CONCLUSION AND SUGGESTIONS
CONCLUSION

This is a study of food security and rural development which has been conducted at district, village and household level in western Uttar Pradesh. Physically, the western Uttar Pradesh is mainly influenced by Indo Gangetic Plain. Being a part of alluvial plain of Uttar Pradesh it is drained by perennial river of the Ganga system which provides every facility for the development and construction of canals. The drainage system of the area under study is well developed. The main rivers i.e., the Yamuna, the Ganga, the Ramganga and the Gomati share as the main source of water supply. A study of the activities and behavior of these rivers are important where agriculture forms the mainstay of the economy and land irrigation is the only source of water supply. The predominant soil of the region is alluvium which is fertile for producing a variety of crops. The climate is damper and at the same time less extreme than in the Punjab and the rainfall is less than the rainfall of eastern Uttar Pradesh. Not only the land of the study area is fertile but the climate is tolerable.

Irrigation has played a vital role in transforming the precarious agriculture of semiarid regions, into productive agriculture over last many years. The success of high yielding variety programs depends mainly on the availability of adequate irrigation facilities as high yielding variety seeds require high doses of chemical fertilizers and more water supply to plants. The irrigated area to the total cultivated area has increased from 61.87 per cent in 1972 to 126.92 per cent in 2001 in the study area. Canals irrigation has decreased from 18.07 per cent to 15.15 per cent during 1972-2002 in the study area. On the other hand area under tubewell irrigation to the net irrigated area has drastically increased from 18.11 per cent in 1972 to 85.1 per cent in 2002.

It has been found that the growth rate of population was recorded to be increased more than foodgrains production during all the study periods. During 1971-2001, the growth of population has registered to be increased to 96.33 per cent. The highest percentage growth of population was found 28.64 per cent during the decade of 1971-1981 in the study area. Moradabad and Jyotiba Phule Nagar have registered higher population growth rates while, lower population growth has been recorded in Pilibhit during 1971-2001. The density of population has been recorded higher in Ghaziabad (2866 sq. km) and lower in Pilibhit (470 sq. km). The per capita income of the population of state is much lower than national average, which is directly affected
by the purchasing power of the people and moreover domestic production of foodgrains can not provide the self sufficiency.

It is evident that food security based on food production is one of the major aspects of the agricultural development. The data on area, production and yield of foodgrains are based on three years moving average during the periods of 1970-83, 1980-83, 1990-1993 and 2000-2003. This part of study shows that growth rate of area under foodgrains has been reported to be declined (-0.47 per cent) during 1970-2003 in the study area, while the production has observed to be increased (173 per cent). Similarly, yield has increased (174.60 per cent) during 1970-2003. The eastern part of the study area reported the highest area, production and yield of foodgrains. The highest foodgrains production is due to lack of cash crops. Farmers only give preference to grow foodgrains like wheat, rice, maize and barley. But pulses have lost more area, production and yield due to its replacement by wheat, rice and cash crops. A picture of cash crop shows that more area of foodgrains has been replaced by cash crop e.g. Meerut district is counted highest in sugarcane production while it is lowest in foodgrains production. Therefore, this district is reported for very low food security region.

It has been concluded that foodgrains availability in gram per head per day has increased from 669 gram in 1972 to 788 gram in the study area in 2002. The regional variations recorded districtwise reveal an interesting result. The highest concentration in availability in foodgrains is found in Pilibhit district (1451 gram) where lowest density of population is reported in this district (470 sq.km) in 2001. Calorie availability of foodgrains in gram per head per day increased from 1972 to 1982, since then it tended to decline because of more than half of the districts of the study area has reported negative growth in foodgrains production. It is due to high increase of population growth.

The assessment of food availability, stability, accessibility and overall food security based on composite z-score reveals that the study area is characterized by highly diversified situation. The concentration of indicators of food availability is reported very high in six districts, namely, Rampur, Pilibhit, Aligarh, Farrukhabad, Etawah and Auraiya. The patterns of food stability is positively related to food availability while, both are inversely related to food accessibility.

Districts of Rampur, Pilibhit and Agra are stated in low accessibility but these districts are found in high food availability and food stability regions. The overall
assessment of food security based on scores of nine indicators reveals that the districts of Mathura, Etawah and Auraiya come with very high food security region which are positively correlated with pattern of food availability and food stability regions. Only one district comes in lower category of foodgrains availability, food stability, food accessibility and food security i.e. Hathras.

The study further concludes that overall food security is positively correlated with infrastructure development but negatively associated with agricultural development, because of cash crops that have been omitted from food security regions which includes only foodgrains production. Districts of western portion of the study area lie in lower food security region with lower rural development regions. These belts are low in food security due to high industrialization, high density of population and low foodgrains production.

Food security decreased due to unequal public distribution system. Muzaffarnagar, Meerut, Baghpat, Ghaziabad and Hathras districts come in low food security regions. It is due to fair price shops are estimated low in these districts. It refers that public distribution system is not going in a proper way. These districts are highly urbanized. The benefit of subsidies mostly goes to the rich people.

The analysis of food security in relation to rural development is characterized by a highly diversified situation i.e., more than half of the districts of low food availability reported with medium rural development. Rampur district comes in high food availability with high rural development. Districts of low food availability are associated with low rural development districts.

In case of food stability, two districts of Rampur and Bulandshahr come in the category of high food stability with high rural development. Low food stability regions are associated with low rural development. In case of food accessibility, only Bulandshahr lies in high food accessibility with high rural development. More than half of the districts come in position of low food accessibility and medium rural development.

Food security is positively correlated to food availability and food stability at 1 per cent level of significance. However, it is also positively correlated to food accessibility and infrastructure development but no one is significant up to the accepted level. It is negatively associated with rural development, agriculture development and industrial development. It may be asserted from the analysis that food security of the region depends on food availability and food stability. But food
Food availability does not significantly effect the food stability. However, though not significantly, rural development, agriculture development, industrial development diminishes the food security in the study region. It is mainly due to the fact that, with the industrialization, urbanization, commercialization and technological innovations in agriculture, farmers tend to cultivate cash crops for quick earning. The large scale cultivation of cash crops severally hampers the production of foodgrain crops, subsequently the food grains availability is reducing gradually, which in turn decline the food security in the region.

Food availability is strongly correlated to food stability at 1 per cent level of significance. It is positively correlated to infrastructure development but not significant up to the accepted level, while it is negatively correlated to food accessibility, rural development, agriculture development and industrial development. It is clear from the analysis that food availability and stability are interdependent and interrelated. It may be said that food stability may increase as much as the food availability increases. But the food availability may be hampered with rural development, agriculture development and industrial development, mainly due to the transformation of cereal crop cultivation in to commercial crop cultivation. Food stability may reduce due to the changing land use pattern associated with industrialization, commercialization and globalization. But food accessibility which is dependent on purchasing power of inhabitants is different from food availability and food stability. Rural development and industrial development enhance the purchasing power of the people, subsequently food accessibility increases. Food security is negatively correlated with rural development due to higher industrial and agricultural development. It is said that agriculture development leads to increase in food security but this study finds that food security negatively correlated with agriculture development. It has been already mentioned that dominated areas of agriculture development are concentrated with cash crops production.

In order to strengthen the study, five villages have been selected for primary survey at village and household levels to test the ground reality of the study area.

The age structure of population shows that high rate of work force, as respondents in young and old age group are less. Hindus are dominant in the religious composition of the respondents in sampled villages. As a caste structure, Rajput caste is dominant of the respondents in sampled villages. Education holds importance among the people as only 48 per cent are illiterate while, majority of the people are
moderately educated (51.89 per cent). It is evident that non workers (69.50 per cent) are counted higher than workers (30.49 per cent) which are not good for socio-economic development of the region.

The village wise analyses of area, production and yield of different crops show that wheat and rice are dominant crops in the villages of Naganva and Manjoor Garhi. These villages are reported for highest concentration of foodgrains crops than cash crops. Area under wheat is reported higher in Naganva and Manjoor Garhi villages. Similarly, production of wheat has stated higher in Naganva and Manjoor Garhi. Rice is also a dominant crop of these villages. Rest of the villages including Megh Chappar and Datavali Gesupur are dominant in cash crops mostly sugarcane.

The analyses of indicators of food security and rural development at village and households levels depict that foodgrains availability has reported highest in Naganva followed by Manjoor Garhi. Rest three villages are counted for low foodgrains availability. Similarly, the distribution pattern of caloric availability of foodgrains in selected villages shows that the caloric availability in foodgrains has been reported highest in Naganva, Suwaheri Buzurg and Manjoor Garhi while lowest in Datavali Gesupur and Megh Chappar. Naganva and Manjoor Garhi villages have scored higher distribution of respondents having APL ration cards. Rest of the villages i.e. Suwaheri Buzurg, Megh Chappar and Datavali Gesupur are dominated by respondents having BPL ration cards.

Employment structure shows that Naganva and Suwaheri Buzurg are reported for dominance of cultivators amounting to 38.19 per cent and 41.66 per cent, respectively. The highest workers are reported in the three villages which include Naganva (36.36 per cent), Manjoor Garhi (31.72 per cent) and Megh Chappar (37.90 per cent). Highest incomes also reported in Naganva and Manjoor Garhi villages i.e., more 4000. These indicators show that purchasing power is reported highest in two villages of Naganva and Manjoor Garhi.

It is clear that high foodgrains production, high purchasing power, high consumption, high calories per day per person, high income, high employment, low poverty and high public distribution system all these leads to high food security. All indicators mentioned above have been found highest in three villages of Naganva, Manjoor Garhi and Suwaheri Buzurg. So, these villages are reported for highest food security.
Village-wise analyses of rural development show very interesting relation with food security. Of the total household (421), nearly 263 amounting to 62.47 per cent respondents have own agriculture land and 158 respondents amounting to 37.52 per cent are landless. This shows some farmers are migrating to urban areas after selling their land to large farmers. This picture has been seen in villages of Megh Chappar and Datavali Gesupur. Nearly 47.52 per cent respondents have marginal sizes of land holdings in selected villages which are uneconomical. Village-wise break up shows that marginal and small size of land holdings are reported highest in Naganva and Manjoor Garhi villages. In these villages, farmers give preference only to grow foodgrains production more than cash crops. Rest of the villages like, Suwaheri Buzurg, Megh Chappar and Datavali Gesupur are observed for large sizes of land holdings which are commercial in nature. In these villages farmers give preference to grow cash.

Datavali Gesupur and Megh Chappar villages are observed richest in irrigation facilities due to concentration of government canals. Suwaheri Buzurg, Datavali Gesupur and Megh Chappar are highest user of fertilizer due to more concentration of cash crops production. These three villages are reported for highest agricultural development but low in food security due to lack of foodgrains production, low purchasing power and unequal public distribution system. Educational status shows that the educated persons are found highest in Naganva, Manjoor Garhi and Suwaheri Buzurg villages. Other infrastructure facilities like availability of water, electricity consumption, pucca house, pucca roads are reported fair in Naganva and Manjoor Garhi villages.

Agricultural development is reported high in Suwaheri Buzurg, Datavali Gesupur and Megh Chappar which have more concentration of cash crops production. It is evident that Naganva and Manjoor Garhi are highest in food security and high in infrastructural development excluding agricultural development. But foodgrains has been found high in Naganva and Manjoor Garhi villages where agricultural development is low, while on the other hand cash crops production is high in the village of Suwaheri Buzurg, Datavali Gesupur and Megh Chappar where agricultural development is high. Infrastructure development is found high in those areas where food security is found high. Overall rural development is found high in that area where agricultural development and industrial development are high.
Thus above analyses show that food security is positively related to infrastructure facilities. But it is found low in the areas of high agricultural development due to high density of population, majority of non workers, more concentration on cash crops than foodgrain production and high poverty

Suggestions

Food security in rural areas is a serious problem. The lack of food security in rural areas is due not just to inadequate resources, but also to inadequate planning. The job of assuring food security is large and complex. Action needs to be taken simultaneously at the household, national, regional and global levels to achieve development in rural areas. There is need of thorough analysis of food security in terms of its three pillars that is, physical access to food, an adequate economic access to food and improving food utilization.

Physical access to food

Physical access to food is related to agriculture which increases to food supplies in rural areas, agriculture production which is needed to sustain the increasing food needs of the tremendously growing population, it increases the employment, purchasing power etc at household levels.

Encouraging rapid technological change

Implementing technological change is essential for agriculture and economic growth. Knowledge of new technology should be increased in rural areas mostly for marginal and small farmers. The availability of appropriate infrastructure services is a precondition to rapid agriculture sectors like power, roads, irrigation etc which help in agricultural development.

Increasing the efficiency of irrigation

There should be increase in the efficiency of irrigation to enhance the agriculture production. There should be proper use of water so that wasteful use of water could be avoided. Government canals system should be provided in a proper way.

Cropping pattern

Cropping pattern should be matched to consumption demand. In this study, it has been evident that those areas are facing problems of food security which are low in foodgrains production but high in cash crops. So, farmers should give emphasis on foodgrains production also. There should be availability of water, amount of rainfall, soil quality, topography etc for the change of cropping pattern.
Dry farming should be practiced in the areas of scarcity of water. Whenever cost of production is higher, the government should provide remuneration price to meet the cost of production with moderate profit to farmers.

**Proper land use planning**

Land should be used in a proper way for agricultural development. It is necessary to restrict crop cultivation only for favorable areas, which have good retentive soils and where water harvesting techniques would be feasible. The remaining areas should be put under forage and economic tree crops.

**Healthy soils**

Farmers should have more knowledge about the characteristics of the soil, especially in terms of its suitability for cultivation of various types of crops. They should have knowledge about minerals content of the soil and what needs to be done.

**Crop intensification and farming system**

There is an immediate need for crop intensification and farming system especially for the small and marginal farmers. Animal husbandry seems to play a promising role here as it generates more employment avenues due to its labour intensive nature. The employment opportunity for women also increases through this sector. Moreover, the nutritional status of households also improves by consumption of milk and dairy products.

**Improving economic access to food**

(The food security implies not only to food availability but more important is economic access to food. Household food security can ensure only when capability to acquire food exist.)

**Enhancing employment**

Employment is the key of development of any nation. It is cause to poverty eradication. Employment should be enhanced in on-farm and non-farm sector which ensures direct access to income. In case of on-farm sector development in agriculture and infrastructure are most crucial. In case of non-farm employment increase should be through rural industrialization, exploring the opportunities for value addition by interacting production with processing, marketing and direct investment by the state for employment generation in programme such as 'food for work'.)
Poverty eradication

On the basis of the above mentioned characteristics, it has been evident that food insecurity is primarily associated with poverty. High poverty levels are synonymous with quality of life deprivation, malnutrition, illiteracy and low human resources development. That is why, eradication of poverty has become a major component of the region. The best way to reduce poverty and hunger is through economic growth.

Education and health services

Providing education and health services is one of the key ways to reduce poverty and hunger. There is substantial evidence that individuals' education is closely linked to their income and that improved education contributes to national economic growth. Education and health services are especially important for women, who have a major role to play in growing crops and in reducing hunger. Education is necessary for both women and boys who are much more productive and earn higher income. Women often use their additional income on investments in family welfare, increase in their incomes like to have greater immediate and long term impacts on poverty.

Investing in infrastructure

When there are adequate communication networks, roads, storage facilities and supplies of electricity, farmers can obtain the information they need to grow the most profitable crops, store them, move them to market and receive the best price for them. During survey it has been found out that some production is lost between farm gates and consumers owing to poor roads and storage facilities, reducing farmers' income and raising urban consumers' food costs. As cities grow, the need for infrastructure becomes all the more important.

Minimum support price

Government should support the minimum price to decide with farmers. These prices are not commensurate with the input costs of the farmers. Hence, farmers consider agriculture as a non-profitable enterprise and they are not willing to continue agricultural operations. In fact many of them are willing to sell their lands. This leads to decline in availability of arable land and consequently lead to food insecurity especially for the vulnerable household.
**Strengthening markets and agribusinesses**

The support of markets and agribusiness has received insufficient attention in the World Bank's assistance to agriculture and rural development, with the exception of assistance provided by the International Finance Corporation. There should be access to market especially for small and marginal. This can be done by fostering agribusiness association of small farmers through a new contract between corporate industry and the resource poor families.

**Rural credit system**

There should be managed access to credit through financial institutions for the resource poor. Rural credit facilities should be extended to small and marginal farmers and most vulnerable groups of the society.

**Improving food utilization**

It involves availability of appropriate quality and quantity of food at affordable prices to those identified as poor.

**Management of proper distribution system**

In the country, the government foodgrains stock exists but it does not reach to target group either due to procedural delay or lack of purchasing power. Unless inequality is reduced the higher food production will not provide food security. It has been evident that poor and vulnerable groups are unable to get benefit of public distribution system. Hence, there is need for targeting public distribution system. It should be identified of the poor people and thereafter appropriate measures need to be undertaken to improve the nutritional status of these households.

**Anti poverty programmes**

Poverty eradication programmes should be initiated relating to self employment and wage employment. Enhancement in employment is necessary for poor and vulnerable group, so that they can increase their purchasing power. If they do not have purchasing power they would not be able to acquire foodgrain.

**Food for work**

These schemes hold to promise for the poor and vulnerable households to gain access to food. This scheme should be organized properly in rural areas for poor households.

**Storage facilities**

The suitable storage facilities should be developed at small places like village, Mandi (whole sale market), market and even at household level to minimize the food
losses as well as the benefits go to both producers and consumers. There is a need of social organizations like *panchayaty raj system* which should come forward to prepare plans and implement them to remove poverty and achieve the goal, i.e., food for all

**Food and cash based programmes**

These programmes will directly provide cash and nutrition to assure food security of the households on one land, and the income generated from work can be used for meeting different households needs. If the staple food is available at subsidized rates or as a fixed part of the earnings, the poor can use the cash received on other food stuffs and on other needs.