ABSTRACT

Although, food is one of the basic human needs and it is indispensable for survival of life, millions of people all over the world do not have enough to eat and are suffering from the problems of under nutrition and malnutrition. Roughly, 800 million people remain seriously malnourished including 240 million children in the world. The daily diet of these chronically hungry people lacks an average intake shortage of 100-400 kilo calories diminishing their ability to lead an active life. Out of the total malnourished/undernourished people of the world, nearly 87 percent of them are found in developing countries and remaining 13 per cent in the developed world. Thus, the problem of hunger is more severe in the poor developing countries because hunger and poverty both are cause and effect of each other.

Hunger and starvation have adverse effects on human health and efficiency. Hunger causes illness and death, robs people of their potentials to work and cripples children’s learning capacity and growth as normal adults. It traps individuals in a vicious cycle of poor health that passes from one generation to the next. The damage caused by chronic undernourishment begins at early age and follows people throughout life.

Thus, hunger not only cuts short the lives of individuals but also damages the peace and prosperity of the nations. As the human development itself gets impaired the country faces a staggering loss in terms of productivity, disease and disability. As an off shoot of chronic hunger the nation faces enhanced conflict and social unrest often accompanied by blatant misuse of fragile natural resources.

Over a period of fifty years, the Indian agriculture made a spectacular progress in raising production and the country achieved food security at national level. Now India is the leading producer of vegetables and fruits in addition to cereals and food products. This ensures availability of foodgrains of 181 kg. per capita per annum. However, the country has not achieved food security at regional, household and individual levels. It is a paradoxical situation that there is sufficient food production in the country capable of
feeding its entire population, still a large proportion of the Indian population goes hungry to bed without two square meals a day in different parts of the country in varying proportions. The main reasons of chronic food insecurity in the country appears to be had lack of purchasing power, poverty, unemployment and in-access to productive resources. India is still home to the largest number of poor in the world with nearly 26 per cent of its total population living below poverty line. It accounts for one fifth of the world’s poor (260 millions).

Since, nineties average annual growth of food grains in India for example has been 1.73 per cent compared to annual average population growth of 1.85 percent leading to a problem of food crises in future.

Thus, achieving food security will be the greatest challenge for the country in the new millennium owing to declining trend of food grain production in last decade and projected to further drop. The food demand is projected to grow at 4 to 5 per cent for milk products, fruits, vegetables, sugar and raw sugar, 3 to 4 per cent for edible oils and pulses, 2.0 to 2.2 per cent for cereals –2.2 during 2000-10 and 2.0 during 2010-20.

In the background of above facts the present study assumes immense significance in the North Bihar Plain which is one of the backward regions of India where late adoption of modern agricultural inputs and lack of employment in secondary and tertiary sectors of economy has caused low purchasing power among sizable population living in rural areas.

The North Bihar Plain has a predominantly rural and agrarian economy. About 92.71 per cent population of the region lives in rural areas and 80 per cent of this depends on agriculture. The total population of region is 54.17 million with a growth rate of 2.8 per cent per annum. The density of population in the region is 1005 persons per square km, whereas, the state as a whole has a density of 880 persons per square km. Per capita land availability (0.073 hectare) is very low due to greater pressure of population per household. This has led to fragmentation of holding and the average size of land holding is very small (92 per cent land holdings are below 2 hectares). Majority of the people have to depend on the land resources for their livelihood. Total cultivated area of the region is 40.08 million hectares and the total foodgrains production is 7.08 million tones in 2001. The percentage
of main workers to the total population is about 25.34 against the all India average of about 37.5. The literacy rate in the region is about 38 per cent, which is less than the all India rate of 52.2 per cent. A little less than half of the total population (45 per cent) is found below poverty line or is either underfed or malnourished. This area with very high density and immense poverty has been labeled as rural slum.

The objectives of the present study are to examine the physical and socio-economic profiles of the study area which provide the basic framework for evaluating the situation of agriculture and food availability, to study the institutional and technological factors determining agricultural development, to measure the regional pattern of the levels of agricultural productivity as an important indicator of agricultural development and food security, to identify the indicators of food security and examine the inter-district variations in food availability, stability, accessibility and overall food security, to establish relationships among the indicators of agricultural development and food security, to assess the impact of agricultural development on food security and in the last to suggest remedial measures for reducing food insecurity in the region.

The present study is based on secondary data collected from various sources such as Annual Season and Crop Report, Bihar Through Figures and Official Records of Directorate of Statistics and Evaluation, Government of Bihar, Patna. Data related to Population and Social attributes have been taken from Census publications. District has been taken as the unit of analysis. In order to analyze and measure level of agricultural development and food security twenty one variables relating to agricultural development and food security have been taken for the year 2000-2001. Selection of suitable indicators is of immense significance for any study because it constitutes the crux of methodology and with the help of it, pertinent research questions are asked. Only those indicators have been chosen which are relevant to the nature of problem and are available at different points of time.

The techniques of Yang’s yield index and Z-score have been used for the analysis of present work. The indices of crop productivity have been calculated on the basis of Yang’s Yield Index method, whereas, the levels of
agricultural development and the levels of food security have been measured with the help of composite Z-score statistical technique.

For examining the impact of agriculture on food security, the statistical technique of regression equation $Y = a + bx$ and Scatter diagram has been used. To find out correlation between agricultural development and food security, Pearson's correlation method has also been used. Tables and Figures have been prepared on the basis of calculation of data collected from various sources.

The hypotheses of the present study are North Bihar Plain is one of the backward regions of India, where marked regional disparities exist in terms of food security, the agricultural development of the region to a larger extent depends on the use of modern inputs as well as institutional factors. Food security in the study area is positively co-related with its agricultural development, food insecurity is reduced with increase in agricultural development, because agriculture provides food and employment to the largest section of population in the study area.

The present study entitled 'Agricultural Development and Food Security in North Bihar Plain' is divided into six chapters excluding introduction and conclusion. Chapter first deals with a brief discussion of physical environment and socio-economic profiles in the study area. Chapter second examines the concept of food security and changes in its nature. Chapter third is devoted to analysis of determinants of agricultural development which includes the inputs like spatial patterns of irrigation, HYV of seeds, chemical fertilizers, use of agricultural machineries, credit facilities etc. Agricultural development, which is one of the important factors of food security, has been discussed in Chapter fourth. In this chapter agricultural development both in terms of input as well as output indicators has been analyzed. Chapter fifth deals with districtwise distribution of food security in terms of food availability, stability and accessibility and overall food security. Relationships among various indicators of agricultural development and food security have been examined in chapter sixth.

Lastly, the study has been concluded highlighting its main findings and suggestions have been made for overcoming the problems of food insecurity especially in food insecure regions.
The study reveals that there are marked regional variations in the levels of agricultural development, its determinants and food security in the North Bihar Plain. The levels of overall agricultural development measured in terms of a large number of input and output indicators is either high or medium in the western and southern parts of the study area, whereas, its eastern and northern parts is very backward in this regard. This pattern is also in close conformity with distributional pattern of the factors of agricultural development.

It has been observed in the present study that yield of cereals in North Bihar Plain is remarkably lower than the national average which shows that it is one of the agriculturally backward regions of India. It is mainly due to the fact that there is lack of irrigation facility without which success of other inputs are less effective.

The study further also reveals that caloric availability of the study area is far below 1944 calories per person per day than the national average of 2365 in 2001. It means that the study area has not been able to fulfill the total requirement of caloric intake of its people even at national standard level i.e., 2400 calories per person per day. The distributional pattern of caloric availability during 2001 among the districts of North Bihar Plain is not uniform as it varies from 1394 calories per head per day in Madhubani district to 3200 calories in West Champaran.

The position of foodgrains availability which is an important indicator of food security has also not been reported satisfactory during 2001. It has been estimated that 8.43 million tones of foodgrains have been required to meet minimum requirement of the existing population but actual production is 7.08 million tones. Thus, there is shortage of food up to the tune of 1.35 million tones. The regional average in respect of the availability of food has been worked out to 131 kg. per head per annum and the national average being 173 kg. as against a minimum requirement of 176 kg. This clearly implies an overall deficit in the supply of foodgrains to the extent of 45 kg. per capita per annum in the case of North Bihar Plain.

The regional pattern of food availability clearly shows that food deficit districts are mostly confined in the central part of the study area. The position in this regard is better in western and eastern part of the study area which either record high or moderate foodgrains availability. By and large similar pattern in the case of food stability and accessibility have also been observed. The overall situation of food security is better in the western and south eastern part of the study region, whereas it
is worst in north central districts except only one isolated district in south central part. As far as relationship between food security and agricultural development is concerned, it is found to be moderately positive in the case of roughly 41 per cent of the districts.