Chapter-9

Conclusion and Suggestions

The present study attempt to evaluate the impact of irrigation on agricultural productivity in Eastern Uttar Pradesh with a view to do away with the constraints and shortcomings of the present irrigation system hampering its full and optimum utilization and to suggest prudent and pragmatic plan for all round integrated and coherent development of the study area. On the basis of data collected through secondary source for the two periods (1997-98 and 2007-08) the study aims at analyzing the impact of irrigation on agricultural productivity in Eastern Uttar Pradesh.

Eastern Uttar Pradesh is located in eastern part of Uttar Pradesh. This region physically can be divided into two distinct regions namely, the Ganga Plain and the Piedmont region. The Ganga Plain covers about two third of the area of Uttar Pradesh and is traversed by the Ganga and its tributaries.

Eastern Uttar Pradesh is one of the most populous regions of Uttar Pradesh. It supports about 40.10 percent of Uttar Pradesh population, having 35.63 percent area of the state. Consequently the average density in the region works about 775 persons per sq. Km. In terms of area which is 85845 sq. Km.

The study region has sub-tropical monsoon type of climate. The annual mean temperature is 26°C, being the lowest in January and the
highest in May. The average rainfall is 15 mm, more than 90 percent received in rainy season. The rainfall generally decrease from north to south and from east to west

Agriculture is the mainstay of the majority of the population, devoted mainly to the cultivation of food grains. Rice, wheat and sugarcane are the main crops. The region is backward industrially and distribution of transport and communication facilities is uneven. The agricultural products are the main export items.

During the period under review, the intensity of irrigation has increased from 137.85 to 143.16 percent, thus the volume of change amounts to 5.31 percent. The volume of change in nineteen districts has experienced increases, while eight districts have experienced decrease. In one district (Balrampur) is to the tune of more than 38.14 percent, in four districts (Varanasi, Chadauli, Mau), it varies from 19.51 to 38.14 percent, in six districts (low category), it is below 19.51 percent. In two districts, the decrease is to tune of above 15.12 percent, in one district; it varies from 8.76 to 15.12 percent and in five districts it is below 8.76 percent.

Irrigation has exercised sufficient impact on the mechanical and biochemical inputs of agriculture, although its magnitude varies from place to place. The low positive correlation between irrigation and the use of mechanical inputs, i.e. the use of iron plough, improved harrow and cultivators, threshing machine and tractors shows that irrigation does influence the use of these inputs, but there are some other factors as well,
which, to some extends, determine the use of these implements and irrigation is not the sole determinant. Thus the use of these inputs or and increase in their use is not everywhere very much commensurate with the use of irrigation facilities or an increase in them.

The study of the influence of irrigation on general land use reveals that irrigation exercises negative influence on the extension of forested area, which has decreased slightly. The area not available for cultivation has increased, which is due to an increase in its sub category, i.e. land put to non-agricultural use. The area under groves and garden has increased but the area under permanent pasture and grazing land and the area under culturable wasteland has decreased. Most of this area has been put under plough, for which irrigation is greatly responsible. The area under fallow land has slightly increased, which is due to the adverse conditions like floods, water logging etc. But the spatial distribution of fallow land is inversely related. Surprisingly enough, the net sown area has decreased, although quite slightly, which seems due to an increase in the area of other categories. But the positive correlation between the net irrigated area and the net sown area shows that in the areas of high irrigation intensity the percentage of net sown area is also high vice-versa. The impact of irrigation on the intensity of cropping is very significant, which is generally high in the areas of the high irrigation intensity and vice-versa. Both have increased, although not equally, i.e. the increase in the cropping intensity has lagged being the increase in the irrigation intensity.
Irrigation has played an important role in changing the cropping pattern. The importance of the *rabi*, and *zaid* crops has increase with an increase in the irrigated area. The expansion of irrigation has resulted in the increase of the area under finer grains like wheat and rice. The high positive correlation between net irrigated area under these crops shows that generally there is high concentration of these crops in the areas of high irrigation intensity.

The area under nutritive food like pulses has decreased. Although the hectare age under sugarcane has increased, its distribution is not very much commensurate with that of the net irrigated area, which is evidenced by the negative correlation. The reason is that sugarcane has been very popular in the Bhat area where the irrigation intensity is very low and sugarcane can be grown here with little irrigation. The location of sugarcane factories has also affected the spatial distribution of sugarcane cultivation. The area under oilseeds has decreased, the negative correlation between irrigation and oilseeds cropped area shows that the spatial distribution of these two variables is inversely related.

An analysis of positive and negative tendencies in the growth of the area of the individual crops shows that wheat is the crop of leading increase and sugarcane is the second position and rice is the third. As regard the crops of leading decrease, oilseeds and pulses. This reveals that with an increase in the irrigation facilities, better marketing facilities and the change in the food habits of people, there has been a notable shift from inferior
crops to superior food grains and cash crops. The overall cropping pattern has also undergone changes with an increase in the facilities of irrigation, although the changes everywhere are not concomitant with the changes in the net irrigated area. That is why the positive correlation is low.

There is enough influence of irrigation facilities on the agricultural characteristics. There is high level of crop diversification in the areas of lesser intensity of irrigation and lower level of crop diversification in the areas of higher intensity of irrigation. An increase in the irrigation facilities has provided a security to the farmers and safety to their crops so that they might use the larger area of their land to a limited variety of crops. Thus crop specialization has increased in place of crop diversification. With an increase in the irrigation facilities, the relative importance of certain superior crops, which require more irrigation, has increased.

An analysis of the changes in the pattern of crop combination reveals that the number of the crops in the crop combination has decreased. Now the number of the districts in two-crop combination has increased from ten to thirteen and three-crop combination has decreased from fourteen to six. Thus with assured irrigation there is more liking for specialization.

The level of crop productivity reflects that irrigation has exercised great influence on the agricultural productivity. This fact is substantiated by significant positive correlation between irrigation and overall productivity. Similar facts are reflected by the overall development of agriculture, where the correlation is again very significant. It is clear that relatively high level
agricultural development is largely confined to the well irrigated areas and medium, low and very low level of development to the areas of less fertile soils, flooded or water logged areas and the areas of low intensity of irrigation.

Although irrigation is the basic ingredient of agricultural activities as revealed from the foregoing analysis. It does affect other spheres of life as well. It affects rural industrialization through an enhancement in the production of raw materials for agro-based industries. Socio-cultural changes brought about by irrigation manifest themselves in improved health and hygienic conditions. In the irrigated areas, there is an increase in the per capita availability of food grains, which generally leads to their enhanced consumption. An increase in the per capita income enables the farmers to avail of medical facilities. The availability of transport and communication, institutions like bank etc. is influenced, to some extents, by the prosperity of rural areas which in turn, depends greatly on irrigation.

The affects of irrigation are not only positive, there are negative and deleterious affects also. The introduction of surface irrigation has resulted in the rise of ground water table causing water logging and land salinity, silt deposition in the canal beds and fields, exhaustion of soil fertility and land degradation. Depletion of water table has been perceived in the tube well irrigated areas. Adverse output impacts of irrigation have been seen on the growth of pulses and oilseeds. One of the deleterious effects of irrigation is the widening of income and wealth disparities between dry and irrigated
tracts or between farm classes within an irrigated region. There is a steep increase in the diseases in the areas adopting irrigated form of farming. These diseases emerge because of the continuous standing water in the irrigated areas.

**Suggestions:**

In the context of the findings and narrated in the forgoing pages, some viable and pragmatic recommendations for improving the irrigation facilities and socio-economic milieu have been made as under:

1. Although the irrigation intensity of the area is 143.16 percent, still there is a scope for the bringing additional area under irrigation. This can be achieved by extending the facilities of irrigation by introducing water management practices and by improving the existing facilities.

   It has been observed that the irrigation intensity in the study region varies from 101.32 to 182.94 percent. The increase in the irrigation potential and its optimal utilization is to be so planned that all the cultivated land is judiciously benefited by its gains keeping in view not only the principle of productivity, equity, stability and sustainability of Indian agriculture but also that of ecologically sustainable comprehensive development.

   2. For the efficient utilization of irrigation water, the following steps should be taken:
(a) Lining of the canals should be done to prevent the water losses through seepage. The extension of the lined irrigation channels up to the farm edges, perhaps, be more useful.

(b) On farm development programs, viz., construction of the kuchcha irrigation channels in the outlet command, construction of pukka irrigation channels, construction of the field and intermediary drains, construction of farm roads, construction of various pukka structures like siphons, culverts and aqua ducts etc., land leveling and shaping, construction of cisterns, should be completed to the utmost perfection.

(c) For proper functioning of tube wells, energy sources (diesel and electricity) should be made available at demand. It has been noted that in the areas depending primarily on tube well irrigation unreliable water receipts by farmers, which is greatly due to the insufficient and erratic supply of power, has adverse effects on their adopting new agricultural innovations. This warrants the tackling on the energy problem by ensuring the equitable supply of hydro electricity and diesel.

(d) The farmers should be refrained from misusing water, which should be used rationally, economically and judiciously.

(e) More and more canals should be constructed for better and cheap irrigation.
3. The cropping pattern has also to be altered and crops like pulses, oilseeds and sugarcane etc. should be given due importance with proper crop rotation.

4. In addition to above, the following steps should also be taken to accelerate the socio-economic conditions of the rural masses:

(a) Proper and judicious use of chemical fertilizers, pesticides should be encouraged. This requires:

(i) An improvement in the farmers own resources position.

(ii) Availability of farm credit at low interest rate.

(iii) Proper price policy for fertilizers, pesticides, seeds and their availability in rural areas.

(iv) Farmer’s access to institutions distributing credit, fertilizers, seeds, agricultural know-how.

(v) Proper provision of extension services, training and education of the farmers, organization of agricultural demonstration programme.