Conclusion and Suggestions
North Bihar Plain is one of the fertile region of the State of Bihar in India but lags far behind in comparison to some other agriculturally advanced states of the country. The government has made a number of efforts for the improvement, but is still awaits for developmental strategies to become more effective. Since agriculture is the mainstay of the economy of the region where a substantial proportion of the total population is engaged in agriculture and its allied activities, there is an urgent need for the betterment of this sector of the economy, which will ultimately bring economic progress in the region. An analysis of the factors responsible for the variations in the development of agriculture may give new dimensions for understanding the problems. A new phase of agricultural modernization may be brought in different parts of the region.

The continuous growth of population in North Bihar Plain has forced the farmers to pay a special attention to obtain more agricultural output with less efforts in order to meet the increasing demand of a number of commodities for their own sake. Therefore, there has been an increase in area to be brought under cultivation and for an increase in production of foodgrains.

The net area sown during 1985-90 accounted for 62.34 per cent of the total reporting area of the region which increased to 64.76 per cent (an increase of 2.42 per cent) during 1995-2000. Similarly, the area sown more than once also increased in the similar manner during the period concerned. The production of crops recorded a simultaneous increase from 11.65 m.m.tonnes in 1985-90 to 14.08 m.m.tonnes during 1995-2000.
The growth rate in area and production of crops indicate that among the cereals, rice is the dominant crop which has accounted for an increase in production from 2.45 m.m.tonnes in 1985-90 to 2.77 m.m.tonnes during 1995-2000, in spite of decrease in area under its cultivation. Next in importance is the wheat, which stands as the second ranking crop in the study area. Area under wheat has increased from 1.16 m.ha. during 1985-90 to 1.28 m.ha. during 1995-2000.

The area as well as production of pulses has shown a decrease. The area under pulse crops recorded a decrease of 0.10 m.ha., and in production 0.04 m.m.tonnes. The area under oilseeds increased upto 0.12 m.ha. and production by 0.09 m.m.tonnes during the last 15 years. The area under the cash crops show an increase of 0.03 m.ha. during the period between 1985-90 and 1995-2000.

On the basis of crop productivity, the districts of North Bihar Plain were demarcated into high, medium and low productivity regions for three points of time i.e., 1985-90, 1990-95 and 1995-2000. During the first two sets of period agricultural productivity regions in the study area remained more or less same. During these periods, the high productivity regions were located in the western and southern parts, but during 1995-2000, they were marked out to be located in northwestern, central and southern parts of the region.

An input and output analysis performed on the basis of output (productivity) and input (independent variables) adopting a statistical technique for multiple correlation. This analysis reveals firstly, that pH value, nitrogen, phosphorus, fertilizers, high-yielding varieties of seeds,
irrigation by canal and tube-wells, tractor power and pumpsets are positively correlated with productivity, whereas the amount of rainfall and irrigation (by other sources) have a negative correlation. Secondly, the role of independent variables were identified by testing them through factor analysis for each productivity region as well as North Bihar Plain considering it as a single unit. The cause of high productivity at F₁ was revealed by the variables of nitrogen, phosphorus, irrigation by tube-wells and other sources of irrigation and pumpsets. At F₂ rainfall, irrigation by tube-wells and other sources of irrigation, chemical fertilizers and high-yielding varieties (HYV) of seeds and at F₃ rainfall, irrigation by canal and tube-wells, HYV of seeds, tractor power and pumpset were the main cause of making the areas to have high productivity.

The overall assessment of the study reveals, that the agricultural development in North Bihar Plain is more dependent on management of resources committed to cultivation like irrigation, HYV of seeds, fertilizer consumption and mechanization than on ecological parameters. The agricultural development cannot be over emphasized with the impact of ecological factors because they appear to be less significant with the level of agricultural development.

The general distribution of agricultural development shows that western and southern districts are agriculturally more productive than the eastern and northern districts. However, the present levels of agriculture in the region need improvement in order to meet the demand of the population by adopting certain strategies.
In the canal and tube-well irrigation area, water logging is a serious problem which renders the land out of cultivation due to depletion of soil fertility. Farmers do not bother about the scientific angle to crop cycle and donot follow the recommendations given to them. As a result, the natural fertility of the soil is decreasing. To overcome this problem high doses of organic manures as well as the use of gypsum and basic slag (a by-product of steel plants) are required, otherwise, the soil fertility will deteriorate rapidly. The application of gypsum and basic slag are beyond the reach of middle-class farmers. As an alternative high doses of organic manuring and judicious selection of crops may reduce the injurious done to crops by salts. The proper order of plantation at the first instance is sugarcane or rice, then a sugarcane ratoon, followed by pulses or green manuring.

There has been an enormous loss of crops due to inferior quality of inputs and their non-availability on time. Moreover, the adoption of new technology without adequate knowledge and experties has created a host of problems. There is an inadequacy of chemical fertilizer application which is totally related to the income of farmers. The subsidy on fertilizers should be increased and public sector fertilizer plants be modernized.

Agricultural credit is an important input for increasing productivity and production and is also a factor that can help farmers to get fair prices. A major impediment has been the absence of the extension services on part of the modern methods of farming and pesticide application. Farmers should be helped to store crop output with minimal wastage until the marketing of the output is done. The government should declare a minimum support price at the time of harvesting for those crops whose prices have declined and open foodgrains purchasing centres for market intervention to protect the interest of the farmers.
In order to increase the yield level of crops, irrigation facilities should be extended to fulfil the need of high-yielding varieties of seeds and fertilizers. Embankments should be constructed on the rivers and waters restored should be utilized properly by laying of canals. This will help in bringing more area under canal command and reduces the problem of floods.

Land reform measures should be enacted and population growth should be minimize in order to check the fragmentation of land of smaller size. This is to be done through imparting education to the farmers. Education inculcates new ideas and helps in adoption of agricultural innovations. Bihar ranks at the bottom of literacy and accounts for about 47.53 per cent (Census of India, 2001).

It may be stated, that although the present work attempts to correlate a number of independent variables with dependent variable (productivity), and on the basis of this, it is to mention that this itself is not claimed as final or the only suggestion. This can change with more micro and detailed study as well as on the basis of conducting more field works. The present work is only an endeavour to findout the influence of ecological factors on the development of agriculture and the role of technological factors responsible for agricultural development.

In the last, it is suggested that the strategies for agricultural development should be sustainable ecofriendly which may help in maintaining the environment in sound healthy. Such steps will go a long way in making region agro-ecosystems more productive, less fragile and more sustainable.