CHAPTER: II

REVIEW OF LITERATURE

To justify the need of the study, it is essential to do review of literature. To keep in mind the objectives specified for the present study, a review of relevant studies was carried out. The current chapter includes the review of important studies pertaining to food security and agriculture.

Shangri & Gupta (1978)\(^1\) analyzed the growth of agricultural output and the factors affecting it in Haryana state during 1952-53 to 1974-75. Haryana which was part of Punjab before 1966 and this region was relatively backward compared to other parts of Punjab. After creation as a different state Haryana recorded a good growth rate in agriculture sector. The study found that during 1952-53 to 1974-75, crop output in Haryana showed a compound rate of growth of 4.5 per cent per annum. Of this, about 31 per cent growth was because of an increase in area, whereas the rest was on account of productivity increase. The rate of growth in crop output for post HYV period i.e., between 1963-66 and 1971-74, was more than double the rate of growth for the pre-HYV period, 1953-56 to 1963-66. To find the impact of different factor on crop productivity, Cobb Douglas type of production function fitted and found irrigation is the most important factor in increasing agricultural production.

Sen (1981)\(^2\) discussed the recommendations of World Food Conference (1974), FAO committee on World Security (1978) and Brandt Commission (1980) to eliminate the acute hunger from the world. He suggested that there is need to special focus on absolute poor, because cause of hunger is not necessarily lack of food in the shops, but lack of purchasing power. So, it is not enough to have food security agencies at the international and national levels. There is need for food security agencies, and a minimum food stock, at the local or community level where bulk of the vulnerable poor people live and work. Special financial and other assistance needs to be provided to the small farmers to adopt capital cum Labour intensive technology in farms and making them market oriented, industry linked and science based. This would leads to modernization and increase of productivity both per acre and per person and augment employment.
as well as purchasing power and will eradicate absolute poverty and hunger on sustainable basis.

Acharya (1983)\(^3\) explains food security means not only availability of food for direct consumption but has other implication as well. Availability of food grains will have little relevance if people do not possess purchasing power to buy them for their consumption. This compulsion costs a responsibility on the government to devise ways and means by which, in the first instance, food is available within the country and, in the second, people have the means to buy it. As Indian agriculture depends on the vagaries of monsoon, famines and scarcities have been a feature of our past Indian civilization. But such shortages and scarcities have been managed effectively through a policy mix of ensuring food supply from buffer stocks and through imports.

Sharma and Varant (1990)\(^4\) have done detailed analysis of food grain production, agriculture performance and its implication on poverty alleviation and development of the economy. The study examined the food grain and poverty data from 1949-50 to 1983-84. Study also project future demand and supply of food grains by analyzing the past growth and performance in foodgrain production as well as developments in the growth and patterns of food grains consumption. The study found that in future India will remain self sufficient in food grain production. But the rapid growth in foodgrain production would be necessary to accelerate economic growth and reduce rural poverty. They also highlighted the role of diversification of agriculture and importance of major inputs like, irrigation, High Yielding Varieties of food crops, fertilizer, etc. in foodgrain production.

Singh and Singh (1991)\(^5\) examined the change in area under different crops in Haryana from 1966-67 to 1988-89. The result indicated that area under rice and wheat increased at the rate of 9.28 and 6.34 per cent per annum respectively during the period. The area under coarse cereals like jawar, bajra, maize and barely and the area under important pulses however declined during the same period. Area under rapeseed and mustard and sesame increased by 4.07 and 12.02 percent per annum respectively and area under groundnut and sugar cane has showed decreasing trends.
**Bhalla (1994)** projected demand under alternative scenarios. This study identified that the growing demand for livestock products with income growth would drive the future demand for cereals primarily as livestock feed, which in turn would result in a rapid increase in future demand for food-grains. To project the expenditure elasticities to 2020, the authors used their best guesses along with the assumption of a continuing decline in the elasticities of cereals but increasing elasticities for livestock products. The supply predictions are made based on after deducting SFW (almost 7.5 percent of output) with a 2.7 percent past growth-rate trend extrapolated. Also, they conducted simulations using alternative scenarios of expanding irrigation and fertilizer use and other technological changes.

**Maxwell (1995)** reviewed the various conceptually and methodological literature on food security risks and discussed the shortcoming of various method in mapping the food insecurity at household level. The author developed a composite index to measure food insecurity based on the coping strategies adopted by the head of household in situation of distress. Eat less preferred food, limiting portion size, borrowing food or money to buy food, maternal buffering, and skipping meal were major coping strategies adopted by households. Study carried out two round of survey of coping strategy of household to capture the seasonal variation in food security. One survey carried out during that part of year when food is easily available and prices were low and second was carried out when relative availability of food is difficult. A simple scale of 1-4 was developed for the frequency of each individual strategy, and multiplied by the weighting factor based on ordinal ranking assigned by focus groups. A discrete score for each strategy was obtained, which added together made up a cumulative food security score or index. The score of this index can be used both for comparison of food insecurity among different groups or also as one of component in estimation of nutrition status among targeted group. Index developed by this study was simple, cost efficient compare to other methods, study the difference between of seasonal variation and income in determining food insecurity; but this also not free from some shortcomings like it was based on subjective judgment of food sufficiency,
does not addressed the minimum basic need, only gave result for present food insecurity could not determine predictive value for future etc.

Pandey and Sharma (1995) studied the relationship between crop diversification and food grain self-sufficiency. Comparison of growth ratio between two periods, 1967-81 and 1981-85 showed that there was an increase in the area under food grains during the first period with respect to total cropped area, but this pattern changed during the second period which recorded a small increase in the area under food grains, along with a substantial growth in the area under non food grains. To study the changes in diversification over the time liner trend equation was estimated. The results shows that crop diversification have not any conflict with self-sufficiency in food grains.

Dresrusse (1996) was in a firm belief that food security could be measured through traditional demand and supply equations. He considered population growth; per capita food consumption and income elasticity in demand equation and on supply side, access to land, yield and marketing cost were the main component affecting the food security. He suggested that agricultural research should be given top priority to achieve food security.

Bhalla and Hazell (1997) projected feed and food demand for food-grains for India to 2020 using log inverse Engel functions (estimated across class-wise data for different commodity groups for both rural and urban areas) based on NSS data for 1987-1988 (43rd Round) for different scenarios of growth of per capita income and three alternative assumptions on feed coefficients (prevailing in India, China, and Indonesia as specified in the IMPACT model). Consumer expenditure elasticities were calculated from 43rd Round (1987-1988) NSS for rural and urban India separately.

George (1998) while evaluating the food security situation in India analyzed the availability and consumption of food and nutrition status of Indian population. He found that about half of the rural consumers and about two third of urban consumers had nutritionally inadequate food consumption and suggested that economic access to food could be achieved through a mix of employment and income policies for farm sector. He reiterated that no strategy can be successful in reducing poverty and achieving food security, until it is based on agricultural development.
Kumar (1998) projected total demand (food or feed) for food grains using food characteristic demand system (FCDS) and used integrated dynamic model for supply projection. Food demand is estimated for 2010 and 2020 under alternative GDP growth scenario (4.5 and 7 per cent) and assumption of population growth rate, urbanization rate and income distribution using 1987-88 as the base year. To incorporate the structural shift in household consumption pattern, this study used two national cross-sectional household survey taken several year apart.* for the supply side analysis, an integrated dynamic supply model was used to project the supply of cereal under different scenario of TFP growth. Long run supply elasticities estimated within the supply response system were used for supply prediction of cereal under assumption of constant growth and decelerating growth in TFP.

Mohnty et al (1998) provides the food grain projection of India from 1993-2015. Demand projection had been made by using income elasticity approach. NSSO’s 1993-94 consumer expenditure data were used to estimate Engel curve and elasticities of demand separately for urban and rural and five differentiated group within a region. By using semi-log, log-log inverse, and log-quadratic functional form study projected that per capita wheat consumption would be increase throughout the period due to income growth and urbanization. Unlike wheat, per capita rice consumption is likely to increase for the next few years but then declines as incomes rise. For other grains such as corn and sorghum, total demand increases because of higher feed use.

Production is estimated by estimating area and yield based on data of Agriculture Statistics at glance, GOI. Area is allocated among various crops according to the returns for own and substitutes and considering total physical land availability and cropping intensity and expected, total physical land will remain more or less flat in the next two decades. But net cropped area is projected to increase through higher cropping intensity. More than 70 percent of additional area is likely to switch to horticultural and permanent crops. A comparison of production and consumption of grain indicates that Indian wheat consumption is likely to exceed production. India is also likely to be an importer of corn over the longer run. Unlike wheat and corn production, Indian
rice production exceeds consumption throughout the period. Overall, India is expected to be self-sufficient in cereals until the beginning of the next century, but then cereal consumption exceeds production, making India a significant net importer of cereals, particularly wheat and corn.

**Bhalla, Hazell, and Kerr (1999)** used a log inverse expenditure function based on 50th NSS data (1993) to project demand under alternative scenarios. This study identified that the growing demand for livestock products with income growth would drive the future demand for cereals primarily as livestock feed, which in turn would result in a rapid increase in future demand for food-grains. To project the expenditure elasticities to 2020, the authors used their *best guesses* along with the assumption of a continuing decline in the elasticities of cereals but increasing elasticities for livestock products. The supply predictions are made based on after deducting SFW (almost 7.5 percent of output) with a 2.7 percent past growth-rate trend extrapolated. Also, they conducted simulations using alternative scenarios of expanding irrigation and fertilizer use and other technological changes.

**Tweeten (1999)** outlines that food security traces its genesis from poverty and it must be addressed by economic development. He presented a standard model for economic development. Food-insecure countries do not follow the standard model; their policies for agriculture and other sectors deter development. Political and institution failure are the major reason of prevailing food insecurity in these nations. It is challenge for economists to works towards socio-institutional changes essential for proven policies and practices to supply adequate diets.

**Vyas (2000)** make an opinion that though the concept of food security acquires interpreted in variety of ways but it realizes its meaning when it connotes with nutritional security at the household level. He stressed that recognizing the roles played by the State, market and civil society and also making them complementary to one another would ensure food security.

**Scanlan (2001)** examined neo-Malthusian and techno-ecological determinants of food security in lesser-industrialized societies between 1970 and 1990 using an OLS regression of food security change. Findings of the study reveals that population pressure and over urbanization concerns are
indeed valid for food availability, having negative implications, while adaptive measures such as the application of fertilizer technologies, land-use intensification, infrastructural development, and the internationalization of food markets help balance these negative effects. However, findings are less conclusive for food access, indicating that improvement in availability does not necessarily translate into meeting distribution needs.

Goyal and Singh (2002)\(^{18}\) in their study addressed the three issue namely: (1) the food supply and trend for future, (2) shift in food consumption pattern over the year, (3) the food demand projection for the three decades in the context of Food Security. To project future food grain supply, growth trend in production prevailing during 1990-91 to 1998-99 had been explored and expected food grain supply about 245, 291, and 342 million tons by 2010, 2020 and 2030AD respectively. The study analyzed shift in consumption pattern and future demand for rural and urban area separately. The study project future food grain demand by considering factor like population growth, growth in per capita income, urbanization and consumption behavior and assumed that growth in population will decline by 0.05 per cent year in future and urbanization will increase by 0.3 percent per annum. Study based on these assumptions reached to conclusion that in absence of favorable growth factors, the food supply to match the demand in future may be a matter of great concern for food security and to meet the demand the increased production will have to be brought through increase productivity as the possibility of area expansion is very minimal.

Mahendera Dev (2003)\(^{19}\) works on the possibility of right to food in India in terms of availability, accessibility, adequacy and sustainability by analyzing the data of NSSO consumer survey, economic survey and various welfare program which support right to food. He concluded that availability is not a problem in case of India to provide right to food but on accessibility front right to employment is crucial for achieving right to food and argued that Government can facilitate labour intensive growth and provide direct programs to generate productive employment which in turn can ensure right to food.

Gandhi, Zhou and Mullen (2004)\(^{20}\) in their study examined the characteristic of Indian wheat economy addressed question on the nature of
production and consumption, demand and prospect of future growth as after rice wheat is the main component of Indian food security. By using time series data since 1950-51 authors analyzed production behavior by estimating Cobb-Douglas form of production function and found that irrigation, HYV yield area were statistically significant in productivity of wheat and effect of fertilizer on raising yield was statistically non significant. Consumption analysis of wheat is based on NSSO survey indicates, given the population growth rate, estimated income elasticity of demand with past growth rates Wheat demand will go 4 percent in near future. The study shows that wheat production was driven predominantly by yield increase and to some extent by a shift in the area from other crops. Future growth would likely to be constrained on both counts. A demand gap would emerge in the future depending on the income and population growth, posing a challenge to India’s Food economy.

Ray (2004) conducted a study of agriculture policy in India. He found both positive and negative of policy intervention in development process of agriculture. The policy intervention made India largest producer of wheat and rice and solved countries food security problem. But the policy interventions in the development process also contributed substantially to negative environmental and other effects of agriculture. The stress on large irrigation projects for fast agriculture growth and the haste in attaining food security in the closed economy with emphasis on growing rice and wheat (through protection of output and input prices) have contributed to problems of water logging and salinity and also the mono cropping of rice and wheat. Large input subsidies had impacted the soil health and power subsidies had created stress on underground water resources. On the food security front despite the food sufficiency at national level, household are far from achieving the food security. Food subsidy programmes aimed at poor consumers have failed to achieve their goals. India is currently facing a paradoxical situation of huge food grains surplus accumulated as stocks alongside a significant incidence of chronic malnutrition. After studying the agriculture policy of India, the study suggests that agriculture’s role in reducing food insecurity can be strengthened by reorienting agricultural policies. Policies should enhance the positive externalities from agriculture include restructuring of agricultural research to
address the problems of the poor and disadvantaged areas, rationalization of input pricing and development of decentralized institutions.

Singh and Kaur (2004)\textsuperscript{22} have examined important indicators of economic development in Haryana along with agriculture sector. The study analyses development of agriculture in Haryana on the basis of various output and input indicators such as crop pattern, irrigation, use of modern technology, etc. Growth of agriculture in the state shows remarkable trend, but majorly concentrated on rice and wheat production. The large accumulation of rice and wheat stocks, along with distinct shift in the consumption pattern away from cereals to non-cereals; makes a case that policy focus needs to be reoriented towards the growth of non-cereal crops, i.e. oil seeds, pulses, fruits, vegetables and dairying. To promote diversification there is need to develop a rural infrastructure, i.e. transportation, rural roads, improved and reliable power supply, watershed management, cold storage and institutional support by providing new market facilities. Agricultural research and extension should be promoted. Emphasis on minimum price support which has benefited only rice and wheat at the cost of other crops and agricultural products requires a re-examination of policy so that crop diversification gains momentum.

Timmer (2004)\textsuperscript{23} studied the food economies of east and south Asia. Food security and economic growth are mutually reinforcing process; but in case of these economies public provision of food security deviates from its role economic stimulus to a political response because of rapid structural transformation. This phenomenon affecting the economic efficiency of these economies as their food security largely based on strategy of food price stabilization a key element of “support led security”. Study suggest that there is need to make growth process “pro-poor”; government must provide support to rural economy as most of change in agriculture productivity came from public investment not from price policy. This study provide a linkage between economic growth and establish a scope of further research how economic growth and food security affected each other in case of India and other developing nations.

Chakavarty and Dand (2005)\textsuperscript{24} explored the problem of food insecurity prevailed in India. The study used several data sources and analyzed various
scholarly works available on this topic to study the food insecurity in rural and urban India, and among tribal and other vulnerable sections. The study found that main cause of food insecurity in India is lowering down of purchasing power among poor and breakdown of public distribution system in most region of the country. The author emphasized self sustain of growth with redistributive policy to alleviate poverty and promote food security among insecure.

Khatkar and Singh (2006) to find out the relation between consumption and production in arid region of Haryana and Rajasthan studied two selected districts from each state. Study based on the data collected from two categories of farm i.e. irrigated and non-irrigated farms. It is found that consumption of cereals in both the categories farms is less than the recommended level, viz., 520 gm/per capita/day but it is more than the national availability of 428 gm/per capita/day. The consumption of cereals in non-irrigated farms is more than the irrigated farms, which represents the prosperity because income and consumption of cereals have negative relationship. The per capita consumption of pulses in both types of farms is less than the recommended quantity. It does not show any relationship with irrigation. The consumption of coarse cereals and pulses was found to be higher on non-irrigated farms owing to more production of these commodities on such farms and that of fine cereals. The lower consumption of coarse cereals and pulses in these arid areas shows nutritive imbalance in the diet as these crops are majorly grown in the arid regions. Keeping lower productivity of major crops in the study areas, there is a need to improve the productivity through suitable technology development and gearing up the extension activities for meeting the food security

Mittal (2006) used the data from the consumer expenditure survey of NSSO to estimates the demand elasticities, which subsequently helped in making projection for 2010, 2015 and 2020 under alternative assumptions of income growth. The study used two stage budgeting framework to model the consumption behavior of household using Quadratic almost Ideal system (QUAIDS) model. To arrive at total demand of food grains, the study made use of food elasticities of Kumar (1998).
Mohan (2006) reviewed the agriculture credit in India since 1947 and present future agenda. Study observed that though the overall flow of institutional credit has increased over the years, there are several gaps in the system like inadequate provision of credit to small and marginal farmers, paucity of medium and long-term lending and limited deposit mobilization and heavy dependence on borrowed funds by major agricultural credit purveyors. With the changing in consumption and dietary pattern of country the study called for diversification in agriculture, which requires strong and viable agricultural financial institutions are needed to cater to the requirements of finance for building the necessary institutional and marketing infrastructure.

Chand (2007) estimated demand for agricultural products in India and projected demand for food-grains toward the end of the 11th Five-Year Plan (2007-12) and by the year 2020-21. An estimate of direct demand was obtained from various rounds of the NSS. However, no estimates are available for indirect demand. The study uses the income elasticities based on the FCDS estimated by Kumar (1998) to incorporate the income effect. To estimate the indirect demand for food, the study used a five-year average, ending with quinquennium rounds of the NSS, beginning with the year 1987-88.

Goyal et. al. (2006) estimates the technical efficiency of paddy farmers in Haryana by taking panel data from 1996-97 to 1998-99. The result of study showed the declining trend over the time. Thus the study found a scope to improve the productivity of the crop with given level of input use and technology. Improvement in efficiency significantly helps the farmer in terms of higher profits. Study also found that inefficiency in production is also related to age of farmer and year of observation.

Mittal (2008) extended the result of 2006 to include projection on demand and supply of sugar and oilseeds in addition to food grains and cereals. Although many of studies had projected future demand for food grains, this study was one of the few studies to project future demand for edible oil seed and sugar and sugarcane under different scenario for 2011, 2021 and 2026. Projection of food demand were based on assumption about the base year (1999-2000) demand and expenditure elasticities from Mittal (2006).

Shergill (2008) in this study reviewed situation of India’s food
economy from the time of independence and tried to show significance of Haryana-Punjab region as food provider of Indian economy. In 2007 government of India launched National food Security Mission to raise the production of wheat, rice and pulses in low productivity area by inflowing large chunk of money. In this study author showed with the help of trend coefficient by running regression from period 1996-1997 to 2005-06 and found that high hopes of meeting the emerging food shortage through production in low productivity states are bound to be disappointment. The food security of India will remain dependent on the traditional surplus grain producing state Punjab and Haryana. Study presented the case improving the productivity of wheat and paddy cultivation in Haryana-Punjab region and making it sustainable.

Herrmann (2009) while analyzing the effect of high commodity prices argued that, food security is both a demand-side and the supply-side challenge. High food prices make it more difficult to address food security on the demand-side, as more and more low-income households become unable to afford sufficient food, but at the same time, higher food prices can provide impetus to address food security on the supply-side, as more and more farmers may find it lucrative to increase agricultural production. But the in his paper argues that higher international food prices will not automatically result in an increase of agricultural output. This reaction depends upon two factors, namely: (i) the pass-through of international commodity price changes to the farm gate; and (ii) the farmers’ capacity to raise production in response. In many developing countries, especially low-income countries, the pass-through to farm gates and the productive capacities of farmers, is insufficient. The Countries that do not have potential in agriculture will need to address food insecurity through the development of non-agricultural sectors, which generate more, and more productive and remunerative jobs, particularly for low-income households. So in his study he make a case that, efforts to promote food security must distinguish between short-term and medium-term measures, but also between countries with agricultural potential and without such potential.

Mellor et al. (2009) in his Allama Iqubal Memorial lecture focus on the theme that path of food security leads from agriculture production. He
quoted number of studies to establish relationship that increased agriculture production increased income: which reduced the poverty and leads to food security.

Parduamn et al (2009)\textsuperscript{34} estimated the food grain (rice, wheat, coarse cereal and pulses) demand for India for the years 2011-12, 2016-17 and 2021-22 using demand elasticities estimated from the household expenditure data from various round of NSSO. Consumption pattern differ across income lifestyle and region. To capture this difference study grouped household unit level data two lifestyles (rural and urban), six regions (eastern, western, northern, southern, north-eastern, and northern-hills), and 4 expenditure (income) groups based on expenditure classes of NSSO. Demand elasticities were estimated by Food characteristic demand system (FCDS). Disaggregated demand elasticities were estimated and then added up estimate is used to obtain national level estimates. Income growth is the one of the factor which affects the demand pattern. Study used growth rates in per capita income obtained by subtracting population growth rate from economic growth and were used in predicting the per capita consumption. Estimated per capita consumption was multiplied by population, and aggregated by regions, income groups and lifestyles to obtain the total demand. Assuming Indian economy will grow at the rate of 9percent during the study period direct household demand and indirect demand (seed, feed, wastage and other uses, home away demand) is estimated to get total demand of food grains. The total demand for food-grains had been projected to be 227.1Mt in 2011-12, 241.7Mt by the end of 2016-17 and would rise to 253.2 Mt by 2012-22the. To meet the future demand the required level of yield target are estimated as the expansion of area is not possible. To meet the future demand the yield of crops should be raised.

R.B. Singh (2009)\textsuperscript{35} to study the environmental consequences of agriculture development; he conducted a study on Haryana, which is one leading state on agriculture front. He found that state had made much progress in agricultural productivity during green revolution period, but at the cost of land and water degradation.

Sinha (2009)\textsuperscript{36} evaluated the current crisis and challenges of agriculture, which is backbone of food security in India. Increasing food availability is
essential ensuring food security but stagnation in productivity, less availability of land creating threat of physical availability of food in future, where as increasing population, urbanization and increase income due to economic growth would increase future food demand and put extra pressure on agriculture. The author analyzed the growth rate of agriculture and non agriculture and production of various crops and found that performance of agriculture is not satisfactory. Performance of agriculture played a key role in the progress of the economy in achieving the development goals of eradicating poverty, faster and sustainable growth and modernization of society. Agriculture is an essential sector for over all development of Indian economy. Author suggested different measure like increase in education so that farmer can adopt more technological innovation would enhance productivity, more targeted and social security programs for farmer, focus on dry areas and nutrient and water management with more ecological balance will boost agriculture performance and ensure food security.

Dev & Rao (2010)\textsuperscript{37} evaluated the effectiveness of agriculture price policy in helping farmers get sufficient profits to promote investment, technology and productivity, thereby to the food security of the country. To analyze this they consider the time period from 1981 to 2007-08 for wheat and rice and calculated trends in movement of costs, prices and returns to find the profitability of these two most cultivated crops. The study found that agriculture price policy has been largely successful in achieving its objective and there is need to give higher emphasis on non-price interventions through public investments to supplement price policy measures. They can help in increasing yields; reduce the exclusive reliance on prices for farm profitability and food security.

Kaur and Goel, (2010)\textsuperscript{38} made an attempt to explore the extent and determinants of crop diversification across different farm size categories in Punjab based on the primary data collected from 180 farmers belonging to different farm size categories spread over three agro-climatic zones of the State. The study confirmed the existence of paddy-wheat monoculture on the farms. The variations in the cropping pattern and concentration of paddy and wheat crops also varied across different farm size categories. The overall
diversification index for the State was 0.72. However, there was no clear trend in the extent of crop diversification across different farm size categories. The highest level of education in a farm family significantly and positively affected the extent of crop diversification. The operational area was found non-significant. The extent of crop diversification was positively and significantly influenced by the income from dairying and cropping intensity.

Kaur & Goel (2011) highlighted the strategic role played by the Punjab state in national food security through its major share in the production of rice and wheat. However, in the long run, it is resulted in continuous monoculture and exhaustion of natural resources. This calls for diversification of agriculture to sustain the ecological balance. This situation faces tradeoff sustainable agriculture and national food security. The study concluded that keeping in view the food security status in the country; it is difficult to support diversification to a considerable extent.

Nathalie Pons, (2011) examined the impact of increase in food prices on the household's welfare in India from the NSS Survey "Consumer Expenditure" (Round 61st). It attempts to understand which households are more vulnerable to rising food prices. Demand reactions and elasticities are computed from the Almost Ideal Demand System. The effect is computed assuming that the other important parameters have not changed. The study showed that there are different impacts of food prices on different categories of households. Rural households are more vulnerable than urban households. The impact of prices also depends upon the commodity which price has increased. An increase in cereal prices affects more the households than the same increase in fruit price.

Ramsunder and Jaydeb (2011) analyzed that increasing population, environment pollution, water scarcity, commercialization of agriculture, Industrialization are some reasons of current food crisis in India. Author examined food policies of GOI and suggested remedial measure to provide sustainable food security which ensures enough food for everyone at present and ability to provide enough food in future. Study left the scope of further empirical investigation to find sustainability of food security in future by projecting future demand and supply of food grains.
V. Goel (2011) based upon both primary data obtained from farmers and secondary data from government publications, examines the country’s food security status, role of domestic food production to enhance national food security, and its impact upon the agricultural sector in the surplus agrarian region state of Punjab. Research indicates that the poverty level continues to be high and it varies across regions. The Public Distribution System constitutes a key element of food security in the country. The PDS rely upon internal procurement of wheat and rice from the surplus regions. The state of Punjab has emerged a major contributor for both these crops. As this has heavily tilted the cropping patterns toward these crops, farmers have come to face several environmental problems, particularly that of water depletion. Due to low socioeconomic profiles and the lack of adequate market infrastructure, farmers are unable to make large-scale shifts in their cropping patterns. Thus it has endangered farmers’ own food security and country as well.

Gardner (2012) reviews the existing literature to find out the cause of persistent food insecurity in India. The study evaluated historical, economical and political factor that have contributed in perpetuate food insecurity in India. The green revolution, liberalization and safety nets programmes developed over the time period positively impact the food insecurity and poverty. But India still is the home of large number of food insecure. Therefore the study suggests there are need of new programs and policy efforts; more pro poor and pro food-insecure.

Goel & Sunaina (2012) analyzed the current situation of agriculture through compound annual growth rate which has important implications on food security of the nation. The study shows that agriculture has reached to a stagnant phase and increase in agriculture production is not possible through area expansion. Production can be enhanced only through increase in productivity. These trends call for sincere efforts to raise the productivity which requires investment, research and development activity, but the investment and capital formation in agriculture is showing declining trend. The growth of agriculture is required not only to ensure macro level food security of country in future but also for livelihood security more than 50 percent of population working in agriculture and to maintain the stability in food prices,
contributing to nutrient requirements also. The emerging trend calls for redoubling our efforts to increase agriculture growth and effort towards second green revolution which should be sustainable in nature.

Gulati et al. (2012)\textsuperscript{45} tried to find out the interplay between agricultural performance and malnutrition indicators, by analyzing whether states that perform better in agriculture record better nutritional outcomes. Correlation analysis and a simple linear regression model were used to study the relationship between agricultural performance and malnutrition among children under 5 years of age and adults from 15 to 49 years of age at 20 major states using data from the National Family Health Survey-3 for the year 2005-06 and the national accounts. Result of the study shows that agricultural performance or income has a strong and significant negative relationship with indices of under-nutrition among adults and children, a result suggesting that improvement of agricultural productivity can be a powerful tool to reduce under-nutrition across the vast majority of the population.

Sinha & Kulshreshta (2012)\textsuperscript{46} study the food security in state of Rajasthan in terms of availability of two important crops; wheat and pearl millet from desert and non desert area. These two crops contribute the 50 per cent of cereal consumption of state. Using panel data from 1981 to 2007 study tried to find out the factor affecting these two crops with the help of random effect model. The result of the study showed that Gross Cropped Area and energized well are significant in pearl millet production while rainfall, fertilizer consumption, cropping intensity, gross irrigated area and energized well, has statistically significant role in production of wheat. Desert effects the production of pearl millets positively while wheat is affected negatively.

Gulati & Saini (2013)\textsuperscript{47} tried to find out the factor that could explain the food inflation in India. The study covered the time period from 1995-96 to 2012. The study took 1995-96 as the starting point as major changes in agri-trade policies were ushered in at that time, which paved the way for gradual integration of Indian agriculture with global markets. Based on the empirical results of the econometric analysis, it was found that large fiscal deficit, the rising farm wages, mechanization of farms, large fund as MNREGA payments and world rising price pressure contributed to food inflation in India. To tame
the food inflation the study suggests that to bridge the fiscal deficit direct cash payment of subsidy should be implemented. There is need to boost the supply response in agriculture and save on large wastages in the supply chains. This would require large investments in the whole supply chains, from agri-R&D to get high quality and high yielding seeds, to investments in irrigation. Private sector investments should be encouraged.

**Swaminathan & Bhavani (2013)** examined his study food production situation in India as food production is base of food security. India is the third largest producer of food grain, first larger producer of milk and second largest producer of inland fisheries. Between 1950-51 and 2006-2007, production of food-grains (comprises production of rice, wheat, coarse cereals and pulses) in the country increased at an average annual rate of 2.5 per cent compared to the growth of population, which averaged 2.1 per cent during this period making country food secure. Now there is no scope of increase in agriculture area and productivity is also showing declining trend and population pressure is continuously increasing the study suggested integrated crop livestock/fisheries farming system to ensure sustainable food security in future. To increase production and productivity study said there is need to bring evergreen revolution and there is need to mainstreaming the nutrition dimension in agriculture development.

**Goel, M.M. (2014)** observed that the alarming position of India in terms of 66th rank in Global Hunger Index (GHI) 2008 with 23.7 score in 100-point scale needs serious introspection by all the stakeholders including the Government. He noted that food in India is politics and not economics. A pragmatic approach is required for inclusive growth. To increase production and productivity of agriculture there is need of timely availability of fertilizers, credit, water, seeds, contract farming, organic farming, green house sheds, integrated pest management, organized retail chains for farmers, cash subsidy under self-help group strategy, crop insurance, rural industrialization (agro based) and above all good governance.

**Goel & Sunaina (2014)** analyzed the situation of agriculture credit in India, in pre and post reform period. A big challenge for sustaining food self-sufficiency is raising production which, given that available land is fixed, has
to come from improved productivity. So agriculture credit is play important role to boost investment in agriculture and raise productivity. The study found that agricultural credit flow has increased both in pre and post reform era, but the easy and adequate access to credit is not up to the needs and requirements of the farming community in spite of the conscious efforts of institutionalization of agriculture finance. SCBs have major share in credit expansion story of India, where as the share of co-operatives is declining and RRB’s share remain stagnant. This declining trend for the RRBs and co-operatives is a reason of concern for our agricultural credit delivery system. The co-operatives have a great potential not only enhancing credit facilities to the poor, but also distributing agriculture inputs at village level. So the study suggests that need of the hour is to revitalize the co-operative credit in India. There is need to liberalize RRBs from the clutches of their sponsoring banks and provide with the long-pending financial and administrative autonomy. It is recommended that the government enhance and simplify the agricultural credit disbursement particularly to marginal and small farmers. To reduce the risks in agriculture sector, crop insurance, scheme like Kisan credit Card must be strengthened.

Sihmar (2014)\textsuperscript{51} tried to find out the instability in agriculture production in Haryana. The study measured the agricultural instability with cuddy Della Vella Index of twelve major districts of Haryana; started from the period of 1980-81. The study found that crops like rice and wheat and rice shows satisfactory performance over the years. On the other hand the crops like gram, massar, maize, sesamum, ground nuts etc registering the negative growth rates. The instability is low and declined over the period for the crops of rice and paddy: but trend of instability is very high in case of pulses and coarse grain. The major reason of the instability in the production of these crops is that area under the production of these crops is shifted towards the rice and wheat.

It has been reveled from the above research studies that there is a continuous need of studying the various issues related with food security and agriculture which justifies the need of our study.
References:


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