daughter are never sent to school because she has to take care of her younger siblings. They are only engaged in skill development like stitching and cooking classes. Formal education cannot be substituted with the skill development courses.

When asked about the entity they find costliest, majority of the respondents found that education is caused them a big toll of money followed by expenses on transportation and food. Other major expenditure includes housing tax, water tax and electricity bills.

5.2.3 g) Alcoholism

The individual factors like eating behaviour, smoking, drinking, individual health status also seemed to be influenced by the distinctive attributes of the environment (Yen & Kaplan, 1999). People in such distressed social milieu are predisposed to smoke as well as alcoholism, though addiction of any sort was recorded only ten percent in both the slums respectively. Some people stayed in *jhuggi*'s even after selling their land because for them alcohol and spending money on gambling are more important than owning a house. He considers alcohol is the major issue with the male population. As an in charge of an NGO, one women suggested the researcher not to visit such communities alone after 5 pm. She narrated the problem of alcohol abuse.

The rickshaw pullers and auto drivers take drugs and youngsters are involved in looting people. On asking about the significant issues faced by women, she emphasised on the problem of alcohol abuse. Most of the women are working as domestic help and all their husbands are drunkards. It is true that people lack money, but they all borrow and anyhow manages their expenditures. The reason not to buy fruits is women hide their savings from their drunkard's husbands, because if a woman buys fruit for children, she will be beaten up by her husband for money.

This shows that the women bargaining power decides the food choices available to her children. The working women does not seems to have right to expend their own income. Their income is controlled by their husbands.

5.2.4 Availability of Markets

The urban slum dwellers do not get the advantages of the rural background in terms of access to food. Since there are irregularities in issuing of PDS cards, slum dwellers end up buying grocery from small shops which are infamous for adulteration of food items. Dry ration includes staple i.e, wheat and rice are stored for 3-6 months due to lack of storage space in the temporary settlements but other perishable food items including vegetables, milk and pulse are bought as per the need. They cook food in the living room only with no availability of separate kitchen.

The market in vicinity is more accessible to Deendayalpuri compared to Bhuapur. Therefore the availability of markets in Deendayalpuri was more in comparison to Bhuapur. Women are mostly working as a maid, construction worker, or self-employed. The children often eat lunch outside. Salary days are usually celebrated with cooking food items like paneer or non-vegetarian food. The grocery items are also bought according to the days of getting a salary. The grocery item are often bought by the male head of the family while returning from their work. Only one of the respondents mentioned that they buy pulses and rice from village due to low prices. Only two of the respondents in Bhuapur mentioned that the quality is bad so they visit main city markets in Kuashambi to buy grocery as they believe the quality is dependent on the price of how much one can afford.

On asking about the quality of food to a respondent, she answered that she buys all the grocery items from city markets as it is well packaged and often get good offers but little

costly. Small shops here give everything in loose packets and quality is also not good. Dry stock mainly includes wheat and rice which she buys in every six months and for vegetables she goes to Ghazipur mandi.

Women believes it is well packed and hygienic but the prices are little high as compared to small grocery shop. However, they also get good offers when they buy in bulk. Twelve respondents mainly do the grocery shopping from the small shops; they buy all the food items in loose packing as it is affordable, excludes GST and as per the amount needed for one-day cooking. On asking about the quality she said whatever is available in less price she has to buy or moreover rice and pulse they clean before cooking. They relish the variety of food items available but also mention about adulteration.

One of the respondents said ‘The food is good here that’s why we have come here, but everything is adulterated. I always buy vegetables for my family. The vegetables are getting costlier how we will afford I do not Know’.

As husband-wife duo work as a daily wager, children often have their lunch in small eateries. The kind of food they eat is biscuits, Maggi, chips and chilli potato and they usually skip proper lunch.

On asking about the food consumption pattern she explains the availability of food has increased so much that people do not want to eat at home. Eating small snacks outside is quite cheap rather than preparing a full meal at home. My granddaughter studies in College. She often brings chilli potato and chowmein and skips lunch at home.

On the contrary, having a dinner treat(complete meal) outside is an impossible dream for most of the respondents in Bhuapur. Seven out of eleven respondents mentioned that they could not afford to eat in restaurants and feel that eating outside in roadside eateries is unhealthy and unhygienic.

One widow residing in bhuapur responded that I am only surviving. I do not earn that much to expend. I sell vegetables. Sometimes I earn 50 sometimes 100. I buy wheat flour 1 kg then spend three days in that, Rs 2200 I have to save to pay as rent. Staying with the landlord provide social security to us as I only stay with my daughter. I have no money to eat and feed my daughter but I am paying rent.

On asking another woman if they ever ate outside, she replied that she could not afford to eat outside and uttered “Ek din bahar khayenge tow doosre din chulha Nahi jal payega’(Even if she eat outside for one day, she will not be able to afford cooking next day). She goes on calculating that even if she cooks rice at a time for five (family members) of them. It will cost around 100 only but if they eat outside it will be above Rs 300.

Two years back, there was a huge explosion in one shop due to leaking of LPG gas cylinder in one of the eateries. While the slum dwellers are struggling for their survival on one side, landowners believe that they are at a better position as they get government houses in the lottery and they as landlords have to pay their bills.

5.2.5 Caste Based Discrimination

Migrants struggle has been full of hardships and caste discrimination adds into their agony and makes them more vulnerable. The cost of living has increased to thousand folds in 30 years. Despite miserable life in the slum, people chose to stay here for a long because of unaffordable house, slow pace social and economic mobility and insecurity. Bhuapur community comprises of various clusters of caste including Gadharia's; Shepard caste (OBC), Jatav's (SC), Guja's(OBC) and Muslims. Caste hierarchy is visible with the presence of Ration shops in the Brahmin Community. The oldest houses were located where fair price shop exists. There is no area wise segregation according to caste as mostly comprise of the migrants and with few landlords (75 % and 25 % respectively as per the informant) in which majority of the landlords are Brahmins and Gadhariya. The landowners are mostly self-employed as shopkeepers and their major part of the earnings comes from rent. One informant compares her situation while epitomizing it;

“They are only irritating their tenants and their job is to throw our stuff if we are unable to pay rents. Some are playing cards all day, drinking, and some are the shopkeepers. Like where I used work, my employer had its chakki shop. Have you seen farming, the owners are the farmers, and we are their crops and if we do not pay rents they will not be able to harvest”

In Deendayalpuri also some clusters were found of Saifi's(Muslim) and the dominating caste is Jatav (SC). This slum also comprises of a various cluster of classes where all the Muslim were residing near Mosque area.

Unlike in Urban areas, the concept of Pradhan (Sarpanch) is prevalent in rural areas but in Bhuapur, people have their Pradhan from Gujar samaj as they are the oldest and have covered a substantial ancestral land which was earlier used in farming. The other reasons

why people visit Pradhan for their problems is because they are influential, affluent and educated.

Caste hierarchy also hampers women work opportunities in both the slums, they are being asked about their caste before recruiting them as a maid. The person who belongs to upper caste does not look for the lower caste women for domestic help. Due to which, most of the women who work as a maid in the apartments often hide their caste due to the fear of not getting the job of cooking. It is difficult for the lower caste people to survive where the caste-based discrimination as a social norm is deep-rooted and persists. Especially people from upper caste families do not like to eat the food which has been touched by a Dalit. In the majority of the families, caste differences are in the conscience of elderly but not in the younger generation. For instance in the same house mother in law always ask about the caste but for daughter in laws it does not matter. Some upper caste people also claimed that the lower caste people do not want to change their lifestyle even if get money or if they are earning well. People from upper caste accused lower caste for creating dirt and wastage and claimed themselves who only want cleanliness.

Women from lower caste have to face double assault of discrimination. One of the possible occupations these women are to get job as cook in nearby growing housing colonies. However, the families staying these colonies do not prefer cook from lower caste. This problem is more rampant among the older generation while people from recent generation are coming out of this caste bias. So to tackle this problem, usually women have to hide their caste identity while seeking job as a cook. Caste discrimination is also the reason that most of the women from lower caste in this community prefer self-employment instead of salaried job because of caste discrimination, uncertainty and irregularity of income. However, they lack financial sources to start their own business as well.

One respondent belonging to lower caste acknowledged this as a cheap mentality of higher caste and questioned to those who eat outside or in social gatherings; how would they identify the caste of a person who has cooked meal for them.

She shared an anecdote, where one landlord's wife's (Brahmin) ordered a plate of chow mein from a vendor, her father in law asked her in front of all that, why you are eating from the hands of lower caste(Harijans). Then the vendor owner despite being handicapped rubbed the chow mein plate on her father in law face. What a poor person can do, if you hamper his source of income.

There were only two ration shops in Bhuapur; in which one is believed to be serving only the dominant upper castes and another one is unofficially allocated for lower castes.

One respondent charted out the differences between the two ration shops. One is in neelkanth (name of the place) for poor people like us and another one, which is for Mahatma's (higher caste people who are wealthy and are from the village).

The dominating castes together constitute 'Pal Samaj' (Gujars) who are the in charge of the temple and also own various shops in the market. This caste is therefore socially and economically dominant caste. Adjacent to Gujjars is Pundit Mohalla mainly comprised of Brahmins while dalits occupy remaining space. Due to unavailability of loans from banks to build own house, the shopkeepers have to pay rents to Pal Samaj. The slum dwellers avoid seeking jobs at far places to avoid pressing transport expenditures and limit themselves to that place only.

One of the respondents accused the Pal Samaj is economically strong and so have bought huge land at lesser cost in the past. They raised the numbers of buildings on this land to rent out to migrating families. People from this caste have good alliance with officer in MCD to tweak the rule in their favours to raise unauthorized constructions. Even though they are less educated have accumulated most of the resources through collection of rents and seen spending time and money on leisure items.

5.2.6 Functioning of the Ration Shops

Despite ration shops in Bhuapur functioning since last ten years, more than half of the families do not have ration cards of their own. Due to lack of permanent residence, many of the families do not know the application procedure of the issuance of ration cards. As most of the families in Bhuapur are daily wagers, they find it difficult to follow up their application for issuance of ration card. They are also afraid of losing their daily wages and hence sometimes unable to collect their share of grains. Some are unaware the procedure for applying due to their temporary stay in the slum. They are not entitled to take ration from the village as their cards get deactivated due to their stay in urban slums. So majority of the families in Bhuapur are entirely dependent on the market for the

purchase of food items. Apart from that, ration shops in Bhuapur operates for three days in a month.

One community elder stated that he is still struggling to get the ration card and questioned where my applications are decaying I do not know. He also mentioned

It has been thirty years and still I do not have ration card, I have never enjoyed any benefit from government. The availability of ration card in the village is easier than in slums due to the temporary settlements and lack of identity proofs in urban setting. It is difficult to leave this community as it provided employment to him. I have earned my survival by fighting with the increased prices of vegetables.

The recent change in the norms of distribution under FPS is creating bewilderment among distributors as well as beneficiaries. Few months back, government came with a notification asking all beneficiaries to change their ration card. Accordingly many of the beneficiaries got their ration card renewed following tedious procedures. However, recently there was again change in the rule with introduction of Aadhaar card. Now it is mandatory to have Aadhaar linked ration card to avail the facilities of PDS shop. Due to frequent change in the rule, beneficiaries of Bhuapur, who are also daily wagers, finding it difficult to get Aadhaar linked ration cards. Working women usually miss on their daily income while standing in the queue for ration. It usually cost them two to three days of daily wage loss every time they visit the government office. Earlier the system of ration distribution was good and only one person from the family was enough to have a UID only. The newly issued ration card a year ago is supposed to have the names of all the family members with their UID. The procedure also demands every member of the family to visit the ration shop once to give their UID details. Based on this data, new ration cards are awarded which mentions names of only those family members who have given their UID data. Here cultural barriers are creating many hurdles. In some of the castes of Bhuapur community, women are meant to stay inside the house. Even if some manages to get ration, it only helps them for 10 -15 days as it does not last for long.

One senior woman from Pal Samaj stated it does not look good that our daughters or newly wed women go to ration shop. Most of them do not even know how to talk, they are not educated enough to even write their name. Moreover they also suffer from health issues.

The woman in Pal Samaj feels uncomfortable to send their daughters and newly-wed daughter in laws to the ration shop because it is not allowed in their community

In such a scenario, it becomes strenuous for women to visit ration shop to give UID data and get enrol them in family ration card. Because of this reason, many women's names are missing in the newly issued ration cards. It was also observed that, though widows are entitled to ration card under Antodaya scheme, the APL ration cards were issued to them. In that case, they also have to rely on the market for purchasing food items and face difficulties to manage household expenditures on their own.

The FPS shops are allegedly a den of Augean stables; According to some of the respondents, they usually get their entitled ration in alternate months. The distributors forthrightly deny the ration stating that stock is insufficient. Due to this callous attitude of the system, people are accustoming to the corruption.

One of the respondents mentioned that the distributor said I also want some ration for myself. So, he gives ration on alternate months only. It is of even if he gives on alternate months but it been four months I am not getting ration. The corruption should be in the limits. One of the ration shop is allegedly own by an acquaintance of corporator of that area. So it is believed that the Parshad (from dominating caste) is involved in the corruption as his relative is managing at FPS. Some of the beneficiaries are even facing problems in authentication of UID data and that is why they are denied ration they entitled. Some respondents also highlighted some cases of favoring particular caste. It has been also alleged that as distributor is partial towards people of his caste.

Two of the respondents from Pal Samaj who are in the business of keeping tenants negates the problem faced by tenants and said they that they do not get ration for themselves and its only tenants who get it as they usually make fake id's to get a ration.

In Deendayalpuri, despite corruption and technical problems related to punching thumb, two respondents also mentioned that the staff at FPS is quite supportive and helpful. Five respondents mention that they always get 2 kg lesser the amount they are entitled to. It does provide some help but gets finished in 10-15 days only. On asking about the functioning of the Fair Price shops to a Nagar Nigam subordinate, He recounted

“I am entitled to 6 kg but they only give 5 kg. Have you seen the movie Nayak, that inspires him. I believe he also uses a magnet and gives 1 kg less to the public. I have checked on my own. If I they give me 15 kgs according to them, it is 12 kg when I weigh it at home. I have warned him also that stop doing this otherwise I will complain, and your

shop will be closed. I have complained to my officer also. These people went to my senior and said that they will give me for free. Then I said I do not want for free. Whatever I have earned i have earned with honesty and will always do that”

As per the statement by a respondent, people lose on their wages, despite sitting for long hours in the queue; the biometric machine does not accept their thumb impression, so they do not get the ration. He also enlisted the problem people face while taking ration

“Same problem happened with me also; I asked when I am getting ration for ten years. Why I will not get ration because of this machine. They say that there is a problem in your hand only. This is how they are eliminating 10-15 women every month. Where the entire ration is going I do not know”

Women sit there for a whole long day just because they get it very cheap. It is difficult for them to sit for the whole day as some are working as daily wage labourers or as a maid, and they also have to look after the children. The person who distributes ration also faces problems and mentioned that this online system is creating problems; they do not have the complete information about the beneficiaries who avails ration card. He has seen the cases that there are two ration cards in the same house with the same name.

5.2.7 Empowering Women: Role of Self Help Groups

Self-help groups are seen as a developmental intervention for numerous issues including indebtedness, unemployment, gender inequalities and food security(Vighneswara Swamy and B.K, 2013). Self Help groups reduce impoverishment and indebtedness of the poor by improving economic status, creating resources at the household level, improving household capital, empowering women, and enhancing the accessibility of the financial services at the local level.

As said by women in Bhuapur, currently there is no Self Help Group (SHG) operating in the community. They have organised intermittently to protest against unhygienic conditions in the community. There is a widespread conception in the community that, women are not meant to actively involved in Corporation politics. Hence women are discouraged from contesting elections and even if they get elected in women reserved seats, their husbands are the puppet master. Researcher also found one inoperative Anganwadi in the community. As per residents, the Anganwadi worker seldom comes to the Anganwadi because she often visit her village. Whenever she comes, she conducts

some sessions related to cleanliness and hygiene. She also helps women in community and organises the campaign for vaccination.

The focus on the enhancement of the economic status of the women has been lauded since several decades. The women are the eventual facilitator of nutrition to households both through the procurement of food as the groundwork involved in cooking for consumption.

The women employment not help household financially but also improves household Nutrition. Women have curbed decision-making and negotiating power over household economic processes which lead to less incurred expenditure on health, nutrition and education, and poorer outcomes for family members, including children (National Nutrition Policy, 1993).

According to women in this community, SHG's can be one of the tools to gain control over household income. They feel that through SHG's, they can save some money and it can also provide the loan if any catastrophic event occur. However, women in Bhuapur are mainly involved in household chore, so they do not have any sustainable source of income of their own. Four respondents candidly expressed the need of SHG as a tool of empowerment of women and expressed that educated women in the community should take lead.

Unlike in Bhuapur, the women in Deendayalpuri were empowered. Currently there are two active SHGs in this community, each group has ten members. Around twenty women were engaged in the Self-help groups with one leader in each group. The woman leader of the SHG, collects monthly contribution from each group member. The democratic mechanism has been developed to provide loans to group members who are in need of money. As per SHG head, tri-monthly meetings are conducted to audit the account and dispense loans to their members. According to leader of the SHG, these meetings are also helpful in educating women to become self-sufficient and self-reliant. Women usually take loan for their daughter's weddings and to start businesses like tailoring and vegetable shop. In some instances it happens that group members are unable to pay their monthly contribution or loan amount. In that case those group members are expelled from

the group. As per SHG leaders, the groups are inclusive to women from all the castes. These SHG's also have mechanisms to inform the bank to remove the one who is found to be guilty, so that person should not be included in any other group.

5.2.8 Gender Gap in Nutrition

5.2.8 a) Unpaid and Invisible Labour

Women in both the communities face a range of structural barriers related food security. Women are primarily accountable for administering all the activities related to food within the household and hold a crucial role in intrahousehold food sufficiency. The understanding of gender based issues is of extreme importance in achieving food sufficiency. There have been documented evidences of the deprived households governed by women have the propensity to provide more nutritious food for their children than those only governed by men. Women often sacrifices their intake due to engendered communal norms to bolster the consequences of the scarcity on their household members. Therefore they are called as the *shock absorbers of household food security*. The reduced food intake of women did not seem to be intended due to dietary discrimination, but due to cultural influence of gendered roles involving to serve other family members first. This further results in skewed intrahousehold distribution of against women and girls owing to gender specific societal norms (Baker JL, 2008 as cited in Holme et al., 2009).

5.2.8 b) Time Poverty

As working women are hold responsible for multiple work, at home and work outside, they often encounter role of conflict and stressful situation. It is difficult to meet both the challenges at the same time when a woman have small children to feed and to take care of. In these cases elder female sibling is considered to take care of the younger ones at the cost of her education or career. The increase market availability and due to more number of working women in Deendayalpuri, cooking time is reduced. They find it feasible to buy ready to eat, packaged food for their children rather than cooking. Children in slums like to eat foods by following the diets of rich, which includes burger, noodles and momos. The family member hardly eats together; breadwinner eats first then children and then female counterparts. Only dinner is eaten together but in the same order. Almost all women tend to have brunch in the noon time and then dinner with tea in between;

therefore women follow two meal patterns. They also believed that earlier food was cheap and tasty but it is costly and everything is adulterated, but due to lack of time, they also prefer to eat outside sometimes. Three of the respondents also stated that increasing price of vegetables is one of the reasons which encourage them to buy cooked food outside.

5.2.8 c) Eating Disorders and Poverty

The association of skipping breakfast and obesity is evident (Goyal and Julka, 2014)(Watanabe *et al.*, 2014)(Sakurai *et al.*, 2017). Obesity does not occur only due to the overconsumption of fatty food items only but the faulty eating habits are also the leading cause of obesity in the food insecure households. The higher prevalence of overweight and obesity among women in the present study could be due to imbalance in the diet as discussed in fourth chapter. This imbalance is attributed to the faulty eating habits or rather the availability of the unhealthy street foods. In addition to this the temporary availability and shortage of food may also cause women to indulge into binge eating and imposed starvation after that.

Majority of the women in both the communities consume tea and rusk in their breakfast. This finding corroborates the data obtained in the first phase. Working women skip breakfast by only having a cup of tea before going to their jobs. Non-working women also start early in the morning with the breakfast and packed lunch preparation for children and husbands. After that they finish their household chores like washing clothes, utensils and other activities. They also follow two meal patterns by skipping breakfast. Their diets mainly include food items like rice, chapatti and potato preparations which comprise carbohydrates and fats. Beside two meals pattern, they also relish snacking outside i.e., chowmein, samosas and momos. Unlike Bhuapur, more number of women was working in Deendayalpuri and therefore was engaged in grocery shopping and was more independent in making economic decisions of their family.

5.2.8 c) Gendered differences in Occupational Structure and wages

Unlike men, women who voluntarily or involuntarily stuck in such household chores activities, limits their space to move out and find difficulties to work in a profession of their choice. Patriarchal social system also constructs their voluntary decisions. The wage

structure also had gender disparity, so women are forced to work at much less wages as compare to men with no social security. The women who were engaged in daily wage labourers were getting less pay as compare to male counterparts. In Deendayalpuri, only a few women were found to be self-employed in petty businesses like tailoring, making envelopes and pickles etc. and their earnings are meagre.

The women who are somewhat educated get some job opportunities in secondary sector or tertiary sector. Otherwise the popular conception that women are meant to work in boundary walls of house is prevalent in these communities as well. A gender bias in kind of work is clearly visible where men are mostly involved wage earning activities while women are restricted to do household work. One woman was an exception as she was highly educated but had to reside in Bhuapur due to her husband's government job in the vicinity.

She recounted her sacrifices due to engagement and commitment to the family. One feels empowered when one decides on others behalf. I was offered a position of Adhyaksh (leader) in Mahila Mandal, but had to sacrifice my career and job so that my child does not face any problem. I also have aspirations to become a politician or to open my own NGO, but due to the responsibilities towards family I cannot fulfil my dreams.

Major economic activities of both the slum were more or less similar. In bhuapur, male heads of the family are engaged as factory workers, rag pickers, junk dealers, vegetable vendors, cleaning workers in the apartments and malls. Whereas in Deendayalpuri, some were also engaged in self-employment enjoying liberty as compared to salaried jobs. Others were involved as rickshaw pullers, auto driver, painter and factory workers. The job is contractual and they get an average monthly income of Rs 4000 -5000. The women daily wage worker grumbled about exploitation at the workplace as,

I get work as per the contractor choice. If there is no raw material available on a particular day, construction activities get halted, and so I do not get wage work of that day so as my daily wages. We both are construction labourers but I get little less money. The employer gives us concession in house rent at the rate of Rs 1000 instead of Rs. 2000 per month. However, for this favours, he always try to exploit us by paying lesser wages. There are so many things I want to have for my children, like they should get quality education. Nothing can be done for the suffering we have gone through, but I want my children to be well doing in their life.

This waomen labourer was not getting money for the amount of work she was doing, the employer deducts her salary as housing rent. This condition also makes them vulnerable to exploitation.

5.2.9 Coping Strategies for vulnerabilities

Families look for the options to minimise stress, they prioritise expenditure on the basis of necessity which comprises of paying rent, education, transportation and then food. They have to struggle for everything from a pin to the plane.

If the composition of the slums is seen together, majority (around forty percent) of the households were food secured. They may be considered well off due to their establishment in the same place long ago. This category may include the evolved families who have stable source of earning and could have built their social networks. Twenty percent households fall under the category of food insecure with hunger. Some attributes can be estimated to cause this severity includes the history of vulnerabilities with seasonal employment, inhabitants of pavement dwellings, single headed families (widow or widower) and senior citizen couples abandoned by children. Other categories with food insecure without hunger (37.7 percent) somehow struggle and adapt some coping mechanisms to prevent them from the severity. The coping mechanisms adapted by food insecure households are enlisted below:

5.2.9 a) Pavement dwellings

The temporary squatters are often destroyed, due to which migrant leave their squatters and are forced to reside on pavements. Their endless visits to Ghaziabad Nagar Nigam offices in the hope of fulfilling their demand go in vain. They live in distress situation and develop coping strategies for their survival under extreme weather conditions

5.2.9 b) Defensive Expenditures

Safe drinking water is the necessity to the slum residents which is otherwise provided to the non-urban poor. The drinking water is bought in the majority of the people in Bhuapur .i.e., 20 litres for Rs 25 in every three days in winter but in summers 20 litres is required every day. The government water is used only for washing clothes and bathing. In the times of hardships when they are struggling to get food, they spend money buying water. Those who cannot buy water are often at the risk of GI infections as the

Government water supply is not drinkable. On the contrary slum residents in the city resort to have illegal mutual submersible connections to get safe drinking water (ninety-four percent). They are not dependent on the government water supply.

5.2.9 c) Undiversified diet and daily rationing of food items

The nonfood expenditure including rent, education and transportation also curtails the rationing. During food inflation, households probably shifts their consumption pattern by reducing quality and the quantity of food.. The quality of diet thus is determined by the purchasing capacity as the micronutrient rich diet is unaffordable to poor. The mere consumption of fruits was seen as one of the coping strategy. Due to price inflation of specifically protein-rich food items (dhal, milk and meat products) and fruits, these food items are unaffordable to poor. Women often seemed to plan their diet according to the food prices of specific vegetables. Most of the families buy ration on daily basis. They usually try to spend fix amount on food items. For example one woman used to spend hundred rupees on food items for the preparation of three meals. So they usually end up buying food items which are affordable. So women end up buying potato and rice while they cannot afford expensive food items like milk and milk products. Ultimately most of the families end up compromising on quantity and quality part of the food items. In order to get food items in less quantity women tends to buy food items in loose packaging, which poses them at health risks. The food items which are bought in loose packaging are compromised in quality and they have no other option but just to consume the same. They rarely could make special food item on festivals but just buy a small amount of sweets for their children.

5.2.9 d) Food reserves

In Deendayalpur some of the respondents reported that they use food reserves during the time of scarcity. Food reserves mainly include dry rations like wheat flour, rice and pulses. These food items are stored by the households to be consumed during the time they could not to buy. Whereas in case of bhuapur, the most deprived food insecure specifically did not have reserve with either due to lack of money or due to lack storage space.

5.2.9 e) Invariable strategies

Social relationships also confer health benefits, from fostering a sense of belonging to providing links to valuable resources. The measurement of social capital at the individual level is seen as potential indicator of health in general and access to food in particular. Help from others was largely defined as economic support rather emotional support (Padgett, 2012). Despite spending half of their life they lack social support and advocacy. They lack trust and feeling of belongingness among their neighbourhood. They often borrow money to buy ration but in return they pay more due to interest on the borrowed money. The adopted strategies are found to be negative as people fall into vicious cycle of poverty and lifelong repayments. (Gupta et al., 2015)

As informed by the respondents, grocery shop owner gave food on credit to those who are familiar to him for a long duration of time, which makes the new households more vulnerable as compare to the old ones who have built the trust with the grocery shop owners. Households without a perpetual income or who were engaged in the seasonal employment were getting advantage from this system of borrowing. Likewise in Deendayalpuri people manage their expenditures by taking money from grocery shopkeeper or the neighbours but, people do not have to pay interest due to the feeling of trust and social support. This phenomenon was lacking in Bhuapur.

5.2.9 f) Liquidation of assets

Some households specifically in Bhuapur sold their assets like bicycle, jewellery or utensils when they needed to buy food. However, no such cases were found in Deendayalpuri. Some of the daily wage labourer's sale their wives assets as they never get their salary because of borrowing money from their employer only for household expenditure. Women who work as maid borrow money from their owners and which is paid back by the deductions in their salaries. Poor of the poorest families did not have assets to sell. Few grocery shop owners also collected money from these households on fortnightly basis as they save money with them to buy food during the time of need. The households which were dependent on the seasonal employment were most likely the ones to get benefit from this practice.

5.2.9 g) Dropout from school

Male children were either studying in private or Public School. In Bhuapur some girls were engaged in rag picking and it segregation just to support the parents work while in Deendayalpuri only few girls were into skill development of non-formal education. In majority of the household among both the slums, elder daughters were withdrawn school to save on school fees and instead they were busy in household activities and caring activities of the siblings. It came out during discussion with the community members that the parents also delayed the admission of the school going female child to save money and take care of younger siblings.

5.2.9 h) Eat at religious places

Homeless people flock together and assemble at the religious people in need of food. They try to satiate their hunger with the food offered at religious festivals. People from slums went to these places to have their meals and if possible, brought some food home for subsequent meals. Presence of a mosque and temples allows the people in Deendayalpuri to enjoy food quite often, where food is distributed as Prasad. In Bhuapur there was no such case.

5.3 Discussion

This chapter gives a whole range of explanations to touch upon the interplay of endless factors, which are responsible for framing household food security situation and thus nutritional status of women in particular. The studied slums add on to the evidences of the drivers of the household food security. Spatial differences related geographical location, accessibility to the market and livelihood opportunities, efficiency of welfare services (PDS, Health services, education), status of women and social, cultural and liaisioning relationships among community members in two slums have imposed multiple barriers to the food security. The comparative analyses of the two slums illustrates that a broad category of 'nonfood' expenditures in Bhuapur is shrinking the food budget of the community members. However, both the slums demand better quality and equitable, Bhuapur need more attention to relegate the barriers to food security.

As popular conception assumes that food is a sole solution to the prevent food insecurity, study encompasses other structural, social, economic and political factors which are

responsible for the food insecurity. The Right to food policy needs to be more comprehensive by addressing macro-level factors such as gender differences, locality barriers, livelihood opportunities, historical exploitation and vulnerabilities.

CHAPTER 6

COMBINING QUANTITATIVE AND QUALITATIVE DATA

6.1 Introduction

This chapter draws upon the interpretation of quantitative and qualitative findings together in line with the conceptual framework, which was adapted in the insipient phase of the study. The retrodution may be done on the basis of wide range of quantitative data obtained in the first place. The intensive nature of the authentic experiences, unstructured interviews of qualitative data allows to analyse the circumstances under a larger picture. The first section deals with the spatial differences and how it causes multiple deprivation in the two slums. The second sections digs into the conceptual framework with the inclusion socio-ecological perspective, which is well informed with both quantitative and qualitative data. The last section discuss the research questions framed during the initial phase of the study.

6.2 Spatial differences and inadequate living conditions in the slums of Ghaziabad City

Both the clusters that have been selected come under the category of notified slums as per the Ghaziabad Development Authority list. The socio-demographic characteristics of both clusters suggest that the slum which is located in the city has better livelihood conditions as compared to the other which is located on the outskirts. The house ownership is higher in cluster 1(seventy-eight percent) as compared to the other cluster (thirty-one percent). The migrant population is higher in cluster 2 (ninety percent) as compared to cluster 1 (seventy-five percent). The illiteracy rate is higher in cluster 1 (fifty percent) as compared to cluster 2 (thirty-six percent). However, the income in cluster 2 is higher but the percentage share of food expenditure is lesser as compared to cluster 1. As far as the employment opportunities are concerned, none of the head of the family were unemployed but they do lack the potential self and casual employment opportunities in Bhuapur as they are mostly migrants who lack financial support from their neighborhood or the community as a whole. Cluster 1 not only has better

availability of adequate safe drinking water but also had better toilet facilities. Whereas in Bhuapur, because of unauthorized settlement, households were spending money to get drinking water and using shared toilets. Due to the unavailability of proper identity proofs among the migrant population, they were excluded from availing subsidized food items from fair price shops.

The overall average monthly per capita expenditure was Rs. 2748.8 for both the slums whereas the average monthly per capita expenditure on food and non-food items was Rs. 729.5 and Rs. 1384.21 respectively. According to the critical indicators of Household Consumer Expenditure NSSO survey 2009-10, In Uttar Pradesh the average mpce on food and nonfood in urban areas was Rs. 728 and Rs. 1574 whereas 46.3 % was the shared expenditure on food. The total monthly average expenditure on food in the selected two slums is corresponding well with the NSSO data (Ministry of Statistics & Programme Implementation, 2009).

It is seen that with the increase in the total monthly per capita expenditure the shared percentage of expenditure on food decreases. This signifies inadequate amount of consumption of calories. Inability to increase adequate amount of calories in food can be attributed to expenditures on other pressing needs. There are other factors responsible but it is difficult to capture all of them, as this factor comprises of expenses on daily needs of urban life (S. S. Vepa et al., 2001). In addition to these existing issues of financial constraint, it is also known that a large segment of the population spends a substantial proportion of their income on repayment of loans borrowed at high interest rates. House rents and expenditure on alcohol consumption also takes quite a bit away from their income.

As per the WHO BMI classification most of the women had normal BMI (51.8%), 27 % were overweight, 13% were obese, and only 7.9 % were underweight. If the BMI of the women is seen cluster-wise, more percentage of obese women were present in cluster 1 (17%) as compared to cluster 2 (5%). The obesity can be attributed to various factors including, sedentary lifestyle, and easily available cheap unhealthy foods. Food insecurity has been a significant factor for obesity in women.

The continuous cycle of unhealthy eating habits like consuming either huge amounts at one time or restricting intake of food without maintaining any healthy diet results in gradual weight gain. Binge eating and unhealthy practice of food restraint may put the women at risk of being overweight and obese (Zalilah and Khor, 2004).

Most of the women had a sedentary lifestyle (44.7%) whereas 35.1% were moderate workers, and 20.2% were heavy workers. Almost 81% of the women were found among the borderline food consumption score, and only 3 % were falling in the category of poor food consumption score.

If both the slums are considered together, the food consumption score, the poor and the borderline food consumption score identifies the calorie deficits among the households. The cluster in the city shows lesser number of women with micronutrient deficiencies as compared to the slum located on the outskirts. The majority of the women's diets were rich in fat but was lacking in the various micronutrients. Therefore, they are likely to suffer from micronutrient deficiencies.

The majority (sixty percent) of the food secure households belong to literate category (graduate) whereas thirty seven percent were illiterate. Around eighty nine percent of the food secure households and seventy percent of the food insecure household dealing with issues of hunger and inadequate consumption of nutrients were acquiring high standard of living index. Majority of the households were falling in the category of High SLI because of the added weight to basic resources. However, the standard of living index lack a direct measure of living standards and has its limitation (Wag staff, O'Donnell, Wagstaff, & Lindelow, 2008).

The working status of women in the households also influences the food security status. In both the clusters, it was observed that majority of the woman were housewives. Nearly Seventy percent women were found be housewives, which may be a cause of their sedentary lifestyles resulting in obesity (twenty-seven percent).

Around 13 % of the insecure households with hunger were self-employed and casual workers, only 8.7 % were including regular wage earners.

Among the food secure households only 8.3 % were self-employed and casual workers and 12.5 % were regular wage earners. It can be stated that regular wage earners were in a better condition with concern to household food security, whereas seasonal and self-employment often tends to increase the risk of transitory food insecurity. The major problem with the unemployed is to get assured job for 365 days of the year. Unlike the rural poverty pockets, the urban poor lack supported structures provided under the NRLM. However NULM implementation by SUDA in Ghaziabad seems to be in a formative phase (State Urban Development Agency, 2015).

Urban women are the major sufferers as they form a considerable section of those usually seeking jobs in the unorganized sector. In conclusion, it is observed that there is a significant association of income with food insecurity. This observation highlights the importance of linking urban poor women with income generation avenues, schemes, skill upgrading, training and linkages with potential employers. Obesity was observed to be much more prevalent in the food insecure household in comparison to households with food security. About 47.8% of severe food-insecure households experiencing hunger belonged to obese women whereas only about 4.3% of the same household had an underweight population. With the increasing level of obesity among this population, it becomes essential to investigate what other factors are responsible for fueling obesity prevalence in this population. The association between severe food insecurity and abdominal obesity in adult females indicates their vulnerability and the need for tailoring programs to prevent further health problems in this group (Mohammadi *et al.*, 2013).

Some of the above findings are conceptualised by understanding the dynamics of these two settings. The following are specific characteristics of the studied slums which causes multiple deprivations:

6.3 Locality as a barrier to Household Food Security and its impact on the expenditure and consumption

6.3.1 Housing

The location of a household plays an essential role in creating social inequalities. Deendayalpuri slum was well connected to the city with proper access to small shops and

markets. The house ownership was higher in Deendayalpuri (seventy-eight percent) as compared to Bhuapur (thirty-one percent), as the migrant population was higher (ninety percent) in Bhuapur as compared to Deendayalpuri (seventy-five percent). These differences can be seen due to the resettlements of slum dwellers. The unavailability of identity proofs in temporary settlements in Bhuapur also prevented the residents from availing the subsidised food from fair price shops.

6.3.2 The economic and industrial base of the locality

The economic and social class of the poor is determined by the condition and status of the local labour market economy. Since most of the urban poor's livelihood is dependent on income from precarious informal sector jobs which rarely meets their consumption needs. They are more likely to employ risky survival mechanisms like taking loans at high-interest rates which ultimately traps them in the cycle of endless debt. Due to the uncertainties in employment, they are vulnerable to economic shocks, which leads to the unavailability of affordable housing or hygienic living conditions. In total, these factors affect the ability to fulfill basic needs of shelter, security, food and water. For example, the poor may have to pay for basic amenities such as subsidised food, water and toilets that may otherwise be widely available and affordable to the non-urban poor through public systems.

Unlike the rural areas where there is a strong presence of kinship which act as a strong social support system, in the mixed slum communities located in urban set up there is a lack of such support systems (Khanna, 2014). These social networks were lacking in Bhuapur slum as compared to Deendayalpuri where people not only seemed to be monetising their basic needs as a social group but there was also a great sense of belonging and attachment.

The women in Bhuapur slum did not have access to employment on regular basis, which made their condition even shoddier. Thus, due to limited opportunities of work around the year they are forced to take up an occupation that is readily available in the vicinity, which further makes them less specialised and without any skills.

The place where an individual resides also affects his or her employment opportunities (casual vs regular employment). In both of the identified slums, where unemployment is a major problem, the majority of the women were housewives. In Deendayalpur, those working took regular wage jobs like maid servants, labourers, vendors in the nearby posh areas owing to the slum's proximity to the city. That was not the case in Bhuapur where self-employment opportunities were bleak mainly because of the location, which was further away from the city. Since most of the people residing in Bhuapur slum were migrant labourers they were deprived of financial support from the neighborhood or the community as a whole. Here, working women were engaged in menial jobs like envelope making, rag and waste picking.

6.3.4 Environmental issues

Overcrowding, poor water supply improper sanitation, pollution, open sewers, contamination and pestilence which create spaces for diseases to breed are acute in the slums and have a significant impact on the health of the household (Macintyre et al., 2002).

Inadequate sanitation and poor quality of water often lead to gastrointestinal disorders that could affect absorption and can cause digestive disorders. This kind of crowded physical environment also increases susceptibility to communicable diseases. Hence, dietary intakes that could be adequate in ideal conditions may, therefore, be inadequate in a poor environment those who live in such conditions are usually the poor who suffers from inadequate dietary intake. Both the slums were under the same situation in terms of hygiene and sanitation with minor differences among them. The majority of the households (ninety four percent) in Deendayalpur had shared submersible connections, whereas in Bhuapur most of the households were dependent on government supply (thirty five percent), and others (twenty five percent) were buying drinking water due to the irregular and undrinkable water supply.

Individual factors like improper eating behaviour, smoking, drinking, individual health status also seemed to be influenced by the distinctive attributes of the environment (Yen & Kaplan, 1999). People in such distressed social milieu are predisposed to smoke as

well as alcoholism, though addiction of any sort was recorded at only ten percent in both the slums.

6.3.6 Transport facilities

Due to the lack of an efficient government transport mechanism which is accessible by the common populace, and the high expenses related to the usage of private transport services, the unaffordability of private transport acts as an indicator of deprivation. In relevance to this issue, an important matter of concern is that the problem lies not in whether there is a grocery store or a primary school within walking distance of every household, but whether there is an adequate provision of public transport giving access within a reasonable time to a grocery store or primary school (Macintyre, Ellaway and Cummins, 2002). This problem is especially prominent in Bhuapur slum, where there was lack of basic facilities like schools, hospitals and employment opportunities. Since the expenses on these basic needs like transportation, education and health takes a large share of their income, it further worsens their capability to afford a quality diet. In situations where the work location is distant, the daily commute expenses becomes unaffordable, and hence, many people especially the women folk are forced to quit their jobs which leaves them to survive on whatever little income they have.

6.3.7 Social and cultural attributes of the neighborhood

The availability of proper nutritious food is dependent on the social, cultural and economic environment of the place of residence. Social environments can promote risk factors like the price, availability of and proximity to a variety of healthy foods which in turn plays an important role in determining the food habits of the populace. The financial state of the community and employment levels of its population also plays an important role in determining the availability of healthy foods. The consumption of street food was more in Deendayalpuri due to more number of working women as well as the considerable availability just around the corner.

The food products available in nearby markets also influence eating habits. The family eating patterns, huge availability of food vendors, peer pressure and cultural influences also make urban-poor more dependent on packaged food. The time constraints and wages

earned govern the purchasing pattern. People on wages who earn and spent daily tend to buy their food in small quantities from neighborhood shops rather than central markets. The huge variety of street foods and copycat packaged products (especially copied from the well established brands) available in the vicinity also becomes a significant source of food for many urban dwellers, both in terms of energy intake and food expenditure (Pingali and Khwaja, 2004). Food markets in poor urban areas tend to be inefficient regarding adequate quantity and quality. The small shops available in slums lack a proper storage facility, which compromises both the quality as well as quantity of food items. The food market is constantly shaped by the demand of busy mothers, childcare, coping strategies adopted by time constrained mothers, intra-familial dynamics of child rearing, influence and use of “ready - to - eat” market foods, and other issues like household expenditure on non-food (Chaturvedi et al., 2016). This demand determines the price structure of food items in the market. Hence, almost exclusively dependent on the market for food and other necessary items, slum dwellers are vulnerable to price increases and other market shocks. Owing to this and other factors, it was found that in the majority of the households studied people could only afford to have two meals per day.

6.3.8 Food and Non-food expenditure

The shift has been observed in the composition of the household budgets which is moving from food to non-food expenditure (Basole, & Basu, 2015). The same findings were reflected in the present study, where the average percentage share of monthly total food expenditure was less in Bhuapur as compared to Deendayalpur (see Table 5.1).

Table 6.1

Average Monthly Food and Non Food Expenditure in both the slums

	Deendayalpur	Bhuapur
Location of the slum	In the city(% share in expenditure)	At periphery(% share in expenditure)
Total food expenditure average	36.2	22.8
Total nonfood expenditure	29.6	69.3
Transportation cost	6.5	14.2
Water and electricity cost	10.4	4.76

A considerable difference was also found between the total average percentage of non-food expenditure of the two slums. The above-stated factors justify these differences as slum dwellers in Bhuapur were spending less on food due to pressing non-food expenditures. Whereas in Deendayalpur which had better employment opportunities, transport, and government structures like hospitals, school, availability of PDS, and bank services people were spending less on non-food items. Hence, due to the conditions at the slum in Bhuapur the people residing there faces food deprivation.

While considering the spatial differences, the collective factors are being missed out. Besides, this study of contextual features does not give an account of the time interval between environmental exposures and any effects on health. The various factors that make a healthy community include; the physical features of the environment, secure employment, accessible and affordable services to support people in their daily lives. A proper connection between houses in the community and access to places of employment plays an important role in maintaining a healthy lifestyle. Public transport matters a lot

primarily when you are residing in an isolated area. Health and welfare services and other socio-cultural features of the neighborhood consist of networks of community support. Thus, it is essential to recognize the interplay between supply and demand for services to meet a range of basic survival needs. Both the slums selected for this study shows how a location can influence an individual's health. However, both demands better services of quality and equity. However, the squatters placed on the periphery needs attention due to their seclusion at various fronts.

There is a need for health policies to have a comprehensive outlook where the relationship between a person's social environment and its impact on health is not overlooked.

All these factors causing multiple deprivations are further informed in the next section in search of more in-depth explanations and for broader understanding.

6.4 Socio-ecological Perspective on Food Sufficiency

There have been socio ecological model in the literature from Bronfenbrenner's social ecological theory, which explained four levels of environmental impact; Microsystem (Individual interaction with family members), Meso and Exosystem (interrelations among individual outside family i.e., workplace), and Macro system (cultural values). Each of these systems are affected by each other and therefore behaviour may be influenced through changes in these levels.(Townsend and Foster, 2011). Another socio ecological framework by Dahlgren and whiteheads suggested a relationship between health and physical, social and economic environment. (Barton and Tsourou, 2000, as cited in Barton, 2005) pointed out that individual behaviour and lifestyle is influenced by the presence of safety and quality of routes and facilities by the density and shape of towns and by the distances which have to be travelled to reach places. The local living and working conditions are important for health in terms of availability of housing, work and essential services to evade social exclusion. The major environmental conditions including air, water are also affected by the formulation of policies. With adherence to the predictors of household food security as conceptualised. The themes emerged in

qualitative phase can be segregated into the three levels; upstream level, center and downstream level.

Figure 6.1

Socio ecological perspective on food Insecurity



Socio-ecological perspective enables the researcher to look at the impact of various levels in accessing food security in an urban poor environment in Ghaziabad slums. The

restricted access to quality foods through the socio-ecological domains in the formed environment. This domain includes social, structural factors, family and household levels. These factors together create hindrances in achieving optimum food sufficiency, and thus, affect the nutritional status. The various levels are described below.

6.4.1 Upstream: Environmental level

It is very crucial to understand the role of the environment as a mediating factor between food insecurity and nutritional status. Most of the women surveyed had normal BMI (51.8%), while 27 % were overweight, 13% were obese and only 7.9 % were underweight. If the BMI of the women is seen cluster-wise, more percentage of obese women were present in cluster 1 (17%) as compared to cluster 2 (5%). The prevalence of obesity can be attributed to various factors including, sedentary lifestyle, and easy availability of cheap unhealthy foods. Food insecurity has been the most significant factor for obesity in women. There is another study which suggest that the effects of food insecurity varies over time (Bhargava, et al., 2008). There is causal pathways that coexist between food insecurity and overweight.

The data collected also indicates that the focus on the availability and quality of food in specific. The food insecure families are vulnerable to unhealthy food environment due to less access to healthy food either due to location or due to the structure of households and poverty. Prevalence of obesity among women may be related to the constraints over time for meals, which promotes faulty eating patterns that then causes health problem which are often associated to the poor economic condition of women. A possible causal mechanism could be the over consumption of low quality, high fat food as compare to the higher income families. Another reason could be the inadequate food intake, which lead to binge eating when excess food is available. Following are the factors that communicate with both food insecurity and obesity in complicated ways.

6.4.1 a) Energy dense and lesser cost

This refers to high availability of energy dense options at lesser prices and less availability of the nutrient dense food items. It is also evident in the literature that the calorie dense foods lack nutrient and are cheaper (Drewnowski and Specter, 2004). In the

study by Powell (Powell et al, 2010) they also found an association with the increase in the price of the fruits and vegetables with the increase BMI.

6.4.1 b) Food marketing

The huge availability of ready to eat food and copycat packaged foods was evident in both the slums. Slum dwellers are susceptible to these food items not only are these available in abundance but are also very affordable.

Others factors involve the shopping destinations, that is, it is not only about the distance of grocery store but also the type of shopping destinations. Majority of the slum dwellers preferred nearby grocery shops but few of the slum dwellers did not to go to the nearby shops because they did not want to compromise on quality. They used to visit supermarkets which are farther away from the nearest groceries to their homes.

6.4.1 c) Community factors

Other factors involved are the availability of employment opportunities, modes of transportation, availability of public health services and hygienic environment to prevent the occurrence of infectious disease. The better availability of Public systems in one slum clearly showed a stark difference in the total average food expenditure. This emphasizes the viewpoint that food insecure neighborhood are responsible for the coexistence of poverty, utilization of available resources and food insecurity.

6.4.1 d) Societal factors

The composition of community members also influences the extent of social bonding. The types of migration also varied in both the slums which affected the social networks as individuals from the same regional background possessed no language barriers and also shared similar cultural and traditional practices. Women in the city's slum had self-help groups and were seemingly more empowered than the slum at the outskirts. With the self-help groups women were engaged in their businesses which made them financially independent and improved their bargaining power. This information was gathered in the in-depth qualitative interviews and it is imperative to quantify such data. There have also been studies conducted to assess the impact of time women spend in domestic and agriculture work and its impact on the diet diversity of the women and children. It was found that, among poor women those who spend more time in cooking have more diverse

diets in Bangladesh, Cambodia and Ghana. In Mozambique, a positive association was found between women's cooking time and minimum acceptability diet in poor children. Women domestic work found to have positive effect in children achieving a minimum acceptable diet in Ghana. The study also concluded that lack of time in domestic work and cooking negatively impacted the diet diversity of women and children particularly for the poor. Women's time spent in cooking emerged to be of great significance in poor rather than in non-poor children. Women's diets were more diversified when women spend more time in cooking, this is because the non-poor women start with better diets than the poor and are less sensitive to the reductions in cooking time and domestic work (Komatsu et al., 2018).

Caste wise segregation was more prominent in Bhuapur due to its formation by one dominating caste which is still ruling in the entire community. There was no clear caste wise segregation in relocated colony in the city due to more number of house ownership and small businesses but segregation along religious lines was evident there. Despite the higher number of educated women in Bhuapur there were more non-working women, and a few women who were self-employed. This was due to the dearth of opportunities and also a lack of social belongingness due to barriers in communication due to language differences which hindered the chances of running small businesses like in case of Deendayalpuri.

6.4.2 At the Centre level: Role of women and livelihood issues

The role of women is placed at the Centre due to their key role as providers. Despite their limited opportunities, they juggle between their responsibilities towards home as a care taker, and as a financial supporter by working outside for the security of the family. Women's educational statuses also proved to be significantly associated to food insecurity. There have also been cases where women were earning but they did not have control over their money which in turn effected their freedom to make choices for themselves. In such cases they are more vulnerable to livelihood issues as food expenditure is compromised in order to fulfill the basic minimum needs of the family. It was also found that the lowest quartile had the maximum food expenditure. Thematic analysis helped to understand the women issues in greater depth. Time poverty also

restricted them to have a balanced meal not only for themselves but also for their children. Almost eighty-one percent of the women were found to have borderline food consumption score and only three percent were falling in the category of poor food consumption score. The poor and the borderline food consumption score identified the calorie deficits among the households. Only sixteen percent found to have an acceptable food consumption score, which suggests only a small fraction is consuming a wholesome or diversified diet. Though the calorie requirement for women are a little lesser the other micronutrient requirement remain the same or more in case of Iron.

Due to the lack of house ownership, slum dwellers faced difficulties in getting a ration card, which further increases their food expenditure. In that way they had to entirely depend on the markets for the purchasing. The slum at the periphery had the worst health conditions due to the unavailability of proper toilet facilities, which increased the chances of contracting gastro intestinal infection as well as increased hospital stay (50%) in the last 365 days.

Other factors that negatively associated with food insecurity were the number of family members, income and food expenditure. All these factor together contribute in impacting food security.

6.4.3 Downstream level: Household and family level

Women take responsibility for food insecurity through a variety of actions to conserve food and contribute resources to families. In a majority of the cases women were consuming only two meals due to time constraints. Another factor was economic insecurity among women which make them incapable of making independent decisions, beside this they also possesses a care giving role. All these factors together affects the women's all over wellbeing. The food availability at home is guarded by time for cooking, limited storage, cooking facilities, inadequate or costly transportation and competing demands for other non-food expenditures. In a majority of the households in the slums, the frequent items which were found were mainly the sources of starch from potatoes, fat from oils and refined cereals from bread because they are cheap. Majority of the household tends to lack fresh vegetables and fruits.

Type of work performed by women outside the home also influences the dietary pattern of the family. For instance children often eat lunch outside or elder daughter often take care of the siblings. Regular wage workers were more food secure as compared to casual and self-employed, additionally, casual work led to the repeated episodes of transitory food insecurity.

Women employment opportunities were also determined by their caste, as women from upper caste only wanted upper caste women as domestic help or cook. Women from lower caste were mainly involved in small business like tailoring or as construction labourers. The business opportunities were fewer at the periphery which made the woman more vulnerable as compare to the woman in slum in the city.

The environment can also affect food consumption and purchasing pattern through various mediating mechanism including inefficient small grocery shops, marketing and community factors. The convenient foods available on the road sides provided a substantial portion of the calories, which slum dwellers consumes and it provides opportunities to influence their consumption patterns. Therefore, a prospective way of analysing the environment is to consider neighborhoods as food insecure.

Individuals are enclosed within the household, environments which together constitute the socioecological context of person's life. The relationship between food insecurity and nutritional status of women can be understood by examining the processes that occur at an individual level. These processes can only be deeply studied by qualitative methods.

This section emphasize the need to understand the context in which people live, beside measuring the food secure and insecure households it is important to investigate the frequency and duration of food insecurity. Specific gender roles entails the understanding of how food security differs between the family and the individual. This would help to achieve the food sufficiency for all in a holistic manner.

The result of this analysis will add to theories on upstream policy sectors that may contribute to food security and the quality of dietary intake by the women in urban poor slums. Women livelihood issues poses a need for understanding of the place based causal pathways for urban poor food security. Poor nutrition in women specifically is more

important for program and policy decisions. The impact of spatial variables on the selected two communities also cannot be neglected.

6.5 Discussion

This section aims to discuss the research questions framed during the initial phase of the study.

6.5.1 Predictors of household Food Security and their linkages

Predictors of household food security are numerous but the study focuses on some of the important factors which are relevant in the context of the two selected slums. The idea was to address the livelihood issues beyond the boundaries of the environment in which specific behaviour prevails. The lower socio-economic status is highly associated with the measures of household food security and nutritional status and overall wellbeing of the individuals. The present study addresses the multifaceted approach to tackle the issue of food insufficiency.

The qualitative approach used in the study facilitated the researcher to establish the linkages between the opportunities available in the socio-physical environment and the outcomes of food security. It is particularly helpful to policy makers and planners as it provides descriptive information and understanding of the concept of informal survivalism. At the community level, the broader contextual factors that emerged were the type of migration, availability of ration cards, safe drinking water and toilet facilities.

The location of a slum also makes a difference as the unavailability of healthy food, lack of local grocery store, poor access to food, low-income residents, and limited transportation options do effects the dietary pattern, and thus, effect food security. The concept of food deserts is valid to the slum at the outskirts where the residents in urban area could not afford to purchase food that was both healthy and affordable (Beaumont *et al.*, as cited in D'acosta, 2015, pp 3-5).

The compositional factors include house ownerships type of work and education of the mother seems to influence the household food security. It was also found that the number

of members in the household and livelihood conditions are major factors in determining nutrition security or maintaining a healthy nutritional status.

The correlation of the measure of food security with the nutritional status makes this as a unique quantitative study. It provides us with a distribution of the gradients of malnutrition among the food secure and insecure households, as there was a higher number of obese women belonging to food insecure households. Various collective factors were also traced which were found to be causally linked to the measures of household food security. The factors were related to caste discrimination, formation of social groups, patriarchal and gendered norms, which were reflected in the biased thinking towards girls education and dissuading women to seek employment opportunities outside home.

6.5.2 Impact of migration on consumption patterns and its implications on nutritional status of women

The overcrowding and increasing number of jhuggi's is mainly because of the huge influx of migrants. People find it easier to settle in suburbs because of three main reasons, firstly, housing prices are lower, e.g. Bhuapur, which is located at the border of Delhi and Ghaziabad, distant from the main city. Secondly, the presence of family, friends or other people from the same ethnic background, and finally, the availability of job opportunities and educational facilities for their children.

The change in the living conditions due to migration should be accounted for the dietary patterns and health concerns. The physical labour in the informal sectors hampers the social and mental wellbeing. The increasing demand of housing in the cities and severe dearth in the public utilities, overcrowding and unhygienic conditions makes women more vulnerable. Men who migrate from ancestral rural household often find it difficult to earn living as per the city standards. Women get separated from the elders in the family. Managing home, children and doing work outside becomes the triple burden. Husband's migration does not provide complete autonomy to the women who are left to care of home but sometimes it offers more space for decision making to women. Due to lack of education and limited skills, they hardly get jobs in the formal sector. They usually find themselves in the manual labour jobs like maids, construction labourers, and

fruits and vegetable selling. Though the men are, still consider as the breadwinner, the poorest of the poor families have to be dependent on the women's income as the men's income does not fulfill the basic household needs. It has been mentioned in the literature explicitly that women are more considerate than men to spend a major part of their income and physical needs of the children. The present study corroborates the same aspect, but the women also had limited control over their income, as they do not take their decision independently as their choice of spending is guarded by the men.

The slum and its congested habitation have caused epidemics and other health hazards including infections as well. Frequent supply of unsafe and contaminated water poses the risk of developing severe health issues. Due to the unavailability of safe drinking water, the proper utilisation of food does not take place precisely in case necessary nutrients. Water security is often overlooked despite of the abundant literature on its relation to health. Safe and clean water is still unavailable to the poor households. Therefore, healthy living conditions should be added as a new dimension to food security.

Women working as domestic help and as construction labourers find it difficult to prepare three meals for their children. Furthermore, due to a lack of storage, cooking facilities, and of time some women prefer to buy cooked food. The higher socio-economic strata in contrast has the advantage of being able to afford healthier food items, they also have domestic help to prepare fresh meals but the lower socio economic group or migrated nuclear families lack time, and any sort of help. Therefore, in this context the availability of healthy food for poor is of a great significance. Especially in situation where women were often found overburdened with the household activities and work outside home.

Another factor to consider is that female work is valued lower than male work, and the requirements of women are presumed to be less than those of men. Gender, age and kinship hierarchies, seniority are the parameters within which the authority, consumption rights and the requirements of the various members of a household are played out. The wage differential was also found in the present study in support of the existing literature.

A gender bias in the kind of work is clearly visible where men are mostly involved in wage earning activities while women are restricted to do household work.

Due to migration from different regions of the country the slum located in the cities have inhabitants from different ethnicities. In the presence of such mixed slum communities, the urban social networks are perceived as unreliable due to lack of social supports unlike the rural areas that are believed to have more dependable social networks (Khanna, 2014).

6.5.3 Slum dwellings and Nutrition security

Inclusion of the term ‘nutritious food’ under the ambit of food security poses challenges to meet the nutritional aspect to achieve an adequate nutritional status. It is necessary to have access to safe drinking water and health services. The food consumed should be utilized biologically to maintain a healthy and active lifestyle.

The lack of basic amenities is not only due to their inability to access but also due to the location of their settlements. They experience social exclusion at many levels that results in inequitable access to opportunities, services and basic human rights that affect their vulnerability to achieve food security. Therefore, it is useful to think of vulnerability as a hindrance rather than a state of static characteristics. Due to the unavailability of safe drinking water, the proper utilisation of food does not take place precisely in case of necessary nutrients. Water security is often overlooked despite of the abundant literature on its relation to health. Safe and clean water is still unavailable to the poor households. Therefore, healthy living conditions should be added as a new dimension to food security.

Poor access to safe water and basic sanitation also has a considerable adverse effect on the physical and cognitive development of children, results in the range of gastrointestinal disorders in adults and makes it difficult for girls and women to maintain personal and menstrual hygiene. Especially women who are living under such circumstances are particularly at risk of sexual violence. The poor may have to pay for essential amenities such as subsidized food, water, and toilets that may otherwise be

widely available and affordable for the non-urban poor through public systems such as PDS.

The undrinkable government water supply adds to their miserable conditions. As a defensive mechanism, people in Bhuapur ought to buy bisleri water bottles in bulk from bisleri factory in the vicinity. The government water is used only for washing clothes and bathing. In many instances of hardship they often have to choose between spending money on water or on food. Those who cannot buy water are often at the risk of contracting GI infections as the government water supply is not drinkable. On the contrary, slum residents in the city resort to installing mutually shared submersible water connections illegally to get safe drinking water (ninety-four percent). These connection make the residents less dependent on the government water supply.

Due to the lack of a proper sewage system and a lack of space for separate toilet in each house, people in the slum were using shared toilets, while the elderly male members generally end up going defecating in the open. Additionally, the reoccurrence of gastrointestinal, respiratory disorders, jaundice and diarrhoea is quite common due to the consumption of poor-quality water and unhygienic conditions including water logging and choked sewerage. Most of the hygiene and cleanliness issues can be attributed to negligence on the part of the government officials, as very little action is taken even after complaints lodged by the residents of the slum.

The type of income or working pattern of the household members also determined the food consumption pattern. If one household has a stable but subsistence monthly income and the other is depended on irregular but larger daily wages, a stable food acquisition strategy is often reflected in the first instance rather than in the second. The urban poor with irregular income could not plan a food budget for a month.

6.5.4 Challenges faced by women in acquiring household food security: Gender perspective

A women's access to food cannot be seen in isolation to their position in the social realm. Consumption of nutritive food items in terms of their access to market is dependent on their purchasing power and independent economic decision-making. Therefore, it is very

important to study the socio-economic dimensions of women's food security and its impact on their nutritional status. A women status in the household is dependent on power and resources acquisition. It is well understood that a women's active participation in food acquisition fosters an adequate health status for the family members. Nevertheless, the role of women in purchasing, cooking, and providing other care activities is guarded by the other family members. The nutritional status of women is also dependent on her empowerment and the choices she makes, not only for herself but also for her family members. Women who were engaged in self-help groups were more confident in taking independent economic decisions. The South-Asian enigma also confers the same; that the reductions in child malnutrition in South-Asia require for the promotion of equal freedoms, opportunities, and rights for women including the right to participate in decision making both within and outside the home. Such factors may also result in a reduced incidence of low birth weight, improve access for women to basic services, and increase control over their fertility". What is Essential is, a shift from welfare to a human rights in approaching the issue of malnutrition, with an emphasis on community empowerment.

The women who were engaged in social activities or were empowered were more aware about the government food distribution policies and programmes, and they generally collected their own rations. In some households, where the family was unable to afford adequate food, some women were unaware about their entitlements. Therefore, they could not make full use of the government's food distribution policies and programmes.

The literature reviewed discusses issues regarding the disparities and unequal distribution of food within household, unequal nature of food requirements and unequal nature of perceived requirements by age, sex and gender (Seth, 1998). Though the calorie requirement for women are little less but the micronutrient requirement remain same or its higher in case of iron. Despite the presence of a gender gap in the intake of nutrients, physiological or reproductive factors tend to play an important role for the higher incidence of anaemia among women. The majority of the women participant analyzed for diet history were found to be calorie deficient and were likely to suffer from various micronutrient deficiency. There was no pro male bias in the intra- household allocation,

but it was their timing for food which differed. That is, the women and girl child would first serve the male members and then would eat at the end. “This too makes up a portion of the time unaccounted for in which women spend laboring at home. It is unaccounted because caring activities are not measurable, since these activities are concurrent and invariable. In this way women sacrifice their own health.” Women sacrificing their own health and caring activities are not measurable, because these activities are concurrent and invariable.

It must be mentioned here that intra-household gender inequalities should be well understood before targeting social protection at the family or household level. There are no structured mechanism, which can ensure that the entitlements would be distributed equally within the household. There is also a huge lacuna in the legalities of women ownership on papers like bank account, property ownerships and electricity connections. This too prevents them from availing their rights and entitlements. The multiple vulnerabilities faced by women can only be tackled by countering the patriarchal norms that inhibits the women’s progress. Hence, a uniform assistance is required to fulfil the right to social security and protection (Mehta, 2013).

There is also a biasness in the community based on gender in terms of spending money on education. It was very much evident in the community because male children were sent to private schools while schooling of girl children was done in government schools. Additionally, as one has to travel for availing further education, girls are usually abstained from continuing secondary education. Almost all the children in the community were first generation learners and in most cases male children barely finished their higher secondary education after which they are forced to quit their education. This is generally due to unaffordable higher education and financial crisis. Ultimately, they end up working as daily wagers, pitiable jobs in some local industry, or providing a helping hand in their small family business.

In most of the cases where, a husband-wife duo is outdoor economic wage worker, female children of in the house are enforced to take care of household chores. Their involvement in drudgery is the reason that girl’s literacy rate was very less. Most of the

elder daughters have stopped schooling after the seventh standard because they have to take care of their younger siblings.

There have been documented evidences of deprived households governed by women which had the ability to provide more nutritious food for their children than those only governed by men. Women often sacrifice their intake due to engendered communal norms to bolster the consequences of the scarcity on their household members. Therefore, they are called as the *shock absorbers of household food security*. The reduced food intake of women did not seem to be due to dietary discrimination, but due to the cultural influence of gendered roles which often involved having to serve other family members first. This further results in a skewed intra-household distribution of food against women and girls owing to gender specific societal norms.

Often the gendered factors, including power and resources acquisition, play a larger role in the context of the Indian society. There is a lacuna in addressing women's issues related to their food sufficiency and nutritional status. Despite the rich literary discourse on food security, there is little evidence-based and qualitative research addressing the political, social, and economic factors which lead to gender inequalities.

6.5.5 Causal Linkages between poverty and obesity: Co-existence of food insecurity and obesity

The adaption of in-depth qualitative interviews helped the researcher to establish a causal linkage between obesity and poverty. The paradox of the occurrence of over and undernutrition revolves around the ability to spend for nutritive and healthy diet. One of the possible causes of this is the lack of purchasing power, or the inability to buy nutrient dense food, and over-consumption of cheap calorie sources. These may be seen as reasons for the prevalence of obesity in the lower socioeconomic groups.

There have been studies conducted to examine the relationship between the price of food and its energy density. They highlight that choices are made considering cost, convenience, taste and lesser extent to nutritive component and variety (Drewnowski and Darmon, 2005). Cost stands out as the single most important factor especially among poor households. Therefore, the socio-economic status is directly linked to the food

choices made. High energy density food items including fat, sugars and refined grains are cheaper, highly palatable and convenient as compared to the low-density energy food items. The food items which are low on energy are also more nutrient dense. These include fresh vegetables, fruits and fish which is costly and unaffordable for the poor. These highly dense low nutritive food products are marketed to the poor due to their lack of awareness and compulsion to buy cheaper food products. The implication of which processes are seen in the increasing obesity among the poorer households

Another linkage is regarding the perpetual cycle of temporary food restriction and abundancy, which is the leading cause of obesity in poor and insecure households. The gradual weight gain in women is due to intermittent episodes of binge eating and starvation. This further leaves the questions open for understanding the paradox of food insufficiency, obesity and poverty.

Additionally, the increased consumption of unhealthy foods is enhanced due to the huge availability of copycat foods in the slums. This is a leading cause of obesity, especially among children of working parents. Children of working parents who are living with food insufficiency consume high sources of energy, fat and sugar and less consumption of protective foods like fruits, vegetables, meat and dairy products mainly due to unavailable cooked food at home.

The sole solution to this problem is creating awareness and making woman self-sufficient in modifying their food behaviour and lifestyle pattern within their friendly environment. Besides this, the technological developments have changed the lifestyle pattern and elevated the social status of women. It has been stated that, despite the hardworking laborer job, prevalence of central obesity was common phenomenon in majority of the selected women regardless of their dietary practices (Prabhat and Begum, 2012).

6.5.6 Interrelationship between food security and nutritional status: Challenges in addressing nutrition security

It has been argued that improving household food security may be necessary but not sufficient to impact the nutritional status of young children. Food insecurity occurs “whenever the availability of nutritionally adequate and safe foods or the ability to

acquire foods in socially acceptable ways is limited or uncertain” (Anderson 1990 cited in Liberal et al., 2014).

Food adequacy was defined into three components: i. nutritional need should be satisfied both in terms of energy and in all essential nutrients; ii. food consumed should be safe and palatable; iii. types of food commonly available should be acceptable within the prevailing food culture. Income, food prices and access to home production were identified as the major determinants of food availability. The predominant form of malnutrition in India is undernutrition (lack of one or more nutrients) where the over nutrition (excessive intake of nutrients) discourse is gaining importance and referred as double burden of malnutrition.

The measures of nutritional status and food security are quite different. The nutritional status is measured by various methods. Firstly, by assessing physical growth with the help of indicators like wasting, stunting, BMI, anthropometric measurements. Secondly by assessing dietary intake and lastly by looking for any clinical symptoms like anaemia and vitamin deficiencies. Whereas measuring household food security status is a challenge due to its subjectivity. It involves the study of the household dynamics not only in terms of consumption but also the mediating factors that promotes or hinders in achieving health.

Undernutrition sets in due to the long-term consumption of inadequate food which lead to poor health. The poor households have limited capacity to avail the specific nutritionally adequate and safe foods due to food insufficiency, and if it persist for longer duration hunger would likely set in (Coates et al., 2006).

The mere consideration of the calorie consumption and studying its relationship with the nutritional status at the individual level is not justified. The recommended dietary allowances and calorie recommendations were made for different kinds of work (sedentary, moderate and heavy). Different kinds of work were identified, and the calorie cost computed (for example, carry loads, dig a well or climb stairs) and then multiplied by the number of minutes or hours for which that work was done. However, there is no way of knowing what damage was done to the body when people did heavy work and

consumed only cereals for calories without other nutrients like vitamins, minerals from milk, eggs, vegetables and fruits. Only one parameter is known i.e. the calorie cost of that work. There is no direct information on the diversity of foods needed for work. There is indirect information on the different aspects such as some B-complex vitamins needed for 1,000 calories (Deaton and Dreze, 2009).

The important cause for chronic undernutrition is now has being diagnosed with micronutrient insufficiency. Micronutrient sufficiency adds another dimension to the food security discourse. Inclusion of essential micronutrient in the PDS system seems to be a long-term goal, where distribution of sufficient calories seems to be a significant challenge at present.

Women nutritional status is of utmost importance. The drivers of food sufficiency or rather health goes beyond the individual level. If one has to seek health of women, the person-in-environment approach need to adhere to have a comprehensive view including gender-specific, political and socio-economic factors. Hence, the study aims to have a holistic view by addressing these aspects in achieving nutrient sufficiency, and thereby, looking at the nutritional status of women. The study is exploring the risk and protective factors for achieving food sufficiency and food-related behavioural outcomes among women in urban slum households.

6.5.7 Coping strategies or different mechanism adapted in dealing with the food insecurity

Families look for the options to minimise physical and economic stress, they priorities expenditure based on necessity, which comprises of paying rent, education, transportation and then food.

The household which were found to be food secured were the ones who settled in the slum a decade ago. These families had stable source of income and had strong social networks. Therefore, the history of vulnerabilities also decides the household status. The poorest of the poor families mostly included those with unstable income or seasonal employment, inhabitants of pavement dwellings, single headed families (widow or widower), and senior citizen couples abandoned by their children. Other categories with

food insecurity without hunger somehow struggle and adapt some coping mechanisms to prevent them from the severity.

A variety of coping mechanisms were adopted to deal with food security. In the case of water availability, as mentioned earlier the slum which was located at the outskirts of the city had very limited water supply. The slum, which was located at the outskirts of the city, also had very limited water supply. The water quality was also poor as some women mentioned they used the supplied water for washing and bathing only. Also, a majority of the families were buying water bottles for drinking. On the other hand, people residing in the city's slum had mutual submersible connections. These were the different mechanisms, which slum dwellers resorted for water consumption.

Daily rationing of the food items was also adopted to cope with the inflation of their prices. Daily consumables like vegetables, oil and sugar was bought daily due to the limited storage capacities and cooking facilities at home. These methods leave them with limited food sources as the quality of diet is determined by the purchasing capacities. In times of scarcity, food reserves mainly include dry rations like wheat flour, rice and pulses which are consumed. People were also taking advantages of their social networks, as informed by the respondents, grocery shop owner gave food on credit to those who were familiar to him for a long duration of time. This makes the newer households more vulnerable as compare to the old ones who have built the trust with the local grocery shop owners. Households without a perpetual income or those who were seasonally employed benefitted from this system of borrowing. Likewise, in Deendayalpur people manage their expenditures by taking money from grocery shopkeeper or their neighbors, but people did not have to pay interest due to establishment of trust and social support. This phenomenon was lacking in Bhuapur.

Other coping mechanism included selling assets, dropping out children from school, and eating at religious places to survive times of economic scarcity.

6.5.8 Food Systems

The food system differs with the location, social, cultural and economic environment. The first and the foremost is the PDS, which serviced slum dwellers who were dependent

for their food grains. The other was purchasing from the local grocery stores or markets. People were taking wheat grains, rice and pulses from the native places. Lastly only a few families were engaged in the production or cattle rearing.

Local markets are the dominant providers in urban poor food system, and it determines the quality and variety of food consumed. Social environments can promote risk factors like the price and availability of healthy types of food. Availability of healthy food in the vicinity plays an important role in determining the food habits of the populace. The financial state of the community and employment levels of its population plays an important role in determining the availability of healthy kind of foods. The consumption of street food was more in Deendayalpuri due to a larger number of working women as well as the availability which was conveniently located.

The food products available in nearby markets also influence eating habits. The family eating patterns, huge availability of food vendors, peer pressure and cultural influences also make the urban-poor more dependent on packaged food.

6.5.9 Factors governing food consumption patterns in the selected slums

Globalization is the main cause of the expanding market for ready to eat foods and processed foods. Beside the direct consumption of products from popular global brands, the consumption of cheaper substitutes has increased the overall consumption of processed food. The increasing consumption of processed food was not limited to higher sections alone but had caveats for urban poor as well. The food processing industry is also synergistic and the urban food consumption pattern are inclined towards cereal and sugar based products, and not towards meat, fish, poultry, milk and vegetables. (Vepa, 2004).

With the huge excess of cheap packaged food in India, a swift transition in nutritional, socio-economic and overall demographic profile is seen. Simultaneous occurrence of over-nutrition and under-nutrition among the women in developing countries is now corresponding to the developed countries. The dual construction of severity is transpiring into a public health concern especially among the poor population.

The purchasing pattern of the urban dwellers is governed by time constraints and on the wages earned. When wages are earned daily and spent daily, it enables them to buy their food in small quantities from neighborhood shops rather than central markets. The small shops are compromised regarding their storage capability and the quality of the food items. The tiny quantities in which food is often sold in this sector make food more accessible to the poor, who may have very little to spend and cannot afford the cheaper bulk purchases possible from supermarkets, this is because often supermarkets do not provide the option to buy food items in small quantities. (Kennedy and Reardon 1994; Drakakis-Smith 1992 as cited in Ruel *et al.*, 1998). The concept of food deserts is valid to the slum at the outskirts as residents of an urban area cannot afford to purchase food that was both healthy and affordable (Beaumont *et. al.*, as cited in D'acosta, 2015, pp 3-5).

Poverty limits the household's access to nutritious food, and it also impacts nutrition sufficiency. The limited capacity to afford nutritionally adequate food confers to the capability approach which is primarily well established by the economist Amartya Sen in the 1980's. Burchi and DeMuro reviewed the different approaches in analysing food security in the broader area of wellbeing and development. While assessing the nutritional capabilities the authors cite Dreze and Sen (1989) and goes beyond the access dimension to the utilisation of food. As it is not the quantity of food consumed but the interrelationship between the intake and nutritional status which is governed by various factors, like health care, drinking water, sanitation, education, and intra household food distribution. Capabilities take into account institutional and environmental factors which are beyond the human control. Therefore, the availability and accessibility to nutritious food is coupled with the capabilities which leads to actual utilization.

The food acquisition is dependent on the earning power or working pattern of the household members. The children are given the prime importance and are usually prevented from the acute hunger. A two-meal pattern was observed among the adults whereas the children ate more frequently. This study established that the eating sequence was based on the working pattern and cultural beliefs.

Economic growth alone cannot have a strong impact on the nutritional status in the near future, however, it offers a good amount of opportunities for efficient public intervention. These interventions should have the ability to provide food enabling environment until all the individuals are adequately fed and achieve good health (Radhakrishna and Reddy, 2000). This detailed study also seconds the significance of women and girl's education for the nutritional wellbeing of the children, which has already been the goal of various developmental programmes

CHAPTER 7

POLICY RELEVANCE

The key highlighted issues in the previous chapters enable us to develop the potential strategies to link the underlying drivers of the food security. The studied slums add on to the evidences to capture nuances related to the household food security. Spatial differences related to geographical location, accessibility to the efficient market and livelihood opportunities, efficiency of welfare services (PDS, Health services, and education), status of women and social, cultural and liaison relationships among community members in two slums have imposes multiple barriers to the food security.

It is quite challenging to translate the findings into theories or programs, but this chapter aims to discuss the identified issues while finding the plausible solutions.

- Nutrition-sensitive programs: Development of Urban Centers Enabling healthy food environment
- PDS to address Nutrition Security
- Gender Dimension: The underlying causes of household food security includes gender differences by following the typical gender roles; study of the determinants of the certain behaviours or rationale for women behaviour; decision-making power influence the resource allocation in the household

The food insecurity cannot be dealt as a siloed approach. The popular conception assumes that food is a sole solution to the prevent food insecurity. This study encompasses other structural, social, economic and political factors which are responsible for the food insecurity. Similarly, women are usually the procurers at household levels and therefore they cannot be seen in isolation and it is rational to see women and the food environment as one.

Household food insecurity is instead a **social** construction which is formed by the social characteristics that are disadvantageous like the groups, communities, households and

household members who are deprived of power or ineffective at several fronts. There is an utmost need to develop local or community perspectives to create sustainable livelihoods.

The community as a whole collectively can fight to clean up Augean stables in allocation of housing to poor as well as public distribution systems. There should be enactment of 74th Amendment of the constitution with the formation Area Sabha ward to reflect public voices in the decision making and to keep vigilance on public authorities. As per the perspectives of the slum dwellers, PDS have found gap in coverage and quality. Collective efficacy was found to be the key mechanism which solves the various issues at local level only.

The **economic** constraints includes the restriction to choose food. The financial insufficiency leaves lesser freedom of choices. The purchasing power of quality food can only be improved when the households do not have to spend on the exorbitant nonfood expenditures. Even though the increase in food prices has been a global phenomenon it is worth noting that regional factors have also caused this particular global problem to rapidly develop into a local one.

The **political** construct also influences the survival of the weaker households, which is controlled by the powerful social groups governed by a hierarchy. The concept of Pradhan and existence of dominating social groups created by caste and class are the examples which are still playing their catastrophic role. The political relations influences the PDS functionaries and are in turn shaped by them.

Food security has evolved with the inclusion of **nutritional** aspects as well. Though the concerns are being raised to focus on the nutrition-sensitive programmes but the challenges are lesser known. Nutrition-sensitive interventions are quite challenging due to its comprehensiveness unlike the nutrition specific, which is limited to the nutrient intake interventions only. Nutrition-sensitive program requires integration with an explicit goal of localization.

7.1 Emphasizing on nutrition-sensitive rather than nutrition specific intervention

Nutrition-sensitive programs interventions should involve the amalgamation of the various drivers including water and sanitation, education, health, social protection, agriculture. Whereas nutrition-specific interventions are usually based on the supply of nutrient dense food to cater specific nutritional needs only.

The right to food policy needs to be more comprehensive by addressing macro-level factors such as gender differences, locality barriers, livelihood opportunities, historical exploitation due to caste barriers and vulnerabilities.

The development of urban centres can bring positive **structural** change. There are increasing concerns of making smart cities in India, which further requires development of more number of urban centres. The urban poor seems to have no place in the smart cities. Slums are displaced in the suburb areas either in the name of rehabilitation or poor people are compelled to move there due to low cost of living. However they face numerous challenges.

Adequate public transport should be available to the poor so they can save that money for other basic needs. Every citizen should be entitled to get adequate safe drinking water as a part of the right to food in both urban and rural areas, which is more chronic problem in urban slums. Slums, shanty towns and so-called illegal colonies should be properly developed with clean drinking water facilities, roads, health and education systems, sewerage and other utilities on priority basis; only then the conception of smart cities will indeed materialize.

Specifically, at periphery and in the urban poor context, where the communal support structure is weak. Mobilising and training community members to form groups which would help families to improvise their access to information, linkages to food- security and nutrition services is important. It would provide a support system to depend on.

NGOs and SHGs working for the skill development in Deendayalpuri slum is an example for improving the status of women. The majority of the people were not fully aware of their entitlements which made them to continue to live in misery.

7.1.1 Enabling healthy food environment

Food is cultural. The food items which come to the plate are the part of the environment. With the increase in the spectrum of processed foods, there is a need to have regulated markets. These spectrum of food products involve processed foods (packaged and unpackaged) and nutraceuticals supplements. The marketing of both the type of products caters to the various socio-economic status. The issues related to their marketing include misleading claims on labelling, manufacturing faults and adulteration.

The nutraceutical products are fortified food products or supplements that are consumed to prevent diseases. They are costly and are consumed by the high-income groups. However, processed foods are consumed by all the classes with the difference in packaged and unpackaged. Consumption of the unpackaged processed food items by the low socio-economic class is critical. The type of fat used even in the freshly prepared and convenient products available across streets by the local manufacturers need to put under the regulation and targeted intervention. It is crucial to improve the quality of foods available in the food environment of low-socioeconomic groups residing specifically in slums. Low socioeconomic families have less time and help to prepare healthy meals and snacks. Therefore enabling their food environment is more critical than high socio-economic groups who have enough money and support with food preparations.

Unregulated local food manufacturing companies have been found using bad quality of fat to reduce the cost of preparation. Other danger which is on the rise, is the prevalence of non communicable disease in low-income groups. The overconsumption of the salt, sugar and fat unknowingly either due to misinformed labelling or due to its inexpensiveness across the classes is an emerging public health concern. The constituted committee by FSSAI is accountable for the food safety as whole. Policy convergence between ministries, mass media and researchers should impart the public awareness about the healthy choices of food.

Another way of promoting healthy food environment is by identifying the agencies who are engaged in procuring healthy and nutritious foods locally. These agencies can be promoted and set an positive examples to scale up improved nutrition outcome. For

instance, small group of women in Deendayalpuri were found to be engaged in making pickles, and other food items and selling them for financial help.

The *Poshan Abhiyan* was launched on March, 8th, 2018 with a view of enhancing the digitalisation of the schemes related to nutrition, convergence of the various ministries involved in the Abhiyan and to improve the nutrition outcomes. Several nutrition strategies and targeted interventions were enlisted but there was no mention of the regulated markets. At a broader level, controlling food markets is monumental in creating a healthy food environment.

A holistic and sustainable plan is needed to achieve the nutrition targets., The goals related to malnutrition are dependent on the interdependence and interconnectivity beyond the accountability of the vulnerable and most marginalised. Enabling healthy food environment would encourage the individuals to have healthier eating option and adequate nutrition. Addition of a policy for regularised market will prove to be of a great support for creating a healthy food environment.

Nutrition Literacy is also a crucial factor, as it is not only about the food but also feeding. The information regarding the cheap and locally available foods are important among the poor population. Small farms can be made viable to urban poor to prevent them from the economic shocks and food scarcity.

7.1.2 PDS to address Nutrition Security

Dietary diversity is a neglected area among the policymakers. The public distribution system has achieved some targets wherein only some part of the population has received sufficient calories to meet their energy requirement to some extent. The PDS approach is however vertical, as it is deals with the macronutrient sufficiency of a smaller group of population and ignores the micronutrients deficiency. It is only promoting the calorie dense diet by inclusion of grains and rice. Incorporating mere calories are not sufficient to ensure good nutrition. Other essential micronutrients are excluded in the state regulated policy itself. Inclusion of essential micronutrient in the PDS system seems to be a long term goal where distribution of sufficient calories seems to be a big challenge currently.

7.1.3 The Gender Dimension

There are various determinants considered in the course of study but the central to all the determinants is the inequalities between men and women. Women empowerment is one of the major underlying causes of food insecurity. The social protection linked to undernutrition, religion and cultural factors are other big drivers. Women possess a tremendous role in achieving household food security. There is need to recognize both physical and intellectual contributions of women. They should be given equal representation in the local bodies. The timeless caring activities carried out by women in the household are fundamental in securing household food sufficiency. Their unpaid care and work should be acknowledged. Women's ability to make economic judgements within male-headed households is significant for household nutrition as whole. The inequalities should be removed in right to assets, but also wages, working conditions and maternity benefits.

As per the framework given by FAO, the food security of a household involves caring practices, food preparation nutrition education and intrahousehold food distribution. All these factors require an active participation of women. Factors like maintenance of household, taking care of the sick, the old and children contribute significantly to human welfare. Women have a very valuable role in society. They are the ones who produce and take good care naturally. The selflessness and sacrificial nature of women is overwhelming and is not adequately appreciated. This is especially relevant and prominent in India. These qualities of women are something that needs to be addressed.

The communities studied also depicting the same scenario where women are primarily supposed to be limited to household chores. Many of them shared their stories of struggle for moving out to work but stepped back either due to their safety concerns, patriarchal mindset or caste discrimination. Women are seldom a part of discussions wherein food security is the focus. The comparative description of the community dynamics and the difference in the status of women in the studied slums has given a perspective to understand the predominant part of women in food securing activities.

In weaker section of the population, women specifically should be provided support by ensuring enough employment opportunities while giving them role in shaping policies. Women's critical roles in food acquisition, preparation and intrahousehold food consumption should be considered in formulating food security policies and programs. The existing social protection such as PDS may include women's choices through expansion of food baskets.

Women's time poverty is another crucial issue which is overlooked, because of their dual responsibilities of jobs outside and inside home. There are other several way which has been suggested to reduce women burden without affecting nutrition is to invest in their own education, more participation in paid employment. The interventions in reducing the women's time burden needs to take into account the variations in the context like the family structures and gendered norms (Komatsu et al., 2018). Family dynamics related to structures are particularly important for time use and decision making by daughter in laws. They experienced great suffering due to work load and limited autonomy over time and resources. Women sacrifice more as during the distressed situations their assets are the first to be sold for money. The workload can be redistributed between spouses and other household members. The women who work outside limits their care work at home and it can be taken up the presence of other household members and hence the time constraints can be minimised. Child care programmes can play a critical role in reducing women's poverty. Others time savings approach which have been suggested is to increase the access to technologies (Johnston et, 2018 as cited in Komatsu et al., 2018). There was no impact seen on child nutrition indicator (stunting) when other adults substitute for mothers as caregivers (Headey et al., 2012 as cited in Komats et al., 2018).

7.2 Way forward

“When women earn the money for the family, everyone wins because women dedicate 90% of the income to health, education, to food security, to the children, to the family, or to the community, so when women have an income, everybody win”

Michelle Bachelet

There is substantial change in economic policies in India since last two decades, which is centred around globalisation. It is evident that the urban poor population is increasing and has a significant contribution to the country. The studied factors is establishing the whole range of causal factors leading to women food insecurity as she juggles between her role as food procurer at household and other livelihood issues. It is challenging to make a coherent picture of women living conditions in an urban poor context. This is mainly due to the complex interaction of economic factors with caste and gender. Substantial reliance on technology along with migration and discrimination have given rise to competition and profit seeking. For instance, in case of Bhuapur, illegal constructions for rent seeking from the migrants is creating a huge business for upper class. With the technological advancement, it can be stated that there are more opportunities for urban educated women with technological and need-based qualifications and skills, while for the poor and uneducated women with inadequate skills, these things are far scarce. Therefore, they are engaged manual, unskilled work at lower wages. There are trepidations about such women that they will be further marginalised, if proper steps are not taken to protect such sections of the society. The decline of expenditure in public sector and tendency of the private sector to reduce the cost have hit regular jobs especially those in unskilled and semi-skilled categories. Its implication are seen in the exploitation of surplus labour. Trends in globalisation and liberalisation have altered and created an imbalance in the pattern of work. It is believed that, due to mechanisation small, casual and non mechanised jobs will be wiped out and at the same time there will always be some need to do laborious and hand picked jobs for which women workforce will be available.

It is not possible to address a cohesive picture of women contribution but one thing is sure that women work is very important for not only the family but also to the society and nation as whole. The following key considerations would help in addressing the colossal problem of livelihood in a comprehensive manner.

- Equality of opportunities and choices
- Comprehensive and Multisectoral approach: Local perspectives to create sustainable livelihoods

- Research point of view: Promotion of observational mixed methods

7.2.1 Equality of opportunities and choices

The arguments made above highlights the status of women or gender inequality; however, it does not mean a disconsolate forecast. The scenario in women's employment has thrown up new challenges at the beginning of the 21st century. The standard of living is rising due to new avenues of opportunities. Increasing career aspirations and women's rising awareness are the significant drivers that are motivating women to achieve heights and overcoming obstacles. Despite several limitations imposed by the patriarchal society, women are keen to uphold their status while learning new skills and proceeding for their career prospects. They are balancing their role in and outside home as mother, managerial activities at home, factory worker and maid to feed their households. On the one hand working women in the urban areas are visible and vocal, and on the other hand working women in the unorganised sector are struggling in the battle of daily survival.

7.2.2 Comprehensive Multisectoral approach

The undertaken study encourages the better integration of the action based research. The study provides a clear picture of how different livelihood systems influence and are linked to food security situations in the two slums. This highlights the need to have a comprehensive solution to understand how social security and environment is essential to tackle household food insecurity. Bridging the divides between the micro (Household and family members) and meso (Community including city, district and village) will provide an impetus to solve the local issues. As discussed in the first chapter, the existing framework of food security by FAO only talks about National and sub-national level determinants. Certain levels of drivers are not explicitly included in the framework. For example, the physical determinants comprise of the availability and accessibility but the leading drivers including availability of efficient markets and purchasing power are never addressed.

Likewise the malnutrition framework (UNICEF 1990) mentioned the inadequate care of women and children at household level as underlying causes but efforts to understand the

drivers which interplay at household level has given less attention which further needs comprehensive analysis of the underlying causes. For example, gender differences, locality barriers or livelihood opportunities are the intersecting issues that are not explicit in the UNICEF framework yet, since the 1990s it has been shown to be more interesting and potentially helpful in addressing the drivers of malnutrition.

7.2.3 Research point of view: Promotion of observational mixed methods

The correlation of the measure of food security with the nutritional status makes this as a unique quantitative study. It gives the distribution of the gradients of malnutrition among the food secure and insecure households. Beside this the qualitative approach enabled to identify themes which has facilitated the researcher to establish the linkages between the opportunities available in the socio-physical environment and the outcomes of food security. It is particularly helpful to policy makers and planners as it provides descriptive information and understanding of the concept of informal survivalism. In the absence of the horizontal approach, such study provides an evidence base and additional areas for consideration. The study promotes mixed methods to investigate in depth causal pathways, which in turn is useful to enhance the design and targeting of intervention to make them more efficient. There is a need to collaborate and have an interdisciplinary approach that systematically identifies drivers, interactions, and pathways of food security.

The traditional responses to food insecurity are no longer sufficient. In the absence of comprehensive social policies traditional measures to tackle food insecurity, relating to production shortages in a geographical area are insufficient. Responses such as food aid, subsidized food, and “cash for work” programmes can only target a small proportion of the total population while the bigger need is to address the scope of this situation.

There is an urgent need to make cities not only slum free but to have mindfulness of the colossal problem of the squatters placed at periphery. Provisioning of the civic infrastructure and property rights for slum dwellers is important. The conventional origin of the deprivation is livelihood that includes, water and sanitation, housing, healthcare, education, social bonding, but still these factors are overlooked. Above all these stand a

potential and stable income generation to earn livelihood. Overcoming the livelihood would suffice the household food sufficiency and thus would improve the nutritional status of women. Implementation of nutrition-sensitive programs, improved status of women and enabling their healthy food environment, impartial functioning of PDS are proved to be the significant player in achieving household food security.

GLOSSARY

Casual worker: It involves the seasonal work due to the non-availability of work throughout the year and very meagre wage for women.

Collective Efficacy: It is defined as social cohesion among neighbours combined with their willingness to intervene on behalf of the common good.

Defensive expenditure: these are the expenditures that seek to minimize potential damage to oneself. A defensive expenditure occurs when one spend money on something that does not increase welfare, or is necessary to avoid a decrease in well-being.

FCS: The FCS is a composite score based on dietary diversity, food frequency, and relative nutritional importance of different food groups.(WFP & FAO, 2008).

Food Sovereignty: It asserts that the people who produce, distribute, and consume food should control the mechanisms and policies of food production and distribution, rather than the corporations and market institutions they believe have come to dominate the global food system.

Jhuggi: a slum dwelling typically made of mud and corrugated iron.

Junk Food: It comprise of the food containing high levels of calories form fat and sugar and low on nutrition value. These are in the form of cooked, packaged, unpackaged and processed food items consumed to substitute main meals or between meals. These food items are mainly sold at small shops in slum areas.

Minimum wage: A minimum wage is the lowest remuneration that employers can legally pay their workers. Wage labour is the socioeconomic relationship between a worker and an employer, where the worker sells his or her labour power under a formal or informal employment contract.

PDS: The Public Distribution System (PDS) is an Indian Food Security system under the Ministry of Consumer Affairs, Food and Public Distribution. In this, major food commodities including staple food grains (such as wheat and rice), sugar and Kerosene

oil (a fuel used for cooking) are distributed through a network of public distribution shops (also known as ration shops/fair price shops) at subsidized prices. The PDS ration card is an official document entitling the holder to a ration of food under various categories of poverty.

RDA: Recommended Dietary Allowances (RDA) are the levels of intake of essential nutrients that, on the basis of scientific knowledge, are judged by the Food and Nutrition Board to be adequate to meet the known nutrient needs of practically all healthy persons.

Self-employed: It is the condition where an individual works for himself instead of working for an employer that pays a salary or a wage. A self-employed individual earns his income through conducting profitable operations from a trade or business that is self-operated

SEWA: An organisation works for the self-reliance of women, training them in skills, organizing production units to earn income from the skills, forming and running such production units and marketing their products.

Shram Shakti: A Report of the National Commission on Self Employed Women and Women in the Informal Sector(1988)

Social Adjustment: It is a psychological process in which "getting along with the members of society as best one can" is called adjustment. Social adjustment is an effort made by an individual to cope with standards, values and needs of a society to be accepted

The 74th amendment to the Constitution, 1992: It includes the formation of Area Sabha/Ward Sabha meetings is to ensure people's participation in municipal governance and to make the public voice reflected in the decision making process of the 4 municipality.

Village Accountant: is an administrative government position found in rural parts of the Indian sub-continent.

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APPENDIX

1. SEMI STRUCTURED INTERVIEW SCHEDULE

SOCIO-ECONOMIC AND DEMOGRAPHIC INFORMATION

A. BASIC INFORMATION

1. Respondent: _____ Age _____ Sex _____ Edu _____
2. Marital Status: Married () Unmarried () Divorce () Widowed () Separated ()
3. In case married, No. of children: ()
4. Where does your family stay? Own/ or purchased () (b) Rented house ()
5. Caste (SC/ST/OBC/Others)----- Specify _____

Living Conditions

6. a. Type of work Casual Labour() Regular Wages() Self-employed ()
- b. Do you own land for agricultural activity?
7. Landholding in beegha _____
8. If yes, Is the agricultural production sufficient for the family
9. Type of House – Pucca/Semi-Pucca/ Kutcha?
10. Toilet Facility within household-Yes/No _____
11. Drinking Water Facility - Hand Pump/Tap/Tankers/Well/Pond/Borewell, Specify Distance _____
12. Electricity -Yes/No _____
13. Vehicle- Yes/No _____ if yes specify- _____
14. Total Family Income per month

15. BPL Status- BPL/State BPL/APL/Antodaya/Annaporna

16. If No how do the family manage- Ration Shop/Buy from market/Borrow

17. Is there any production of milk in the house – Yes/No?

18. If Migrant-Yes/No

Interstate migration

Intra-state migration

19. Purpose of migration?

20. No. of Family Members: ()

TABLE: 1

DETAIL INFORMATION OF FAMILY MEMBERS

S.No	Name Self-reported (S) /Proxy (P)	A	S	MS	Relation with Respondent	Edu.	D/E	MO	SO	No. of meals per day	Usual activity status	History of addiction, if any	Meal eaten during work/school (MDM) outside from home
1													
2													
3													
4													
5													
6													
7													

8													
9													
10													
A-Age/S-Sex/MS-Marital Status/RR-Relation with the respondent/Edu-Education/D/E-Dependant, Earning/MO-Main Occupation/SO-Secondary occupation/													

B. HOUSEHOLD EXPENDITURE

1. Are you sending/receiving money or food items from anywhere?
2. Do you grow any food stuff that is consumed by the household? Yes/no
Specify, _____
3. Has anyone been hospitalised in the past 5 years?
Yes () (b) No ()
Who? _____
4. Tell us a bit about this, why? _____
5. How much does it cost? (Rs.) _____
6. How did you pay for it? _____
7. Has there been any casualty in family from the last 5 years?
Yes () (b) No ()
8. If yes, what was the cause of death? _____

TABLE:2 HOUSEHOLD EXPENDITURE											
S.No	Food							Water	Education	Medical Expenses	Rent/Taxes/Conveyance
	Milk & milk products	Pulses	Meat & meat products	Ve g.	Fruits	Fat & oils	Cooking fuel Gas/Kerosene				
Any											

Week											
Month											

9. Are there things you would like to buy every month/more often, but can't afford?

Yes () (b) No ()

10. What are they? _____

C. SLUM INFORMATION - Availability of resources/Contextual factors

1. Is your family income sufficient to cover the consumption needs?

2. What do you do to finance the consumption needs?

Borrow money.....

Cut down on meals.....

Other, specify?

3. Where do these food items for your home consumption come from?

Cooking oil

Milk

Wheat flour/pulses

Fruits & vegetables

4. How do you find the quality of available food items?

5. Is the PDS entitlement adequate as per your monthly expenditure on those items

D. UTILISATION OF RESOURCES/Compositional factors

1. Does male members are involved in buying food items?

2. Are you aware of the quantity or prices of commodities you are entitled to at fir price shops?

3. Do you take your entire entitlement? If no, specify

4. Do family members eat together-Yes/ No?

5. How many times in a day.....

6. Do you get enough quantity of food for yourself?

E. CHALLENGES FACED/Collective factors

1. In case of inadequate income, what gets most affected?

Food

Non food

2. What kind of government support would you like? For example in terms of food supply or other government support that you think must be prioritised.

3. Are you satisfied with the food consumption pattern? Is it good/fair/poor?

Satisfied, specify.....

Dissatisfied, specify.....

4. What do you think is affecting the food consumption pattern? _____

5. How food consumption affects the health of the family members

6. Do you think that the balanced diet affect the work efficiency or earning?

2.1 FOOD FREQUENCY QUESTIONNAIRE

Food stuffs	Dietary Information					
	Frequency of food stuffs					
	Daily	>3/week	3/week	2/week	1/week	1/month
Cereals						
Bajra						
Jowar						
Makka						
Rice						
Rice flakes						
Puffed rice						
Chapatti						
Puri						
Parantha						
Suji						
Vermicelli						
Brown /multi grain bread						
White bread						
Oatmeal						
Cornflakes						
Pulses						
Whole dals						
Washed dals						
Beans						
Sprouts						
Leafy Veg.						

Seasonal Veg						
Tomato						
Onion						
Potato						
Roots and tubers						
Foodstuffs	Dietary Information					
	Frequency of foodstuffs					
	Daily	>3/week	3/week	2/week	1/week	1/month
Nuts						
Almonds						
Cashews						
Chilgoza						
Coconut						
Groundnut						
Pista						
Walnut						
Til						
Fruits						
Citrus						
Seasonal						
Pkd juice						
Fresh juice						
Canned						
NV						
Fish						
Egg						

Chicken						
Mutton						
Pork						
Organ meat						
Lamb						
Milk						
Milk						
Curd						
Buttermilk						
Cheese						
Paneer						
Tofu						
Cream						
Oil/fat						
Butter						
Ghee						
Vanaspati						
Cooking oil						
Sugars						
Sugar						
Honey						
Jaggery						
Food stuffs	Dietary Information					
	Frequency of food stuffs					
	Daily	>3/week	3/week	2/week	1/week	1/month
Fast foods						
Samosa						
Pizza						

Burger						
Sandwich						
Momos						
Noodles						
Chinese						
Choley bhature						
Pao bhali						
Chaat						
Matar kulcha						
French fries						
Dosa						
Dhokla						
Idli						
Vada						
Pakora						
Kebabs						
Patties						
Pastries						
Pasta						
Kathi rolls						
Fried chicken						
Cakes						
Processed foods						

*The food frequency questionnaire may vary for slum households depending on their eating pattern or common food items consumed.

3. ANTHROPOMETRICAL MEASUREMENTS (BODY MASS INDEX)

BMI = weight (in kg) / height (in m²)

The standard BMI values used for comparison are:

GRADE	BMI (Kg/m ²)
Underweight	<18.5
Normal	18.5 – 24.9
Pre-obese	25 – 29.9
Obese grade I	30 – 34.9
Obese grade II	35 – 39.9
Obese grade III	40 and above

Source: Adapted from WHO 2004

4. FOOD CONSUMPTION SCORE THRESHOLD LEVELS

Categories	Food consumption score
Poor consumption	1-28
Borderline	28.1-42
Acceptable	>42

Source: (FCS Module, World Food Programme, 2008)

5. SATYANARAYANA METHOD

This method has been devised by Satyanarayana. In this method, variation due to body weight and intensity of physical activity in the estimation of energy expenditure of an individual has been included. Using this method, the energy requirement for an entire day can be calculated using codes (1-9) what we define as the Satyanarayana code. Energy cost of nine groups of activities (codes) has been included in this method

List of activities, corresponding code, and energy costs (Kcal/kg/15 min/1 MET = 200 ml of oxygen = BMR of 60 kg person/min = 1 kcal)

Code Value	Examples of Activities and energy cost
1.	Sleeping, resting in bed, relaxing, lying still awake(0.26 Kcal/kg/15 min.;1.0 MET).
2.	Sitting, eating, listening, writing, sitting in the classroom of college or writing or reading notes, etc. Sitting and talking, sitting and seeing T.V., praying, visiting friends, studying, lying and talking, lying and reading, lying and listening radio or watching T.V., serving meals on table(Sitting and talking to guests(0.38 Kcal/kg/15 min.;
3.	Light activity-Standing, washing face, shaving ,combing, cooking, brushing teeth, toileting, standing and talking, standing and to swing the child, sitting on shop, sitting with child, feeding the child, dressing /undressing children ,teaching children, sewing(hand),mending clothes, sitting and knitting ,sitting and office work, making bed, sitting and copy correction and shouting ,standing quietly, standing and watering the plants(0.57 kcal/kg/15 min .; 2.3 METS).
4.	Slow walk (4km/hr), driving, to dress or to change dress, to shower, walking to bus-stop or hotel, taking bath. etc., filling water, marketing, cleaning of child, watering animals ,cleaning grains, sewing (machine),dusting, removing dried cloths from wire and wrapping them, standing picking and arranging things, feeding pets(0.69 Kcal/kg/15 min.; 2.8 METS).
5.	Light manual work-Floor sweeping, window washing, waiting on tables, nursing chores, several house chores, electrician, barmen walking at 4 to 6 km/hr., cleaning utensils, bathing the child, grazing animals, bathing pets, gardening, mopping floors, washing floors, wringing clothes, ironing clothes, bed lifting, hand grinding ,standing taking child, cowdung preparation, collecting cow dung /manure, beating of clothes(0.84kcal/kg/15 min.; 3.3 METS)
6.	Leisure activities and sports in recreational environment, warm up in general and light play of base ball, golf,volley ball, bowling, cycling(10 km/hr), table tennis, fetching, lifting bucket full of clothes, walking upstairs and downstairs,sowing, seeding out, thinning out and replanting, feeding animals, milking animals(1.2 kcal/kg/15 min.;4.8 METS).
7.	Manual work at moderate pace, mining, carpentry,house building,plumbing and wood cutting, loading and unloading goods, walking upstairs and downstairs with some load, grass cutting, harvesting,(1.4 kcal/kg/15 min.,;5.6 METS).
8.	Practice of all sports and game activities of higher intensities(non competitive)(Friendly matches),bicycling(15km/hr),dancing,badminton(Shuttle),gymnastic,swimmimg,tennis,horse

	riding,digging(1.5 kcal/kg/15 min.;6.0 METS)
9.	Intense manual work,high intensity sport activities or games,tournament matches,tree cutting,carrying heavy loads,jogging and running (9 km/hr); competitions in badminton (shuttle), swimming, tennis, cross country running or skiing(5 km/hr),hiking and mounting climbing etc.(2.8 kcal)/kg/15 min.; 7.8 METS)

These codes (from 1-9) include certain activities and the energy cost of each category of an activity is given in the coding sheets as MET value. MET stands for metabolic unit. MET (ml of O₂) corresponds to BMR of 60 kg person/minute, i.e.

$$1 \text{ MET} = 200 \text{ ML OF O}_2 = \text{BMR of 60 kg person/minute} = 1 \text{ Kcal}$$

By using this method, a minute –to - minute record of all activities undertaken in a day is needed that is recorded on the energy expenditure sheet. After coding all the activities under different categories, the total time under each activity coded (1—9) is recorded and totalled to 1440 minutes, which are total minutes in 24 hours.Next, the energy cost of each category, is recorded on the coding sheets MET value (for example 1.0 for activity code 1, 1.5 for code 2 etc. which indicates kcal /min requirement for 60 kg person. The total time spent in each category is then multiplied by the MET value given for that category to get kcal/min spent on particular activity. However, for a particular activity, MET value is given regarding kcal/min/60 kg. However, the weight of the individual whose energy expenditure is being estimated may be different than the standard 60 kg taken in this method. To accommodate this, therefore, a correction factor is considered which can be calculated using the formula given herewith

$$\text{Correction factor} = \text{Subject's body weight (kg)}/60 \text{ (kg)}$$

Kcal /min/subject is then calculated by multiplying the MET value with the correction factor.The value so obtained for each code is then multiplied with total time spent in doing various activities of that group. These resulting values (For each code) are then added up to give energy output/energy expenditure

Energy Expenditure Code Sheet

Time (in minutes) spent in each activity (code) Pattern

Time	I	II	III	IV	V	VI	Vii	Viii	IX	Total
5.00-6.00 AM										
6.00-7.00 AM										
7.00-8 AM										
11.00 PM -5 AM										
Total minutes spent										
No. of hours spent										
Kcal/Min/60 kg (MET)										
Correction factor(Ind.wt/60 kg)										
Kcal/Min/Subject (C.FXMET)										
Energy output/day(Minutes spentXC.FXMET)										

BMR calculation

Using the FAO/WHO/UNU predictive BMR equation, BMR can be calculated based on the age and sex from the equation mentioned below

Male				
18-30	2879	$0.063X.Kg+2.896$	0.641	$15.057X....kg+692.2$
30-60	646	$0.048X...kg+3.653$	0.700	$11.472X...kg+ 873.1$
>60	50	$0.049X...kg+2.459$	0.686	$11.711X...kg+587.7$
Female				
18-30	829	$0.062X...kg+2.036$	0.497	$14.818X..kg+486.6$
30-60	372	$0.034X...kg+3.538$	0.465	$8.126X...Kg+ 845.6$
>60	38	$0.038X...kg+2.755$	0.451	$9.082X...kg+658.5$

Physical activity level

It is calculated as energy spent in an activity /BMR, for the selected time unit.

$$PAL = \text{Energy spent in activity}(\text{Total energy expenditure}/\text{BMR})$$

Classification of lifestyles in relation to the intensity of habitual physical activity, or PAL

Category	PAL value
Sedentary or light activity lifestyle	1.40-1.69
Active or moderately active lifestyle	1.70-1.99
Vigorous or Vigorously active lifestyle	2.00-2.40*

*PAL values >2.40 are difficult to maintain over a long period

6. HOUSEHOLD FOOD SECURITY SCALE

The first statement is, “The food that (I/we) bought didn’t last, and (I/we) didn’t have money to get more.” Was that often, sometimes, or never true for (you/your household) in the last 12 months?

Often true

Sometimes true

Never true

DK or Refused

HH4. “(I/we) couldn’t afford to eat balanced meals.” Was that often, sometimes, or never true for (you/your household) in the last 12 months?

Often true

Sometimes true

Never true

DK or Refused

AD1. In the last 12 months, since last (name of current month), did (you/you or other adults in your household) ever cut the size of your meals or skip meals because there wasn't enough money for food?

Yes

No (Skip AD1a)

DK (Skip AD1a)

AD1a. [IF YES ABOVE, ASK] How often did this happen—almost every month, some months but not every month, or in only 1 or 2 months?

Almost every month

Some months but not every month

Only 1 or 2 months

DK

AD2. In the last 12 months, did you ever eat less than you felt you should because there wasn't enough money for food?

Yes

No

DK

AD3. In the last 12 months, were you every hungry but didn't eat because there wasn't enough money for food?

Yes

No

DK

Coding Responses and Assessing Households' Food Security Status:

Responses of “often” or “sometimes” on questions HH3 and HH4, and “yes” on AD1, AD2, and AD3 are coded as affirmative (yes). Responses of “almost every month” and “some months but not every month” on AD1a are coded as affirmative (yes). The sum of affirmative responses to the six questions in the module is the household’s raw score on the scale. Food security status is assigned as follows:

- Raw score 0-1—High or marginal food security (raw score 1 may be considered marginal food security, but a large proportion of households that would be measured as having marginal food security using the household or adult scale will have raw score zero on the six-item scale)
- Raw score 2-4—Low food security
- Raw score 5-6—Very low food security

For some reporting purposes, the food security status of households with raw score 0-1 is described as food secure and the two categories “low food security” and “very low food security” in combination are referred to as food insecure. For statistical procedures that require an interval-level measure, the following scale scores, based on the Rasch measurement model may be used:

Number of affirmatives	Scale score
0	NA
1	2.86
2	4.19
3	5.27
4	6.30
5	7.54
6 (evaluated at 5.5)	8.48

However, no interval-level score is defined for households that affirm no items. (They are food secure, but the extent to which their food security differs from households that affirm one item is not known.)

(2) Response Options: For interviewer-administered surveys, DK (“don’t know”) and “Refused” are blind responses—that is, they are not presented as response options but marked if volunteered. For self-administered surveys, “don’t know” is presented as a response option.

(3) Screening: If it is important to minimize respondent burden, respondents may be screened after question AD1. Households that have responded “never” to HH3 and HH4 and “no” to AD1 may skip over the remaining questions and be assigned raw score zero. In pilot surveys intended to validate the module in a new cultural, linguistic, or survey context, however, screening should be avoided if possible and all questions should be administered to all respondents.

(4) 30-Day Reference Period: The questionnaire items may be modified to a 30-day reference period by changing the “last 12-month” references to “last 30 days.” In this case, item AD1a must be changed to read as follows:

AD1a. [IF YES ABOVE, ASK] In the last 30 days, how many days did this happen?

_____ Days

[] DK

Responses of 3 days or more are coded as “affirmative” responses.

(5) Self Administration: The six-item module has been used successfully in mail-out, take-home and on-site self-administered surveys. For self-administration, question AD1a may be presented in one of two ways:

- Indent AD1a below AD1 and direct the respondent to AD1a with an arrow from the “Yes” response box of AD1. In a parenthetical following the “No” response box of AD1, instruct the respondent to skip question AD1 and go to question AD2.
- Present the following response options to question AD1 and omit question AD1a:
 - Yes, almost every month
 - Yes, some months but not every month
 - Yes, only 1 or 2 months
 - No

In this case, either of the first two responses is scored as two affirmative responses, while “Yes, only 1 or 2 months” is scored as a single affirmative response.

The two approaches have been found to yield nearly equal results. The latter may be preferred because it usually reduces the proportion of respondents with missing information on how often this behaviour occurred.

7. STANDARD OF LIVING INDEX

It is calculated by following score

Summary of Household measure

Name of facility	Classification	Score	Maximum Score
House type	Pucca house	4	4
	Semi-pucca house	2	
	Kaccha house	0	
Toilet facility	Own flush toilet	4	4
	Public or shared flush toilet or own pit toilet	2	
	Shared or public pit toilet	1	
	No facility	0	
Main source of light	Electricity/Solar system	3	3
	Kerosene/Gas oil	1	
	Others	0	
Main fuel for cooking	Electricity, liquid petroleum gas, or biogas	2	2
	Coal, charcoal or kerosene	1	
	Other fuel;	0	
Source of drink water	Pipe, hand pump or well in residence/Yard/plot	2	2
	Public tap, hand pump or well	1	
	Other water source	0	

Separate room for cooking	Yes	1	1
	No	0	
Ownership of house	Yes	1	1
	No	0	
	For no irrigated land	0	
Ownership of Livestock	Owns livestock	2	2
	Does not own Livestock	0	

Name of the facility	Classification	Sore	Maximum Score
Ownership of durable goods	Car	4	4
	Moped/Scooter/Motorcycle	3	3
	Telephone	3	3
	Refrigerator	3	3
	Color Television	3	3
	Bicycle	2	2
	Electric Fan	2	2
	Radio/Transistor	2	2
	Sewing machine	2	2

	B/W television	2	2
	Water Pump	2	2
	Bullock Cart	2	2
	Mattress	1	1
	Pressure Cooker	1	1
	Chair	1	1
	Cot/Bed	1	1
	Table	1	1
	Clock Watch	1	1
Total		55	

Index scores range from 0–11 for a low SLI

12–20 for a medium SLI and

21–55 for a high SLI

8. CUT-OFFS FOR NUTRIENT ADEQUACY RATIO

NAR	Cut-offs
Adequate	>1.00
Fairly adequate	0.66 to <1.00
Inadequate	<0.66

9. TOOL FOR IN-DEPTH INTERVIEWS

1. Elder Community Leaders

Talking to the elderly will collect the history of the slum because these are people who have witnessed the events around their community and slum for the longest time. The researcher will discuss the following questions with the help of in-depth interviews and FGD's along with the plausible probing.

- 1.1 Individual background. (Icebreaking/open up session)
- 1.2 Please narrate the history of origin of this slum
- 1.3 What was the behaviour of state personnel during the process of relocating?
- 1.4 What was the purpose of migration? (Pushing and pulling factors of migration)
- 1.5 Socio-Demographic information and formation of social groups (if any)?
- 1.6 How has the food consumption pattern changed over the years?
- 1.7 What are the factors responsible for this transition?
- 1.8 How do you manage the basic food expenses during the time of financial shortage?
- 1.9 What was the reaction of the people when they went to PDS for taking rations?
- 1.10 Has the provision of subsidised food changed food the expenditure in any way?
- 1.11 Suggestions and comments.

2. Female Head of the household

The researcher will ask questions regarding the intra-household food dynamics, type of work performed by women, their coping strategies and household food security situation.

- Intrahousehold food dynamics
- 2.1 Individual background. (Icebreaking/open up session)
 - 2.2 Who are usual buyers of food items in the family and why?

- 2.3 What is the frequency of grocery shopping and what food items are purchased in bulk?
- 2.4 What food items are stocked for an year? (secured food items)
- 2.5 Does everyone eat together in the family?
- 2.6 Females that are associated with women's group are more empowered and take independent decisions as compared to females who are not associated?
- Type of work performed by women
- 2.7 How work pattern affects number of meals consumed? If mother is going to long distances for work, how children food is suffered (especially lunch)
- 2.8 What are the invisible household food securing and care activities performed by women
- 2.9 Does caste impacts the type of work one gets?
- 2.10 Is their occupation (work schedule, conditions at work place) or occupational diseases impact their food consumption pattern?
- 2.11 What are the consumption patterns when female head is sick? Who perform the household work during that time?
- 2.12 Is there any Self Help Group (SHG)? Role of SHG in empowering women?
- Coping strategies
- 2.13 Is food availability secured throughout the year, if not when it is scarce or any homogeneity of experiences?
- 2.14 What strategies household use to meet family food requirements?
- 2.15 How do you manage the fluctuation in prices of food items?
- 2.16 Identifying the coping strategies in dealing with food insecurity, is it same for all the households or how it differs?

- 2.17 Do you think that the increased nonfood expenditure affects the choices of buying food items? Identifying the pressing non-food and defensive expenditures.
- 2.18 When and how did the household first apply for Ration card and what is the experience at FPS?
- 2.19 What is the role of FPS in helping to meet family food needs?
- Household Food Security condition of the selected slums as whole
- 2.20 Do you have ration card? If not, did you face any problem while applying?
- 2.21 What is the availability of markets and what is the mechanism being used to store the food items in the local shops?
- 2.22 When and under what circumstances do household members eat out or purchase cooked food?
- 2.23 How food preferences and seasonal variation affects consumption pattern