

Czech University of Life Sciences Prague

Faculty of Economics and Management

Department of Management



Diploma Thesis

**Food Security and Obesity in Developing Countries
A Case Study on India**

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CZECH UNIVERSITY OF LIFE SCIENCES PRAGUE

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DIPLOMA THESIS ASSIGNMENT

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Economics Policy and Administration
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Thesis title

Food Security and Obesity in Developing Countries: A case study on India

Objectives of thesis

The aim of the diploma thesis is to analyse the various measures through which India has managed to attain food security in the country and the practical impacts on its population, especially the people belonging below the poverty line. It would look into the reasons which lead to food insecurity and its impact on the health standards of people.

Methodology

The thesis will be divided into three parts.

The first part is a theoretical one and is based on literature search. It defines the current state of knowledge in the field of food security. In this part, articles, books, researches, and different electronic resources will be used to provide information. Methodologically, this part of the thesis will be the analysis of documents.

The second part will rely on the theoretical part and it is the key component of the thesis. Methods of quantitative research such as statistical and mathematical methods will be used in this part. The analysis will be done on India case study.

The final part concludes the results of the previous parts and discusses it with another author.

The proposed extent of the thesis

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Keywords

Food, India, obesity, security policies, developing countries.

Recommended information sources

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Declaration

I declare that I have worked on my diploma_thesis titled **Food Security and Obesity in Developing Countries: A case study on India** by myself and I have used only the sources mentioned at the end of the thesis. As the author of the diploma thesis, I declare that the thesis does not break copyrights of any their person.

In Prague on 30 November 2020

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Abstract

The current research sheds light on the different aspects of food security and obesity in different developing countries. The aim of the research is to study the various measures through which India has managed to attain food security in the country and the practical impacts on its population, especially the people belonging below the poverty line. However, the current study has mainly focused on India. The introduction chapter indicates that India is yet to achieve several targets within the scope of food security as compared to developed nations. On the other hand, the literature review section focuses on the detail concerned with the relationship between food insecurity and obesity in the developing countries, as well as India. The methodology section follows the methods that are best suited for the current research. The growth rate of the population of India is one of the main reasons behind the issue of accessibility. Further improper recording of population and data on the same prevents the government from planning strategies and implementing them through proper funding. As a result, these areas, especially the dense forests or mountains where the tribal reside are often ignored and as a result, they suffer from acute food insecurity. Thus, it is evident that there is an uneven distribution of food products among the population of India.

Keywords: Food, India, obesity, security policies, developing countries

Abstrakt

Současný výzkum osvětluje různé aspekty zabezpečení potravin a obezity v různých rozvojových zemích. Cílem výzkumu je studovat různá opatření, kterými se Indii podařilo dosáhnout potravinové bezpečnosti v zemi, a praktické dopady na její populaci, zejména na lidi pod hranicí chudoby. Současná studie se však zaměřila hlavně na Indii. Úvodní kapitola naznačuje, že Indie ve srovnání s vyspělými národy ještě nedosáhla několika cílů v oblasti zajišťování potravin. Na druhou stranu se část přehledu literatury zaměřuje na podrobnosti týkající se vztahu mezi potravinovou nejistotou a obezitou v rozvojových zemích i v Indii. Metodická část sleduje metody, které jsou nejvhodnější pro současný výzkum. Míra růstu populace Indie je jedním z hlavních důvodů problému dostupnosti. Další nesprávné zaznamenávání populace a údajů o nich brání vládě v plánování strategií a jejich provádění prostřednictvím řádného financování. Výsledkem je, že tyto oblasti, zejména husté lesy nebo hory, kde kmen žije, jsou často ignorovány a v důsledku toho trpí akutní potravinovou nejistotou. Je tedy zřejmé, že mezi obyvateli Indie existuje nerovnoměrné rozdělení potravinářských výrobků.

Klíčová slova: Potravinová bezpečnost, Indie, obezita, bezpečnostní politiky, rozvojové země

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1 Introduction

Food security is understood as a phenomenon whereby a country guarantees and ensures proper distribution of food amongst all its citizens irrespective of their purchasing power. Not only has that food security involved ensuring the maintenance of proper nutritional standards among every citizen. Food security is thus, one of the major issues that every third world country faces, being one of them. The issue arises due to the presence of various social issues like poverty, widespread unemployment inflation and so on (Ritchie *et al.* 2018). With the operation of the National Food Security Act, the Government of India guaranteed the distribution of food grains at subsidized rates along with arranging for midday meals for children so as to ensure that the deprived section of the Indian society are free from being malnourished. Not only that, while on one hand, a fragment of the population suffered from starvation, some people, especially the youth also suffered from obesity which is yet another health issue that the country needs to deal with. There are various parameters on the basis of which the strategies to implement food security were based on which included availability of food, proper quality standards of the subsidized food and so on. However, it is to remember that though the food security act implemented by the Government of India covered two thirds of the Indian population, India is yet to achieve several targets within the scope of food security as compared to developed nations.

Since food security is one of the major criteria for maintaining the health rates of a country, it is therefore, one of the most important challenges that countries must strive to overcome.

Being amongst the third world countries that are trying to cope up with several internal issues along with external competition, India has tried and taken significant steps to enhance the quality of food distributed amongst the people, especially the ones deprived (Saxena, 2018). Owing to several economic reasons India has seen an inflation which led to a sharp increase in food prices which made it impossible for the poorer section of the society to afford. Thus, ensuring subsidized food grains while maintaining the quality of food and its nutritional value at the same time was imperative for the country in order to maintain an overall health standard of the population. However, the implementation of the act was not just an enough measure to eradicate food insecurity in the country completely as a result of which the government had to build and employ various efficient strategies in order to implement and monitor the same. It is because of this, that the study of the plans and strategies and overall impact of both food security and insecurity in India has become imperative while studying its overall economic growth and development.

2 Objectives and Methodology

2.1 Aim

The aim of the research is to study the various measures through which India has managed to attain food security in the country and the practical impacts on its population, especially the people belonging below the poverty line. It would look into the reasons which lead to food insecurity and its impact on the health standards of people.

2.2 Objectives

1. To compare situations of food insecurity with the scenario after implementing the food security act by the Indian Government.
2. To look into the various health hazards that result from consuming various kinds of food and therefore study the causes and impact of obesity in the country.
3. To analyse the various strategies to bring about food security in India and locate the problems in the existing strategies to develop efficient ones in future.

Rationale of the study

The study focuses on the issues of food security in India and the problem of obesity along with it. Over the years, food insecurity and unavailability of food for the deprived sections of the people have become a pertinent issue in India which has not only resulted in deaths from starvation but has made such people susceptible to various diseases decreasing the overall health standard of the country. This is a pertinent issue because for most underdeveloped countries, economic growth does not always ensure economic development, implying that economic growth does not focus on the wellbeing and overall health standards of the people. Thus, since development of a country depends on the wellbeing of its citizens. It is imperative to study the problems of food security in India and thereby locate the disastrous effect of the same on its population.

With the gradual economic advancement of the country marked by a shift from agrarian to an industrial economy, India has often faced sharp inflations. Even currently, owing to the global lockdown worldwide, most underdeveloped countries have been a victim of high rates of unemployment which not only reduced their purchasing power but also decreased their overall living standards. Additionally, the cases of obesity have also risen over time amongst youths due to excess consumption of fast foods or poor-quality foods which do not maintain an

adequate nutrition level. Thus, it is imperative to study both at the same time in India to understand the need for food security and maintenance of food quality standards among every section of the society.

This research would study the various impacts of food security and insecurity among the people of India and the positive outcomes of the National Food Security Act. Not only that, the research would also treat obesity as a medical condition and therefore focus on the causes of the same along with trying to recommend measures for bringing about a more efficient system of ensuring food security among the Indians.

Significance of the research

Guaranteeing a proper health standard quality by eradicating both poverty and obesity does not only lead to individual welfare but also the welfare of the state because it is only then that the individuals can work efficiently and raise the total output of the same. This would in turn increase the per capita income of the individuals along with a rise in the gross domestic product of the country. Thus, if this entire process is seen as a circular one, each of the impacts are causal to each other that begins with the implementation of food security among the citizens. Furthermore, if a proper health standard is maintained through food security, it would also prevent obesity among the youths and help them to lead a healthier life. In order to implement all these, it is important to analyse and conduct an in depth study on the reasons and impacts of food insecurity along with exploring existing food security models in order to understand the areas which need further focus and planning. While on one hand, this research would help the policy makers in bringing about sustainable development in the economy, it would also ensure raising the health standards of the Indian society by filling the gaps between the rich and the poor at least in the field of food security and nutrition.

Research questions

1. What are the causes and impacts of food insecurity in India and how obesity is raised due to changes in food habits in developing countries?
2. What are impacts of the new National Food Security Act on the people below the poverty line in India?
3. What are the main causes of obesity in India and is it connected to poor food quality standards?

4. Is obesity a sectional health issue or do the people below the poverty line face it too?
5. What are the causes and impacts of obesity on the overall health standard of India?

2.3 Research Methodology

This segment of the research methodology will underline and recognize the employment of the different methods of research procedures that will be incorporated in the study. This would successfully analyse the knowledge of the various measures through which India has managed to attain food security in the country and the practical impacts on its population, especially the people belonging below the poverty line (Kumar, 2019). Therefore, with the use of different research methods, the section of methodology will highlight the incorporation of the research philosophy, the methods of data collection, the analysis of the data collected, and the use of valid and reliable data.

Research philosophy

The usage of the research philosophies based on the perspectives of the present research can be seen to be influenced by different paradigms of the research that essentially comprises phenomenology, epistemology, and axiology. Viewing from the perspectives of research, the use of the philosophies of the research may include realism, subjectivism, interpretive, and positivism. It has been found that each stage of the process of the research is based on prior assumptions about the nature of the information and the knowledge (Corry, 2019). The research philosophy reflects the author's essential assumptions that serve as the base for the research strategy. In order to successfully outline and investigate the overall knowledge of various measures through which India has managed to attain food security in the country and the practical impacts on its population, especially the people belonging below the poverty line, the research philosophy of *positivism* has been undertaken. The incorporation of the philosophy of positivism has been justified for the enabling of different derivation and cross-checks of the analysis with differentiation based on the facts, ideas, and the concepts related to the research dimension. Furthermore, in addition to this, the basic implementation of the philosophy of positivism has also effectively helped the researcher for the implementation of the key achievements based on the precise or authentic collection of information, facts that have helped in the generation of the effective results (Nowell, 2017). This would ensure the fulfilment of the findings of the analysed information based on the various measures through which India

has managed to attain food security in the country and the practical impacts on its population, especially the people belonging below the poverty line.

Research approach

In relation to the interpretation of how the attainment of food security affects the population, especially the people belonging below the poverty line, and the measures through which the country of India has managed to attain it, the research has significantly used the basic phenomenon and directions of the specified research. In this respect, the use of research approach that is mainly of two kinds the deductive and inductive approach has been used. The process of the deductive of approach specifies the basic incorporation of the aspects of the validating of a selected area and the testing of the same area of the research through analysis and the review of authentic data and information that is obtained through inferences from scholarly papers and materials (Zalaghi, 2016). It also allows the researcher to answer and incorporate specific research questions. On the other hand, the implementation of the *deductive* research approach enables the appropriate generation of newer concepts, knowledge, based on the idea of the development of newer and better models.

In respect to the present topic of the study of the various measures through which India has managed to attain food security in the country and the practical impacts on its population, especially the people belonging below the poverty line, the deduction approach or investigation has been selected. The overall research has been conducted and has been based on scholarly reviews, articles, journal, reports, and other secondary sources of data; hence, the selection of the deductive approach is appropriated (Woiceshyn, 2018). Furthermore, as there would be no creation of any new concepts, model or theories nor will the process of the reviewing or upgrading any old theories, models or concepts, the selection of the deductive approach to conduct the research is justified.

Research design

The implementation of the research design is characterized as the encompassing of the various approaches that are used to enable or facilitate the effective implementation or the integration of the specified elements and the basic components of the research area in terms of the logical and the rational manner. Thus, it can be said that the overall suitability of the basic research design effectively addresses the basic research problem (Friedman, 2017). In addition to the said criteria, the incorporation of the research design helps the researcher for the attainment of

the different results and findings with more accuracy and higher rates of authenticity for the correct fulfilment of the purpose of the research. Based on the specified research topic to analyse the various measures through which India has managed to attain food security in the country and the practical impacts on its population, especially the people belonging below the poverty line, the focus of the topic has been based on the implementation of the research design which is descriptive in nature. As mentioned, it allows the researcher to address the problems of the study. In this study, the basic issues are highlighted as, the underdeveloped countries, economic growth does not always ensure economic development, implying that economic growth does not focus on the wellbeing and overall health standards of the people and hence, the development of a country depends on the wellbeing of its citizens. Based on the issue of the research that finds itself incorporated in the contemporary issue, the research design of *descriptive* has been implemented. The use of the description form of the research design allows the researcher for the effective implementation of the use of secondary and qualitative sources like scholarly reviews, articles, journal, reports, and other secondary sources of data to gain plausible results.

Data collection techniques

As for the data collection technique, the research is mainly based on conduction of online questionnaire. Based on the chosen research topic, the implementation of the techniques of data collection is of the utmost importance for obtaining highly reliable data and information that is substantially based on the chosen research paradigm, the interpretation, and the evaluation of the data that would yield the accurate results, and the specific outcomes (Fletcher, 2017). In respect to the present research topic of the analysis of the various measures through which India has managed to attain food security in the country and the practical impacts on its population, especially the people belonging below the poverty line, the process of *secondary and primary data collection* has been chosen to generate the effective results and outcomes.

The process of the secondary form of data collection facilitates the process of data collection by gathering information, where the overall data and information are observed to be based on the dependable, genuine, and suitable secondary data sources. Based on this perspective, to congregate the important information on the subject of the interpretation of the knowledge among India's population to have obesity and the influence of poverty on the same, the process of deduction approach was used. This was implemented to gain precise data and valuable assumptions for different but relevant foundations of the secondary information the preferred

research vicinity. The divergent use of the secondary data to serve the intention for the conduction of the research was the research papers of scholars, scholarly articles, online articles, books, journals, reports, and others. The relevant journals or articles based on the influences of poverty on the India population of incurring obesity were used as the sources (Farmer, 2017). Based on this perspective, the soundness of the secondary sources of data were continually checked and reviewed to keep clear of any deceptive form of data or any erroneous information and managing the effective legality of the research information. Hereby, with the collection of accurate qualitative data, the preferred research conclusion was maintained.

As for the primary method of quantitative research method, there will be conducted an online questionnaire that will be gathered from Indian individuals living in India aged 18-40 from online social media platform, Facebook. The usage of primary method will allow to turn the questionnaire into the numerical data for the conduction of numerical research on tables and figures by providing the description to each of figure and table used.

Data analysis procedure

It has been found that in terms of qualitative methods of data collection, the best mode for the process of data analysis is the *thematic analysis*. As per the specified research topic of the analysis of the various measures through which India has managed to attain food security in the country and the practical impacts on its population, especially the people belonging below the poverty line, the thematic process of data analysis has been incorporated. The thematic form of data analysis identifies, interprets, and analyses the patterns of the themes within the paradigm of the qualitative data (Nowell, 2017). There would be preferably used the quantitative method in this study to gather the data. Primary and secondary data methods of quantitative analysis will be applied to gather the data from online questionnaire and use the already existing literature from previous study to support the study. Furthermore, the incorporation of the thematic analysis has been justified due to its usage for the effective exploration of questions about perspectives, lived experiences, practices, the factors that influence and shape the particular phenomenon of the research and the social construction of the meaning with the representation of the social objects in the particular context. The context that has been talked about is the influence of India's economy that is demarcated as the third-world economy and the influence of it over the eating lifestyle of the country's population.

Research limitations

The scope of the research is limited owing to the following problems-

1. Limited on field data- one of the major limitations of the research is that the researcher should not solely depend on the officially recorded data because of several inaccuracies in order to mask the failures on the part of the government. However, owing to the vastness of the topic, the researcher has to, however, base his/her research on secondary sources of data primarily through employing qualitative methods of studying (Sherif, 2018).
2. Lack of transparency- as a part of secondary resources, the researcher might use case studies or pre-recorded official accounts on food insecurity. This however, might not throw light on the actual scenario of the people facing the burden of food insecurity.
3. Too many middle men- the researcher has to consult and reach secondary sources of data on food insecurity and its actual impacts on people through a number of middle men who might tamper the data or might be unwilling to disclose the same without noticing much utility in the process.
4. Inaccessibility in a number of places- there exists a number of inaccessible places in India where people face acute malnutrition and other health problems due to inaccessibility of food (Ainscough, 2018). Thus, secondary sources of data might tend to ignore or overlook these places and thereby not provide valid information on food security of India.

Investment of resources-the researcher needs to invest both time and money in order to get a grasp over the resources and data required to carry out this research. As a result, this research might not be feasible where adequate amounts of resources are not available

3 Literature review

3.1 Overview of food security scenario in India

According to ODI (1997), the phase of food security comes from the mid-1970s when there were problems in food amidst food crisis which meant the perseverance of food from being toxic and non-qualitative. Food security entails the activities that enable or upgrades the scope to ensure an adequate supply of food to the people. The survey regarding food availability, which helps to know the available quantities of qualitative food according to journal Food Security (2006) in India has shown a wide image of the aspects of food security in the country. According to UN-India, nearly 195 million people suffered from malnutrition in India that equal to one-fourth of the total hunger burden of the world. In the food security index, India ranks 74 out of the 113 of the major countries. The issues that have been highlighted in the Indian context of food security is not the lack of availability of nutrition standard as the nutritional standard is found to be 100 percent. However, the issues have been found to be lying in the quality of the foods as it lags in terms of quality protein intake which only stands at 20 percent (Bhattacharya, Falcao & Puri, 2017). The difference is large when compared to the nutritional standard value.

There have been a number of initiatives in India to ensure the right to food for every citizen of the country. The Parliament of India enacted legislation in the year 2013. The act is known as the National Food Security Act. This act brought in an opportunity to provide subsidized food grains to the two-third of the population of India. There have been generative schemes that have been undertaken by the state and the central governments of the country to cater to the issue of food security.

The initiatives taken by the Central Government to ensure food security to the citizens include implementation of programs like Integrated Child Developed Services schemes, Midday Meal scheme, and Public Distribution System. During the year 2017 to 2018, an amount of over 1500 billion Indian Rupees have been allocated as the total expenditure under this scheme. On the other hand, the maternity entitlements were also recognized under the NFS Act of 2013. The women who qualify under this scheme are pregnant women, lactating mothers, and children belonging with certain categories have been included under this scheme. The state governments in India have produced schemes and implemented to go hand in hand to eradicate the issues of food security (Kumar, Parappurathu, Babu& Joshi, 2017). Activities have been launched in states like Karnataka where all the meals beginning from breakfasts to dinner are available at

quite affordable and low prices. The scheme is known as Indira Canteen. Tamil Nadu has also launched Amma canteen that is providing food to thousands of needy people.

3.2 Food price and food security in India

A number of aspects have been identified that can be termed as important aspects to reduce food insecurity in India. These are availability of the foods, accessibility of the foods, and the nutrition matters contained in the foods. An increase in food prices has been identified in majority of regions in South Asia that include India. The prices of food have been seen to have increasingly risen in the years between 2007 and 2011. Most of the countries in South Asia including India showed inflation in food prices in double digits (Bhattacharya, 2016). This produced a major blow to the food security of India and provoked the implementation of measures to ensure food security to the laid-back population within the country. The Table 1 below shows the rate of food inflation over the years standing from the financial year of 2006 and 2007 through the financial year of 2010 and 2011.

Commodities	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011
All	5.42	4.66	8.1	3.8	9.6
Primary	7.85	7.61	11.0	12.7	17.7
Food articles	7.78	7.78	9.1	15.3	15.6
Fuel and power	5.61	0.93	11.6	-2.1	12.3
Manufacture	4.43	4.97	6.2	2.2	5.7
Food products	3.22	4.27	8.7	13.5	3.7

Table 1. Overall food inflation in India

(Source: Bhattacharya & Sen Gupta, 2018)

According to Gustafson (2013), a number of domestic and global factors have been responsible for such a rise in the food price in India. Among the major global factors, the population growth and restrictions in exports have been the most active reason behind the rise of the price of food materials in India. Few other areas that are considered responsible for the same include natural disasters that have taken place repeatedly over the years in different regions, increasing changes to the demographics, increase of financialization in the commodity markets, and high growth in food demand along with high growth the emerging economies are bringing.

On the other hand, Gustafson also mentioned that the domestic reasons that have been fuelling the price of food in India would be shocking to reveal. These have been characterized in

cyclical and structural factors. The structural factors include changes in the consumption pattern. A large population of India has shifted from their consumption pattern lined by a majority of fruits and cereal diet. On the contrary, the choices have shifted towards food habits comprising of dairy, Vegeta, fish, and meat. Inflation in the price of protein has been identified in a number of states of India that shows another connection between the price rise and food insecurity. Besides, the study of the history of the past few years on the agricultural system of India, a large gap has been found in the investment done in the agricultural fields. Lack of proper investments in technology has also been found as an important aspect of the rise of food prices in the country.

3.3 Gross national income measured by world development indicator

The term Gross national income is often utilized to reflect on the economic strength of a particular nation. The definition of sustainability of an economy is typically influenced by its gross national income as a generic function of per capita income. India is considered as one of the fastest growing economies all around the world. Many business entities from around the globe have considered Indian economy as a fertile territory for business investments concerning the gigantic market size and thick population density. However low per capita income and high rates of unemployment has been a critical hindrance in India's path of development. A proper reciprocation of administrative authorities and influence of corruption and red-tapping has indeed retarded the pace of development.

The indicator standards for India are merely a fair representation for reducing the poverty margins within the economy. A continued increase in unemployment rate and lack of adequate remuneration for skilled and unskilled labour has negatively influenced the gross national income for the state. A challenge to the income margins of the greater average of the population tends to limit the disposable income margins for the same. An appreciation of the considerable elements can be deemed as typically necessary for boosting the economic margins of a nation.

As mentioned by Abraham & Krishnan (2017), Indian street foods, which are ready-to-eat and quickly prepared street-based food, have a worldwide acknowledgement considering their relative variances of taste, ingredients, dish preparations and local food habits of average population. However, the food habits of the Indian population have mostly been criticized for its prolonged impact on consumer health. The average mentality of traditional Indian population appreciates the taste of the foods over its health values. The process of cooking adapted in order to make it attractive mostly degrades the nutrient values. It can be indicated

that the fast foods are mostly available at a wide price range which enhances its affordability among maximum consumers. However, a decrease in price by a margin of (70% to 80%) increases the scopes of degradation of the food quality. The impacts of consumption of unhealthy foods are mostly reflected on a longer period which increases blood sugar levels, cholesterol and heart diseases. Obesity, diabetes and Asthma are some of most common diseases caused as a result of bad food habit of the Indian population. The inclusion of the paradigms for developing of a healthy food environment is characterized by the buying abilities, health consciousness and disposable income margins of the considered population. A major segment of the Indian population is suffering from nutritional deficit which rose due to the faulty management procedures of the administration and their relative inability in contributing towards the society. A preferential accumulation of the income margins with relation to the basic livings for completing the rightful amenities of life are often vandalized as an influence of low ranking on the world development indicator.

3.4 Status of food insecurity and its reasons

The study by Ritchie et al. (2018) has revealed a number of internal aspects that have been the reason behind the increase of food insecurity in India along with resulting in a hike in their prices. With the government subsidies that the farm owners are availing, there is a disproportionate availability of benefits of such subsidies that tend to be more beneficial to the large farm owners. Such initiatives are failing to develop the situation as such benefits are making the large farm owners worry less about sustainable usage (Ritchie, Reay & Higgins, 2018). This is encouraging wasteful usage of subsidized products like fertilisers and fuels. The negative aspects produced by the same are any possible and effective output of such actions to enhance the productivity of the farms.

It is needless to mention here, that rise in food prices has been a prominent reason behind food insecurity and malnourishment in various states of India. Food price rising has been attributed to a number of causes that sums up to a situation of uncontrolled regulation and functions. This issue has been associated with many others like corruption in different departments, lack of adequate policies that did not provide equal access to food to all citizens of the country, etc. (Saxena, 2018). There are other aspects that have added up to the reason for degradation of the food security situation within the industry like environmental degradation, barriers found in trades, insufficient growth or agricultural productions, inequality in social status and gender, low level of education limiting to get access to better living conditions, etc. Natural disasters

during different times have been a prominent reason to boost the aspects of food insecurity in the country. This has also been reflected in the poor health status of the citizens.

There have been multiple approaches of the Central and the State governments to reduce food insecurity through Public Distribution System. In spite of such initiatives the data shows about 36 percent of children in India are underweight and about 21 percent is too light for their weight. Nearly 75 percent of the population has been suffering due to a lack of vitamin (vitamin deficiencies) (Khadilkaret *al.* 2017). It has been identified, that India needs a new paradigm of agriculture in order to survive the food insecurity situations and to control the rise in food prices. Comparison of the growth in the percentage of different crops in India with other nations such as China and the United States has been seen as an eye-opening report to reduce the large gap between the yields these countries produce and Indian yields. The yield gap is presented in the Table 2.

	India	U.S	China
Barley	2.67	3.91	4.06
Corn	3.12	11.08	6.11
Millets	1.27	2.02	2.44
Rice	3.85	8.41	6.92
Soybean	1.04	3.30	1.79
Sugarcane	69.74	82.41	76.15
Wheat	3.22	3.11	5.48

Table 2. Yield of selected crops in India and other nations in the period of 2016

(Source: Sapkota, Jat, Jat, Kapoor & Stirling, 2016)

3.5 Study on undernourishment in India

According to Singh (2020), India alone shares a quarter of the global hunger burden with 195 million undernourished people. 4 out of 10 children in India do not meet the basic nourishment standards, the fallouts of which are reduced capacity of learning, physical or mental stunting, risks of chronic diseases like pneumonia or tuberculosis etc. The cycle of undernourishment and malnourishment is vicious in nature. Factors that affect undernourishment in India are:

- **Poverty:** The lesser the money in hand, the lesser people's purchasing power becomes. Lower the purchasing power of an individual, less nutrients and healthy food can be brought to the family. Lesser nutrient supplies lead to an undernourished family. An undernourished mother gives birth to an underweight infant who grows up dealing with the poverty in the family. The undernourished infant grows up to be an undernourished

individual with low productivity. Lower productivity leads to lesser pay and lesser pay leads to low income. Poverty thus creates a vicious cycle of malnourishment throughout generations.

- **Population:** India is a country with a population of around 1.365 billion which is growing at a rate of 1.5-1.7% annually according to the National census in 2006 ((India, 2020). There are not enough employment opportunities for such a huge population and most of the population lives below the National Poverty Line. Proper medical facilities and infrastructure are also unavailable for such a huge population therefore malnourishment or undernourishment can hardly be treated or cured in this country. Proper family planning also does not exist in the rural belts of the country. There are more mouths to feed in a standard rural family than in a standard urban family and more than 60% of the Indian population live in the rural belts. More mouths to feed will lead to undernourished infants in rural India as income is already low there. A rise in population is directly proportional to the rise in the number of malnourished individuals in the country.
- **Region:** The prevalence of more undernourished people are there in the rural belts of India. There is a huge socio-economic gap prevalent in the urban and rural population of the country and therefore it is found that most of the undernourished individuals dwell in the rural regions of the states of Madhya Pradesh, Uttar Pradesh, Jharkhand and Tamil Nadu. The states which have a higher rural population are bound to have a higher number of undernourished individuals.
- **Unemployment:** According to Khan, & Mohanty, (2018), the problem of unemployment has its roots in many other issues like slow economic growth, increase in population, fall of small and cottage industries, issues of caste system prevalent in the country. Being a developing country, there are not enough job opportunities for the able population. Both skilled and unskilled labourers undergo the problem of unemployment due to the lack of opportunities. Unemployment leads to no or less income which again triggers poverty and the vicious cycle of malnutrition continues.
- **Domestic Violence:** It might seem strange to see any connection between domestic violence and malnutrition but if viewed closely, it will not be very difficult to connect the dots. As stated by Nandi & Mistri (2019), women exposed to regular domestic violence have a lower decision-making capability. It affects the woman's agency and autonomy in the family to a great level. Therefore, decisions regarding portion and type of food and also food allotment are affected by domestic violence. Domestic violence

also creates heavy psychological stress leading to apathy towards food. It is generally seen that women with a history of facing domestic violence are underweight and anaemic. An underweight woman will only produce an underweight and unhealthy infant who will in turn grow into an undernourished or malnourished individual.

- **Inequality in Distribution:** The distribution system in India has posed a problem in the entire food chain and system. As opined by Narayan *et al.* (2019), food distribution goals do not only include connecting the producers to consumers but also how it is allocated. Challenges in distribution and allocation arises due to a lot of factors like who has the power to distribute food and crops, methods used for distribution, also if there is a transparent market where sellers directly sell items to the buyers. The challenges pose a threat to equal and transparent distribution of food throughout the country. Researches prove that there are no shortages in production and there is enough food to feed all mouths of the country but issues in the distribution system makes India one of the countries in the top of the Global Hunger Index.

Manmohan Singh had declared malnutrition to be a 'national shame'. The eradication of malnourishment or undernourishment is considered one of the utmost national priority and government programmes are devised for this purpose. More efficiency and competence is expected in this sphere.

3.6 Differences in food and nutrition security

Food security evolved from the concept of 'freedom from hunger' and refers to all people of a country having the access to food and security or assurance of getting food. Whereas nutrition security evolved over time from the concept of 'multi-sectoral nutritional planning' and is the intake of a wide range of food providing essential nutrients for the growth of the body. According to Rammohan *et al.* (2019), the average dietary consumption in India is 2280 calories per day but in 9 major states of India, the consumption is below average.

It is comparatively easier to achieve food security than nutritional security in a country. As already discussed, there is no shortage in production of food or crops in India. The challenges primarily include the faulty distribution system. If the distribution system is fixed, food security can be achieved more smoothly. Every citizen of the country will have sufficient food to fill their stomachs. But filling one's stomach does not mean providing the required nutrients to an individual's body. Nutritional security is a more difficult goal to achieve. Taking into consideration, poverty, unemployment, faulty distribution systems, overpopulation, lack of

proper government guidance and interference into the system, it becomes more difficult to achieve the correct nutritional value derived from various food items to achieve nutritional security in the country.

The four primary dimensions of food security are:

- **Availability of food:** The availability of food to all citizens will depend on factors like domestic production and harvest of food/crops/livestock, import capacity of food/crops that are not produced in the country, stock of food and storage systems and food aid. One must also look into the availability of water for agriculture and increasing crop production by using various scientific techniques of farming.
- **Access to food:** As pointed out by Rammohan *et al.* (2019), factors affecting the access to food include poverty/purchasing power, transport and market infrastructure and distribution system. Poverty or low purchasing power will lead to no accessibility to food even if it is available in plenty. Also, faulty distribution systems and non-transparent market infrastructure will lead to lesser access to food.
- **Utilization:** Factors affecting the utilization of food in a country are food safety and quality, availability of clean water, presence of health and sanitation facilities, care and feeding.
- **Stability:** Factors affecting stability are weather variability (affecting production of crops), market price fluctuations, political and economic factors. Continuous and stable availability of food leads to food security and all the above factors may affect the continuous flow of availability.

There are 3 primary determinants of nutritional security:

- **Access to adequate food:** nutritional security includes the availability and access of various kinds of foods to supply a constant nutritional value to an individual's body. The factors affecting the access to food are stated above.
- **Care and feeding practices:** For retaining nutrition in one's body, one need to remain in care and have regular feeding practices with nutritional food in the diet.
- **Sanitation and health:** If the health facilities are unavailable or inefficient in a country, there will be issues to spread awareness about and retain nutritional value in an individual's body.

3.7 Governmental policies for food and nutritional security in India

Since India harbours 25% of the world's undernourished and malnourished population and ranks among one of the top 80 countries in the Global Hunger Index, the government of India has devised a few plans and programmes in order to move towards a hunger free India. Enlisting a few of them might elucidate on the proactiveness of the government to eradicate the 'national shame' of the country.

- **National Food Security Mission:** The National Development Council (NDC) had adopted a mission to create the Food Security Mission in May 2007. The objective of NFSM was to increase the production of rice by 10 million tonnes, pulses by 2 million tonnes and wheat by 8 million tonnes by the end of the Eleventh Plan (2011-12). This mission was an overwhelmingly successful one where there was an increase in the production of rice, wheat and pulses by 25 million tonnes in totality. This plan was thus carried forward into the twelfth plan. The government of India harped on the increase in availability of food by implementing this plan (Security Mission, 2020).
- **Rashtriya KrishiVikas Yojana (National Agricultural Development Scheme):** This scheme was launched in the year 2007 as an umbrella scheme which would ensure the development of both the agricultural and its allied sectors. The developmental activities were initiated by the centre but the baton was passed to each state government. This served as an Additional Central Assistance scheme to State Plan Scheme where the Centre provided 100% assistance to states. The scheme tried implementing projects where public investment in the agriculture and allied sectors would increase. The State Governments had been provided complete freedom of granting projects and programmes under this scheme after looking into and prioritizing what the state lacked (VikasYojana, 2020).
- **Integrated Schemes on Oilseeds, Pulses, Palm oil and Maze:** This plan was an umbrella plan implemented in the 10th Five Year Plan in 2004-05. The Department of Agriculture and Cooperation was behind implementation of this plan. This included the integration of a few schemes namely, Oilseeds Production Programme, National Pulses Development Project, Accelerated Maize Development Programme and Oil Palm Development Programme. These programmes also aimed at increasing productivity of crops and assuring food security in the country (Pulses Development, 2020).
- **Pradhan Mantri Fasal Bima Yojana(Prime Minister Crop Insurance Scheme):** This plan was launched in 2016 and is a crop insurance scheme specially launched for

the farmers in India. This scheme provides insurance coverage to farmers for their crops if it is damaged by any natural calamity, insects or diseases. The PMFBY scheme also ensures to fight the plight of farmers, stabilise their income and ensure that they continue farming. This scheme also encourages farmers to adopt modern scientific techniques for farming practices so that there are less chances of crop failure. Ensuring the flow of credit into the agricultural sector is another chief motive of this scheme. This scheme has gained particular favour among farmers (crop insurance, 2020).

- **Anganwadi or Midday meal schemes:** The midday meal scheme had been revised and brought into action from September 2004. This scheme serves a two in one purpose. The children, who go to the schools with the midday meal system, will receive both education and nutritional food once a day. Nutritional experts are generally involved in making nutritional food at low cost. The local community is involved in the management therefore generating employment in the community. Kitchen gardens and locally grown nutritionally rich food are used. Children and teachers are also sensitized on the issues of malnourishment (Meal Scheme, 2020).

Not just the government of India but the United Nations also provides support in the cause of food security in India. It also assists government efforts to make nutrition and food services better and affordable in all parts of India. It also helps in livelihood development programmes of farmers and cottage industries to ensure security of livelihood and in turn security of food for the country (United Nations, 2020).

3.8 Present scenario of food and nutritional security in India

Food and nutritional security have received quite some importance in India over the years due to the gradual increase in malnutrition owing to the aforementioned factors. The government has not only framed strategies like availability of subsidized food products with no compromise on its quality but has also ensured a thorough implementation of the same. However, owing to various social and economic conditions, these strategies have not been able to penetrate deep into the issue and thus, there always remained a section of citizens who were deprived of high quality food products because of its continuous rise in prices and thus suffered from acute malnourishment. In spite of various strategy implementation and revival of agrarian economies through providing high yielding variety seeds to help the landless and unemployed people, there are a number of reasons why there is still a considerable fragment of the Indian population that is under the clutch of food insecurity and malnutrition. According to George & McKay (2019), it has often been seen that though the government implemented several strategies

through the National Food Security Act, the presence of several middlemen, the food commodities reaching the needy were compromised as the former made profits out of it. Not only that, unlike what the Act promised to do, it did not seem to be implemented in the way promised which failed to relieve the people, especially the ones below the poverty line. Owing to the breakout of the global pandemic followed by the worldwide lockdown, there was a massive decline in exports which caused a huge economic slump in India. Thus, according to Pal *et al.* (2019), prices of food commodities soared higher than the usual, making it available only for the ones who own the purchasing power. Not only that, as a result of this economic recession, the government too found it difficult to allocate enough resources that is required to cope up with the problem of food insecurity and improper nutrition levels. Therefore, it is evident that the current situation of India in terms of food security and availability of food to each and every citizen suffered a huge blow because of economic reasons. Since the country was already facing rapid inflation, this economic recession with the global lockdown worsened the situation for the people who are unable to secure food at the existing price rate.

Apart from a problem in the availability of food, as Vijayaraghavan (2016) states, there is also the problem of the availability of unhealthy food products at a cheaper rate which leads to various health hazards including obesity. Obesity, unlike the popular notion, is not a disease suffered only by the privileged section of the people due to continuous binge eating but also affects the lower economic strata of the society. Since food products that use unhealthy raw materials are available at a cheaper rate, they are often consumed by the people who cause the growth of harmful fats in the body thereby causing obesity which in turn causes several health hazards among the people. The worldwide pandemic also led to the shutdown of various restaurants while fast food centres kept functioning in India. According to Mani & Kurpad (2016), not only are fast food cheaper than the food products in restaurants but they also cater to a broader section of the society because of several reasons. However, it is imperative to mention that with the rise in consumption of fast food, there has been a rise in average obesity among youngsters. Though this problem might not affect people below the poverty line, who are unable to secure daily basic meals, it is indeed a problem that has plagued the other strata of the Indian economy which needs adequate focus. Obesity is also a result of food insecurity since the former does not only deal with issues of unavailability of food but also with the problem of insufficient nutrition standards in the economy.

3.9 Exploring mediators of food insecurity and obesity

According to Havrilla (2017), the existence of obesity among low income group individuals has been addressed as the ‘insecurity-obesity paradox’. The limited access to food creates uncertainty which immensely increases stress levels among individuals. Although there has been no direct links or correlation between food insecurity and obesity that could be found in primary or secondary research that have already been conducted. But ‘stress’ is seen as a valid mediator between food insecurity and obesity. One of the causes of obesity is stress according to empirical studies and the fallout of food insecurity is also stress which makes the correlation simpler to understand. Poverty, food quality, chronic diseases related to diet dysfunctions etc are also associated with food insecurity and have potential linkages to obesity but these factors are not completely explored. Gender, marital status, causes of stress and participation of food stamps were all identified as mediators of food insecurity and obesity.

Perceived stress is identified as one of the preliminary mediators between food insecurity and obesity. Perceived stress is the anxiety about a situation that is perceived as a threat to an individual’s appraisal of life and there are not enough resources to cope with the threat. Such immense and continuous stress of threat of being denied something as essential as food, leads to changes and alterations in hormone secretions in an individual’s body which in turn leads to change in metabolism of the body. A change in metabolism will automatically lower the BMR of a person and lead to other psychosomatic disorders. BMR that is lesser than 30 tend to cause obesity in an individual. A model is theoretically derived to show the relationship in a simpler manner. The Vulnerable Populations Conceptual Model states that if there is a lack of availability of resources, it posits a relative risk, increased risk leads to morbidity and health issues in a community which is deprived or faces food insecurity on a regular basis which in turn affects resource availability. Availability of these socioeconomic and environmental resources that creates vulnerability in groups of population or communities was increased.

Dietary Dysfunctions is another primary mediator of food insecurity and obesity. Individuals belonging to the low-income groups generally do not, rather cannot follow cyclic diet patterns (Weaver & Fasel, 2018). With increased prices of basic food grains, one square meal a day is the dream of a lot of individuals among the low-income groups. Skipping breakfast is one of the wrong practices existing in such groups of people. Skipping breakfast and eating food loaded with fat, starch, carbohydrates etc. are two very wrong dietary practices. People from the lower income groups have larger sizes of family and they try to fill the stomachs of all the members with one meal. In order to do so they skip out on the nutritional value of food and

load their diet in starch, sugar, carbohydrates to satiate the hunger. This is an active mediator of obesity and food security.

According to Shin *et al.* (2018), **Marital status** is also a minor mediator in food insecurity and obesity. It is generally seen that married women in households that are in the low-income groups are either absolutely underweight or obese. Both the conditions arise from dietary deficiencies that a married woman suffers. The average family size in a rural area with low income groups is generally 6-8 people. The women of the house, in India, are the last ones to consume food and only live on leftovers from the members who eat previously. This either leads to emaciation of the body or obesity.

Domestic Violence causes immense perceived stress amongst women and the rise in stress levels lead to hormonal imbalance and change in metabolism, following the vicious cycle of dietary dysfunction and obesity.

Unhealthy preparation of food also acts as a mediator between food insecurity and obesity. Proper hygiene and sanitation is often not maintained among individuals from the low income groups. Food cooked in unhygienic ways or regular use of oil other than mustard or sunflower oil might lead an immense increase in weight. Unhealthy cooking conditions lead to the depletion in nutrient content in food and also increase dietary deficiencies leading to obesity among individuals from low income groups.

With the **increase in cost of food** the people in the lower income groups with insecurity of food will be able to spend less on food. In households where poverty is inevitable, a major portion of their income is kept for basics like food. The increase in the cost of food will lead the household to either curtail on their amount of food intake or curtail on other necessary/essential factors like health and education. The lesser food a family consumes in totality, the more dietary deficiencies will occur leading to either malnourishment or obesity (Mohammad *et al.* 2016).

3.10 Challenges concerned with food and nutrition security

The following are the challenges regarding food and nutrition security in India-

1. Faulty food distribution- one of the major challenges faced in ensuring food security in India is the lack of public distribution system and inefficiency of the public distribution systems. This results in a faulty distribution of food supply and maintenance of correct nutrition levels. It has often been seen that subsidies are provided to the people belonging below the poverty line but there is also a major chunk of the Indian population who might not belong to the BPL category but lies at an intermediate

position who are ignored and often not counted among the ones requiring food subsidies. As a result, this fragment of the population fail to receive adequate subsidies in food products and fail to achieve proper nutritional standards essential for themselves and their wellbeing.

2. Uneven monitoring of nutrition levels- the government is not only supposed to ensure a proper distribution of food but also monitor the nutrition levels in the food consumed by the people, especially the poor. However, owing to the large population and diversity in eating habits, the government often finds it difficult to monitor the nutrition levels among the population which leads to major food insecurity. As a result, even if people manage to get subsidized food products, they are often deprived of basic nutrition in their daily meals causing malnutrition and other ailments. India, being a geographically diverse land further strengthens this problem. The government looks into monitoring of nutrition levels among the people only in accessible places thereby leaving out the population residing in isolated villages, or tribal living in the forest areas, which are difficult to penetrate.
3. Lack of intersectional coordination- Though the government of India has made and planned considerable strategies for ensuring food security and nutrition standards in India, this often fails to be implemented efficiently because of various intersectional conflicts between the state and the centre and between different ministries. This not only negatively impacts proper implementation of food security strategies but also results in the problem of budget allocation for the same, making the process of implementation difficult and cumbersome. It is because of these conflicts too that the poor and the needy of the country are unable to secure their basic rights that they are entitled to, food security being one of them.
4. Challenges of food security in rural and tribal areas- a major fragment of India's diverse population comprises the tribal who live in dense forests or isolated landscapes away from the mainstream communities. Monitoring and ensuring food security amongst them is often found to be a major challenge in India because of their distant cultural and geographical characteristics. However, on the other hand, monitoring these populations, who do not have a source of livelihood and live on forest products, is imperative to protect them and ensure a healthy living standard among them.
5. Challenges of food security among children and mothers- the children and their mothers are the worst affected victims of food insecurity in India because of the failure of monitoring nutrition levels among both. Both children and their mothers or pregnant

women require a greater quantity of nutrients and inadequate compositions to ensure proper health standards. This is one of the major challenges in most rural areas because of the failure of proper distribution of food commodities.

3.11 Empirical studies

Food security in developing countries have become a major target to ensure social welfare and India, being one of them, has often taken concrete steps to achieve the same. As Rammohan *et al.* (2019) studies, this involves a thorough study of food insecurity in the country and thereby locating issues within the structure so that each of them can be solved step by step to bring about better health standards among the people and also level the existing stratifications in the Indian society. Food insecurity can be studied based on various parameters which include availability to food and access to the same, utilization of food and stability brought about in the process. Along with ensuring the availability and distribution of food, food security according to Siddiqui & Donato (2016), also comprises of ensuring the maintenance of a proper nutrition level which involves focusing on caring and feeding habits, monitoring of nutrition levels among people to ensure a proper health standards and also looking into the uniform distribution of food supply among different sections of the Indian population. Over the years, India has faced acute inflation which has worsened the situation of food insecurity, thereby making the people who are unemployed or are below the poverty line to be its worst affected victims. According to George *et al.* (2019), it is because of the inflation and the current condition of economic recession in India owing to the worldwide lockdown that has not only resulted in widespread unemployment but also decreased the purchasing power of the people, reducing the number of people who can afford to buy food commodities at exiting market prices to a great extent. The government has taken and initiated a number of relief programs through a number of years in order to uplift the economic condition of the peasants and the landless labourers apart from ensuring the proper distribution of food commodities. These include development schemes initiated by the government like the Pradhan Mantri Fasal bima Yojana and various others which not only look into quality production of food grains by the peasants but also ensures the use of high yielding variety seeds and scientific methods of farming which not only enhances the quality of the food grains but also ensures that the farmers are able to secure a proper price for the same.

However according to Witten (2019), the current food insecurity scenario in India does not only include the people who owing to their poor financial status are unable to secure basic

subsistence and nutrition levels but also various other segments of the population who are being adversely affected by the poor quality food standards available at cheaper prices, the availability of fast food being one such example. This has led to several health issues, especially obesity among the youngsters which has broadened the scope of other diseases as well. Obesity is a health issue that is primarily caused by poor nutrition distribution in the meals of a person and the intake of harmful and artificial fats available at a cheaper rate. With the shutdown of restaurants, fast food centres have become even more functional in India thereby concentrating the crowd. However, the poor quality of raw materials used often lead to the formation of unwanted fats, the regular consumption of which can lead to obesity paving way for other heart and arterial diseases. Thus, food security not only includes the guaranteeing of food products to each and every individual but also ensuring that each of them are entitled to the same nutritional quality in foods, apart from filling their stomachs through the meals. This implies that food security is one of the most broad spectrum issues which have multiple facets that need to be dealt with in order to raise the overall health standards of the population of India with an additional focus on the weaker sections of the society who are affected in the current times because of widespread unemployment.

3.12 Gap of literature

There have often been a number of researches with regard to studying food insecurity and its impact on the population of India. Extensive literature has focussed on the reasons for food insecurity and the various issues both social and economic that rose from the same, apart from affecting the health standards of the population. However, the scope of this research is slightly broader because it aims to cover some important points which previous researches have overlooked. Firstly, the research not only concentrates on food insecurity but also analyses current actions taken by the government to ensure food security followed by critically assessing them along with providing recommendations for a more efficient functioning. Furthermore, this research also focuses on the causes and consequences of obesity, considering it to be a major health issue in India currently (Chandrasekhar *et al.* 2017). Thus, the research draws a connection between how food insecurity might be connected to obesity and what are its long run impacts on both the individuals and the Indian economy. Thus, it is evident that the research studies food security from a broader perspective which has not only affected people below the poverty line but has also affected various people placed at different strata of the society,

connecting the issues with prevailing economic issues like the current economic recession owing to the global pandemic COVID 19 (Broussard &Tandon, 2016).

3.13 Summary

This section of literature review helps in the extensive studying of various forms of literature on food insecurity, its impacts and the necessity of having an efficient food security plan in India. Additionally, the section of literature review also paves way for further enquiry into the aims and objectives of the research conducted through various forms of research methodology, literature review being one of the first few steps of beginning the research. Analysing extensive literature is imperative because it gives broader insights about the issue to the researcher which ultimately helps him in getting his research a definite direction.

4 Data Analysis

4.1 Study

Comparison of the situation of food insecurity before and after the implementation of food security act by the Indian Government and World Health Organization

The National Food Security Act in India was implemented in the year 2013. It had the aim of providing food grains at a subsidised rate to two thirds of the population of the country. As opined by Puri (2017), existing food programmes by the government of India were legally integrated and ‘right to food’ had legal entitlements, now. The midday meal scheme, Integrated Child Development Services Scheme and The Public Distribution System were integrated in this act. Maternity entitlements have also been included and integrated into the NFSA. The priority households would receive subsidised food grains worth Rs.35 per month for Rs.3/kg rice, Rs.2/kg wheat and Re.1/kg millets. Before the implementation of this act, there was only a rationing system to provide food grains at subsidised rates. This act provided the people to receive 20kgs of food grains per month at less than 50% of their minimum support price (MSP).

- The primary difference that came into being after the implementation of this act is that it *converted welfare benefits to legal entitlements*. Article 42 of the Indian Constitution states that “duty of the State to raise the level of nutrition and the standard of living and to improve public health.” These objectives are easily attainable by providing the ‘right to food’.
- *Coverage of the targeted public distribution system (TPDS) is increased*. Before the implementation of the NFSA, the welfare benefits were limited to households identified as ‘below poverty line’ (BPL). Whereas this Act extended its coverage to 75% of the rural population and 50% of the urban population (Drèze *et al.* 2018).
- *Uniformity in provision* of 5kg food grain per person. Before the NFSA was implemented, the welfare benefit would provide households with 35kg of food grains per month, irrespective of the number of members in the household. Post NFSA, each member in a priority household is entitled to 5kg of rice per month.
- *Reduction in prices of food grains*. Before the implementation of NFSA, the central issue price (CIP) was set as the standard price for subsidised food grains at Rs.5.14 for rice whereas post implementation the price paid for rice is Rs.3/kg.

- **Official identification of beneficiaries.** After the implementation of the NFSA, the official beneficiaries of the system were identified. The people in need of the subsidy were identified as priority households and required subsidy.

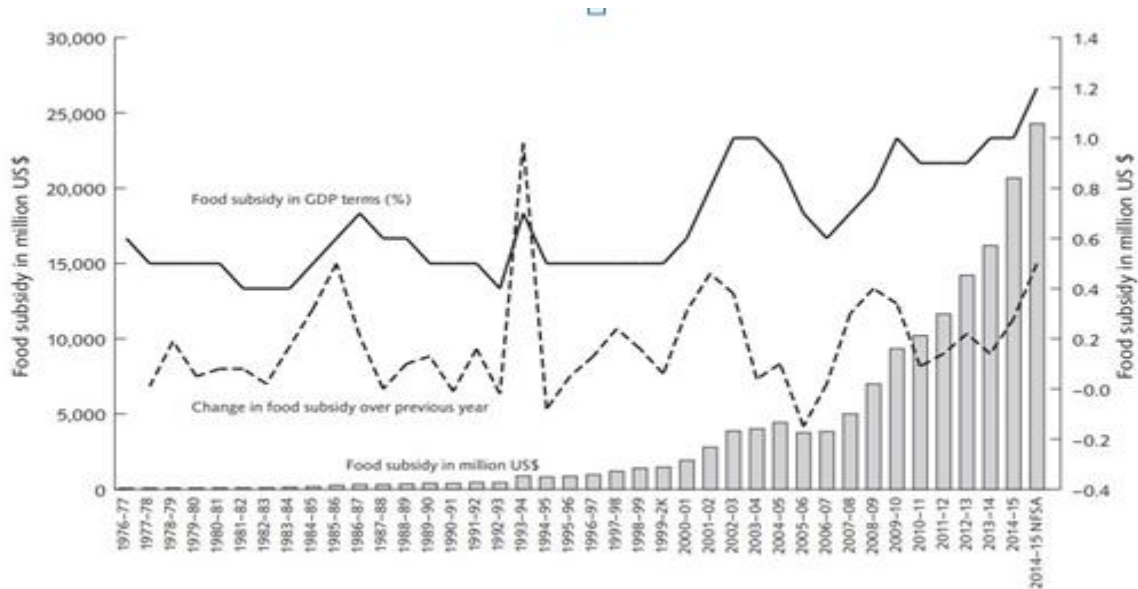


Figure 1. Food subsidiary trends

(Source: www.statista.com, 2020)

The Figure 1 shows the food subsidy trends in the Government of India in the last four decades in the pre and post NFSA era.

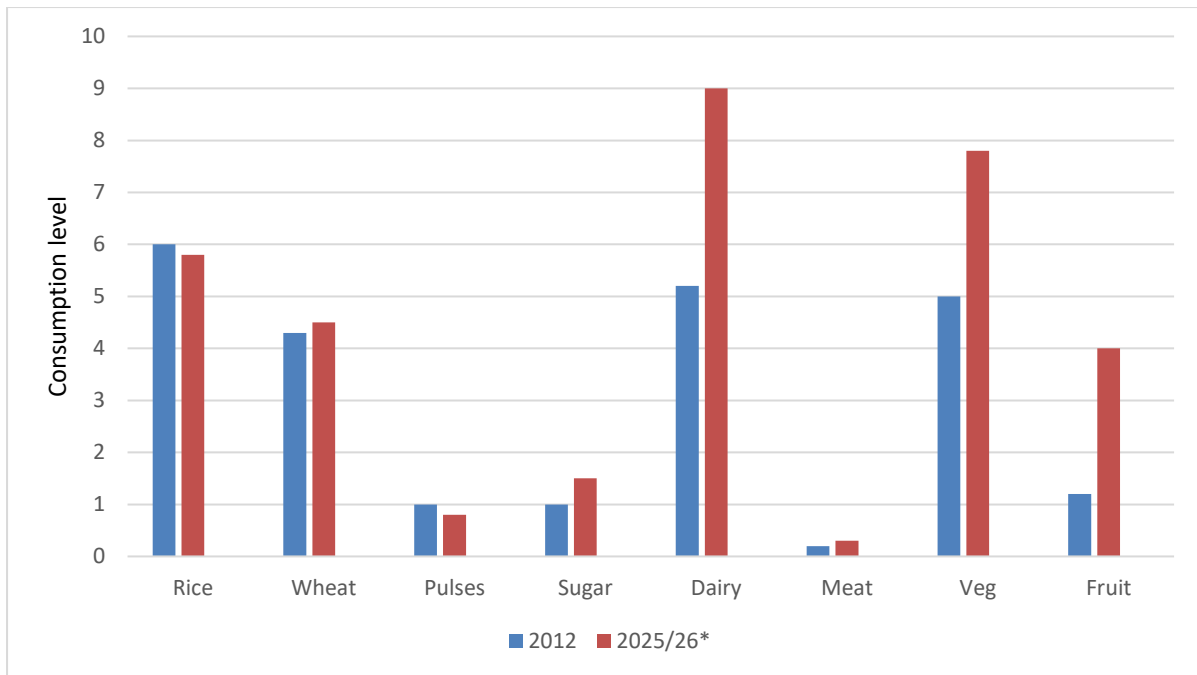


Figure 2. Food safety and security

(Source: www.statista.com, 2020)

Food safety and security, as it's mentioned in Figure 2, as discussed earlier involves the process of ensuring that food commodities are available to each and every citizen of the country irrespective of their buying power along with maintaining proper nutritional standards. Thus, this implies that every citizen should be entitled to having a balanced diet with a combination of all the essential nutrients in correct proportions in order to maintain proper individual health standards. The graph above illustrates the consumption patterns among the population of India based on their per capita income up to 2012 and an estimated consumption pattern for the later years. According to the data attached it is evident that most people of the country are able to secure rice and wheat for themselves that is the carbohydrates. Another reason for the same is the extensive agriculture in India which mainly caters to the production of food crops (Kalra&Unnikrishnan, 2012). However, when we see the statistics of consumption of dairy and meat products, the amount of consumption is comparatively lesser than the former, meat having the lowest consumption among the population because of its affordability (Kar&Kar, 2015). Vegetables and fruits also have a lesser consumption as compared to rice and wheat. Thus, the graph shows an overall lesser consumption of proteins and vitamins. This might be solely because these are the products which were not produced by local peasants and thus, they found it difficult to purchase. Additionally, these products being comparatively more perishable than cereals had a higher maintenance cost which increased their prices in the market, making it

difficult for the peasants and the lower income group to purchase. However, there is an estimated rise in the consumption of all these essential food products over time due to extensive revamping of agriculture and various government security schemes which have increased and strengthened purchasing power among the lower strata of the society, thereby ensuring that they are able to secure the basic nutrients required in their body over time in order to maintain a higher health standard (Luharet *al.* 2018).

The use of the Global Food Security Index to inform the situation in food insecure countries

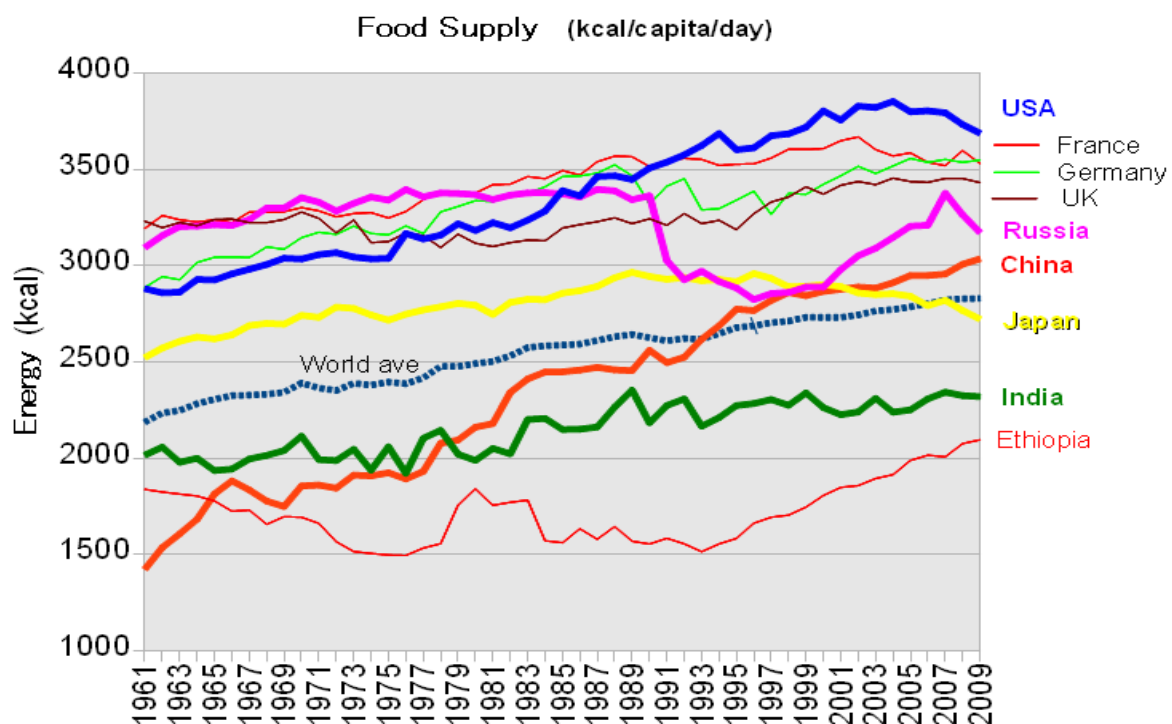


Figure 3. Global food security index

(Source: Security, 2020)

The Figure 3 shows that the consumption of food in calories among a few developed and developing nations which help us to locate the position of India with regard to the global food security index. Over the years we see that the calorie consumption of USA has increased considerably and the point it is not only higher than that of India but the aggregate calorie consumption of the USA has always been greater than that of India. While the calorie consumption of India has risen over time, the rate of growth has considerably been slower than that of countries like the USA, China and Germany.

Impact of Food security Act among the citizens of India

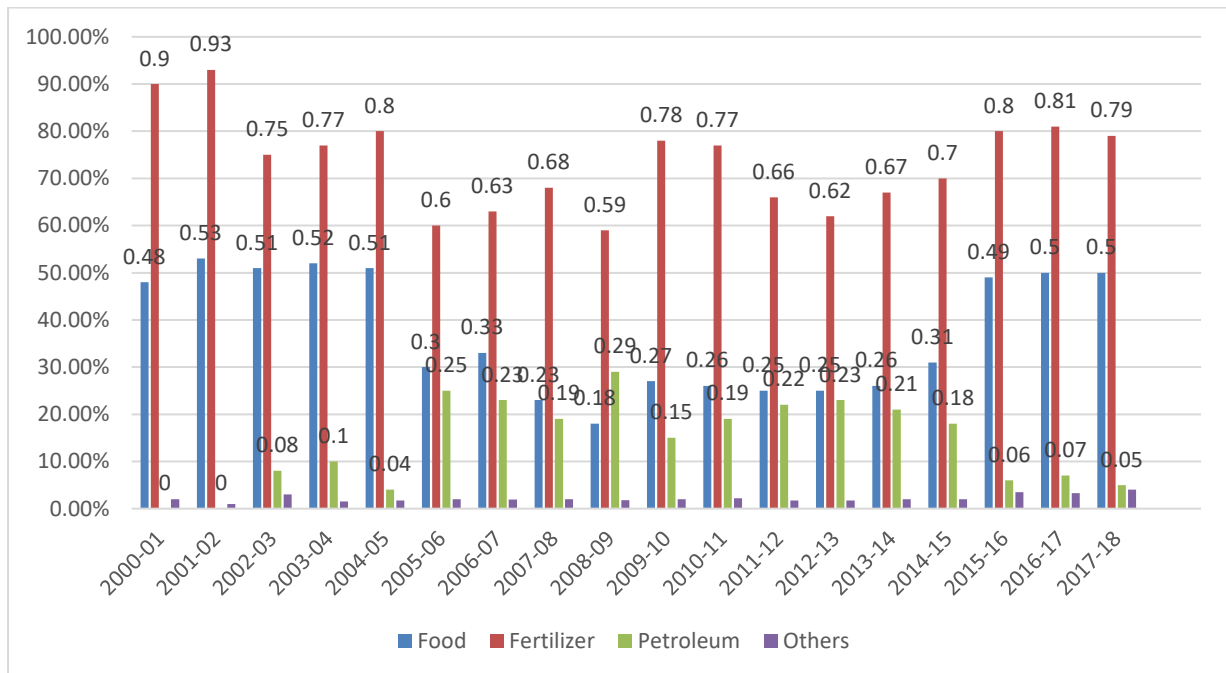


Figure 4. Statistics of food security act

(Source: food statistics, 2020)

The Figure 4 above illustrates the amount of food security provided by the government to the citizens in every fiscal year which varies according to the budget of the union, the expected expenditure in various sectors and so on. If we study the policies of food security implemented by the government since the year 2000, we would see that the amount of food security provided in terms of subsidies and other methods such as helping the farmers raise their annual production, providing mid-day meals for children and ensuring that the people especially the ones unemployed and belonging below the poverty line has increased below 50% in the fiscal years 2002-2005. However, post this, there has been a fall in the food security of India slightly in the next immediate years with the year 2012-2013 being the worst affected. This might be because of several reasons like economic recession, a drop in the export rates leading to negative balance of payments which in turn reduced the Government's total revenue. As a result, the amount invested for ensuring food security for the poor and the needy reduced to a great extent. From the fiscal year 2014, there is again a slow and gradual rise in the investment of food security by the government. It is also evident that the government has also taken considerable measures in providing fertilisers to the peasants which has increased their crop yield over the years, thereby ensuring a decrease in the losses incurred by them earlier.

Fertilisers, high yielding variety crops and other scientific methods were introduced in the field of agriculture by the government in order to increase the agrarian produce by implementing various schemes for the welfare of the peasants and the landless labourers. As a result of this, a number of farmers were able to increase their net income which not only increased the per capita income of the country but also helped farmers to access food commodities at the existing price rates and get adequate nutrition through consuming a balanced diet for themselves.

Statistical representation on obese population in India

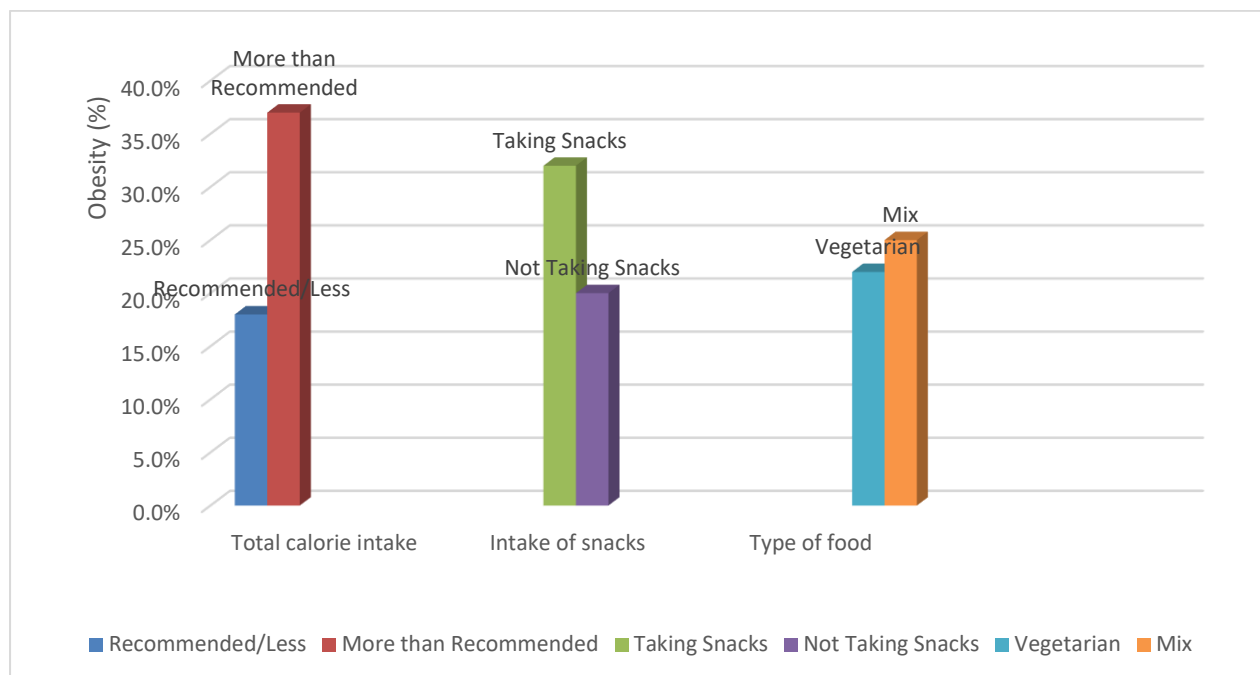


Figure 5. Obesity according to dietary habits

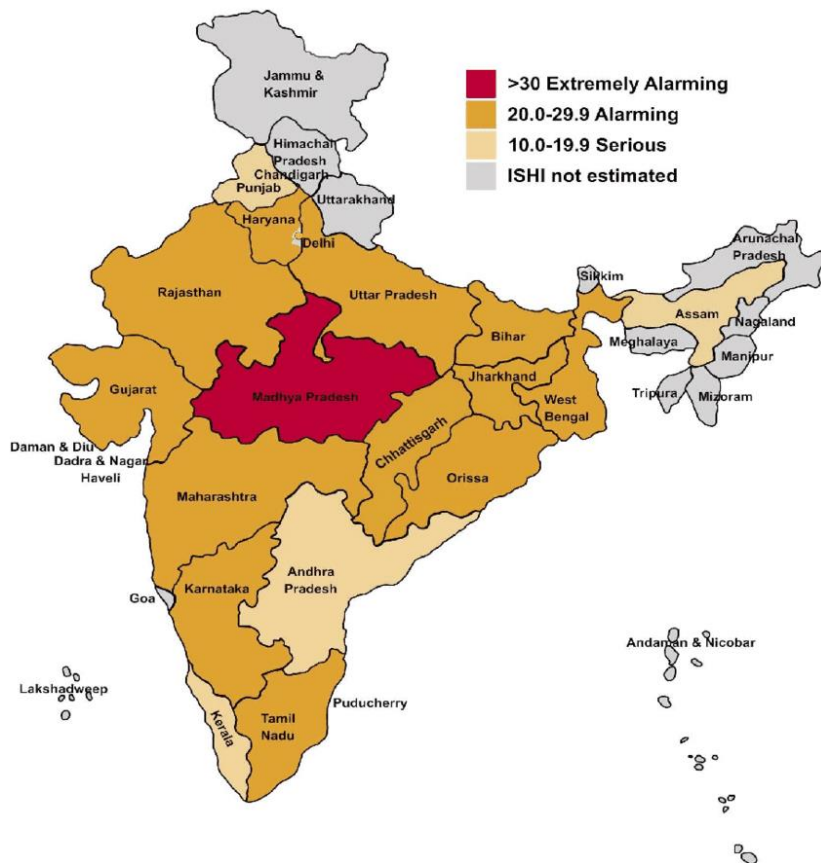
(Source: Dietary habits, 2020)

The Figure 5 above throw light on the number of recommended calories for individuals versus the amount actually consumed, the intake of snacks and the kind of food among the people of India. In the first graph, we see that the number of calories taken is way higher than the recommended amount showing a trend of overeating among the people, thereby causing obesity. This is indeed a phenomenon found between the middle and the higher income groups because people belonging to lower income groups and below the poverty line cannot afford to buy excess food at the existing price level. The next section of the graph showing an increase in the snack's intake level above the recommended level indicates that people turn obese because of consumption of unwanted snacks which fill their stomach but not with adequate nutrients. This is a condition prevalent among all income groups. For the lower-income groups,

it is often seen that people tend to take quick bites of whatever they get at a cheaper price when they are hungry instead of focusing on the intake of nutrients which in turn leads to obesity among them. Thus, it is evident from the graph that the people consuming no snacks at all have a lesser percentage of obesity than the ones who do.

Demand and supply Projections of food

It has been found that there are many studies that have been conducted based on the projections of demand and supply. In the last decade, the demand for rising was at 84.2 million tonnes and by the end of the year 2020, it has been estimated that the demand for rice would reach around 100 million tonnes with supply at 105 million tonnes. The corresponding projections of supply show that it is estimated for a surplus that would reach around 9.73 million tonnes by the end of this year. The projections for the demand wheat are 69 million tonnes for the same year as compared to the supply projections of 97.9 million tonnes, indicating surpluses to 29 million tonnes. The aspect of demand elasticity and the various technical coefficients has been reflected through secondary sources that project the demand for the total cereals at 237.3 million tonnes for the present year. The study used new statistical data for the growth of the livestock (Kumar, 2016). The varying estimates were based on the model of IMPACT and it was found from the data that the assumptions of the growth in GDP were around 7.5 to 7.7 per cent. Based on the large public distribution system that was supplemented by the arrangements for the process of moderating the prices in the open market had provided with the efforts of maximisation of procurement from the areas that were considered to be the surplus areas. This aspect can be viewed as the twin objectives of the government of India's food policy (Kumar and Joshi, 2016).



Picture 1. India's state hunger index

(Source: www.slideshare.net)

Social protection measures

Social protection programmes are a necessity in order to address the problems regarding access to food and nutrition. The social protection programmes help transfer to the poor and underprivileged groups.

The Integrated child development services (ICDS), which started at 1975 works on the holistic development of the child till 6 years of age, while more focus is given to children who are turning 3, besides nursing mothers. The procedure works under a package of 6 services: health check-ups, referral services, immunization, supplementary feeding, and advice on health and nutrition and non-formal preschool education. Despite its growth during the past three decades, the fulfilment of child nutrition and also the right of children is still limited (Aurino, 2018). The ICDS was introduced to basically work on child and maternal malnutrition but has not come into effect with much feasibility. The graph for child malnutrition has not declined much in the past few decades or so, cases of anaemia among both women and children have gone higher. The whole agenda and propaganda alongside acts to bring it into effect had quite low

limited coverage. The coverage of this should be increased by a considerable amount, alongside a proper plan to implement.

Scheme for midday meal: The midday meal scheme had been revised and brought into action from September 2004. This scheme serves a two in one purpose. The children who go to the schools with the midday meal system will receive both education and nutritional food once a day. Nutritional experts are generally involved in making nutritional food at a low cost (Jha, 2016). The local community is involved in the management, therefore, generating employment in the community. Kitchen gardens and locally grown nutritionally rich food are used. Children and teachers are also sensitized on the issues of malnourishment

Availability of human development index of developing countries using Global security index Food security dimensions

It has been found that there is no specific agreement globally in respect to the analysis of food and nutrition security as different entities use different and varying sets of methodologies. Selection of those indicators is very crucial; however, in developing countries like India, data availability is a big challenge.

The Global Food Security Index (GFSI) combines the analysis of 25 indicators to form an index and the index analyses the basic issue across the three globally designated dimensions of availability, affordability, and utilization. The dynamic benchmarking model adjusts the quarterly impact of the food process, rates of exchanges, and the income of India's affordability scores. From the analysis, the five food indicators based on availability were the deficit of food production over consumption, instability of the production of cereal, the number of people affected by natural disasters like floods, cyclones, landslides, and heavy rains (Kummu, 2018). In addition to this, the other factors are the percentage of the area of the country that is affected by drought to the geographic area and the Environmental Sustainability index. The various indicators in respect of access include percentage of the population consuming less than 1890 Kcal, rural infrastructure index, juvenile sex ration, health infrastructure index and many more.

In 2004, World Food Program (WFP) made the Atlas of the Sustainability of Food security in India, which reflected that the production of food and its process must be efficient and environmentally friendly to conserve the natural resources like marine fisheries. Furthermore, it must economic, social, and environmental access to a balanced diet for all (Szabo, 2016).

As per the year 2019, the Human Development Index declared by the United Nations is 0.647, which constitutes a rise of 5.7 percent. However, in terms of Good and security, it has been found that India's development index is lagging due to deep-seated political, social, and environmental issues that are reflected in terms of vicious cycles of food insecurity in vulnerable households. The deeper roots of India's food security paradox are effectively articulated and thereby underscoring the importance of a holistically, multi-prolonged constructed policy agendas (Burchi, 2016). The USDA's International Food security assessment of 2013-33 has estimated that India's food insecure population is at 255 million among the 76 low-income countries that were studied through the Global Security Index.

4.2 Analysis

Correlation between food insecurity and obesity

According to McKay *et al.* (2020), food insecurity refers to the limited or no access to enough food through ways that are socially approved which become a major concern for an individual's health and is the root cause of many chronic diseases including obesity. Studies conducted by various organisations reveal that almost 800 million people are denied access to sufficient nutrition in the developing countries. Food insecurity is a vicious cycle the causes of which come back as its effects in the cycle and there is no relief. Food insecurity thus contributes to lack of sanitation, status of mal-nutrition like overweight, mental illnesses, obesity and other physical disorders. Although the maximum number of annual deaths in India is poverty and hunger driven but the modern sedentary lifestyle of especially urban India and low physical activity is one of the primary causes of obesity in the country. Not only the developed countries, the developing countries are not behind in the statistics of obesity spreading like a pandemic due to change in food habits and lifestyle as a whole and decreased level of activity. This population was primarily urban and those who do not suffer from food insecurity. But the new theory is now correlating the growing obesity among people who are affected by food insecurity. Drawing a correlation between poverty and obesity is the trend in new research.

A few recent researches infer that the anxiety of failing to access the required food and nutrition particularly among households with low income is a cause of obesity. As Nandi & Mistri, (2019) elucidates, the stress that goes into the thought of being unable to feed the family, increases chances of obesity among low income groups. It was also seen in the study that food consumed by people from the low-income group is high in starch, sugar and fat content. This fills the stomach quickly so very little amount can quickly fill the stomach without having to

spend much on food. The nutritional value often skips their attention. Consumption of food rich in fat, sugar or starch will definitely lead to increasing weight of individuals which gradually becomes obesity. Skipping breakfast is often a wrong dietary practice that leads to gain of weight. This practice is prevalent among people with low income groups. Skipping meals, especially breakfast, is one of the unhealthiest dietary practices. This practice also gradually leads one into obesity. Obesity in turn leads to increase in cholesterol, blood pressure and affects the heart dearly. Obesity is a direct cause of increasing heart ailments, globally.

	Men – NHFS 4	NHFS - 3	Women – NHFS 4	NHFS - 4
Bihar	2.6%	4.6%	11.7%	4.6%
Goa	32.6%	20.2%	33.5%	20.2%
Haryana	20%	17.4%	21%	17.4%
Karnataka	22.1%	15.3%	23.3%	15.3%
MP	10.9%	7.6%	13.6%	7.6%
Meghalaya	10.1%	5.3%	12.2%	5.3%
TN	28.2%	20.9%	30.9%	20.9%
WB	14.2%	11.4%	19.9%	11.4%

Table 3. Percentage of obesity among men and women in 8 states of India recording highest obesity

(Source: Percentage, 2020)

Increased prices of food leading to the growth in food insecurity

The rise in the cost of food has a major impact on most households in our countries especially on the vulnerable households. The other view about rising food prices is that the farmers might get higher agricultural prices which in turn improve rural economy and provide stimulus to economic growth for a longer term. As pointed out by Tomayko et al. (2017), the global rise in food prices during 2007-2008 and its effect will be taken into consideration as a case study to elucidate on how rising prices might affect the food insecurity in the country. India has reported low per capita calorie consumption.

The global rise in prices of food during 2007-2008 had created havoc in a lot of households in India. It also led to various political unrests, globally. India was able to cushion it to some extent because of domestic availability of food grains. The increase in food prices snatched the dream of one square meal a day from a lot of people. The increase in food prices is inversely proportional to the food security in India or any country for that matter. The more the prices of

food, the lesser it will be accessible to the masses 'below poverty line'. The more people will be driven towards the insecurity of food (Chen & Lu, 2018). Therefore, there will be a growth in the number of individuals, whose food is not secured, increasing the count of food insecurity in India.

The primary reasons behind the volatility of food prices in India are the lack of investment in the agricultural sector, lack of attention towards the plight of farmers, small agricultural practitioners especially agro-ecologically poor areas. Rise in food prices not only affects food insecurity but a study also says that it affects other basic things like healthcare and education. The population in the lower income group spends a considerable amount of money for securing their food. The rest of the meagre amount is kept for essentials like health care or education. The rise in food prices will either put them in debt for securing their food or consume less than adequate food or lead them to sacrifice other essential things like healthcare and educational facilities.

Performance in access to food

From the perspective of the individual level, it can be said that food security in short means that all the members of the society must have equal access to the unnecessary food that they need, either from the part of their own production, from the transfer of the governments' mechanism, or from the market. In order to effectively achieve food security, it is of the utmost importance for the poor to have sufficient means in order to purchase or gain access to the food that they need. It is not surprising, that in a third world country like India, the poor do not have access or the assets to purchase the food at market prices and hence, the government must implement programmes for social protection of the poor (Reddy, 2016). There are mainly two ways how the poor can easily access the required food; firstly, by gaining access to employment-intensive growth programs to work and gain remuneration to be able to buy food at the market price. In addition to this, the other way is by increasing the incomes and subsidising the food through programmes based on social protection like the PDS and other employment programmes. It has been found from the data of NSS that India has successfully reduced the problem of hunger from 17.3 per cent in the last decade to 2.5 per cent in 2018. The percentage is the highest in the state of West Bengal, which is at the rate of 11 per cent, followed by Orissa at 6 per cent and Assam at 5 per cent. The expenditure on food or the amount of calorie intake is basically the determinants of the poverty line (Singh *et al.* 2019). Hence, the incidence of poverty in a

specified region reflects on the extent to which food is effectively accessible to various householders. The official estimate displays that the rate of income poverty has declined from 55 per cent in the 1970s to around 24 per cent in the year 2018.

The instrument of Public Distribution System (PDS) has been considered to be one of the best systems to ensure household level food security. Based on the data collected from the NSSO on the purchase of wheat, rice, sugar, and other items from the fair price shops, the data has been effectively analysed to examine the utilisation of PDS. The proportion of the consumables that are obtained from PDS provides details about its role catering to the basic needs of the population of India. The share of the consumption in terms of the PDS in the urban sector is around 7.7 percent, which is lower than the rural population of the Country.

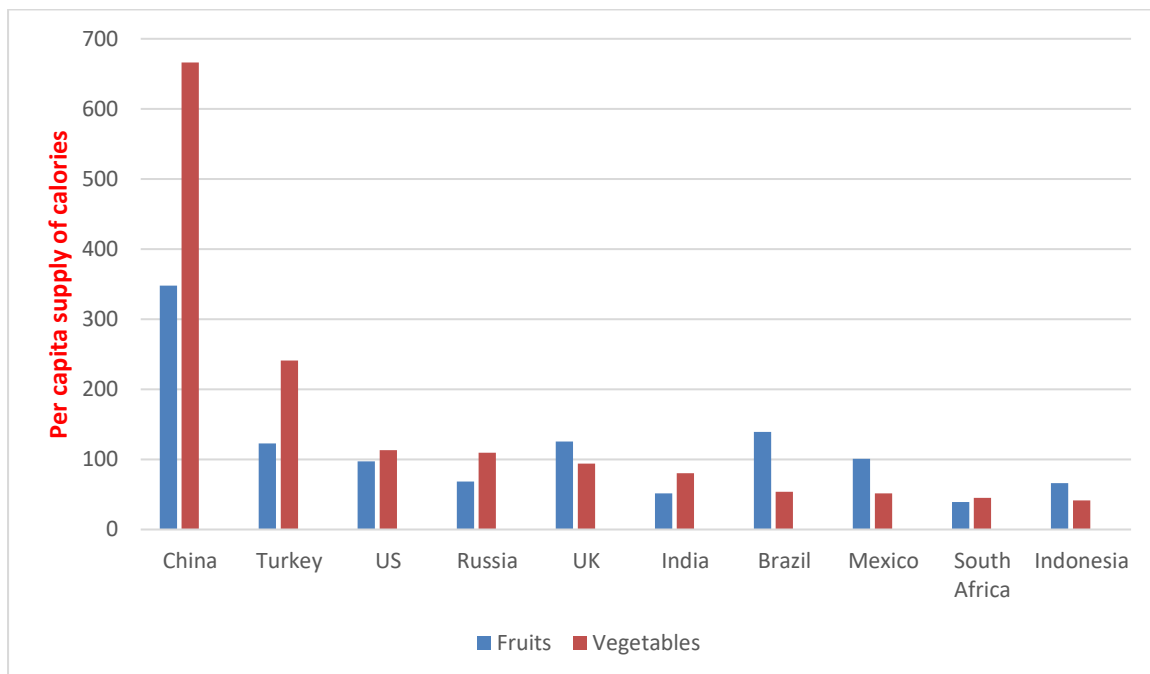


Figure 6. Per capita supply of calories

(Source: ResearchGate, 2020)

5 Results and Discussion

It is from the extensive literature review and secondary collection of data that we find a major reason behind India's growing food insecurity is the issue of accessibility. Though the National Food Security Act has focussed and ensured on providing food products to the poor and the needy at subsidized rates, its plans failed to penetrate as deep as it should have to bring about considerable change in the dietary habits and health standards of the people. The growth rate of the population of India is one of the main reasons behind the issue of accessibility. This is because the government too has limited resources earned through production and export of goods and services. Thus, the budget reserved by the government for ensuring food security among each and every section of the society gets difficult. Further improper recording of population and data on the same prevents the government from planning strategies and implementing them through proper funding. India being a geographically diverse land comprises a population living in various corners of the country penetrating into which is not always possible. As a result, these areas, especially the dense forests or mountains where the tribal reside are often ignored and as a result, they suffer from acute food insecurity. Thus, it is evident that there is an uneven distribution of food products among the population of India. The cause of this uneven distribution comprises two layers. Firstly, this uneven distribution occurs because some people of the country owing to their high purchasing power get the power and freedom to consume each and every product for which they can pay the existing market price (Singh *et al.* 2018). Secondly, this problem exists and is becoming more dangerous over time because the buyers with the purchasing power tend to consume food products in excess quantities or store them for later use thereby reducing the total production of the commodity. As a result, the amount of food that is available at subsidized rates for the people who are unemployed or belong below the poverty line are inadequate as a result of which they suffer from food inequality which not only means shortage of subsidized food but also a shortage of nourishment required by their bodies. Thus, it can be concluded that due to an uneven distribution of food supplies because of various social and economic reasons, the subsidized food products do not reach each and every section of the population who needs it. Further there is also the problem of dishonesty whereby people in spite of owning sufficient purchasing power at the existing market prices of food commodities prefer to buy them at subsidized rates, affecting both the revenue of the government and the quantity of subsidized food available for the weaker sections of the society.

Loopholes within government policies

By identifying food insecurity and malnutrition to be one of the most dangerous and important issues in India, the government has been framing and strategizing a number of schemes and plans in every fiscal year mainly to help the farmers and the landless labourers so that they do not incur losses with their production and are able to gather subsistence. These schemes comprise of schemes like the Rashtriya Kisan Vikas Yojana, the National food security mission and so on. As according to a graphical illustration above, we have also seen that the government of India has tried dealing with the issue of food insecurity by investing a portion of its revenue in the distribution of food and also by helping farmers through the supply of fertilisers and other important products necessary to increase their annual produce. However, there were a number of loopholes because of which the government of the country have not been able to reach its set targets yet. Some of these problems include-

1. Lack of efficiency in implementation-this was one of the major problems in the government schemes and plans. It failed to reach the poorest of the poor section of the country because of lack of information and workforce. Thus, the government schemes only concentrated on areas where they could apparently target a greater section of the farmers and peasants, thereby ignoring the ones who did not fall under this category but required assistance, nonetheless (Kunware *et al.* 2018).
2. Sectional schemes-this implies that the government plans and schemes were directed towards specific category of the peasants or people below the poverty line. However, the peasants only with small land holding or none at all were considered to be eligible for the schemes. This affected those peasants who in spite of having sufficient hereditary land holdings could not produce much owing to lack of resources. As a result, with time, their condition and susceptibility to food insecurity remained unaltered.
3. Unscientific methods of farming-though the government aimed for distributing fertilisers, high yielding variety seeds, chemical pesticides and so on to ensure an increase in the production of the farmers, the unscientificity in farming methods amongst the latter prevented them from increasing their production (Lobstein & Jackson-Leach, 2016). This is because age old farming methods are time consuming and did not yield as much as the new methods. Thus, apart from government schemes, the government should also have focussed on the need for training the peasants on scientific farming.
4. Increased food distribution did not ensure sufficient nutrition- the government schemes and strategies aimed at both increasing the farmers' produce while ensuring increased

distribution of subsidized food among the different sections of the society. However, it is through the results of these schemes and their impacts that we come to know that though the government increased the distribution food products at cheaper rates, it did not check the nutrition levels of the people belonging to the lower strata of the society, especially the children. Thus, the government aimed towards distribution of more rice and wheat but no efforts for ensuring a balanced diet among the people were taken (Luharet *al.* 2018).

Current situation of food insecurity during COVID 19

The condition and susceptibility of the poor, whether employed or not have increased dramatically during the time of the pandemic COVID 19. With the outbreak of the pandemic, India like all other countries had gone for a country wide lockdown which had several social and economic impacts. While on one hand, several unskilled labourers lost their jobs which helped them to earn subsistence, and it also decreased the government's revenue based on the export of goods and services. Thus, the impact of the COVID 19 lockdown has a two layered impact on the lower income group of India. Firstly, it lowered per capita income of the country because several labourers lost their jobs because of industries being shut down as a result of the lockdown. This not only reduced their purchasing power but also made them more susceptible to food insecurity as they were unable to buy food products even at the subsidized rates. Secondly, owing to the fall in exports and the economic recession in the country, there was an acute shortage of government revenue reducing its budget (Touyzet *al.* 2020). As a result, the amount invested in ensuring food security and health standards especially of the lower income group reduced to great extents. Thus, in a situation, where the people of the lower income group or the ones below the poverty line required food products to be available at a lower market price, even lower than the subsidized rate distributed earlier failed to receive so because of low government revenue. These people as a result of being malnourished were also more susceptible to the disease than the ones who could afford to buy nutrition at the available rates. Furthermore, like every other economy, India too used to import a number of essential food products because of its inability to produce within the domestic frontiers of the country which was also affected because of the global lockdown thereby even affecting those people who used to consume these products (Van Lancker&Parolin, 2020). The important products often consist of health supplements and so which are not only essential for people with a difficulty to assimilate certain nutrients but also the people above the age of 60. Thus,

because of the lockdown in order to cope up with COVID 19, India has again sunk into the clutches of widespread food insecurity.

Reasons for the Growth of obesity among youngsters

Obesity has been a constant medical issue that parallel existed as a by-product of food insecurity in India. There are varied understanding of the impact and the causes of obesity which has often been linked to the income of the people. As we see in the graph above, people suffering from obesity mainly belong to the lower and the middle-income groups in India. This is because of consuming poor standards of food which use artificial fats and excess carbohydrates without any vitamins, minerals and other essential nutrients. It is also noticed that a majority of the patients who suffer from obesity are between the age group of 12-30. This can be for various reasons. Firstly, if we consider the middle-income group, it is essential to mention that the youngsters of this group often tend to overeat or binge eat in their free time. Further, the reason for having working parents also adds to the cause since most of the time the child is ordered food from local food joints or fast food centres to avoid cooking at home in order to save time. The fast food centres have catalysed the cause of obesity in most children because of its easy availability.

If we consider the lower income group, we would see that there are several other reasons for obesity apart from consuming fast food and overeating. They are as follows-

1. Consumption of only cereals- if we notice the data analysis of the paper, we would see that the lower income group mainly consumes rice or wheat, that is the cereals that they produce, because in that case they do not need to spend their meagre wages in buying food products from the market. Thus, this adds to the carbohydrate consumption of the body which is one of the sole reasons for obesity (Akseeret *al.* 2020).
2. Lack of essential nutrients- since the lower income group are able to only afford certain food products like carbohydrates, they fall short of having a balanced diet with essential nutrients as a result of which they might turn obese.
3. Inability to buy proper quality food products- the lower income group are also unable to buy food products of proper or high quality and thus tend to consume whatever they can afford just to fill their empty stomachs. As a result of this these people consume food of poor quality which uses extra fat and carbohydrates instead of essential nutrients thereby making them susceptible to obesity.

Though obesity as a medical condition prevails in various sections of the society including various kinds of income groups, it is needless to say that the lower income groups are the worst affected. This is because of the following reasons-

1. Less provision for treatment- obesity can be treated both through diets and also medically. However, the poorer section of the economy that comprises of the lower income groups and the unemployed citizens of India cannot avail treatment to get rid of obesity. However, doing the same is necessary since obesity often affects various organs in the body and harm the overall functioning of the same (Little *et al.* 2016). Thus, obesity often decreases the health standard of the lower income group. As compared to this, the higher or the middle-income group can avail treatment or change their diets according to their health which might prevent obesity and help them to retain their healthy standard of life. As a result, the worst affected are the lower income groups in this case.
2. No remedial measures- Unlike other income groups, who can afford a wide range of food products including enough protein and essential nutrients. The lower income groups cannot do the same because of the lack of resources and the absence of buying power for the products available at the existing market rate. Since the government ensures distribution of only a few food products which are not diverse, people of this section suffering from obesity cannot look out for alternative diets.
3. Effect on work and income- it can be considered that obesity especially among the lower income groups can often lead to worsening their financial condition. This is because obesity reduces the body's energy and often causes lethargy as a result of which the patients suffering from this do not have the tenacity to work at the same pace (Chanak& Bose, 2019). The people of the lower income group who are mostly engaged in unskilled physical labour thus tend to lose jobs because of their inefficiency and under productivity which in turn paves way for unemployment.

Survey Questionnaire

Respondent chosen for this study are based on random choice and aged 18-34 because of active life participation. In terms of the statistical measures, our mode in this study is 15 as mostly 15 responses were directed to one answer. Our statistical range presents 60 as a difference between 60 and 0 which shows statistical dispersion.

1. Do you think India has food security?

	<i>Number of responses</i>	<i>Percentage of responses</i>
<i>Strongly agree</i>	20	20%
<i>Agree</i>	30	30%
<i>Neutral</i>	0	0%
<i>Disagree</i>	30	30%
<i>Strongly Disagree</i>	20	20%

Table 4. Food Security

The above Table 4 describes that the majority have strongly disagreed that the country of India does not have food security. Only 30% per cent people agree and 20 percentage of people strongly agree with the fact. As the majority of 50 percent people have disagreed to the fact, it suggests that the country still suffers from food insecurity based on low standards of food intake, malnutrition, and an equal distribution of food. The implementation of the act was not just enough to measure to eradicate food insecurity in the country completely as a result of which the government had to build and employ various efficient strategies in order to implement and monitor the same. The people who agreed and strongly agreed are mainly from the urban sector that does not bear the brunt of poverty.

2. Do you think the aspect of unavailability of food makes an individual susceptible to various diseases?

	<i>Number of responses</i>	<i>Percentage of responses</i>
<i>Strongly agree</i>	40	40%
<i>Agree</i>	20	20%
<i>Neutral</i>	15	15%
<i>Disagree</i>	15	15%
<i>Strongly Disagree</i>	10	10%

Table 5. Connection of Social Issues and Food Security

The above Table 5 describes that 40 percent of Indian respondents have strongly agreed that the aspect of food insecurity is linked with social issues. The aspects of social issues that are linked to the effects of food insecurity are based on domestic violence, the birth of female children, and other aspects. 15 per cent of the respondents have stayed neutral. The fact that 15 percent and 10 percent of the respondents have strongly disagreed shows that there are yet many people who stay indifferent towards the social issues faced by most women and children in the country.

3. Do you think the Food Security Act implemented by the government of India has addressed the issues of food insecurity?

	<i>Number of responses</i>	<i>Percentage of responses</i>
<i>Strongly agree</i>	15	15%
<i>Agree</i>	15	15%
<i>Neutral</i>	15	15%
<i>Disagree</i>	25	25%
<i>Strongly Disagree</i>	30	30%

Table 6. Attitude towards the Food Security Act

From the Table 6, it can be seen that around 30 percent of the respondents feel that the Food Security Act has not implemented effective changes to reduce or curb the aspects of food insecurity in the country. Almost 15 percent of the respondents have stayed neutral, as they probably have no proper knowledge about the act, and 15 percent of the respondents strongly agree that the Act of Food Security has brought plausible changes to tackle the situation. This clearly states that urban people are mostly indifferent towards the brunt of poverty that the rural people have to undergo.

4. Do you think the internal issues based on the health standards of the population are related to food insecurity?

	<i>Number of responses</i>	<i>Percentage of responses</i>
<i>Strongly agree</i>	40	40%
<i>Agree</i>	15	15%
<i>Neutral</i>	20	20%
<i>Disagree</i>	15	15%
<i>Strongly Disagree</i>	10	10%

Table 7. Connection of Internal Issues of Health Standards and Food Insecurity

From the above Table 7, it can be seen that around 40 per cent of the respondents feel that the internal issues based on the health standards of the population are related to food insecurity. Almost 20 percent of the respondents have stayed neutral, as they probably have no proper knowledge about the effects of internal issues such as domestic violence and other social issues, economic issues of the country based on the growth in GDP and other issues. 10 percent of the respondents strongly disagree that the internal issues based on the health standards of the population are related to food insecurity.

5. Do you think the major global factors play a vital role for the rise in the food products?

	<i>Number of responses</i>	<i>Percentage of responses</i>
<i>Strongly agree</i>	40	40%
<i>Agree</i>	30	30%
<i>Neutral</i>	5	5%
<i>Disagree</i>	15	15%
<i>Strongly Disagree</i>	10	10%

Table 8. Connection of External and Global Issues on Food Insecurity

From the above Table 8, it can be seen that around 40 percent of the respondents feel that the external and global issues based on the health standards of the population are related to food insecurity. Almost 5 percent of the respondents have stayed neutral, as they probably have no proper knowledge about the effects of external issues such as changes in the technology systems, expansion of business, and global presence of India in the global business affairs. 10 percent of the respondents strongly disagree that the external issues based on the health standards of the population are related to food insecurity.

6. Do you think the inflated prices of the food products give rise to malnutrition for the majority of the population in the country?

	<i>Number of responses</i>	<i>Percentage of responses</i>
<i>Strongly agree</i>	45	45%
<i>Agree</i>	25	25%
<i>Neutral</i>	10	10%
<i>Disagree</i>	10	10%
<i>Strongly Disagree</i>	10	10%

Table 9. Impact of Inflated Price on Malnutrition

From the above Table 9, it can be seen that around 45 percent of the respondents feel that the inflated prices of the food products give rise to malnutrition for the majority of the population in the country. Almost 10 percent of the respondents have stayed neutral, as they probably have no proper knowledge about the effects of high food prices causing an effect on the purchasing behaviour of the rural and the people of the below poverty line in the country who are unable to buy the food items due to high prices. 10 percent of the respondents strongly disagree that the inflated prices of the food products give rise to malnutrition for the majority of the population in the country.

7. Do you think the pay gap between the rich and the poor is the main reason behind obesity in the country?

	<i>Number of responses</i>	<i>Percentage of responses</i>
<i>Strongly agree</i>	45	45%
<i>Agree</i>	25	25%
<i>Neutral</i>	10	10%
<i>Disagree</i>	15	15%
<i>Strongly Disagree</i>	10	10%

Table 10. Impact of the Gap between Rich and Poor on Obesity

From the Table 10, it can be seen that around 40 percent of the respondents feel that they think the pay gap between the rich and the poor is the main reason behind obesity in the country. Almost 10 per cent of the respondents have stayed neutral, as they probably have no proper knowledge about the fact that the pay gap between the rich and the poor leads to an unequal distribution of wealth, where the rich can afford fast food which leads to obesity while the poor are unable to buy necessary food items. 10 per cent of the respondents strongly disagree that they think the pay gap between the rich and the poor is the main reason behind obesity in the country.

8. Do you think the aspect of unavailability of food makes an individual susceptible to various diseases?

	<i>Number of responses</i>	<i>Percentage of responses</i>
<i>Strongly agree</i>	50	50%

<i>Agree</i>	30	30%
<i>Neutral</i>	10	10%
<i>Disagree</i>	5	5%
<i>Strongly Disagree</i>	5	5%

Table 11. Relation of Unavailability of food to Diseases

The Table 11 describes that the majority have strongly agreed that the unavailability of food makes an individual susceptible to various diseases, a major part has also agreed. Very few people have disagreed or strongly disagreed with it. One-tenth of the entire population beholds neutral reaction about it. The reason for the majority agreeing with it is because lack of food causes a lack of nutrition. If a human body does not receive proper amount nutrition like the right percentage of protein, carbohydrates, vitamins it can affect the immunity system. Human immunity system provides the strength to fight against harmful bacteria and viruses which make people sick, the balanced and a proper diet is a source of that otherwise it is normal to easily fall sick. The one provided neutral reaction is probably confused about this fact and those who disagree with it probably do not have a clear knowledge about the importance of food for the human immunity system. They may think the food cannot protect us from diseases.

9. Do you think gender inequality is a result of malnutrition and food insecurity in the country?

	<i>Number of responses</i>	<i>Percentage of responses</i>
<i>Strongly agree</i>	40	40%
<i>Agree</i>	15	15%
<i>Neutral</i>	30	30%
<i>Disagree</i>	15	15%
<i>Strongly Disagree</i>	0	0%

Table 12. Relationship of Gender Inequality and Malnutrition and Food Security

The above Table 12 describes that the majority have strongly agreed that gender inequality is a result of malnutrition and food insecurity in the country but as a contrast, an equal part of people agreed and disagreed with it. No one strongly disagrees and thirty per cent of the total population was natural about their reaction regarding the question. This defines that the gender inequality in our country is still a major problem and which is caused by food insecurity and malnutrition, but a majority of people do not have any clear idea about it. People have strongly agreed but as a contrast to this, the number of people who agreed and who disagreed to it is the

same. Thousands of people and children die because of this. The people who have neutral reactions probably do not have any clear idea about the malnutrition or they are confused if these things are the only cause which results in gender inequality in a country. The people who have disagreed probably have the very same logic behind their response.

10. Do you think the consumption of fast food due to the industrialisation of the country the main reason behind obesity?

	<i>Number of responses</i>	<i>Percentage of responses</i>
<i>Strongly agree</i>	35	35%
<i>Agree</i>	10	10%
<i>Neutral</i>	30	30%
<i>Disagree</i>	20	20%
<i>Strongly Disagree</i>	5	5%

Table 13. Connection of Consumption of fast food to Obesity

The above Table 13 describes that the majority have strongly agreed that the consumption of fast food due to the industrialisation of the country is the main reason behind obesity. A few people only agree with it. Thirty per cent of people were neutral about their view about this question. A good amount of people disagreed with it and a very little amount of the audience strongly disagreed with it. This suggests that the people who strongly agree with it think that the main reason behind this obesity trend is the tendency of eating fast food. This industrialisation made people lazy and acquired all of their valuable time, the fast-food can easily be consumed at the fat, and cholesterol tends the disease like obesity. The people who disagreed and strongly disagreed probably think this is not the main reason behind but the major factor is something else. The people who were neutral were probably confused or they may think that this is not the one and only main reason behind one of the main reasons behind.

11. Do you think eradicating the issue of food insecurity would lead to the rise in the overall Gross Domestic Product of the country?

	<i>Number of responses</i>	<i>Percentage of responses</i>
<i>Strongly agree</i>	60	60%
<i>Agree</i>	20	20%
<i>Neutral</i>	5	5%
<i>Disagree</i>	15	15%
<i>Strongly Disagree</i>	0	0%

Table 14. Impact of Food Insecurity on GDP

The above Table 14 describes that the majority have strongly agreed that eradicating the issue of food insecurity would lead to the rise in the overall Gross Domestic Product of the country. A majority of people also agree with it. Only five percent of people were neutral about their view about this question. A smaller number of people disagreed with it and no one strongly disagreed with it. This suggests that the people who strongly agree with it think that if the food insecurity can be managed it will help to enhance the overall gross domestic products in the country. The total value of the goods produced a year will be increased because hunger and insufficient nutrition are the main constraints between. The one who was neutral probably does not know the relation between Gross Domestic Product and malnutrition or was clueless about it. The one who disagreed probably has the very same logic behind. They are most likely lacking the overview of the hunger scenario around the country.

12. Do you think that the country of India requires sustainable development to eradicate the problems of food insecurity?

	<i>Number of responses</i>	<i>Percentage of responses</i>
<i>Strongly agree</i>	60	60%
<i>Agree</i>	25	25%
<i>Neutral</i>	5	5%
<i>Disagree</i>	10	10%
<i>Strongly Disagree</i>	0	0%

Table 15. Need of Sustainable Development

The above Table 15 describes that the majority have strongly agreed that the country of India requires sustainable development to eradicate the problems of food insecurity. A large number of people also agreed with it. Only five percent of people were neutral about their response to this question. A very few people disagreed with it and no one strongly disagreed with it. This states that sustainable development is one of the main ways which can control the food insecurity issues. People normally believe that if the growth of sustainable development is enhanced it can secure the availability of the food to each and every individual. The invention of sustainable projects can produce scopes and employment for the citizens of the country. The people who disagreed probably believe that only sustainable development cannot achieve food security, it needs something more. The people who were neutral about their reactions probably beheld the same view regarding the matter or was demented about it.

13. Do you think the problem of obesity is linked with poor quality of food standards?

	<i>Number of responses</i>	<i>Percentage of responses</i>
<i>Strongly agree</i>	20	20%
<i>Agree</i>	40	40%
<i>Neutral</i>	10	10%
<i>Disagree</i>	20	20%
<i>Strongly Disagree</i>	10	10%

Table 16. Connection of Obesity to Poor Quality of Food Standards

The above Table 16 describes that the majority have agreed that the problem of obesity is linked with poor quality of food standards. A majority of the audience have also strongly agreed with it. Where a very few people disagreed with it. The number of people who were neutral about their reaction to this specific topic and the number of people who strongly disagreed it is strikingly the same. But the number of individuals who gave these reactions is very limited. This suggests that people believed that the poor quality of food can cause obesity. The low-cost oils and other ingredients which cause harmful elements like fat, cholesterol is the main source of obesity. The population who were neutral with their reactions, which disagreed and strongly disagreed to it, probably is not aware of these harmful elements of cheap quality foods. Those who gave neutral reactions were probably unbalanced about their view regarding this particular topic. They probably lack information about food quality and the causes of obesity.

14. Do you think that street food in the country of India due to its cheap price has more value than health standards?

	<i>Number of responses</i>	<i>Percentage of responses</i>
<i>Strongly agree</i>	30	30%
<i>Agree</i>	30	30%
<i>Neutral</i>	5	5%
<i>Disagree</i>	35	35%
<i>Strongly Disagree</i>	0	0%

Table 17. Benefits of Street Foods

The above Table 17 states that an equal number of people agree and strongly agree that street food in the country of India due to its cheap price has more value than health standards. a very few were neutral and no one strongly disagreed. But a good amount of people disagreed with it. The mass has a mixed reaction towards this fact where it is true that fast food offers a varied

range of products to the people who belong from a lower economic background. The one who disagreed probably believes that the health standards are at the top of the priority list and the one who was neutral probably was unclear about their statement regarding this.

15. Do you think that the youth of the country suffers the most in terms of obesity?

	<i>Number of responses</i>	<i>Percentage of responses</i>
<i>Strongly agree</i>	35	35%
<i>Agree</i>	10	10%
<i>Neutral</i>	30	30%
<i>Disagree</i>	25	25%
<i>Strongly Disagree</i>	0	0%

Table 18. Impact of Obesity on Youth

The above analysis describes that the majority have strongly agreed that the youth of the country suffers the most in terms of obesity. A few people only agree with it. Thirty per cent of people were neutral about their view about this question. A good amount of people disagreed with it and no one strongly disagreed with it. This narrates that the people who strongly agree with it think that the youth of the country suffers the most in terms of obesity. The youth of this country does not have sufficient time to cook for them; they consume fast food to save time. Unhealthy ingredients naturally cause the chances of having obesity. The people, who disagreed and strongly disagreed probably only youth do not suffer in terms of obesity and it is a disease and people from any age group can suffer from this situation. The people who were neutral probably did not have any clear idea and were confused. They may think the youths are getting affected with obesity, it is true, but not only can the youths be counted in terms of obesity.

16. Do you think due to the faulty management procedure, the population of the country is suffering from food insecurity?

	<i>Number of responses</i>	<i>Percentage of responses</i>
<i>Strongly agree</i>	60	60%
<i>Agree</i>	20	20%
<i>Neutral</i>	5	5%
<i>Disagree</i>	15	15%
<i>Strongly Disagree</i>	0	0%

Table 19. Connection of Faulty Management Procedure and Food Insecurity

The above Table 19 describes that the majority have strongly agreed that due to the faulty management procedure, the population of the country is suffering from food insecurity. A good number of people also agreed with it. Only five per cent of people were neutral about their view of this question. A very few people disagreed with it and no one strongly disagreed with it. This expresses that many people believe that faulty management is the main reason behind the food inequality in the country. The management procedure has contracts like corruption, time management issues, lack of connectivity which results in food scarcity to a group of people of the nation. The people who disagreed probably think that the system and the management is perfect but the problem remains somewhere else. The people who were neutral about their reactions probably behold the same thought about the statement or do not have any valid information about it.

17. Do you think that the Public Distribution System has effectively produced positive outcomes?

	<i>Number of responses</i>	<i>Percentage of responses</i>
<i>Strongly agree</i>	5	5%
<i>Agree</i>	5	5%
<i>Neutral</i>	15	15%
<i>Disagree</i>	50	50%
<i>Strongly Disagree</i>	25	25%

Table 20. Review on Public Distribution System's Measures

The above Table 20 describes that the majority have disagreed that the Public Distribution System has effectively produced positive outcomes. A few strongly disagreed. The people who gave a natural reaction belong from the fifteen per cent of the entire mass. A very little number of people have agreed and strongly agreed with it. The people who have strongly disagreed and disagreed probably thought that if the system was effective enough there would be no food inequality. Those who gave neutral reactions tried to be diplomatic and those who agreed they might think that there are positive outcomes but the problem is something else.

18. Do you think the concept of lack of education and awareness leads to food insecurity?

	<i>Number of responses</i>	<i>Percentage of responses</i>
<i>Strongly agree</i>	20	20%
<i>Agree</i>	40	40%
<i>Neutral</i>	10	10%

<i>Disagree</i>	20	20%
<i>Strongly Disagree</i>	10	10%

Table 21. Impact of Education and Awareness on Food Insecurity

The above Table 21 describes that the majority have agreed that the concept of lack of education and awareness leads to food insecurity. A majority of the audience have also strongly agreed with it. Where a very few people disagreed with it. The number of people who were neutral about their reaction to this specific topic and the number of people who strongly disagreed it is amazingly the same. But the number of individuals who gave these reactions is not much. This describes that the majority believes that the lack of education and awareness is the reason behind food insecurity. The lack of education and awareness about the system and the current scenario does not provide the idea of controlling the issues in a tactful way, to the individuals who suffer from the lack of food. The population who were neutral with their reactions, which disagreed and strongly disagreed to it, probably is not aware of the current illiteracy rate of the country. Those who gave neutral reactions were probably unclear regarding their view and opinion for this particular topic.

19. Do you think the policies of the government like the National Food Security Mission are effective?

	<i>Number of responses</i>	<i>Percentage of responses</i>
<i>Strongly agree</i>	0	0%
<i>Agree</i>	5	5%
<i>Neutral</i>	20	20%
<i>Disagree</i>	50	50%
<i>Strongly Disagree</i>	25	25%

Table 22. Reviews on National Food Security Mission's Measures

The above Table 22 describes that the bulk amount of the mass has disagreed that the policies of the government like the National Food Security Mission are effective. A few strongly disagreed. Twenty percent of people tried to remain neutral about their point of view. A very little amount of people has agreed and no one has strongly agreed with it. The people who have strongly disagreed and disagreed could be able to identify that the result of successful government policy should not lead to a food insecurity scenario. The one who tried to remain neutral and agreed probably does not have any information regarding the drastic food inequality

scenario of the country or they might think the policies are effective, some other factors might be creating issues.

20. Do you think that the lack of intersectional coordination is the main reason behind food insecurity?

	<i>Number of responses</i>	<i>Percentage of responses</i>
<i>Strongly agree</i>	20	20%
<i>Agree</i>	40	40%
<i>Neutral</i>	10	10%
<i>Disagree</i>	20	20%
<i>Strongly Disagree</i>	10	10%

Table 23. Impact of Intersectional Coordination on Food Insecurity

The above Table 23 describes that the majority have agreed that the lack of intersectional coordination is the main reason behind food insecurity. A good number of the audience have also strongly agreed with it. Where a very few people disagreed with it. The number of people who were neutral about their reaction to this specific topic and the number of people who strongly disagreed it is astonishingly the same. But the number of individuals who gave these reactions is only a few. This describes that the mass believes that the lack of intersectional coordination is the main reason behind the food insecurity. A country which is culturally, geographically has a huge diversification within the sections, each and every section should have good communication within. The population who were neutral with their reactions, who disagreed and strongly disagreed to it, probably does not think that this is the main reason. Those who gave neutral reactions was probably confused about their opinion for this specific topic or they may think that this is not the only and one main reason behind but one of the several key reasons. Population of neutral respondents are quite confused at making the right decision on their preferred choice and thus, ending at neutrality by thinking diversely about the relationship of external factors on obesity. Concerning the group of population of respondents who disagree and strongly disagree, they reflected the firm and final decision that external factors do not play any role on obesity and do not affect it in any way.

6 Conclusion

The study attempted in elucidating on the causes and impacts of food security in India. It tried to delve into details of the causes of food insecurity in India and studied undernourishment as one of the primary fallouts of the existing food insecurity in India. It also traced the differences between food security and nutrition security and how the misconceptions about the differences in the two lead to undernourishment right from the birth of a child. The dimensions of food and nutrition security were also discussed. Various governmental policies and acts that were designed to eradicate hunger from the country were discussed in detail in the research. Mediators of food security and obesity were discussed along with discussing the existing challenges involved and associated with it. A successful correlation between food security in India and rising obesity has been drawn in the study.

The study also included various data analysis and details about the larger scope of global and national factors that have affected food security in this country. Graphic details have been provided about various socio-economic factors that are tangible and can be pointed out as factors affecting the food security in India. The study has finally inferred about its findings and how challenging it is to maintain food security in a country like India where there are so many factors that exist as hurdles and loopholes in the process. It also analyses the current situation of Covid 19 and its effect on food security in India.

One of the primary objectives of this research was to elucidate on the differences before and after the implementation of the food security act in India. To establish the differences vividly, the acts implemented by the government were looked into in detail. The causes and fallouts of food insecurity in India were also discussed and elucidated to place the pre and post NFSA situations in context. The second objective of the research was to look into the health hazards resulting from consumption of various foods, keeping obesity as the focus. Researches and surveys have been conducted to identify the current situation of food consumption trends in India and the relationship between poverty; food insecurity and nutritional adequacy have been established. The differences between food and nutritional security have been identified and explained. Also, the results of malnourishment and food insecurity have been called out and addressed in the research. Obesity is one of the new diseases spreading like pandemic in not only developed countries but also developing countries like India. Reasons behind the spread of obesity have been identified in this study and also the newest correlation found between

food insecurity and obesity has been raised here and discussed to a certain extent. The final objective was to place the strategies adopted to build food security in the country under microscope. This study will be helpful in analysing the various strategies of the government to attain food security. To place it in context, the policies and acts have been discussed. The loopholes and the challenges have also been looked into. The reasons behind the failure of certain plans have also been discussed in this study.

After studying the situation of food security before the implementation of NFSA and a few changes that were brought about after the implementation of the Act, there were a few challenges and loopholes that were found in the governmental strategies. Few recommendations for the betterment of the strategies and developing more full proof goal for attaining food security in our country. The greatest strength achieved by the NFSA in India is the self-sufficiency in cereal production and in setting up the Public Distribution System. Essential food grains have been distributed across the country at rates that are subsidised and affordable. This subsidy can only be continued or even lowered if the production of food grains is increased. The more the availability of grains, the more access to food can be provided by the government at subsidised rates for the people of low-income groups. The first recommendation to increase food security in India would thus be to create more availability of agricultural products and food grains. One of the greatest weaknesses identified in the food security system is the faulty distribution channels and mechanisms. The corruption and power politics existing in the distribution system hamper the trickling down of necessary food grains to the people who require them the most. Also, transportation incurs a huge cost in the system and has to be looked into so that maximum food grain is transferred with minimum cost incurred to the places that have urgent requirements. Eradication of corruption and introduction of a clean and transparent system of distribution will ensure better access to food and therefore it will be a boost to the food security system in India. While conducting the study, it was seen that there are very few people implementing scientific ways of producing crops and food grains. Therefore, education and awareness about use of scientific tools can be an important way to increase the availability of crops leading to better food security in the country. But modern tools come with a higher price; therefore, the government needs to look into more investments in the agro-based sector so that these tools can also be available at a lower price than the market. India is more or less self-sufficient in the production of cereals but is lagging behind in the production of oilseeds and pulses. If there are more kinds of crops or if the section of crops is diversified, the total production will increase. Each area can be marked out according to which

crops they produce best and the production can be optimised accordingly. According to Ritchie *et al.* (2018), integrated water management is also an important factor to increase food security in India. The groundwater is depleting at alarming rates and the production of crops per unit land is therefore reducing. Looking into the environmental factors and replenishing groundwater level is an important factor. Irrigation systems should also be better planned than the existing ones (Chakrabarty, 2016). These recommendations have been based on the research conducted in the light of food security in India and the aim is to achieve a better food security chain and move towards eradicating hunger from the country. The government has the most important role to play in achieving the aim and have to overcome the challenges in the existing system. The weaknesses have to be worked on and the opportunities grabbed at the right moment. The threats to the system need to be analysed earlier and dealt with precision. Only then can one achieve a fool proof system.

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8 Appendices

Do you think India has food security?

- Strongly Agree*
- Agree*
- Neutral*
- Disagree*
- Strongly Disagree*

Do you think the aspect of unavailability of food makes an individual susceptible to various diseases?

- Strongly Agree*
- Agree*
- Neutral*
- Disagree*
- Strongly Disagree*

Do you think the Food Security Act implemented by the government of India has addressed the issues of food insecurity?

- Strongly Agree*
- Agree*
- Neutral*
- Disagree*
- Strongly Disagree*

Do you think the internal issues based on the health standards of the population are related to food insecurity?

- Strongly Agree*
- Agree*
- Neutral*
- Disagree*
- Strongly Disagree*

Do you think the major global factors play a vital role for the rise in the food products?

- Strongly Agree*
- Agree*
- Neutral*
- Disagree*
- Strongly Disagree*

Do you think the inflated prices of the food products give rise to malnutrition for the majority of the population in the country?

- Strongly Agree*
- Agree*
- Neutral*
- Disagree*
- Strongly Disagree*

Do you think the pay gap between the rich and the poor is the main reason behind obesity in the country?

- Strongly Agree*
- Agree*
- Neutral*
- Disagree*
- Strongly Disagree*

Do you think the aspect of unavailability of food makes an individual susceptible to various diseases?

- Strongly Agree*

- Agree
- Neutral
- Disagree
- Strongly Disagree

Do you think gender inequality is a result of malnutrition and food insecurity in the country?

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

Do you think the consumption of fast food due to the industrialisation of the country the main reason behind obesity?

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

Do you think eradicating the issue of food insecurity would lead to the rise in the overall Gross Domestic Product of the country?

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

Do you think that the country of India requires sustainable development to eradicate the problems of food insecurity?

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

Do you think the problem of obesity is linked with poor quality of food standards?

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

Do you think that street food in the country of India due to its cheap price has more value than health standards?

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

Do you think that the youth of the country suffers the most in terms of obesity?

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

Do you think due to the faulty management procedure, the population of the country is suffering from food insecurity?

- *Strongly Agree*
- *Agree*
- *Neutral*
- *Disagree*
- *Strongly Disagree*

Do you think that the Public Distribution System has effectively produced positive outcomes?

- *Strongly Agree*
- *Agree*
- *Neutral*
- *Disagree*
- *Strongly Disagree*

Do you think the concept of lack of education and awareness leads to food insecurity?

- *Strongly Agree*
- *Agree*
- *Neutral*
- *Disagree*
- *Strongly Disagree*

Do you think the policies of the government like the National Food Security Mission are effective?

- *Strongly Agree*
- *Agree*
- *Neutral*
- *Disagree*
- *Strongly Disagree*

Do you think that the lack of intersectional coordination is the main reason behind food insecurity?

- *Strongly Agree*
- *Agree*
- *Neutral*
- *Disagree*
- *Strongly Disagree*