

ASSESSMENT OF FOOD SECURITY AMONG FARM WOMEN IN MIRZAPUR DISTRICT (UTTAR PRADESH)

काशी हिन्दू
विश्वविद्यालय



BANARAS HINDU
UNIVERSITY

THESIS SUBMITTED IN PARTIAL FULFILLMENT OF
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In

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Supervisor

Prof. H.P. Singh

Submitted by

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Through: The Head, Department of Agricultural Economics,
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Respected Sir,

I have great pleasure in forwarding the thesis entitled “**ASSESSMENT OF FOOD SECURITY AMONG FARM WOMEN IN MIRAZAPUR DISTRICT (UTTAR PRADESH)**” submitted by **Mr. Dinesh, I.D. No. 17412AGE017**, in partial fulfilment of the requirements for the degree of **Master of Science (Agriculture)** in **Agricultural Economics**, of the Banaras Hindu University and placing on record that he has completed the requisite requirements as contained in the statutes of the university.

I certify that the entire scheme of investigation reported herein was planned and carried out solely by the candidate under my guidance and supervision. The data presented in the thesis, to the best of my knowledge and belief, are genuine and have not been utilized for the award of other degree or distinction.

Thanking you,

Yours faithfully

Forwarded by:

Head

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*A good teacher can inspire hope, ignite the imagination,
and instil a love of learning*

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INTRODUCTION

Hunger is not an issue of charity, it is an issue of justice

Food is our body's fuel and without fuel it will be shut down. Food plays the role of the elixir in life. Food is known to be one of the most common necessity of any living creature being microscopic or a macroscopic one. Food draws its beginning since the emergence of the early man. The discovery of plants emerging from seeds of fruits was the event that began the quest for food via agriculture. Agricultural development is a predefined situation for a country to grow in its multi-dimensional outfits of economy. Growth in agriculture should be at par with other sector growth to achieve self-reliance and household food security. The food security of a populous country is more than just economics and trade.

FOOD SECURITY

1.1 Definition and Concept

Food and Agriculture Organisation (FAO) has portrayed the advancement of the idea of food security at various occasions by various bodies for example-

The World Food Summit (1974) characterized food security as "consistent accessibility of satisfactory world supplies of essential food commodities to continue a relentless development of food utilization and to counterbalance changes in costs and production". Around then the emphasis was on the food supply and not on the food access.

Later, in 1983, FAO propelled the idea by including secure access to the food and nutrition by individuals in danger accentuating balance between the supply and demand of foodstuff and expressed as "guaranteeing all individuals consistently physical and financial access to the fundamental food commodities that they need". Here monetary access by vulnerable individuals is focused.

The meaning of food security set at the World Food Summit in 1996 has been generally acknowledged. The summit perceived that "the food security exists when all people, at all instance of time, have physical and financial access to adequate and nutritious food to meet out the demand of their dietary and food for a well-functioning and sound way of life".

Food security is likewise characterized as far as energy aspect of food. As indicated by Meade and Stacey (2013), food security is characterized as "enabling people to achieve 2,100 calories per capita per day". The World Food Program (2006) has been made advances in food security in various classes dependent on calorie consumption. These are:

1.1.1 **Food Secure** - If day to day calorie uptake is reliably over 2,100 kcal.

1.1.2 **Mildly Food Insecure** - If day to day calorie uptake is in the middle of 1,800 to 2,100 kcal.

1.1.3 **Moderate Food Insecure** - If day to day calorie uptake is in the middle of 1,500 to 1,800 kcal.

1.1.4 **Severely Food Insecure** - If day by day calorie uptake is under 1,500 kcal.

1.2 Different Dimensions of food security

Four components of food security have been depicted by Food and Agriculture Organisation (FAO) given as following-

1.2.1 Food availability:

The physical availability of nourishment consistently is the chief prerequisite condition of food security. Accordingly, Food availability addresses the aspect of food security. The supply may originate from imports and production.

1.2.2 Food access:

The availability of food does not really imply that all individuals can get access to food. In this manner, physical and monetary access to the food items is another part of food security.

1.2.3 Food Consumption:

Food consumption is generally comprehended as the manner in which the body synthesises different supplements from the food. Adequate nutrient and energy intake from various food items is fundamental for nourishment prosperity. Food usage is to metabolise supplements in the body and is dependent on the well-being status of the person.

1.2.4 Stability:

To be food secure, the other three elements of food security must be satisfied consistently. Additionally, there ought not to be a risk to lose access to nourishing food. The hazard may result from monetary, climatic and political change.

However, from 1996 World Food Summit emphasise on the components that are excluded in the four parts of the food security as portrayed above are the "Preferences for food to lead a well-functioning and solid healthy life". The components identified with "Preferences for food" could be the object of some evolved research and analytical thinking, which, at the family unit and individual dimension, could be tantamount to what food sovereignty is with respect to nation

To accomplish Food security these four measurements must be satisfied in the meantime. Further, the capacity to get food in socially acceptable ways is a significant component of food security (Jones et al., 2013).

1.3 Levels of nourishment security

World Food Summit (1996) utilized a staggered meaning of nourishment security and has distinguished food security at the individual, family unit, national, territorial and worldwide dimensions

Food security at the individual dimension can be comprehended as having the option to have enough food and at the family level having the option to buy enough food-items. As quality aspect, people observe that their food was significantly deficient however, for the families' food was not suited for consumption. So also, the psychological part of nourishment security at the individual level was characterized as lack of choice, while at family unit level as anxiety for food.

The social component of insecurity in food was depicted as disturbed eating designs at the individual level and procurement of food by socially unsatisfactory methods at the family unit level (Radimer et. al., 1992).

1.3.1 Individual food security

As described by Radimer et al., (1992), food insecurity for the individual is characterised by food scarcity, absence of preferences, insufficient intake and level hardship and disturbed eating designs. Food security for an individual can be comprehended as reasonable access and customary utilization of adequate, nutritious, and a variety of food by a person for a functioning solid and healthy life.

1.3.2 Household Food security

Food security at the household level is "the use of the idea of the food security to the family level, with people inside families as the focal point of concern" (FAO, 2009). As indicated by FAO (2010), family units are food secure when they have around the year access to the variety and quantity of safe food for their individuals need to lead dynamic and sound lives. At the household level, food security described as the "capacity of the family unit to secure food, either from purchases or the production, to meet out the dietary needs of all individuals from the family.

Family food security can be comprehended as the capacity of a family unit to meet dietary and supplement necessities of all individuals in a socially acknowledged way all-round the year.

1.3.3 Community Food security

Hamm and Bellows (2003) described the community food security (CFS) as "a circumstance in which all people in the community groups acquire a safe food, socially affirmed, healthfully get the job done through a practical sustainable framework that expands community and social equity". On these lines, a community can get the status of food secure. There have been numerous techniques to give solidarity to community food security. Community Supported Agriculture (CSA) which joins producers and shoppers is one of them.

The customers pay the farmers monthly or weekly and share the production just as sharing of the risk associated with the failure of crops (Engler-Stringer and Harder, 2011). Other people's group approaches include Community Kitchens and Community Gardens.

People in these projects join their assets, for example, time, work, instruments, supplies and expertise. In community kitchens they prepare one or more meals to share and in community gardens peoples have a common garden to produce food (Howard and Edge, 2013)

1.4. Evolution of Food Security:

Since, ancient ages India is known as the land of agriculture, while on other hand it shared a long history of lack and shortage of food: annabhava, doorbhiksha and manvantara. Such insecurities were articulated in Vedic literature too:

**"Kaleyvarshatuparjanyam,
prithvishashyashalini,
lokasantuniramayah."**

(May there be on time downpour and abundant crops. Give individuals a chance to get relieved of their illnesses.)

Nature was handling all in maximum of occasions. But the stance has changed since the Feudalism developed and get matured, there was expanding the role of the

State in giving food security. Since the time of Chandragupta Maurya, a lot of starvation alleviation measures had advanced. Kautilya's Arthashastra reference the estimates like: distribution among the general population, at subsidised price for the food and seed from the state stores; undertaking food for work projects, for example, fortifications of building or water system works and sharing out the food stocks. However, there was no brought up together and intelligible code or approach towards food security and famine relief even in Mughal times.

The British discovered starvations happening and re-happening in different pieces of India, e.g. 32 recorded famine in different pieces of India somewhere in the range of 1860 and 1908. Not for the welfare of large famine stricken Indian population but rather in fear of any uprising against their standard, the British government needed to assume a job in starvation alleviation. Consistent with its character, it set up Famine Commissions and spelt out Famine Codes. The Famine Code planned by the First Famine Commission (1878-1880) was tuned in to this.

It said that wage for work was to be given to all the physically fit however, compensation paid were to be only adequate for the food grains, help in their very own towns was to be offered (just) to the infirm and aged (and ladies in purdha) who couldn't offer themselves for work on open works.

Anyhow, a great deal of progress found in the English arrangement towards nourishment security and starvation commission in 1878 and afterwards. Some of the featured significant changes were:

- The Government of India Act, 1919 made famine relief programme as a commonplace subject. Every Province was required to make and keep up a Famine Relief Fund.
- A Royal Commission was set up in 1905 to enquire into the functions of the New Poor Law. Many innovative laws were passed, e.g., the Pensions Act (1908), the Labour Exchange Act (1909), the National Health Scheme (1911), the National Insurance Act (usable since 1912).

- The apex change in advancement of food security likewise came in colonial era for example in 1943 that there happened the man-made Bengal Famine, slaughtering more than 3 million. 'Famine Inquiry Commission' made which suggested the brief presentation of rationing in towns with a population of around at least 25,000.

In a story recounted by John Maynard Keynes about his meeting with Albert Einstein, the latter apparently told Keynes to the effect that, —I don't know any economics I only know that Marx was right, but I will not be able to tell you why. Einstein intuition about Marx being right had marched ahead of his reasoning. Likewise on August 15, 1947, at the time of independence, it was common intuition for many that country should not export agricultural or agro-based industrial goods. Nehru and Mahalanobis shared that intuition. The Nehru-Mahalanobis strategy was usually faulted for ignoring India's food grain demand by emphasizing not on agriculture but heavy industries. In fact that rationale of the strategy was derived precisely from the fact that it was essential for India's food security. With a grim picture of impending food famine, there was fear that unless our agricultural production goes up, famines of the Bengal famine kind (1943) may recur. It was in this context that Jawaharlal Nehru said everything else can wait, but not agriculture.

Food security has been a major goal of development policy in India since the beginning of institutional planning. Food availability and price stability were considered important measures of food security till the 1970s and the achievement of self-sufficiency was accorded high priority in the policy. The stress on food grain production provided a solid base for food security at the national level. India achieved self-sufficiency in food grains in the year 1978 and has sustained it since then.

Swaminathan and Sinha (1986) have stressed the need for shifting to the concept of Nutrition Security', which he has defined as physical, economic and social access to balanced diet, clean drinking water, environmental hygiene, primary health care and nutritional literacy. Three dimensions viz. availability, access and absorption are encompassed in the definition. According to Swaminathan, given that India's population is likely to reach 1.5 billion by 2030, the challenge facing the country is to

produce more and more from diminishing per capita arable land and irrigation water resources and expanding abiotic and biotic stresses.

In 2000, the United Nations Millennium Summit met in New-York in September as a special session of the UN General Assembly. The Summit approved 8 Millennium Development Goals (MDGs) the first of which refers to “Eradicate Extreme Poverty and Hunger”.

The 1996 + 5 Summit in 2002 approved the creation of the International Alliance Against Hunger (IAAH) to deal with advocacy, accountability, resources mobilization and co-ordination in order to 21 strengthen national and global commitments and actions to end hunger. (Food and Agriculture Organisation, 2002)

Green Revolution genes had a transformational effect in the area of yield enhancement, particularly cereal crops. After 67 years, The Food Security Act confers a legal right to food to nearly 70 per cent of our population with home grown food. But still, India at present, finds itself in the midst of a paradoxical situation of widespread mass-hunger coexisting with mounting food grain stock.

The food grain stocks available with Food Corporation of India (FCI) are about twice the required level of 41.1 million tonnes as on 1 June 2015 (Business Standard, 7 June 2019). Still, an estimated 195.9 million peoples are undernourished in India. (State of Food Security and Nutrition in World, 2018)

In contemporary scenario (2005- 2019)the development in food security aspects are developing the Millennium Development Goals and Sustainable Development Goals were a major milestone in food security as both given priorities to end hunger, developing sustainable agriculture and made people food secure.

There have been evidences that the food and nutrition insecurity prevails even in the food surplus areas, with low income households being more vulnerable to it. Increase in production alone does not ensure food and nutritional security. There have been evidences on wide variations in demand elasticity across states, income groups and rural/urban sectors. It also explained partly the decline in cereal demand over time despite rise in per capita income and fall in relative prices of cereals. Therefore, the reduction in average cereal consumption again points towards food insecurity.

1.5 Present Scenario of Food Security:

1.5.1 Indian Context

Food security has been a noteworthy worry in India. India, in spite of being the main producer of food grains but it is confronting a circumstance known as triple effect of malnutrition. Disappointment from the level of food security has prompted a noteworthy issue of under-nutrition alongside different level and components. As indicated by UN-India, 17 percent of the total population and 14.8 percent of the world's undernourished population, India bears a colossal weight of food and nutrition insecurity (more than 195.8 million people). Also generally 43 percent child in India are constantly undernourished. India positions 76th in Food Security Index (2018) which was 74th out of 113 nations as far as in Food Security Index (2017) which indicate the level of food security further deteriorating. Further, India positions 100 out of 119 nations in Global Hunger Index (2017). It shows the stand of the India against food insecurity is still at not par with world. According to the first-historically speaking India State's Hunger Index, Madhya Pradesh has the most extreme dimension of hunger and food insecurity in the nation, trailed by Jharkhand and Bihar. Punjab and Kerala scored the best on the Index. In India, 53 percent of family income spent on food in provincial India (NSSO, 2011-12) and 14.5 percent of malnourished population dwell in India (The State of Food Insecurity in the World, IFPRI, 2017). In spite of the fact that the accessible nutrition standard is 10 percent of the prerequisite condition, India lingers a long ways behind regarding quality protein admission at 20 percent which should be handled by making accessible protein rich nourishment items, for example, eggs, meat, fish, chicken, and so on at moderate costs (India: Global Food Security Index, 2019). While India has seen amazing monetary development lately, the nation still battles with far reaching hunger and poverty. India's poor population adds up to in excess of 300 million individuals, with right around 30 percent of India's population living in village are poor. The improvement as seen is, poor population has been on the decreasing trend as per the recent studies. As per official administration of India estimates, poverty decrease from 37.2 percent in 2004-05 to 29.8 percent in 2009-10. Rural poverty declined by 8.1 percent from 41.8

percent to 33.7 percent and urban poverty by 4.9 percent from 25.7 percent to 20.8 percent over a similar period. (World Bank, 2012)

1.5.2 Global Context

At world level food security is a noteworthy concern and such as which is in developing pattern from 2015-2018. (The State of Food Security and Nutrition on the Planet, 2018)

The year 2017 was set apart by expanding vulnerability in the midst of blended indications of development. The world appreciated as solid recovery of financial development following a time of stagnation however, worldwide hunger expanded as clashes, starvation, famine and outcast emergency in trend. Hunger at global level took its upper hand after almost a time of decrease in a decade. The number of undernourished individuals universally ascended from 778 million out of 2015 to 815 million in 2016. What's more, to this circumstance "The Climate Change" goes about as cherry on the top to such an extent that the worldwide network faced starvation as an expected 38 million individuals in Nigeria, Somalia, South Sudan, and Yemen confronted extreme level of food insecurity, and Ethiopia and Kenya faced continuous critical dry spells.(Global Food Arrangement Report, 2018, IFPRI)

However, on a positive note India is relied upon to stay independent or self-reliant in the creation of staple food at least up to 2025. Nonetheless, no proper functioning and inefficiency aspects in the downstream portions of the food production and supply network are as yet uncontrolled, and influences to undermine self-reliance and to sustain hunger. (The Diplomat, 2 April 2012)

1.6 Challenges for global food security

The worldwide food security challenge is clear: by 2050, the world must feed 9 billion individuals on planet. The food demand will be 60 percent more than it is today. The United Nations has set goal to end hunger, accomplishing food security and improved level of nutrition, and advancing sustainable agricultural practices as the second of its 17 Sustainable Development Goals (SDGs) by the year 2030.

As the problem of food insecurity is the most discussed point worldwide and furthermore the worldwide players are offering shape to their policies to handle its impacts, yet a great deal of difficulties looked by them and a portion of the significant ones are given as following : (Global Agenda 2016, WEF)

- 1.6.1 Climate change** – presently, 40 percent of the world's landmass is dry, and the temperatures is on increasing trend that will transform yet a greater amount of the agricultural land into desert. At current rates, the level of the food production the peoples on earth enjoying will nourish just 50 percent of the world population by 2050.
- 1.6.2 Water scarcity** – this is another looming emergency: 28 percent of farming lies in water deficit or arid areas. It takes around 1,500 litres of water for a kilogram of wheat, and around 16,000 litres for a kilogram of meat to get produced. In 2050, world demand will be twice as much water as at present.
- 1.6.3 Troubled ranchers** – By considering the population of the developed nations, 2 percent of individuals do farming and practice agriculture to grow food for peoples and feed for animals. Less and less individuals are selecting agriculture as an occupation of their livelihood sustenance. In the interim time, food costs are rising, arable land keeps on being lost and soil is being corrupted by the faulty practices in agriculture represents a risk to the level of food security at present.
- 1.6.4 Agriculture should likewise be sustainable:** The agriculture sector share 30 percent of ozone depleting substance or greenhouse gases discharges and 70 percent of freshwater withdrawals so consideration must be paid to vitality and water use in farming practices. Waste management is additionally an issue, with an expected 33 percent of food the people consume and approximately \$750 billion in value is lost.

Agribusiness divisions need to turn out to be increasingly gainful by receiving productive plans of action and open private organizations. Furthermore, they have to wind up practical by tending to address the problem of ozone depleting substance outflows, water use and waste.

1.7 Objectives of the study

- i) To study the socio-economic status of farm women in Mirzapur.
- ii) To examine the food security status among farm women in the study area
- iii) To determine the food habits and expenditure pattern of the respondent on food items.
- iv) To assess the relative contribution of the independent factors on Body Mass Index (BMI).

1.8 Scope and importance of study

Women as farmers, laborers and entrepreneurs are the significant driving force of India's agriculture. According to OXFAM (Oxford Committee for Famine Relief, 2018) agriculture sector employs 80 percent of all active women in India, women comprise 33 percent of the agriculture labor force and 48 percent of the self-employed farmers. In spite of their large contribution towards the rural economy of India the food security status of farm women is still a major aspect which was not dealt in a proper manner. Economic policies made at national level to alleviate poverty which was recognized as one of the major case but still one frame doesn't fits to all. As the food security varies from place to place so the present study done in Mirzapur district to get through the Food Security at micro level among farm women by using the Household Food Insecurity Scale (FAO, 2013)

Results from the study can help the government to produce an active policy to improve the food security status of farm women in the region. And also to determine the factors which should be given priority in formulation of their policy.

1.9 Limitation of study

The study was conducted in year 2018-19 and past years were not considered in study. And the information collected on basis of response given by the respondent which may not be free from individual bias and prejudice. However, despite of such limitation well concentrated efforts at micro level applied to carry out the research on the objective as systemic as possible.

1.10 Organisation of thesis

The outline of the study has been divided into six chapters:

- 1) First chapter comprises of introduction giving details about the Food security's definition, element, dimension, historical evolution, and significance in Indian and global context along with objectives.
- 2) The second chapter gives selected information from the previous research done by different researchers on similar topic at international and national level.
- 3) The third chapter consists of research methodology or process and analytical tool used to get the result from the raw data collected in present study.
- 4) The fourth chapter includes the description of the study area.
- 5) The fifth chapter consists of results and discussion after analysis of specific analytical tools.
- 6) The sixth chapter comprises of summary and conclusion deciphered from the study undertaken followed by the references.



REVIEW OF LITERATURE

Review of literature related to research topic is a necessary step to conduct any scientific research. It helps in knowing relevant research work carried out by other investigators. It provides needed information regarding our study and helps in formulating the framework of the study, deciding objectives and methods of approach to the problem and analyzing the data collected. The knowledge of similar research work previously carried out relating to the problems under study is useful and provides guidance to the researchers in approaching the problem and carrying out research in the proper direction. It also helps to compare the results of such other studies and the reasons for the variation. Some of the literature published related to research topic are reviewed in this chapter in following subheads:

- 2.1 Socio-economic status of farm women.
 - 2.1.1 Sanitation facilities available to the households.
- 2.2 Food security among farm women.
- 2.3 Food consumption and expenditure pattern.
- 2.4 Association between Body Mass Index (BMI) and socio-economic status.

2.1 Socio-economic Status of Farm Women

Ene-Obong et al., (2001) attempted an examination to decide the impact of financial and social factors on the well-being and nutritional status of 300 ladies of childbearing age in two rural cultivating networks in Enugu State, Nigeria. The ladies were occupied with the cultivation, business and teaching profession. Poor literacy was for the major part credited by the absence of fiscal help by guardians (34%), marriage in school age (27%) and gender inferiority (21%). As the influence of all factors, the fact arises that none of the ladies met their iron, riboflavin, and niacin recommendatory allowances. More instances of endless vitality insufficiency were seen among the ranchers (16%) and business peoples (13%) than among the educators (5.00%).

Government of India (2004) reported that poverty was amassed in a pastoral area of the districts of Assam, Bihar, Orissa, West Bengal, Madhya Pradesh, Uttar Pradesh and the eastern area of Maharashtra. The more unfortunate states were sensibly nourishment secure as far as cereal dissipation or consumption. The high rate of grain impoverishment in the more extravagant areas could be because of the movements in utilization predilection for non-cereals.

Singh et al., (2004) investigated the financial status of the small landholders of Punjab. The gross sample of 270 ranchers (127 marginal and 143 small farmers) from nine villages from three districts of Punjab state for the examination was chosen. The majority, of 96 percent and 81 percent of the marginal and small farmers have one to three relatives occupied with the farming occupation. The investigation additionally uncovered that the little farmers had similarly more machinery than the marginal farmers. The obligation of the marginal and small farmers was to the degree of Rs. 9450 for every section of land and Rs. 9600 for each section of land individually.

Kruger et al., (2006) surveyed the socioeconomic indicators, food security status and living status of farm workers and their families in two areas of the North-West Province, South Africa. Results featured down the poor living state of farm worker's families. Food security at the household level was undermined because of an absence of capital assets, financial resources, and furthermore family resource allocation. It had a negative effect particularly on kids, with half of them (50.1%) being underweight, hindered growth and wasted. Business is typically connected to men, while most ladies were daily wage workers as a fact.

Gurung (2008) uncovered the fact that in spite of the fact that ladies' rural workforce participation was high yet there was no huge change in the status of women farmers. Ladies were as yet denied and bigoted on financial and economic criteria. Dalits were chiefly experiencing this hardship and discrimination. In this way, farm women required a higher degree of concern for their work and livelihood. There was a

tremendous need for women empowerment projects and a good salary package to break this endless loop of the economic mishap.

Idrisa et al., (2008) conducted a research on nourishment security status among cultivating family units in Jere Local government area (JLGA) of Borno state in north-eastern Nigeria. Essential information was gathered from 140 family units chose through a multi-stage sampling method. The result showed that 45 percent of the respondents were of 40 – 49 years, the major part (52%) had just essential training with a high extent (57%) occupied with cultivation as a major occupation. The family size of 40 percent of the respondents was between 7– 9 people. Families with large family size, low pay level, and low literacy dimension were generally influenced by food insecurity and nutrients deficiency condition eating once a day, allowing children to eat first and buying food on credit were among the coping strategies adopted by the respondents.

Saha et al., (2010) conducted a study on poverty in the woodland based area in Southern Orissa and showed that chronic destitution, as far as the degree of poverty and long term effect, was an overall reality for very nearly nine out of 10 family units. The frequency of poor peoples among Scheduled Castes was higher contrasted and Scheduled Tribes. Reducing cereal consumption is the most significant adapting procedure under the condition of an internal economic mishap.

Dwivedi (2011) broke down the statistic variables of farm women from four towns of Milkpur square of Faizabad District, Uttar Pradesh. The statistic factors viz., age, instruction, standing, family type, family estimate, land holding, occupation, salary and material belonging were examined through a general data plan. The socioeconomic examination of farm women concerning the statistic qualities uncovered the fact that dominant part of rural ladies or farm women were illiterate, had a place within neglected class, joint family, huge family burden, marginal (land holding), pucca house (made of blocks and concrete) and work as auxiliary, and most extreme have a place with medium financial status.

Singh and Singh (2011) contemplated the financial status of marginal and small farmers/ ranchers with and without auxiliary occupation in Punjab. Discoveries of the investigation demonstrated a trending pattern that the little just as marginal ranchers with the beneficial wellspring of salary would have a number of basic facilities at home and have better budgetary status contrasted with those subject to exclusively agribusiness. Accordingly, they should be encouraged to adopt extra backup occupations.

Afzal (2012) revealed that family income positively affects sustenance. He recommended that increment in salary alone isn't adequate to decrease malnutrition , demonstrated that wholesome results were an after effect of complex cooperation between different components like better well-being , learning or health knowledge or better access and sanitation frameworks. Appropriate sanitation and medical services facilities were emphatically identified with lower dimensions of malnutrition.

International Food Policy Research Institute (2012) demonstrated some noteworthy contrasts in dietary and use designs among the countryside and urban family units. Be that as it may, the distinction in the dietary diversity score was extremely little and not altogether significant over pastoral and suburban families. The real contrast was in offer of family budget outlay plan allotted to food products. Grains had a lot higher spending share in country regions (38.7% versus 28.7%), while meat, eggs, milk, vegetables, and organic products all had a higher spending share in urban territories, with the major distinction existed for milk items.

Mugadur and Hiremath (2013) found the various injustice faced by the ladies, for example, ignorance and child marriage. The spouse did not work appropriately and did not give the cash for the house costs. The men give problem to the ladies by chastening, beating so the ladies needed to go in the hunt of occupation by which she can take care of the family duties and care her kids. However, the jobs are low paid.

National Sample Survey Organisation (2013) demonstrated the socking state of farmers (75.00 %) owing not exactly a hectare of land. Just 10.00 percent of

sample farmers were small farmers (1-2 ha) and 0.24 percent were large farmers (in excess of 10 ha). It was recommended that if the condition arises in case of marginal farmers the expenditure (up to Rs. 6020) was more than the salary (up to Rs. 5247) in spite of the way that all cultivators supplement their income with different income sources, for example, off-farm activities and business. The emerging crisis because of climate change influenced small and marginal farmers and less impact on the medium and large ranchers who were flourishing.

Radheyshyam et al., (2013) had done an examination on the network of the fish farming community and its economy was done in eighty-one arbitrarily picked regular network fish lakes from two delegate areas specifically Khurda and Puri of rural Odisha. The study uncovered a low level of innovative reception of aquaculture with customary and broad techniques for carp culture. The effect of a couple of the executive's measures was observed to be sure on the fish profitability improvement.

Singh (2013) demonstrated that agriculture was not capable to give a good sustenance level to a major of the farmers' group in Uttar Pradesh state. The per-day per-capita salary from agriculture was Rs. 15.00 for marginal farmers, Rs. 31.00 for small ranchers, Rs. 45.00 for medium farmers and Rs. 84.00 for large farmers. Along these lines, every single marginal farmer, who is more than three-fourths of UP ranchers, fell beneath the poverty line of Rs. 22 on the off chance that they depend exclusively on agriculture pay.

Mwakanyamale et al., (2015) surveyed the role of sweet potato to food security among agri household in Kilosa District in Eastern Tanzania. Organized polls were utilized to gather information from 120 arbitrarily chosen family units. Results demonstrated that the size of farmland provided for sweet potato cultivation marks a positive and significant relation to food security. Family heads' age, sex, long periods of schooling and non-agriculture income were an additional factor affecting family food security at the household level.

2.1.1 Sanitation Facilities Available to the Households

Tambekar and Rajgire (2012) investigated and analyzed down open defecation free (ODF) and open defecation not free (ODNF) town in Amravati locale. The outcomes demonstrated that drinking water in open defecation free towns was 18 percent polluted while in ODNF town 48 percent. All the water tests having poor Water Quality Index (WQI) were

E. coli identified. In this way, it demonstrated that open defecation was a standout amongst the most significant components for contaminating the groundwater sources, for example, open well, hand siphons, and tube well in the countryside and better sanitation improves human well-being as well as advances monetary and social advancement.

Banerjee et al., (2013) directed an investigation to comprehend the conduct and frame of mind towards outdoors poop by the occupants and stimulus to use open can/private can among 236 families of Nandivargam town of Kurnool District. Critical affiliation was found between lower financial status and outside lavatory practice. After defecation, all family hands washing with water and 66 percent of families don't see Open Defecation practice as a disgrace.

Bhardwaj et al., (2013) had done a cross-sectional examination in a village of Pune among 288 subjects infers that, despite the nearness of network lavatories, 77 percent of the populace turned to outside lavatory practice. Insufficient water was a significant explanation behind underuse (58.6%) of network restrooms pursued by a lack of awareness about the accessibility of these (11.5%). Just a few of them (13.5%) didn't know about any destructive impact of outside crap and the dominant part knew about the significance of hand washing as to counteractive action of the malady. Ladies discovered outside defecation much additionally humiliating and hazardous.

Prasad (2013) assessed the situation of accessibility of latrine facility in India had improved amid the previous 10 years (2001- 2011), yet the greater part (more than 50%) of the country's household still need toilet facilities. As high as 79 percent

of the family units without toiletry facility in Jharkhand and Odisha. Countless were crapping in the open since they can't stand to assemble capital to make a toilet for their own family. The primary reason behind the substantial number of population in India as yet defecating in open was as the major part of the Indian population were not persuaded of the need to stop open crap, in light of the absence of appropriate measure about the issues related with open defecation practices.

2.2 Food Security among Farm Women

Yaro (2004) reported that food insecurity among rural women happen when there was sick well-being, loss of land and work, fall in salaries, price of food climbs and loss of business. Likewise, unexpected calamities, for example, flood and dry spell may cause prices of food to expand prompting nutrition and food uncertainty.

Saghir et al., (2005) investigated the wholesome status of rural ladies in tehsil Fateh Jung, Pakistan. The outcomes demonstrate that the food uptake of respondents as far as calorie intake was significantly less than the suggested ones.

Babatunde et al., (2007) inspected the financial qualities and determinants of the food security status of countryside agri household family units in the Kwara State of Nigeria. In view of the Food and Agriculture Organisation undernourished measure, the examination found that 64.00 percent of family units were undernourished.

Food And Agriculture Organisation (2007) found that there was a deviating pattern of consumption of Myanmar individuals as far as both quality and amount. The effect of poverty and hunger was especially serious among farm women and kids bringing about hunger and illnesses. The maternal mortality (2.81 per 1000 live birth) was additionally high in the countryside women as a result of the absence of a health or doctor clinic office and sanitation facilities. Further Food and Agriculture Organisation recognized that food security of family units (little ranchers, landless workers) who establish about 30.00 to 35.00 percent of the provincial populace turned out to be more nutrition insufficient.

Mishra (2007) investigated the adapting techniques to battle food insecurity include the utilization of less favoured food, constraining the size of food, acquiring nourishment or cash, eating less to guarantee kids have enough to eat and the skipping of suppers for entire days. The utilization of tobacco and the utilization of privately prepared alcohol (from mahua and date palm juice) additionally fill in as significant adapting techniques against yearning among Oraon clans of Odisha.

Omonomo and Agoi (2007) investigated the food security circumstance among rural family units in Lagos State, Nigeria. Essential information was gathered utilizing an organized survey from 165 randomly chosen families in 7 networks. In the investigation, a nourishment secure family unit (49.00%) was characterized by those whose per capita month to month expenditure on food product falls above or is equivalent to 66 percent of the mean per capita food consumption.

Vijayakumar et al., (2007) led an examination to inquire about the food and nutrition security profile of 300 Dravidian women in Salem area. The information proposed that the level of salary and sum spend on sustenance every month was 40.93 percent and Rs. 1609.00 individually. Among the chose ladies 11.00 percent fell under food insecure without hunger, 82.00 percent undernourishment shaky with moderate hunger and 7.00 percent under food insecure with severe hunger status.

As per **Kruger et al., (2008)**, agri household security includes three measurements i.e. accessibility, openness, and use. Nourishment accessibility was comprehended as having an adequate amount of food accessible for consumption. Physical accessibility alluded to what was accessible for utilization in the network, rely upon access to arable land and the capacity of a family to get food products through its activities. Food accessibility is the capacity of a country and its family units to procure adequate sustenance on an economic premise. Access to nutrition notion includes whether the accessible food can be acquired, and incorporates family units that have the assets, capacity, and information to deliver or get food.

Lawal et al., (2008) considered the degree of food security and determinants among farm women in the dry and semi-dry Giwa region of the north-focal zone of Nigeria. The Food and Agriculture Organisation's food security index was utilized to decide percent undernourished. The investigation uncovered that most of the family

units in the examination are sufficiently fed, contrasted and 34.48 percent undernourished.

Gorton et al., (2009) have talked about different financial, physical and social components identified with food and nutrition security. They opine that a low dimension of training is related to diminished food security. Individuals living in urban territories when contrasted with their rural partners were to be more food secure.

Ibrahim et al., (2009) led an investigation to evaluate the condition of food security among urban family units in Gwagwalada, Nigeria by utilizing a 9 set of inquiries that are utilized to sort family food security status into 3 gatherings (food secure, moderate nourishment secure, non-food secure). The results reveal that 70 percent of urban family units in the investigation region are sustenance secure or modestly nourishment secure, while 30 percent are nourishment shaky.

Kayunze et al., (2009) had given the reasons for nutrition frailty in numerous developing nations incorporated the little size of land, reliance on precipitation, the utilization of low dimension advances for culturing, poor yield and animals cultivation, poor stockpiling and handling of harvest and domesticated animals items, post-gather misfortunes, money related powerlessness to utilize improved seeds, composts, pesticides and herbicides, low costs offered in real money crops, poor markets for agrarian and domesticated animals items, poor horticultural expansion administrations, poor division of work at the family unit level, awful cultivating works on prompting different natural debasement and poor transportation implies that influences the dispersion of information supply and items transportation to commercial centres.

Barrett (2010) discovered three mainstays of food security are accessibility, access, and use. Accessibility showed the physical accessibility of grains for the populace. Access mirrors the demand side of food security. The usage reflects whether people and family units utilize the food products to which they have approach.

Saha (2010) examined the situations existed in Southern Orissa, one of the districts encountering a high rate of poverty over a period. This examination of perpetual destitution in one forest-based area in Southern Orissa showed that constant destitution, as far as long duration and severity, was an all-encompassing situation for right around nine out of 10 family units. It likewise featured extreme hardships as to food consumption. Diminishing cereals utilization was the most significant adapting technique under states of interior economic stun. This prompts an ascending trend of low food, prompting low mobility and physical ability.

Belachew et al., (2011) examined young people in Ethiopia and found that altogether increasingly (34.00%) sustenance shaky teenagers were missing from school contrasted with their nourishment secure companions. food insecurity not just influenced the physical development and soundness of kids yet additionally their scholarly improvement, school participation, and scholastic execution.

Camara et al., (2011) surveyed the effect of ladies rancher (n=1140) action on need of poverty reduction and nourishment security in the Kindia district of Guinea. Unmistakably the general population most vulnerable who were living in countryside territories, explicitly ladies and youngsters. Regardless of the basic job of ladies in ranch generation, domesticated animals and authority of assets, they have responsibility for 1.00 percent of the land. Ladies were likewise avoided from participation in public programmes and cooperatives.

Rahim et al., (2011) led a cross-sectional investigation of 2500 family units to decide the impacting factors on family nourishment security status. 40 percent of family units have encountered low nutrition frailty and 20.00 percent have encountered low food insecurity. It diminished with an expansion in family size. The correlation test likewise proposed that mean per capita salary had a noteworthy reverse relationship with women food insecurity status.

Barrett (2012) opined that most extreme food insecurities were regularly connected with calamities, for example, dry season, floods, war, or seismic tremors. Ninety-two percent of death worldwide was related to unending or reoccurring hunger

and ailing health. Agrarian families were routinely presented to seasonal hunger during its consumption period, the period when a family's sustenance stocks run out before new harvest were accessible - with climatic stuns and change, political variables, and variability in worldwide markets, nourishment instability can immediately compound. There is an unmistakable regularity to food insecurities in numerous areas. The "hunger season" was when food product supplies were depleted in the middle of consumption year. Families in general, adapt strategies to get themselves through the season, for example, lessening their nourishment consumption amount.

Bread for the World Institute (2012) revealed that women frequently need access to adequate healthy nutritious food and eat small because of social practices inside the family unit. Women substantial tasks at one hand and local duties additionally make them defenseless against malnutrition. At the point when food is short in supply, one adapting technique for ladies and young ladies to eat less so there was more nourishment for men and young men. They have less access to nutrition as well as regularly eat the food of poor quality, undesirable and unsafe. Lacking access to safe drinking water and poor sanitation put ladies at an expanded danger of ailment, ailing health, and death tremors.

Hazara (2012) reported that the food grain yield was 228 million tons (2008-09) however, simple physical accessibility of food products did not convert into availability. The most stunning reality was that notwithstanding the flooding of sustenance stocks, per capita food grain accessibility keeps on being among the least on the planet. Food grain accessibility in 2009 was simply 444 gm every day and it came down to a horrifying 434 gm for each day in 2010. He reasoned that sustenance security lies in the best possible availability of nourishment to the provincial poor, not in increasing food reap.

Kumar and Joshi (2012) contemplated the adjustment in dietary trends and wholesome status of various financial gatherings of rural family units in India by taking two areas of each state. It was additionally seen that in each one of the states,

the extent of inadequacy in countryside families was higher in landless, sub-minor and marginal class and it diminished with the hold on assets. It was seen that Assam and Orissa were the most inadequate state in the majority of the supplements. Punjab and Haryana were at a superior circumstance as far as food and nutrient consumption in the eating routine.

Shakeel et al., (2012) investigated the state of sustenance food security among farm women in the Bundelkhand area of Uttar Pradesh. Most of the areas were moderate and low food secure as a result of low nourishment grain accessibility and low acquiring intensity of the families. The irrigation water utilization was additionally not all around created prompting low utilization of manure and low efficiency of harvests. Work rate, rate of urbanization, stockpiling limit and the number of reasonable value shops were additionally not on par, prompting pitiable food security conditions in the investigation territory.

Victoria et al., (2012) broke down the food security circumstance among Nigerian provincial ranchers. Information gathered on 202 rustic farmer families from Benue State. The outcome uncovered that the per capita calorie utilization for food secure family unit was 3221.2 kcal contrasted with 2432.8 kcal for nourishment shaky families among women in agri-households. The most generally utilized adapting methodologies amid nourishment stress included intercropping (99.2%), dependence on less favoured food (98.1%), limiting size of meals (85.8%) and crop diversification (70.8%).

Brahamananda et al., (2013) proposed that food security in India can be accomplished by giving higher consideration to environmental change. The yield efficiency was contrarily influenced by the extraordinary deviation in temperature prompting a higher rate of catastrophic events, for example, floods and dry spells. It was proved that food security can be accomplished by handling the particular challenge identified with environmental change in a variety of areas.

Kirimi et al., (2013) recognized elements that impact family unit sustenance security for Kenyan country smallholder families, and specifically, decide whether family commercialization as characterized by a family unit interest in the inputs

(compost and seed) and yield markets influences nourishment security position. Results demonstrated that family unit commercialization was related with a decreased danger of being in the incessantly nourishment poor and oscillator group contrasted with the food non-poor locale. Henceforth, results support that participation in marketing activity in lessening destitution, consequently guaranteeing nourishment security.

Agwu and Oteh (2014) assessed the components that impact food security among the ranchers in South Eastern Nigeria, Abia State. The outcome demonstrated that the Majority of the respondents, establishing about 68.57 percent were in food insecure groups in the examination region. The regression results demonstrated that the age of the family head, literacy of the family unit head and monthly salary of the head were the significant factors affecting food security status in the investigation territory. The examination also suggests that administration approaches focused at ranchers ought to be fortified, so as to conquer any hindrance in ranchers' income.

Keino et al., (2014) directed an investigation in 756 family units with farm women of childbearing age from both country and urban zones of Kenya. Of the family unit included 71.1 percent were arranged as serious food insecure, 20.9 percent were reasonably nourishment shaky, 3.8% were mild food insecure whereas only 4.3 percent were food secure. Urban women had higher mean BMI ($M = 25.53$, $SD = 4.36$), compared to rural women ($M = 21.52$, $SD = 3.71$; $P < 0.00$).

Mango et al., (2014) inspected factors affecting household food security among smallholder ranchers in the Mudzi locale of Zimbabwe. Information were gathered from 120 randomly chosen family units. The outcomes demonstrate that family unit dietary assorted variety was affected by the age and training of the family head, family unit work, and size, animal possession, access to market data and settlements. The family unit food insecure score demonstrated that work, instruction of the family unit head; family unit estimate, settlements, domesticated animals possession and access to advertising data all influenced family sustenance security.

Sinha et al., (2014) directed an examination to investigate the elements of destitution and food security in Odisha. By gathering the subjective and quantitative information from two chosen regions of Balangir and Dhenkanal from five diverse business bunches mainly marginal and small scale family units, farm women families, mining specialists' families, craftsman families and scheduled tribal family units. The outcomes uncovered that however, Odisha was self-suffice in food grains, there was a huge commonness of nutritional frailty in the state and around 9.00 percent of the populace was named seriously nourishment unreliable expending under 1800 kcal every day.

2.3 Food Consumption and Expenditure Pattern

Rao (2000) attempted to estimate causes and implications of declining demand for food grains in rural India. The results of the study indicated that demand for food grain in India had been declining and some of this decline indicated an increase in consumer welfare. The decline had been sharper in the rural areas where improvements in infrastructure make other food items and non-food commodities available. Though cereals (used here as proxy for food grains) consumption had increased among the poorest 30 per cent of the population, even this group is near the saturation point.

Babalola and Isitor (2014) conducted a study to identify the determinants of food expenditure among urban households in Lagos Mainland Local Government Area of Lagos State, Nigeria. Respondents (household heads) were selected randomly and data gathered by means of structured questionnaire. Data analysis was accomplished using descriptive statistics and regression model. Results of the study showed that 60 percent of the household income was expended on food which is considered high, suggesting low income and possible high cost of food in the study area. When combined with existing large members (>5) in most households (66%), existence of food insecurity and vulnerability to poverty in the study area was implied. Regression analysis showed that 65.5 percent of the variation in household expenditure on food in the study area was accounted for by the explanatory variables.

Household income, tribe, household size and the composition of the household had a significant effect on food expenditure.

Maharana and Ladusingh (2016) conducted a study which aims to shed light on the changing pattern of household healthcare and food expenditure in the context of changing household age composition in India over time. Findings indicate that per capita expenditure has increased significantly both for food and healthcare during 1993-2010. With respect to the food and healthcare expenditure of household, the share of consumption by children under 15 years has declined over time, while that by adults of 15-59 years and elderly above 60 years has increased substantially during the same period.

Mogaraku (2016) carried out study to analyze the household consumption expenditure on selected staple foods in Ika North East Local Government Area of Delta State, Nigeria. The aim of this study was to investigate household consumption expenditure levels on selected staple foods and determine the effect of socioeconomic characteristics variables on the food consumption expenditure in Ika North East Local Government Area of Delta State. The selected staple food items were rice, beans, yam and meat. A simple random technique was used to select 60 household heads from the study area. Data analysis was accomplished using descriptive statistics and ordinary least squares multiple regression technique. Result indicated that 71.7 percent of the respondents were male household heads. While 29.3 percent were female household heads. The average monthly income of the household head was N 52,000. The average household expenditure of the staple foods was N 16,915.78 in the study area. Regression analysis showed that marital status, household size and income household were positive and significant at 1 percent level while educational level was also positive but significant at 5 percent level. It is therefore recommended that family heads must search for a cheaper alternative protein source since beef product accounted for the highest percentage of food consumption expenditure in the study area.

Pandey (2016) conducted a study on food consumption pattern among rural and urban adult population in Faizabad district (Uttar Pradesh). Majority of urban populations (28.5%) were businessman, while the participants from rural areas were predominantly farmers (47.5%). 78.5 percent and 60 percent of both rural and urban respondents were belonging to vegetarian category respectively. Cereals consumption in rural and urban areas was quite similar in a month, it included mainly wheat and rice only. Consumption of pulses included red gram and green gram dhal had taking by rural population by 15-20 days in a month, while in urban population it was 10-15 days in a month. Only seasonal and low cost fruits were consumed by rural population while all type of fruits was consumed by urban population. Consumption of leafy vegetables was 5-10 days in a month for both urban and rural population. The study revealed that low cost, easily available and staple foods was frequently consumed by rural population. Mustard oil was the commonest type of oil used in cooking food in rural area, while refined oil and soybean oil was frequently consumed by urban population.

Sangeeta V et al., (2017) conducted a study entitled “Assessment of food consumption pattern in Uttar Pradesh: A dietary diversity. In this background, a study had been undertaken with the objective of understanding dietary habits with special reference to dietary diversity and nutritional status among rural population. The study is based on the primary data collected in Baghpat district of Uttar Pradesh during the year 2014-15. The Body Mass Index (BMI), one of the indicators of nutrition status reveals about 10 per cent men, 20 per cent women, 30 per cent boys and 35 per cent girls were coming under underweight and remaining fell in overweight category. Nutrition awareness among the female groups was better than male groups and anganwadi workers were the key informants. The actual consumption of all the food groups were about 50 per cent less than the Recommended Dietary Allowance (RDA) across all the categories. As evidenced from this study, household production enhances food accessibility. Hence, promotion of diversified cropping pattern could be a right strategy for enhancing nutritional security in rural areas. Further, this study suggests targeting men as well women for sensitization and awareness programme

about importance of food and nutrition to achieve nutritional security of all in particular women.

Borkotoky and Unisa (2018) conducted a study to examine the inequality in food expenditure in India and the contributing factors using household level expenditure data from the National Sample Survey Organisation. The study first examined the pattern of food expenditure and then the factors associated with the inequality in food expenditure. The study identified that inequality in food expenditure by place of residence, geographic and agro-climatic regions has increased over time. Moreover, type of occupation and household size had significant contribution to inequality in food expenditure. The findings from gini decomposition suggests that with the increase in food expenditure inequality, share of cereals in total food expenditure increased for the poor; and share of milk products, vegetables and processed food increased for the rich. The geographic variations within the country and the share of each expenditure category within state will also help in explaining the food expenditure inequality in India.

2.4 Body Mass Index (BMI) and Association with the Socio- economic Status

Fernald (2007) completed an examination in low salary family in Mexico and embraced six socio-economic factors in both genders: training, occupation, nature of lodging conditions, family unit resources, and abstract societal position and the outcomes assessed as BMI and family unit income were altogether related in ladies but not in men. In the model including all socio economic factors, instruction, occupation, lodging conditions and family resources all contributed freely and essentially to BMI, and family salary and emotional economic well-being did not.

Fletcher and Frisvold (2009) conducted a study in Wisconsin and found that more prominent level of education may impact preventive care somewhat through business channels and access to potential care facilities. These discoveries propose that increase in education or training have capacity to spread on long haul well-being decisions about nutrition and food intake.

Cohen et al., (2013) analysed the different databases from public health and medicine, education, psychology, economics, and other social sciences were searched, and articles published in English, French, Portuguese, and Spanish were included and revealed that the connection between years of schooling and obesity (BMI >25.6) was impacted by both sexual orientation and the nation's financial improvement level: negative relation was found in investigations of higher-pay nations and a positive affiliation was progressively basic in lower-income nations

Rao and Pingali (2014) conducted a study on connection among BMI and agrarian pay in India entitled “The role of agriculture in women’s nutrition: Empirical evidence from India” which expresses that over the more long duration of time, for the family units that ranch consistently, we find that a 10 percent growth in income from agriculture related with a 0.10 percent point development in BMI. Influence of agricultural income is more among teenager women, in the age-bunch 15-25 years, who face an especially health problem in India. It indicates that the relationship between income from agriculture and BMI development is financially at meager dimension.

Malapit et al., (2015) carried out a study in Nepal and uncovered the fact from study that empowering the women compounded by group participation, working hours, and authority over salary and asset is altogether connected with maternal dietary assorted variety and Body Mass Index.

Abreu et al., (2017) studied the relationship of socioeconomic status with Body Mass Index (BMI) by using sex stratified linear regression and model. The result in age-adjusted models, most socioeconomic indicators were associated with a higher BMI in men; mixed associations were found for women. In multivariate models, living in urban areas was associated with a higher BMI for both men and women. Across all surveys, education was associated with a lower BMI in women, while household assets were associated with a higher BMI in men.

Selvamani and Singh (2018) studied the socioeconomic patterns of underweight and its association with self-rated health, cognition and quality of life among older adults in India by using bivariate and multivariate regression model. The

study examined the socioeconomic differentials in underweight among respondents aged ≥ 50 in India. The overall prevalence of underweight was 38 percent in the study population. Further, socioeconomic status showed a significant and negative association with underweight. The association of underweight with poor self-rated health, cognition, quality of life was remained statistically significant after adjusting for age, sex, place of residence, marital status, years of schooling, wealth quintile, sleep problems, chronic diseases, low back pain and state/province.



RESEARCH METHODOLOGY

Research Methodology is a very broad aspect of the philosophy of research or dissertation. In general it includes description of the data collection process and analytical aspects of the various studies. Hence this chapter basically deals with the framework of the research methodology adopted for the study into the following subheads:

3.1 Selection of study area.

3.2 Selection of agri household.

3.3 Method of data analysis.

3.1 Selection of Study Area

Uttar Pradesh is a northern state of India. It is highest populous state in India with an area of 243286 km² area. It has 18 divisions, 75 districts, 822 development blocks, 97941 populated villages, It is pertinent to mention that the strength of work force in the state is 23.7 percent, out of which 65.9 percent are farmers and 5.6 percent are industrial workers. Number of farm workers is 66 percent. Its per capita income is Rs. 13,262 as per existing rate.

However, this study concentrates on Mirzapur district in eastern Uttar Pradesh as this district counted in backward district as per the record of the Ministry of Panchayati Raj. In 2006 it was one of the 250 most backward districts and also still receiving funds from the Backward Region Grant Fund (BRGF) Programme. Also separation of Sonbhadra largely affected the economic condition of the district. Mirzapur is also categorised under low food availability with moderate food insecurity persistent in the district.

There are 12 blocks in Mirzapur district out of which two blocks viz; Jamalpur and Narayanpur were selected purposively because several programmes / trainings

were organized for the development of the farmers in these two blocks for the last many years. The farmers are very friendly in providing the accurate data for the research carried by Banaras Hindu University (BHU) staffs as well as students. From Jamalpur block, Pirkhir village was selected purposively because in this village the farmers follows Rice-Wheat cropping system and Kailahat village from Narayanpur block was selected purposively because Kailahat Village is famous for vegetables production.

3.2 Selection of the Agri Household

From these two selected villages, a list of farm women was prepared who were married couple having more than 35 years of age and engaged in agricultural activities. From this list 100 respondents were randomly selected. Out of these 100 respondents 22 were marginal farmers, 43 small and 35 farm women from medium category. Permission was sought from the head of the family to collect the data from the respondents to fulfill the different objectives of the study. The above criteria for selection of respondents were adopted by Chitrotpala Devadarshini, 2016.

3.3 Method of Data Analysis

3.3.1 Socioeconomic status of farm women

To determine socioeconomic status of farm women , general information was collected by using pre tested schedule (Appendix I) such as social status, age, family members, type of families, education and sanitation facilities. The descriptive statistics was used to fulfill the first objective.

3.3.1.1 Classification of farm women according to Body Mass Index (BMI)

The anthropometric data (include height and weight only) was further used for computing BMI. The Body Mass Index a recent valid index of nourishment status, has been calculated to know the relationship of factors like agricultural income, non-agricultural income, education, age, land holding with BMI. Which is calculated as follows:

$$\text{BMI} = \frac{\text{Weight (kg.)}}{(\text{Height*})^2}$$

(*Height in metres)

Respondents are distributed in different categories on the basis of Table 3.1.

Table 3.1- Classification of Body Mass Index into different categories

BMI Classification	Presumptive Diagnosis
<18.5	Under Weight
18.5-24.9	Ideal BMI
25-29.9	Pre Obese
>30 -34.9	Obese Class-I
>35-39.9	Obese Class-II

(Source: World Health Organisation)

3.3.2 Food security status of farm women

To fulfill the second objective Household Food Insecurity Assessment Scale, (FAO, 2013) was used. The schedule consists of nine questions on the accessibility, quality, preferences and availability etc. Score zero was allotted for the respondents who answered No to the question and if answered Yes then there was a three pointer scale i.e. rarely (score 1), sometimes (score 2) and often (score 3). The procedure used to classify farm women in different food insecurity category is given in Table 3.2.

Table 3.2-Procedure used to classify farm women in different food security and insecurity category

Calculate the Household Food Insecurity Assessment (HFIA) category for each household.
1 = Food Secure, 2=Mildly Food Insecure Access, 3=Moderately Food Insecure Access, 4=Severely Food Insecure Access
HFIA category = 1 if [(Q1a=0 or Q1a=1) and Q2=0 and Q3=0 and Q4=0 and Q5=0 and Q6=0 and Q7=0 and Q8=0 and Q9=0]
HFIA category = 2 if [(Q1a=2 or Q1a=3 or Q2a=1 or Q2a=2 or Q2a=3 or Q3a=1 or Q4a=1) and Q5=0 and Q6=0 and Q7=0 and Q8=0 and Q9=0]
HFIA category = 3 if [(Q3a=2 or Q3a=3 or Q4a=2 or Q4a=3 or Q5a=1 or Q5a=2 or Q6a=1 or Q6a=2) and Q7=0 and Q8=0 and Q9=0]
HFIA category = 4if [Q5a=3 or Q6a=3 or Q7a=1 or Q7a=2 or Q7a=3 or Q8a=1 or Q8a=2 or Q8a=3 or Q9a=1 or Q9a=2 or Q9a=3]

(Source: Food and Agriculture Organisation, 2013)

3.3.3 Food habit and Expenditure Pattern of the Household

In order to achieve the third objective one month recall method was used. To determine the food habits of the household the schedule involved the points to collect information such as food purchase, consumption, monthly expenditure on food items, quantity consumed etc. The information collected was tabulated. Mean and frequency were used to analyse the data further in the subcategories.

3.3.4 Assessment of relative contribution of different factors on BMI

Multiple linear regression model is used and the equation is given below:

$$Y = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + U_i$$

Y = Body Mass Index (kg/m^2)

b_0 = Intercept

X_1 = Education (in term of years of schooling)

X_2 = Age (in years)

X_3 = Expense on food per month per person (in rupees)

X_4 = Agricultural Income (in rupees)

X_5 = Non-agricultural Income (in rupees)

X_6 = Landholding (in acres)

U_i = Error term

$b_1, b_2, b_3, b_4, b_5, b_6$ = The regression coefficient of their respective independent variables.

The regression model analyzed by using Software Package for Social Sciences (SPSS).



DESCRIPTION OF THE STUDY AREA

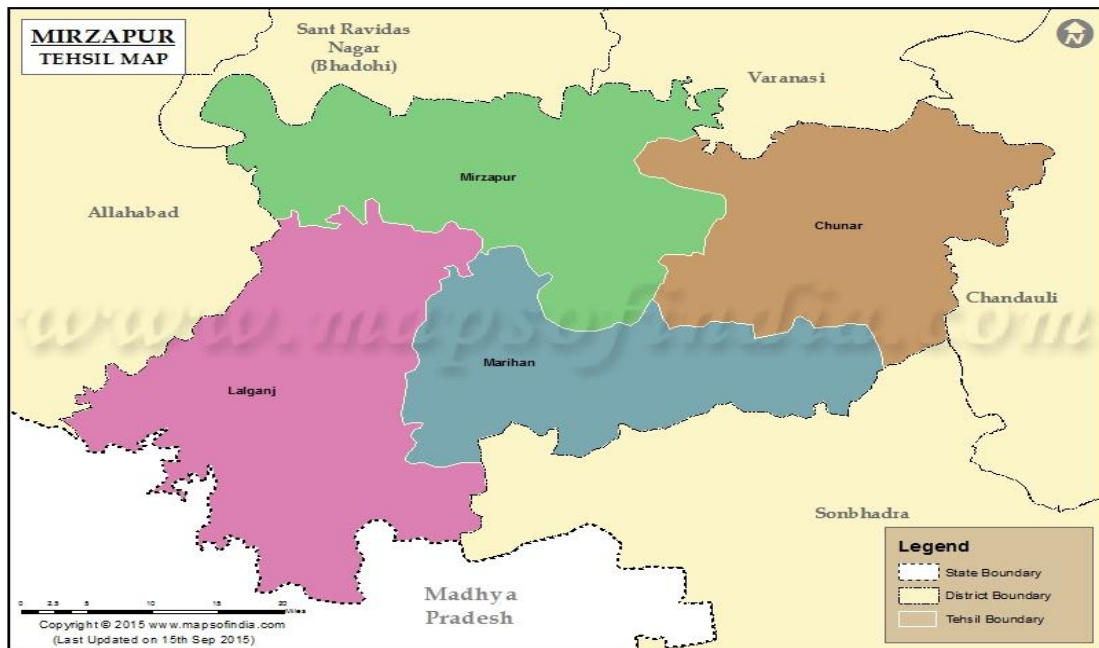
The basic information about district under study with respect to location, climate, population, soil, rainfall and other related information about selected villages in study area is given below:

4.1 Overview of Mirzapur District

Mirzapur district formerly known as Girzapur, after the goddess Parvati (Girija Devi) derives the present nomenclature from the juxtaposition of the terms ‘Mir’ ‘Ja’ and ‘Pur’ meaning sea, outcome, and town respectively. Stretching across 23°52’ to 25°32’ North latitude and 82°07’ to 83°33’ East longitude, Mirzapur covers an expanse of 4521 sq. km.

The jagged terrain of Mirzapur is enclosed between Varanasi on the north and northeast, Sonbhadra on the South and Allahabad on the Southwest. The district Mirzapur is divided into 12 development blocks namely:

- (i) Chhanvey
- (ii) Kon
- (iii) Majhawa
- (iv) Nagar (City)
- (v) Pahari
- (vi) Lalganj
- (vii) Hallia
- (viii) Marihan
- (ix) Rajgarh
- (x) Sikhar
- (xi) Narayanpur
- (xii) Jamalpur

Figure 4.1 Map of district Mirzapur (Uttar Pradesh)

4.2 Topography

Uttar Pradesh is covered by nine agronomic zones, district Mirzapur comes under zone nine (Vindychal region). Topographically the district is divided into two tracts – plains and hilly. The maximum area in this zone is undulated and rocky. Ganga is a regular flowing river and provides natural drainage to the district. The land of district is mostly upland but deep ravines are found near the bank of the river. The district is drought prone area. The rains are uncertain and erratic which often causes drought and sometimes flood situation during rainy season. The water level is very low due to the installation of government or private tube wells require heavy investment of funds.

4.3 Physical Features

Mirzapur is the leading district of Uttar Pradesh (U.P.) from the point of agricultural development. It consists of 4 tehsils and 12 development blocks with 795 revenue villages.

4.4 Soil

The district consists of domat (loamy), matiyar (clay) and bhoor (sandy). Loamy area has fertile land which is soft in touch. Bhoor (sandy loam) is sandy soil to touch, matiyar (clay) stiff clay which is ordinarily used to grow rice. In tarai the soil is alluvial consisting of stratum of loam of varying thickness more or less mixed with sand. In some places soils are present which is not fertile.

Soil varies in type with no assured irrigation facilities and hence, the farmers in the region have to grow specific dry land crops, fruits and vegetables.

4.5 Climate

District Mirzapur enjoy sub-tropical climate and have extreme weather conditions i.e. heat in summer and cold in winter. There are three distinct seasons as mentioned below:

1. Rainy season – From mid-June to end of September.
2. Winter season – From October to end of February.
3. Summer season – From March to mid of June.

The mean annual temperature varies from lowest 4.8⁰C to highest of 45⁰C in Mirzapur district. There is a frequent variation in temperature from season to seasons and from month to month. May and June are hottest months and the coldest months are December and January in the district.

4.6 Distribution of Rainfall

The rain plays an important role in agricultural production especially in absence of assured facility of irrigation. Though the period of rainy season is from middle of June to end of September, most of it, i.e. 90 percent of the total rainfall in a year takes place during end of June to end of August or middle of September.

4.7 Population

According to census report-2011 the district Mirzapur has a population of 2494533. Male population is 1312822 and female population 1181711 comes out to be 52.63 percent male and 47.37 percent female.

Total literacy percentage for male and female was found to be 60.45 percent and 39.55 percent respectively. Thus, there is a wide scope to increase more educational facilities for female in district.

4.8 Density of Population (Per sq. km.)

Density of population is another indicator of population pressure on land. It measures the number of persons residing in one square km. of area. Population density of district Mirzapur is 561 person per km² which is lower as compared to Uttar Pradesh (828 person per km²) and higher than India (382 person per km²).

4.9 Kailahat Village

Kailahat is a large village located in Chunar tehsil of Mirzapur district, Uttar Pradesh with total 607 families residing. The Kailahat village has population of 3719 of which 1914 are males while 1805 are females as per Population Census 2011.

In Kailahat village population of children with age 0-6 is 514 which make up 13.82 percent of total population of village. Average Sex Ratio of Kailahat village is 943 which is higher than Uttar Pradesh state average of 912. Child Sex Ratio for the Kailahat as per census is 985, higher than Uttar Pradesh state average of 902.

Kailahat village has higher literacy rate compared to Uttar Pradesh. In 2011, literacy rate of Kailahat village was 83.00 percent compared to 67.68 percent of Uttar Pradesh. In Kailahat, male literacy stands at 91.06 percent, while female literacy rate was 74.39 percent. General information of Kailahat village is given in Table 4.2.

Table 4.1-General information of Kailahat Village

Particular	Total	Male	Female
Total No. of Houses	607	-	-
Population	3,719	1,914	1,805
Child (0-6)	514	259	255
Literacy	83.00 %	91.06 %	74.39 %
Total Workers	1,249	912	337
Main Worker	1,018	-	-
Marginal Worker	231	41	190

In Kailahat village out of total population, 1249 were engaged in work activities. 81.51 percent of workers describe their work as Main Work (Employment or Earning more than 6 Months) while 18.49 percent were involved in Marginal activity providing livelihood for less than 6 months. Of 1249 workers engaged in Main Work, 334 were cultivators (owner or co-owner) while 357 were agricultural labourers.

4.10 Pirkhir Village

Pirkhir is a large village located in Chunar Tehsil of Mirzapur district, Uttar Pradesh with total 603 families residing. The Pirkhir village has population of 3313 of which 1675 are males while 1638 are females as per Population Census 2011. In Pirkhir village population of children with age 0-6 is 624 which make up 18.83 percent of total population of village. Average Sex Ratio of Pirkhir village is 978 which is higher than Uttar Pradesh state average of 912. Child Sex Ratio for the Pirkhir as per census is 956, higher than Uttar Pradesh average of 902.

Pirkhir village has lower literacy rate compared to Uttar Pradesh. In 2011, literacy rate of Pirkhir village was 57.87 percent compared to 67.68 percent of Uttar Pradesh. In Pirkhir male literacy stands at 68.73 percent while female literacy rate was 46.81 percent. In Pirkhir village out of total population, 1318 were engaged in work activities. 59.03 percent of workers describe their work as Main Work (Employment or Earning more than 6 Months) while 40.97 percent were involved in Marginal activity providing livelihood for less than 6 months. Of 1318 workers engaged in Main Work, 154 were cultivators (owner or co-owner) while 327 were agricultural labourers. General information of Pirkhir village is given in Table 4.2.

Table 4.2- General information of Pirkhir village

Particular	Total	Male	Female
Total No. of Houses	603	-	-
Population	3,313	1,675	1,638
Child (0-6)	624	319	305
Schedule Caste	509	248	261
Schedule Tribe	62	27	35
Literacy	57.87 %	68.73 %	46.81 %
Total Workers	1,318	893	425
Main Worker	778	-	-
Marginal Worker	540	308	232



RESULTS AND DISCUSSION

In this chapter, the results of the study are presented and discussed. The whole chapter has been divided into four sections:

5.1 Socio economic characteristics of farm women

5.2 Food security status among farm women

5.3 To determine the food habit and expenditure pattern on food by respondents

5.4 Relative contribution of age, education, land holding, expenditure on food per person per month on Body Mass Index (BMI)

5.1 Socio-Economic Characteristics of Farm Women

The efforts were concentrated to study the socio-economic characters such as landholding, size of the households, social status, type of family, size of family, age and education.

5.1.1 Classification of households based on land ownership

Out of 100 households 22 women fell in the category of marginal farmer, 43 were in small farmer category and the medium farmer category had 35 women .(Table 5.1)

Table 5.1 – Classification of farmers according to size of holding

Category	Number
Marginal	22
Small	43
Medium	35
Total	100

5.1.2. Average holding size of the households

The average holding size of the households is presented in Table 5.2. It is evident from the table that the average landholding size of all farmers is 4.003 acres whereas the average landholding size of marginal farmers is 1.94 acres, small farmers 3.85 acres and of medium farmers 6.22 acres, respectively. This shows that there is a huge variation in average landholding size among sample farmers.

5.1.3 Family Type

To consider the social aspect of the households, type of families were taken under study. From the Table 5.2, it is evident that 58 percent of the total families were joint families while the nuclear families accounted for 42 percent of the total. The maximum number of joint families was observed among the medium farmer's group i.e. 25 families, while minimum was observed under marginal farmers' subclasses which were 9 families.

5.1.3.1 Mean size of the family

As presented in Table 5.2, we infer that 85 percent of the total households under study were medium size families i.e. having 4-9 members whereas, large size family accounted only 11 percent of the total and small size families (<4 family members) were only 4 percent of the total household.

The small farmers are dominant in both medium family size and large family size category as they account for 41.17 percent in medium family size and 45.45 percent in large family size category respectively.

5.1.4 Age

The average age of the respondents is 46.52 years. A less variation is noticed in the average age of marginal, small and medium farmers which is 52.7 years, 44.58 years and 42.28 years respectively as evident from Table-5.2.

5.1.5 Education:

The study on the education status of the sample households shows that 85 percent of the respondents are literate whereas, the rest 15 percent belongs to the illiterate group. Also, the maximum years of schooling as visible from table 5.2 are up to Higher Secondary level (11-12th class). It is very prominently evident that none of the women ever turned up for tertiary education. Further studies also reveal that among the literate group also only 38 percent of the respondents studied up to the Primary level (1-5th class) which represents low level of literacy among women farmers. At both primary and secondary level of education, the maximum literate farmers fall in the category of small farmers, as nearly 40 percent small farmers are educated up to primary level while around 50 percent have studied up to secondary level.

Table 5.2 reveals the poor status of women's education in the study area, as only 19 percent of the total sample farm women were able to complete their education up to higher secondary level. A majority of women farmers are secondary school dropouts or we can say they have completed education up to primary level only.

5.1.6 Source of drinking water

The source of drinking water is presented in Table 5.3. The majority of farmers nearly 59 farm women have submersible pumps as the ultimate source of drinking water while for the rest 41 women the source of water is public tap. Among families who use submersible pumps, a majority comprises of the small (30) followed by medium farmers (21). In case of public tap even distribution is noticed among the three farmers' categories.

Table 5.2- Land, family, age and education characteristics of respondents

Particulars	Category	Marginal farmers (n=22)		Small farmers (n=43)		Medium farmers (n=45)		Overall (n=100)	
Size of holding	Average holding (Acres) (Mean)	1.94		3.85		6.22		4.003	
		F*	%**	F*	%**	F*	%**	F*	%***
Type of Family	a)Nuclear	13	59.09	19	44.18	10	28.57	42	42
	B)Joint	9	40.9	24	55.81	25	71.42	58	58
Mean Size of the family	a) <4 small	Nil	Nil	3	75.00	1	25.00	4	4
	b)4-9 medium	20	90.90	35	41.17	30	35.29	85	85
	c) >9 large	2	18.18	5	45.45	4	36.36	11	11
Age	Mean Age (years)	52.7		44.58		42.28		46.52	
Education	Illiterate	5	33.33	5	33.33	5	33.33	15	15
	Literate	17	20	38	44.70	30	35.21	85	85
Among literates	a)Primary (1-5 th class)	13	59.09	15	34.88	10	28.57	38	38
	b)Secondary(6-10 th class)	3	13.63	14	30.23	11	31.42	28	28
	c)Higher secondary (11-12 th class)	1	4.54	9	20.93	9	25.71	19	19
	d) College	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil

(F*= Frequency, %**=Percentage taken from the respective sub- total, %***= percentage taken with respect to 100 sample households, n=in numbers)

5.1.6.1 Water treatment

A majority of the farm women consume water, without any treatment. Nearly 78 percent of women have no access to any kind of filtration or water treatment. The basic filtration technique of boiling is not used even by a single household. Only 22 households use treated water for daily consumption as evident from Table 5.3.

5.1.7 Ownership of house

The information on house ownership is given in Table 5.3 which reveals that all the 100 farmers of Mirzapur district have their own and none of the farmers live in rented house.

5.1.7.1 Type of house

From the data presented in Table 5.3 it is inferred that 93 percent families live in pucca houses, rest 7 percent live in kuchha houses. All the small and medium farmers live in pucca houses and only 7 percent marginal farmers live in kuchha house.

5.1.8 Drainage

As evident from Table-5.3, 74 percent households have open drainage while the rest 26 percent have closed drainage.

5.1.9 Garbage disposal

Garbage disposal methods studied were disposing outside the compound or burning it. A large number of families i.e. 72 percent families dispose their daily household garbage outside the compound while the rest 28 families use the method of burning the garbage. This depicts that around 28 percent families have no facility of proper garbage disposal. (Table 5.3)

5.1.10 Lavatory ownership

In contrast to other sanitary measures, particularly lavatory ownership showed positive results as out of 100 families, 86 families have their own lavatories while only 14 families don't have lavatory facilities. The highest numbers of lavatories owners are from the category of small and medium farmers (37 and 35 families, respectively) as presented in Table-5.3.

Table 5.3- Sanitary and hygienic practices adopted by households

Particulars	Category	Marginal farmers (n=22)	Small farmers (n=43)	Medium farmers (n=35)	Overall (n=100)
Source of drinking water	Public tap	14	13	14	41
	Submersible	8	30	21	59
Water treatment followed	Boiling	0	0	0	0
	Filtration	3	10	9	22
	No treatment	19	33	26	78
House	Own	22	43	35	100
	Rent	0	0	0	0
Type of house	Kuccha	7	0	0	7
	Pucca	15	43	35	93
Drainage	Open	17	29	28	74
	Closed	5	14	7	26
Garbage disposal	Outside the compound	10	33	29	72
	Burning	12	10	6	28
Lavatory practice	Have	14	37	35	86
	Don't have	8	6	0	14
Post toiletry Hand wash	By soap	14	27	27	68
	Sometime with soap	8	16	8	32
	No hand wash	0	0	0	0

(n= in numbers)

5.1.10.1 Post toiletry practices:

From the above Table 5.3, it is very clear that 68 farmers use soap to wash their hands, whereas 32 farmers use sometimes soap and sometimes use other

ways to wash their hands. This data reveals that there is an urgent need for awareness about hygienic practices among the farmers.

5.1.11 Social Status

The information on the social status as presented in Table 5.4 reveals that 39 percent of the sample farmer families belong to General Category followed by 32 percent OBC and 18 percent SC and 11 percent ST category respectively.

Table 5.4- Social status of respondents among different categories

Particulars	Category	Marginal farmers (n=22)		Small farmer (n=43)		Medium farmers (n=35)		Overall (n=100)	
		F	%*	F	%*	F	%*	F	%**
Social Status	a)General	6	15.38	16	41.02	17	43.58	39	39
	b)Other Backward classes(OBC)	4	12.5	15	46.87	13	40.62	32	32
	c)Scheduled Castes(SC)	7	38.88	8	44.44	3	16.66	18	18
	d)Scheduled Tribe (ST)	5	45.45	4	36.36	2	18.18	11	11

(F= Frequency %*= Percentage was taken with respect to sub-total of the respective category, %**= Percentage was taken with respect to 100 sample farmers, n=in numbers)

5.1.12 Cows and buffaloes on sample farms

Majority of the sample farmers used to rear cows and buffaloes. Families rearing cows and buffaloes are maximum (30) in medium farmers followed by small and marginal farmers. (Table 5.5)

Table 5.5- Frequency distribution among farm families as per livestock rearing

Particulars	Number	Marginal farmers (n=22)	Small farmers (n=43)	Medium farmers (n=35)	Overall (n=100)
Cow	Not rearing	13	14	5	32
	1	3	14	9	26
	2	4	15	13	32
	3	2	0	6	8
	4	0	0	2	2
Buffalo	Not rearing	9	13	5	27
	1	5	10	14	29
	2	4	10	12	26
	3	3	8	2	13
	4	2	0	2	4
	5	0	1	0	1

(n=in numbers)

5.1.13 Sources of income

The overall average income of sample farmers show that crops are the major source of income (17656 Rs.) followed by the non- agricultural work (93318.91 Rs.) and livestock (29136.68 Rs.), respectively. (Table 5.6)

However, the income from agriculture increases from marginal to medium farmers as depicted in Table 5.6.

Table 5.6- Average income of farmers from different sources (Rs.)

Source of income	Marginal farmers	Small farmers	Medium farmers	Overall farmers
Crops	96600.30	195157.48	238511.37	176756.3
Non- agricultural work	66521.73	83023.25	130411.76	93318.91
Livestock (includes milk sale also)	16951.21	27169	43289.85	29136.68

5.1.14 Monthly expenditure on food per person in a family

The average monthly expenditure on food per person for overall sample farmers found to be 1732.76 Rs. However, medium farmers spend highest among the farmers i.e. Rs. 1966.02, followed by small and marginal farmers as evident from Table-5.7.

Table 5.7- Monthly expenditure on food per person in a family (Rs.)

Category of farmers	Average monthly expenditure on food per person in a family (Rs.)
Marginal	1338.33
Small	1725.79
Medium	1966.02
Overall farmer	1732.76

5.1.15 Weight distribution among farm women

The distribution of weight among farm women in different classes is shown in Table 5.8. From the table, it can be observed that the maximum weight among the sample farm women is 76 kg and the minimum weight is 41.3 kg. Average weight distribution shows an increasing trend from marginal farmers to medium farmers.

Table 5.8- Weight distribution among farm women (kg)

Farmers' Category	Maximum Weight (kg)	Minimum Weight (kg)	Average Weight (kg)
Marginal	62	41.3	48.68
Small	70	42	54.17
Medium	76	52.9	62.9

5.1.16 Distribution of Body Mass Index (BMI) among farm women

The maximum BMI of the overall sample farm women is 30.57 kg/m² and minimum is 17.96 kg/m². Further Table 5.9 reveals that the average BMI of women increase from marginal farmers to medium farmers.

Table 5.9-Distribution of Body Mass Index (Kg/m²) among farm women

Farmers Category	Maximum	Minimum	Average
Marginal	23.72	17.96	19.95
Small	26.83	20.15	23.14
Medium	30.57	22.15	26.08

5.1.16.1 Classification of farm women according to Body Mass Index (BMI):

It is inferred that 6 farm women among 100 sample households were underweight. Out of 94 farm women, 67 women belong to the ideal BMI category, 25 women pre-obese and 2 women belong to obese class-I. (Table 5.10)

Majority of women from small (88.37%) and marginal (72.73%) are under ideal BMI category. However, in case of women from medium farmers majority (57.14%) belongs to pre- obese category. None of the sample respondents belongs to obese class-II.

Table 5.10-Classification of farm women according to Body Mass Index (BMI)

BMI Classification	Presumptive Diagnosis	Marginal farmer (n=22)		Small farmer (n=43)		Medium farmer (n=35)		Total
		No.	%	No.	%	No.	%	No.
<18.5	Under Weight	6	27.27	Nil	Nil	Nil	Nil	6
18.5-24.9	Ideal BMI	16	72.73	38	88.37	13	37.14	67
25-29.9	Pre Obese	Nil	Nil	5	11.62	20	57.14	25
>30 -34.9	Obese Class-I	Nil	Nil	Nil	Nil	2	5.71	2
>35-39.9	Obese Class-II	Nil	Nil	Nil	Nil	Nil	Nil	Nil

(BMI unit: kg/m², %= Percentage taken with respect to sub-total of category)

5.2 Food security status among farm women

In this section, the status of food security among farm women is discussed below:

5.2.1 Frequency distribution of the total sample in food secure and insecure category:

Table 5.11 depicts the distribution of farm women in food secure and insecure categories. It is observed that 78 percent of the sample farm women are under insecure food category of various degrees of insecurity. While the rest 22 percent of the population belongs to secure food category.

Further, it is observed that 90.91 percent of the farm women from marginal farmer households fall under insecure food category followed by small (86.04%) and medium (60%). Regarding the food security status of the sample, it is concluded that 40 percent of the farm women belong to medium farmers who are in food secure category followed by farm women from the small (13.96%) and marginal (9.09%).

Table 5.11-Frequency distribution of farm women in food secure and insecure category

Category	Food secure	Food Insecure	Total
Marginal	2 (9.09)	20 (90.91)	22
Small	6 (13.96)	37 (86.04)	43
Medium	14 (40.00)	21 (60.00)	35
Total	22 (22.00)	78 (78.00)	100

Figures in parentheses indicate percentage with respect to sub-total of individual category

5.2.1.1 Frequency distribution of the total sample according to food insecurity status

Food security being the major concern of study, Table 5.12 shows the frequency distribution of farm women among different food insecurity status categories. A majority of farm women belong to the moderate food insecurity status (45%) followed by mild food insecure (26%), and severe food insecure (7%).

Table 5.12- Frequency distribution of the total farm women according to food insecurity status and scale

Status	Scale	Frequency
Mild Food Insecure	Scale 2	26 (26.00)
Moderate Food Insecure	Scale 3	45 (45.00)
Severe Food Insecure	Scale 4	7 (7.00)

Figures in parentheses indicate percentage with respect to 100 sample farm women

5.2.1.2 Frequency distribution of farm women in the different category according to food security and insecurity status along with scale

Table-5.13 shows the food security and insecurity status of farm women in different categories. Out of the 100 farm women majority falls in scale 3 i.e. moderate food insecure category which is about 45 percent of the total, followed by 26 percent in mild food insecure category and 22 percent in food secure category. The maximum (63.63%) percentage of farm women having access to secure food belongs to medium farmers' category.

Table 5.13-Frequency distribution of farm women in different category according to food security and insecurity status along with scale

Particulars	Food secure	Mild food insecure	Moderate food insecure	Severe food insecurity
Category	Scale 1	Scale 2	Scale 3	Scale 4
Marginal	2(9.09)	7(26.94)	11(24.44)	2(28.57)
Small	6(27.27)	13(50.00)	19(42.22)	5(71.42)
Medium	14(63.63)	6(23.07)	15(33.33)	Nil
Total	22(100)	26(100)	45(100)	7(100)

Figure in parentheses indicate percentage with respect to sub-total of individual category

5.3 To determine the food habit and expenditure pattern on food by respondents

In this section types of food, their consumption pattern and expenditure on food are presented and discussed.

5.3.1 Food habit of the farm women from the different category

As per the data shown in Table- 5.14, the food items are divided into different categories:

a) Cereals:

Among cereals the rice and wheat are mainly consumed. The pattern of consumption of rice and wheat in the meals of farm women is presented in Table 5.14.

i) Rice

Rice is one of the staple food grains consumed by the farmers in the study area. Sixty percent respondents consume it twice a day followed by 40 percent of respondents who consume it once a day.

Farm women from all the three categories of farms show a major affinity towards consumption of rice. That is why majority of respondents from their respective group consume rice twice a day.

ii) Wheat flour

Wheat is the major consumed food grain among all groups of farmers. It is consumed twice a day by the majority (68%) of the population. However, 32 percent of the sample farm women consume wheat flour thrice a day.

b) Pulses

Pulses are regularly consumed by the sample farmers, mainly consumed pulses include gram, moong and arhar etc. Out of the 100 respondents, 68 percent respondents prefer to eat any of the given pulses once a day and maximum respondents are from the small farmers' category.

c) Vegetables

Vegetables are classified into two categories i.e. green leafy vegetables include spinach, amaranths etc. and other vegetables includes potato, tomato etc.

i) Green Leafy Vegetables (GLVs)

83 percent farm women consume GLVs 2-3 times a week which is in contrast to the fact that one of the villages under the study area is known for its vegetable

production. The green leafy vegetable consumption as observed from the table is high among the small farmers and low among the marginal farmers.

ii) Other Vegetables

53 percent respondents consume other vegetables twice a day and remaining 47 percent consumes once a day.

Among 53 respondents who consume vegetables twice a day maximum i.e. 44 respondents belong to category of small (23 women) and medium (21 women). Of the total 22 respondents in marginal category 9 women consume vegetables twice a day while a majority i.e. 13 respondents consume vegetables once a day.

d) Fruits

Only 12 percent of the farm women consume fruits occasionally, whereas 88 percent farm women consume more than twice a week. However, no woman consumes fruits regularly.

Forty percent and 45% small farmers consume fruits 2-3 times and 4-4 times in a month, respectively.

e) Edible Oil

Mustard oil is mainly consumed by the sample farmers.. All the respondents consume oil twice a day i.e. 22 marginal, 43 small and 35 medium farmers .Besides mustard oil refined oil is also used to cook food sometimes.

f) Milk

79 percent consume milk once a day in contrast to the fact that in the rural areas the livestock population is enough to serve the need of milk. Rest 21 percent sample farm women do not consume milk even once a day.

g) Curd

89 percent respondents consume curd once a day and rest 11 percent respondents do not even consume once in a day. All the farm women belonging to medium category consume curd once in a day.

h) Ghee

As in rural area, the ghee is also a good part of the diet, such that 70 percent farm women used to consume ghee but frequency varies i.e. 49 people used to consume once a day and 21 people used to consume twice a day.

Among 30 respondents who don't consume ghee even once a day majority (53.33 percent) belongs to marginal farmer's families.

i) Beverages:

63 percent farm women used to consume beverages 2-3 times in a day shows the inclination towards the beverage especially tea. Remaining 37 percent of the farm women consume beverages once in a day.

j) Fleshy foods:

Consumption of fleshy foods depicted in Table-5.14.1, it is evident from the table that 41 percent farm women are purely vegetarian whereas 59 percent farm women are non- vegetarian. And rest of the description is given below:

i) Chicken

In the case of chicken consumption 2-3 times in a week majority (54.83%) of farm women belong to small farmers. However, in case of 1 time in a week majority (42.85%) of women belongs to medium farmers.

ii) Fish

Majority of the farm women from the small farmer's household i.e. 48.57 percent women used to consume fish 2-3 times in a week followed by women from medium and marginal farmer's families i.e. 34.28 percent and 17.14 percent, respectively.

However, in case of fish consumption once in a week, again majority (41.66%) of women belong to small farmers' households.

iii) Egg

The majority of the sample population who used to consume egg once in a week belongs to the small farmers (57.14%). However, in the case of egg consumption, 2-3 times in a week the majority (50%) of women belongs to the medium farmers.

5.3.2 Average monthly consumption and expenditure distribution on different food items

In Table 5.15, the average monthly expenditure on different food items is represented and analyzed in different section by using their market price as given below:

a) Rice.

Small farmers spend maximum among three farmers categories i.e. 972.82 Rs. per month followed by the medium farmers and marginal farmers i.e. 969.72 Rs. and 859.9 Rs. per month. Average quantity of rice consumed per month is 16.9 kg.

b) Wheat

The average monthly expenditure on wheat found nearly 1363 Rs. in a month and the average monthly consumption of wheat is 27.2 kg which is more than the rice.

The expenditure pattern among different categories follows the order i.e. small (1401.80 Rs.) followed by medium (1374.21 Rs.) and marginal farmers (1313.75 Rs.).

c) Pulses

As respondents were unable to tell the pulse consumption among different types of pulses they told the combined consumption of all pulses. Regarding price information respondents had given on an average price of pulses in the market.

The average quantity of pulses consumed over a month is 5.03 kg and the monthly average expenditure is 377.25 Rs. Medium farmers spend highest i.e. 379.28 Rs. and marginal farmers spend least among sample farmers (367.25 Rs.).

Table 5.14-Food habit of the farm women from the different category

Food items	Frequency of consumption	Marginal farmers (n=22)		Small farmers (n=43)		Medium farmers (n=35)		Overall farmers (n=100)	
		F*	%**	F*	%**	F*	%**	F*	%
Cereals									
a)Rice	Once a day	7	17.5	20	50	13	32.5	40	40
	Twice a day	15	25	23	38.33	22	36.66	60	60
	Thrice a day	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
b) Wheat flour	Once a day	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
	Twice a day	13	20.96	27	43.5	22	35.48	62	62
	Thrice a day	9	23.68	16	42.1	13	34.21	38	38
c)Pulses (include arhar, moong and gram etc.)	Once a day	9	10.22	26	43.18	23	39.77	88	68
	Once in two days	7	19.44	17	47.22	12	33.33	36	36
	Once in three days	6	100	Nil	Nil	Nil	Nil	6	6
d)Vegetables									
Green leafy vegetables	Once in a week	3	15.78	9	47.36	7	36.84	19	19
	2-3 times in a week	19	23.4	34	41.97	28	34.56	81	81
Other vegetables	Once a day	13	27.65	20	42.55	14	29.78	47	47
	Twice a day	9	16.98	23	43.39	21	39.62	53	53
	Thrice a day	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
e) Fruits	1-2 times in a month/occasionally	7	58.33	5	41.66	Nil	Nil	12	12
	2-3 times in a month	9	25.71	14	40	12	34.28	35	35
	4-5 times in a month	6	11.32	24	45.28	23	43.33	53	53
	Regularly	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
f) Edible Oil	Once a day	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
	Twice a day	22	22	43	43	35	35	100	100
	Thrice a day	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
g)Milk	Once a day	13	16.45	36	45.55	30	37.97	79	79
	Twice a day	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
	Thrice a day	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
	Not even once a day	9	42.85	7	33.33	5	23.8	21	21
h)Curd	Once a day	15	16.85	39	43.82	35	39.32	89	89
	Twice a day	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
	Not even once	7	63.63	4	36.36	Nil	Nil	11	11
i)Ghee	Once a day	6	12.24	21	42.85	22	44.89	49	49
	Twice a day	Nil	Nil	14	66.66	7	33.33	21	21
	Not even once	16	53.33	8	26.66	6	20	30	30
h)Beverages (tea and coffee)	Once a day	9	22.5	16	47.5	12	30	40	37
	2-3 times a day	13	21.66	27	40	23	38.33	60	63

(F*= Frequency,%**= Percentage taken with respect to sub- total of individual category, n = in numbers)

Table 5.14.1- Consumption of Fleshy Food among different categories of farm women

Farm women Category	Consumption of Fleshy Food Items								
	Chicken			Fish			Egg		
	1W	2-3W	Don't consume	1W	2-3W	Don't consume	1W	2-3W	Don't consume
Marginal	6 (21.42)	6 (19.35)	10 (24.39)	6 (25.00)	6 (17.14)	10 (24.39)	8 (22.85)	3 (16.66)	11 (23.40)
Small	10 (35.71)	17 (54.83)	16 (39.02)	10 (41.66)	17 (48.57)	16 (39.02)	20 (57.14)	6 (33.33)	17 (36.10)
Medium	12 (42.85)	8 (25.80)	15 (36.58)	8 (33.33)	12 (34.28)	15 (36.58)	7 (20.00)	9 (50.00)	19 (40.42)
Total	28 (100)	31 (100)	41 (100)	24 (100)	35 (100)	41 (100)	35 (100)	18 (100)	47 (100)

(1 W=Once in a week, 2-3 W=2-3 times in a week)

Figures in parentheses given in table are percentage with respect to sub-total of each category.

d) Green Leafy Vegetables (GLVs)

The average quantity of GLVs consumed in the sample farmers is 8.56 kg per month and the average monthly expenditure found to be 191.57 Rs.

Among three farmer categories, medium farmer spend highest i.e. 198.68 Rs. and least by the marginal farmers (185.6 Rs.)

e) Other Vegetables (OVs)

The average monthly consumption of other vegetables that includes tomato, potato and onion and other type of vegetables found out to be more than GLVs and that is 17.16 kg per month and average monthly expenditure is 429.01 Rs.

f) Fruits

Fruits are not regularly consumed in the sample population as evident from Table-5.15. So, the monthly average consumed quantity comes to be 5.96 kg and the average expenditure for overall farmers is 461.25 Rs. which is more than GLVs and OVs, the reason may be the price of the fruits on higher side.

g) Milk per day

As milk is consumed regularly in the sample farmers so average consumption and expenditure on milk is taken on milk per day. Table 5.15 shows that 5.12 litres is average milk consumed by sample farmers' families and 256.01 Rs is the average expenditure per day on milk.

In the different categories of farmers medium farmer's households spend maximum on milk per day followed by small and marginal farmers that is 267.15 Rs. 264.53 Rs. and 236.36 Rs., respectively.

h) Edible Oil

Mustard oil is mainly used for cooking food. The average monthly consumption of the oil is 3.75 litres and the average expenditure comes to be 290.02 Rs. per month. However, among different classes the average consumption comes at similar level i.e. medium, small and marginal farmers spend 290.90 Rs, 290.62 Rs. and 290.02 Rs., respectively.

i) Beverages

Tea is main beverage consumed by the sample households. The average monthly expenditure on beverages comes to be 212.63 Rs. and average monthly quantity consumed is the 1.85 kg. Marginal farmers used to spend maximum on tea i.e. 222.29 Rs. per month.

j) Chicken

The average quantity of chicken consumed by the overall population is 2.85 kg and the average monthly expenditure for the overall sample population comes to be 499.62 Rs.

In case of different category of farmer's household small farmer used to spend highest among the sample farmers i.e. 579.94Rs. followed by the medium and marginal farmers. Marginal farmers spend 405.68 Rs. which is the least among farmers group.

k) Fish

Marginal farmer's families spend 418.18 Rs. per month on fish consumption which is maximum among the sample farmers. The average expenditure on fish consumption per month comes to be 290.2 Rs. for the sample families while the average fish consumed per month is 1.45kg.

l) Egg

The average monthly expenditure on egg consumption is 75.94 Rs. while the average quantity consumed by the sample population comes to be 14 eggs per month by a family.

In case of monthly expenditure on egg consumption, small farmers spend maximum among the sample farmers i.e. 79.81 Rs. followed by medium farmers (76.68 Rs.) and marginal farmers (67Rs.).

Table 5.15- Average monthly consumption and expenditure distribution on different food items

Food items	Average consumption (kg)	Average expenditure on food items (Rs.)			
		Overall Farmers	Marginal farmers	Small Farmers	Medium Farmers
Rice	16.9	934.01	859.5	972.82	969.72
Wheat	27.2	1362.66	1313.75	1401.8	1374.21
Pulses	5.03	377.25	367.05	373.25	379.28
GLVs	8.56	191.57	185.6	190.23	198.68
OVs	17.16	429.01	404.78	443..63	438.97
Fruits	5.96	461.25	457.53	459.35	466.97
Milk per day	5.12*	256.01	236.36	264.53	267.15
Edible Oil	3.75*	290.02	290.9	290.62	290.9
Beverages	1.85	212.63	222.29	206	209.6
Chicken	2.85	499.62	405.68	579.94	460
Fish	1.45	290.2	418.18	313.95	272
Egg	14**	75.9	67	79.81	76.68

(* In Litres ,** in numbers, GLVs= Green Leafy Vegetables, OVs= Other Vegetables)

5.4 Relative contribution of independent factors on Body Mass Index (BMI)

In this section the contribution of age, education, landholding, and expenditure on food per person per month, agricultural and non-agricultural income on BMI was assessed with the help of linear regression model using SPSS software and discussed below:

$$Y = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6$$

Where,

Y= Body Mass Index (kg/m²)

b₀= Intercept

X₁= Education (in term of years of schooling)

X_2 = Age (in years)

X_3 = Expenditure on food per person per month (Rs.)

X_4 = Agricultural Income (Rs.)

X_5 = Non Agricultural Income (Rs.)

X_6 = Land Holding (Acres)

$b_1, b_2, b_3, b_4, b_5, b_6$ = The regression coefficients of their respective independent variable $X_1, X_2, X_3, X_4, X_5, X_6$

5.4.1 Regression coefficients of the independent factors age, education, land holding, expenditure on food per person per month, agricultural and non-agricultural income in relation to Body Mass Index (BMI)

As per the Table-5.16, which shows that R^2 value is 0.783 which indicates that the 78.3 percent of the variation in Body Mass Index is explained by the independent variable taken under study and the rest of the variation is due to other variables which are not included in the model.

Regression coefficient (b_i) of different independent factors which shows the relative influence of the independent factors on the Body Mass Index is represented in Table-5.16.

The result revealed that the regression coefficient (b_2) for age turned out to be negative but was found to be statistically significant at 1 percent. The significant coefficient of age with negative sign indicates that 1 percent increase in age (value term), would bring about decrease in BMI by 0.137 percent.

The regression coefficients of landholding and education were found to be 0.069 and 0.033 but they were not significant.

The regression coefficient of agricultural income is positive ($b_3 = 0.000048$) which is significant at 5 percent probability level. It shows that 1 percentage increase in agricultural income would bring increase in BMI by 0.000048 percent in a significant manner.

The regression coefficient (b_5) of non-agricultural income is 0.0000041 and significant at 1 percent. It implies that 1 percentage increase in non-agricultural income would bring increase in BMI by 0.000041 percent in a significant manner.

The regression coefficient (b_3) of the expenditure on food per person per month is 0.04 and also significant at 1 percent. It shows that 1 percentage increase in expenditure on food per person per month would bring increase in BMI by 0.04 percent in a significant manner. .

Regression coefficient (b_3) of the expenditure on food per person per month is more than the regression coefficient of agricultural (b_4) and non-agricultural income (b_5) in magnitude. It implies that expenditure on food per person per month influences BMI more than that of agricultural and non-agricultural income in a significant manner.

Table 5.16- Regression coefficient of the independent factors i.e. age, education, land, agricultural income, non-agricultural income and expenditure on food per person per month in relation to Body Mass Index

No.	Model	Unstandardised Coefficients		t-value	Significance (p-value)
		b_i	Standard Error		
1	Constant	21.459**	2.199	9.761	0.000
2	Education	0.033	0.042	0.795	0.429
3	Age	-0.137**	0.033	-4.200	0.000
4	Expenditure on food per person per month	0.004**	0.001	6.027	0.000
5	Agricultural income	0.0000048*	0.00000199	2.070	0.041
6	Non-agricultural income	0.0000041**	0.00000129	3.710	0.000
7	Land Holding	0.069	0.095	0.729	0.468
8	R^2	0.783	1.4284	-	-

(*Significant at 5%, ** Significant at 1%)



SUMMARY AND CONCLUSION

Food is the basic necessity of human and agriculture being the source of food need to be developed. However, the deteriorating level of food security all over the world becomes a looming problem for policymakers which can be seen as the number of undernourished individuals universally ascended from 778 million out of 2015 to 815 million in 2016. As the food and agriculture is interrelated so the food security to the farming community is also a significant factor towards the growth of the economy such as a country like India whose population's major part dependent on agriculture for their livelihood. In India also the situation getting worse which can be seen as India rank 76th in Food Security Index (2018) which was 74th out of 113 nations in Food Security Index (2017). However, in the case of agriculture, the labour participation as per OXFAM (Oxford Committee for Famine Relief, 2018) women comprise 33 percent of the agriculture labour force and 48 percent of the self-employed farmers. Still, food security of farm women is a neglected part in the policy. Hence this study is being conducted to assess the food security among farm women in Mirzapur (Uttar Pradesh). The study conducted with the following objectives:

- i) To study the socio-economic status of farm women in Mirzapur
- ii) To examine the food security status among farm women in the study area
- iii) To determine the food habits and expenditure pattern of the respondent on food items
- iv) To assess the relative contribution of the independent factors on Body Mass Index (BMI)

The study conducted in Mirzapur district (Uttar Pradesh) as it is counted among one of the backward districts in the Uttar Pradesh and food insecurity exist in the area. There are 12 blocks in Mirzapur district out of which two blocks viz; Jamalpur and Narayanpur were selected purposively because several programmes /

trainings were organized for the development of the farmers in these two blocks for the last many years. The farmers are very friendly in providing the accurate data for the research carried by Banaras Hindu University (BHU) staffs as well as students. From Jamalpur block, Pirkhir village was selected purposively because in this village the farmers follow Rice-Wheat cropping system and Kailahat village from Narayanpur block was selected purposively because Kailahat Village is famous for vegetables production.

From these two selected villages, a list of farm women was prepared who were married couple having more than 35 years of age and engaged in agricultural activities. From this list 100 respondents were randomly selected. Out of these 100 respondents 22 were marginal farmers, 43 small and 35 farm women from medium category. Data was collected by using a pre-tested schedule.

Household Food Insecurity Access Scale, Food and Agriculture Organisation, 2013 used to determine food security of farm women in Mirzapur and regression analysis is used to determine the relative contribution of the independent factor i.e. age, education, landholding, expenditure on food per person per month, agricultural and non- agricultural income on Body Mass Index.

The main findings of the present study are as follows

Majority of sample farm women belong to general category (39%), 85 percent farm women are literate among which majority (44.70%) farm women belong to small farmers and least 20 percent belongs to the marginal farmers.

The mean age of the sample farm women is 46.52 years. 58 percent respondents belong to joint family and 176756 Rs. is average income from crops which is a major source of income for each farmer's category followed by non-agricultural work. The average expenditure on food consumption person per month found to be 1732.76 Rs.

Classification of farm women on the basis of BMI shows that 6 percent women were underweight. Among the rest 94 percent of farm women 71 percent women belong to the ideal BMI category, 27 percent women pre-obese and 2 percent women obese class-I. None of the sample respondents belongs to obese class-II.

Cow and buffalo rearing is the major type of animal husbandry practice undertaken by the farmers of the study area.

For a majority (59%) of farm women, submersible pump is the ultimate source of drinking water and no water treatment is followed by them. The basic filtration technique of boiling is not used even by a single household before water consumption.

93 percent farm women live in pucca houses rest 7 percent live in kuchha houses. Also, the majority (74%) of sample farm women's houses have open drainage. Garbage was disposed outside of compound by 72 percent women. This depicts that the families lack the facility of proper garbage disposal.

In contrast to other sanitary measures, lavatory ownership particular showed positive results as out of 100 families 86 percent of families have their lavatories while only 14 percent families don't have access to personal lavatory facilities. However, 68 percent farm women use soap to wash their hands and rest 32 percent women sometimes use soap to wash their hands. This data reveals that there is an urgent need for awareness about hygienic practices among the farmers.

78 percent respondents belong to food insecure category where as 22 percent respondents are in food secure category. Further result revealed that 91% percent of the farm women from marginal farmer's households (n=22) falls in the insecure food category. Majority of sample farm women belong to the moderate food insecure (45%) followed by mild food insecure (26%) , and severe food insecure category (7%).

Regarding the food habit of the respondents, the farm women used to consume mainly cereal based diet. Rice consumed twice a day by 60 percent women and wheat is consumed thrice a day by 62 percent women. It shows that farm women among all the three farmers' categories have a major affinity towards consumption of rice and wheat.

The monthly average quantity of wheat consumed is 27.2 kg which is more than the average monthly quantity of rice consumed i.e. 16.9kg and the monthly expenditure on wheat and rice is 1362.66 Rs. and 934.01 Rs. , respectively. Small

farmers used to spend maximum on rice (972.82 Rs.) and wheat (1401.80 Rs.) among three farmers' category.

Pulses (gram, moong and arhar etc.) also consumed regularly by sample farm women. 68 percent respondents preferred to eat any of the given pulses once a day and maximum respondents (43%) belong to small farmers. Altogether the monthly average quantity of pulses consumed by sample farmers' families found to be 5.03kg and monthly average expenditure on pulses is Rs. 377.25 Rs. Medium farmers spend highest (379.28 Rs) and marginal farmers spend least among sample farmers (367.25 Rs.).

Vegetables are classified into two categories green leafy vegetables (include spinach, amaranths etc.) and other vegetables (includes potato, onion, tomato etc.)

83 percent farm women consume green leafy vegetables 2-3 times a week which is in contrast to the fact that one of the villages in study area is known for its vegetable production. However, 53 percent respondents consume other vegetables twice a day and remaining 47 percent respondents consume once a day.

The monthly average quantity of green leafy vegetable consumed by farmers' families is 8.56 kg and monthly average expenditure is 191.57 Rs. Among different category, the expenditure pattern shows that medium farmers spend highest (198.68 Rs.) and least by the marginal farmers (185.6 Rs.).

However, the average monthly expenditure on other vegetables is more than the green leafy vegetables i.e. 429.01 Rs. and the average monthly quantity consumed is 17.16 kg. Here the trend among the farmers seen as the small farmers (443.63 Rs.) spend maximum among the sample households followed by medium (438.97 Rs.) and marginal (404.78 Rs.) farmers.

Fruits are not consumed regularly by any respondents. However, only 12 percent of sample farm women consume fruits occasionally and remaining 88 percent farm women used to consume more than twice a week. The monthly average consumed quantity found to be 5.96 kg and the average expenditure for overall farmers is 461.25 Rs. which is more than GLVs and OVs, the reason may be the price

of the fruits being on the higher side. Forty percent and 45% small farmers consume fruits 2-3 times and 4-5 times in a month, respectively.

Mustard oil is mainly consumed by the sample farm women. All respondents consume edible oil twice a day i.e. 22 marginal, 43 small, 35 medium farmers. The average monthly consumption of the oil is 3.75 litres and the average expenditure found to be 290.02 Rs.

79 percent respondents used to consume milk once in a day and rest 21 percent sample farm women do not consume milk even once a day. Milk is used to prepare further curd and ghee. Curd consumed by majority (89%) of farm women once a day. However, ghee consumed once a day by 49 percent farm women and 30 percent farm women not even used to consume it once in a day. It shows a great affinity towards the consumption of curd in the sample farm women. The average milk consumed per day for overall farmers is 5.12 litres and the average expenditure on milk per day is Rs.256.

63 percent respondents used to consume beverages 2-3 times in a day which shows the inclination towards the beverage especially tea. However, remaining 37 percent respondents consume beverages once in a day.

41 percent farm women are vegetarian and remaining 59 percent women are non-vegetarian who used to consume chicken, fish and egg.

In the case of chicken consumption 2-3 times in a week majority (54.58%) of women belong to small farmers. However, in case of chicken consumption once a week majority of sample farm women belong to medium farmers i.e. 42.85 percent women among 28 women who used to consume chicken once in a week.

Average quantity of chicken consumed by overall farm families in a month is 2.85 kg and average monthly expenditure for overall sample farmers found to be 499.62 Rs. Small farmers used to spend maximum (579.74 Rs.) on chicken consumption and marginal farmer spend minimum i.e. 405.68 Rs.

Majority (48.57%) of the farm women from the small farmers families consume fish 2-3 times in a week followed by women from medium and marginal farmer's household i.e. 34.28 percent and 17.14 percent women respectively.

The average expenditure on fish consumption per month comes to be 290 Rs. for the sample farm women and the average fish consumed per month is 1.45kg. However, marginal farmer's household spends 418 Rs. per month on fish consumption which is maximum among the sample famers.

47 percent farm women don't consume egg while rest 53% percent women consume egg. Majority (57%) of the respondents who used to consume egg once in a week belong to the small farmers. However, in case of egg consumption 2-3 times in a week majority (60%) of women belongs to the medium farmer.

The average monthly expenditure on eggs found to be 75.94 Rs. while the average quantity consumed by sample farm women is 14 eggs per month. In case of monthly expenditure on egg consumption, small farmers spend maximum among the sample farmers (79.81 Rs.) and least by marginal farmers (67 Rs.).

To assess the relative contribution of the independent factor i.e. age (years), education (years of schooling), landholding (Acres), expenditure on food per person per month (Rs.), agricultural and non-agricultural income (Rs.) on Body Mass Index (Kg/m^2), multiple linear regression model is used.

The result shows that the R^2 for the regression model is 0.783 which means that 78.3 percent of variation in Body Mass Index explained by the factors mentioned above.

The regression coefficient (b_2) for age turned out to be negative but was found to be statistically significant at 1 percent. The significant coefficient of age with negative sign indicates that 1 percent increase in age (value term), would bring about decrease in BMI by 0.137 percent.

The regression coefficients of landholding and education were found to be 0.069 and 0.033 but they were not significant.

The regression coefficient of agricultural income is positive ($b_3 = 0.000048$) which is significant at 5 percent probability level.

The regression coefficient (b_5) of non-agricultural income is 0.0000041 and significant at 1 percent. It shows positive impact of non- agricultural income on the BMI.

The regression coefficient (b_3) of the expenditure on food per person per month is 0.04 and also significant at 1 percent level of significance. Regression coefficient (b_3) of the expenditure on food per person per month is more than the regression coefficient of agricultural (b_4) and non-agricultural income (b_5) in magnitude. It implies that expenditure on food per person per month influence BMI more than that of agricultural and non-agricultural income in a significant manner.

Policy Implication

On the basis of the results of this study a few important policy implication can be deduced. Some of these major policy implications have been given below:

1. Agriculture is a major source of income of the population and the farm women participation is significant towards labour force so feminisation of agricultural and labour policy is required, so the farm women's contribution comes to the limelight.
2. Majority of population is moderate food insecure and consume mainly cereal based diet(rice and wheat mainly) so to make them food secure, fortification of the rice and wheat with nutrients is the best step or need to diversify the dietary pattern of the farmers.
3. Body Mass Index (BMI) as a measure of Chronic Energy Deficiency, according to Food and Agriculture Organisation. As per present study, BMI is less influenced by agricultural and non-agricultural income rather depend on expenditure on food items, but still agricultural and non-agricultural income have a significant role to determine Body Mass Index. So ,it is required to increase income of the farmers so they can purchase a variety of food items, which can be done by following policies:

- a) The price of the agricultural produce should include the labour charge of the farmer or farm women on their own field.
- b) Subsidy at input level is also a good option to reduce the cost of agriculture and increase their savings so they spend more on food items.



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APPENDIX-I

ASSESSMENT OF POVERTY AND FOOD SECURITY AMONG FARM WOMEN IN MIRZAPUR DISTRICT (UTTAR PRADESH)

SCHEDULE FOR GENERAL INFORMATION OF THE HOUSEHOLD

1. Identification particulars

Date:

Village:

Block:

1.1 Household No. :

1.2 Name of the respondent:

1.3 Address:

1.4 Caste: General/OBC/SC/ST

1.5 Type of family: Joint/ Nuclear

2. Detail family composition

Sl. No	Name	Age	Sex	Education	Occupation

3. Land holding (Acres):

Sl No	Particulars	Owned	Leased in	Leased out	Total
3.1	Land				
3.2	Area of cultivation				

4 Crops culativated

Crops grown	Yield/ acre
a. b. c. d.	

4. Livestock Information

4.1 Livestock owned (Write the number of livestock)

Particulars	Owmed
a. Cows	
b. Buffaloes	
g. Any other (specify)	

4.2 Sale of livestock products

Sl.No	Livestock product	Yield/Day	Sale/Day	Cost/Unit (Rs)	Net income (Rs/month)
a.	Milk				
b.	Curd				
c.	Ghee				
D	Any other				

5. Average annual income (Rs.)

a.	Crop cultivation	
b.	Agriculture labour	
c.	Milk selling	
f.	Service	
g.	Non Agricultral Labour.	

6. Drinking water facilities

a) Source of water	1.Public Tap 2.Submersible 3. Any other.
b)Whether water is treated?	1.Using Chlorine 2. By boiling 3.Water filter 4.No.

7.Housing condition

7.1	House	a. Own	b. Rent
7.2	Type of house	a. Kuccha	b. Pukka

8. Sanitary Condition

8.1	Drainage	1. Open 2. Closed 3. Stagnant ponds
8.2	Garbage disposed	1. Inside the compound 2. Outside compound 3. Burning 4. Any other
8.3	Lavatory practices	1. Own latrine 2. Public latrine 3. Open field
8.4	Hand washing after toilet	1. Always with soap 2. Some times with soap 3. Without soap 4. Do not wash

SCHEDULE FOR FOOD SECURITY INFORMATION OF THE HOUSEHOLD

1= rarely (once /twice)

2= sometimes (3-10 times)

3= often (more than 10 times)

Household Food Security/Insecurity Assessment Scale

1.	In the past four weeks did you worry that your household would not have enough food?	0= no 1=yes
1.a	How often did this happen?	
2.	In the past four weeks, were you or any household members not able to eat the kind of foods you preferred because of a lack of resources?	0= no 1=yes
2.a	How often did this happen?	
3.	In the past four weeks, did you or any household members have to eat a limited variety of foods due to lack of resources?	0= no 1=yes
3.a	How often did this happen?	
4.	In the past four weeks, were you or any household members have to eat some foods that you really did not want to eat because of a lack of resources to obtain other types of foods?	0= no 1=yes
4.a	How often did this happen?	
5.	In the past four weeks, were you or any household members have to eat smaller meals that is needed for you because there was not enough foods?	0= no 1=yes
5. a	How often did this happen?	

6.	In the past four weeks, did you or any members have to eat fewer meals because there was not enough foods?	0= no 1=yes
6.a	How often did this happen?	
7.	In the past four weeks, was there no food to eat because there was lack of resources?	0= no 1=yes
7.a	How often did this happen?	
8.	In the past four weeks, did you or any of your family members go to sleep at night hungry as there was no foods?	0= no 1=yes
8.a	How often did this happen?	
9.	In the past four weeks, did you or any of your family members go to sleep whole day and night without eating anything as there was no foods?	0= no 1=yes
9.a	How often did this happen?	

SCHEDULE FOR NUTRITIONAL STATUS ASSESSMENT OF THE HOUSEHOLD

1. Anthropometric measurement

a.	Height (m)	
b.	Weight (kg)	
c.	BMI (kg/m ²)	

SCHEDULE FOR FOOD HABIT INFORMATION OF THE HOUSEHOLD

1. Food purchase, accusation, consumption & expenditure

Foods	Frequency of consumption	Quantity consumed (Daily/ weekly/ Occasionally)	Monthly Expenditure (Rs.)
a. Cereals			
i) Rice			
ii)Wheat			
iii) Others			
b. Pulses			
i)Arhar			
ii)Mung			
iii)Channa			
iv)Any other			
c. Vegetables			
i) GLVs			
ii) Ovs			
d. Fruits			
e. Edible Oil			
f. Fleshy foods			
i)Chicken			
ii)Fish			
iii)Egg			
g. Milk & milk product			
i) Milk			
ii) Curd			
iii) Ghee			
h. Beverages			
i)Coffee			
ii)Tea			
iii) Any other			

