CONCLUSION AND SUGGESTIONS

The present study attempts to examine the existing levels of agricultural and socio-economic development in Rohilkhand region which spreads over the north-western part of the state of Uttar Pradesh. Administratively the region includes thirty-seven tehsils of the districts of Bareilly, Budaun, Shahjahanpur, Pilibhit, Bijnor, Rampur, Moradabad and J.P. Nagar. The main findings of the research are based on computation of data collected through extensively field survey and empirical observations.

The landuse classification of Rohilkhand plain has been made with a view to derive maximum benefits from each type of land whether agricultural or non-agricultural. The land classification envisages in grouping of lands according to their suitability for producing plants of economic importance. The district of Rampur shows a high level of cropping intensity throughout the study periods i.e. 1985-90, 1991-96 and 1997-2002 due to the fact that agricultural diversification is highest in the district. Apart from rice, wheat, mentha and sugarcane, farmers of the district also grow sunflower, ginger, turmer and Simla mirch (chilli). Throughout the study period, the Bijnor district shows the lowest cropping intensity, because a monoculture crop of sugarcane conceals the degree of intensity of cultivation.

Crop combination regions were worked out keeping in view the importance of integrated assemblage of various crops grown for planning purposes. It has been observed during the study periods i.e. 1985-90, 1991-96 and 1997-02 that crop combination ranges from two to three crops in the entire Rohilkhand plain. With the passage of time, and the demand, districts are approaching towards specialization of crops cultivation. For instance the district of Shahjahanpur was having three crop combination (wheat, rice, sugarcane) during 1985-90 and 1991-96. Later on in 1997-02, the district shows two crop combination (rice/wheat). District of Moradabad was also having three crop combination (wheat, sugarcane, rice) during 1985-90 and 1991-96, its crop combination restricted two crops (wheat, rice) during 1997-02.

The crop-wise growth computed on the basis of linear regression for each district in area, production and yield for the corresponding periods i.e. (1985-90, 1991-96 and 1997-02). It was evident that in all the districts of Rohilkhand plain, the
crops of rice, wheat, sugarcane and potato showed a positive trend (in area, production and yield) with few exceptions. Pulses and oilseed crops, which occupy only about 10 per cent area, observed fluctuating trends in area, production and yield. In the district of Bijnor during the study periods i.e. 1985-90, 1995-96 and 1997-02 the crops of sugarcane and potato registered a remarkable growth in area, production and yield, even at the cost of wheat and rice. The district Bijnor is approaching toward the monoculture crop of sugarcane. The crop of sunflower observed a significant increase in area (6.24 per cent), production (9.32 per cent) and yield (3.42 per cent) during the period of 1985-90 and again in 1991-96, an increase in area (32.66 per cent), production (38.5 per cent) and yield (4.41 per cent).

Agricultural productivity regions were worked out to delineate the general pattern of productivity in the districts of the region. The district Bijnor observed high agricultural productivity during 1985-90, 1991-96 and 1997-02 which was due to more area brought under cultivation of sugarcane, and better yield of wheat and rice. The agriculture in this district is highly mechanized. Tube-well irrigation well distributed in parts of the district of Bijnor. The district of Bareilly was previously under high productivity region in the period of 1985-90, which come down to be incorporated to medium productivity category in 1991-96, and further slipped to low productivity region in 1997-02. Wheat, rice and sugarcane were the important crops in Bareilly district, but the productivity of rice and sugarcane declined due to decrease in fertility of soil, and meagre irrigation facilities. The district of Bareilly could not diversify its agriculture and arable land to sustain the pace of mechanization with other districts of the region.

The district of Shahjahanpur designated with low productivity throughout the study periods (i.e. 1985-90, 1991-96 and 1997-02). Poor connectivity of villages with urban centres, unorganized marketing system, low level of agricultural mechanization, limited irrigation facilities and poor infrastructural development are some of the factors leading to low level of agricultural productivity. The district of Budaun observed a positive trend in agricultural productivity. The district of Budaun was in low productivity category during 1985-90, but it observed medium productivity in 1991-96, due to fact that the productivity of wheat and potato increased significantly due to better irrigation facilities, cold storages in good numbers (highest in the
Rohilkhand), and better methods of wheat cultivation by the Yadav community which is inhabits the entire district.

A causal relationship between the variables of agriculture and socio-economic development shows, that of interdependence of different variables has decreased during the periods of 1985-90 to 1991-96 and again in 1997-02. For instance, during 1985-90, the variable of population density ($X_3$) was negatively correlated with variable number of junior basic schools (per lakh) of population ($X_{10}$), variable number of students in higher secondary basic schools per teacher ($X_{15}$) and variable foodgrains production (kg) per person ($X_{26}$). Any increase in density of population will lead to decrease in sets of these variables. During 1991-96, the relationship of variable population density became insignificant with variable $X_{26}$. The production of foodgrains increased because of availability of better agriculture technology and changing attitude of farmers, which leads an increase in the per capita availability of foodgrains. Thus a normal increase in population density will not affect the per capita availability of foodgrains.

During the period of 1997-02, the relationship of variable $X_3$ became insignificant with a set of variables $X_{10}$ and $X_{15}$. Variables related to number of junior basis schools (per lakh) of population, and number of students in higher secondary basic schools per teacher registered a massive increase due to adoption of number of development plans. Normal increase in population density is not going to effect inversely the per capita availability of junior basis schools and students in higher secondary schools, because of comparatively fast growth in the latter then that of the former.

In the same way during 1985-90, the variable of foodgrains production per person ($X_{26}$) was dependent on the variable, percentage of workers engaged in agriculture to that of the total workers ($X_{30}$). It means, if number of workers engaged in agriculture will increase, the foodgrains production will also increase. It was largely, due to the use of labour intensity in agricultural operations. But in 1991-96, the relationship between these two variables became insignificant because of mechanization of agriculture of Rohilkhand plain. During this period an increase in agricultural workers would not lead to an increase in foodgrains production.
During the three periods of time (i.e. 1985-90, 1991-96 and 1997-02) interdependency among different variables of agriculture and socio-economic development were minimum. Higher education does not hold a strong relationship with higher income, but it was governed by changes in social and cultural factors such as changes in the attitude of farmers, and development of educational facilities were some of the factors responsible for reducing the relationship among the variables of agricultural and socio-economic development.

The levels of agriculture and socio-economic development were worked out by using the data collected through extensive field surveys in thirty seven tehsils belonging to eight districts of Rohilkhand plain. All the tehsils of Bareilly district belonged to medium and low level of agriculture development, and high and medium level of socio-economic development. Agricultural development with socio-economic development does not hold true in case of Bareilly district. Three crops of sugarcane, rice and wheat constitute the largest share in crops landuse in the Bareilly district. But the productivity of sugarcane and rice has declined due loses in the fertility of soil and lowering of water table. During the last 5 years most of the sugar mills have closed due to declining return for the mill entrepreneurs and farmers. In district of Bareilly farmers could not be able to adopt the cultivation of mentha crop at large scales due to insufficient irrigation facilities, as this crop needs plenty of water. Marketing facilities are limited, Dev Charan Galla Mandi is the biggest market where farmers are exploited by the middlemen (Thekedar). In all the tehsils of Bareilly district, development of water harvesting technique, soil testing facility, diversification of agriculture by introducing crops like mentha and sunflower, crop rotation and efficient marketing system is the need of hour.

Bareilly city is the biggest urban centre of the Rohilkhand plain. It provides secondary and tertiary economic activities to the population of its hinterland. During the survey it was observed that in all the tehsils of Bareilly district the literacy rate is seen above 70 per cent, and there are seven senior secondary schools (per lakh of population) which is one of the highest in the Rohilkhand. All the tehsils of Bareilly district are performing well in social amenities like cemented houses, kitchen, toilet, bathroom facilities. Manufacturing of footwear, and electronic goods industries also play a vital role in providing employment opportunities to the local population.
In the Budaun district, four tehsils fall in high and two tehsils show medium level of agricultural development. But in case of socio-economic development all the tehsils fall in low category. Conditions in the Budaun district are reverse to that of district Bareilly. During the survey it was found that cast was the dominating factor in determining the levels of agriculture and socio-economic development. In the district of Budaun, *Yadav* caste is fairly distributed over the tehsils. Traditionally, they are associated with the crop of wheat and in dairy farming. The average yield of wheat in district was in between 40 and 42 qnt./ha. Almost every household, belonging to this caste is involved in the business of dairy farming which yield much higher returns. The crop of mentha has been introduced in every tehsil of the district of Budaun during last three decades. Return from the output of this crop are very high. Potato is also major crop in the district having a yield in between 500 and 550 qnt./ha., which is higher than the state average. Availability of cold storage facilities particularly in Ujhani town of the Sahaswan tehsil also contribute to the better performance of agriculture in the district of Budaun.

In the district of Budaun, water level is going down very fast particularly in the tehsils of Sahaswan, Bilsri and Budaun, where several development blocks have been declared as ‘dark zone’, and where boring for the installation of pumpsets have been prohibited. The adoption of water harvesting technique is the only way to sort out this problem. Programmes should be launched for masses to make them aware about the problem, and the benefits of water harvesting technique.

Budaun district is one of the least urbanized district of the Rohilkhand, where only 18 per cent of population lives in urban centres. During 2001 census, only 40 per cent of the total population was literate. But field survey data shows that literacy rate in all the tehsil of Budaun district as between 55 and 60 per cent. This sharp rise in literacy rate is attributed to the mid day meal programme launched by the government in primary schools. Evidently the that massive increase in literacy rate is confined only to primary level and the pull out rate from primary level is very sharp due to non-existing of middle, secondary and senior secondary schools within a walkable distance.

It is suggested that apart from establishing secondary and senior secondary schools at block level, government should also offer profession oriented diploma
courses in mobile, inverter and generator repairing, basic computer programming to divert the workforce from agriculture to secondary and tertiary sector. Fund can be diverted by abolishing the schemes like *Kanya Vidhya Dhan Yojna* which has nothing to do with the socio-economic development of the people and launched only for the political gains by the previous government in the state of Uttar Pradesh. Along with *Yadav* castes, Muslims and schedule castes are also fairly in good numbers in all tehsils of the district of Budaun. Educationally they are all at bottom but more due to social and cultural factors. Therefore programmes should be launched to make them aware.

All the tehsils of Shahjahanpur district fall in medium and low level of agriculture and socio-economic development. During the survey it was found that yield of crops, except rice in few pockets is low. Traditional methods of farming, limited irrigation facilities, low agricultural mechanization, limited use of HYV of seeds and fertilizers due to poverty and small size of holdings, poor connectivity of villages to the urban centres, huge dependency on agriculture, poor marketing facilities and complete lack of industrial development are some of the factors responsible for low level of agriculture and socio-economic development. During the survey it was found that the workforce has nothing to do as they spend day and night, weeks and months without employment. Most of the people get employment at the time of sowing and harvesting of *rabi* crops.

During the survey it was noticed, that in the villages of Tilhar and Powayan tehsils *Kaleen* making and *zari* work was operated. They are the efficient workers but exploited by the entrepreneur, as owner provides all the material used in *kaleen* making and the worker gets only Rs. 40 per day, while working more than 12 hours a day. In a surveyed village of Saleempur of Tilhar tehsil, more than 45 handlooms of ‘*kaleen*’ making were operating. The real beneficiers were the entrepreneurs as workers get even less than two per cent of the real cost of the manufactured *kaleens*. These *kaleens* are very much in demand in urban centres.

The small scale industry of *kaleen* making and *zari* work can flourish in the district of Shahjahanpur. Government should provide loan facilities to the workers through micro-financing institutions so that they can establish their own handlooms and can purchase raw materials. The development of this industry in a planned, which
can go a long way in improving the socio-economic conditions of the people of Shahjahanpur district. The establishment of these *kaleen* and *zari* work industry can help in diverting surplus marginal workers from agricultural sector.

All the tehsils of Pilibhit district show medium and low level of agriculture and socio-economic development. The district of Pilibhit has more than 23 per cent of its area under forests. The tehsil of Puranpur which share its boundary with the Nepal has large forests reserve area. Wheat, rice, sugarcane and pulses are the major crops grown in three tehsils of the district of Pilibhit. Low level of farm mechanization, limited irrigation facilities, low availability of arable land, limited use of HYV and fertilizers, poor connectivity of roads, limited infrastructural development and poor marketing facilities are some of the factors placing this district to medium and low level of agriculture and socio-economic development.

A block level survey is need to identify the potential areas to establish growth pole and growth centres in all the tehsils of Pilibhit district. Agro and forest based industries should be developed to generate employment opportunities for the villagers.

All the tehsils of Bijnor district, except the Chandpur fall in high level of agriculture development. The level of socio-economic development is high in the tehsil of Najibabad, whereas the other tehsils show medium level of socio-economic development. Agriculturally the district of Bijnor is a leading district in Rohilkhand plain. Sugarcane with a yield of over 700 qnt./ha. is one of the important crop. Mechanized farms, tube well irrigation almost in every village, use of better quality of seeds, better skills of farming in dominating caste of *Brahman* and *Rajput* is a common phenomena and are some of the factors leading to high level of agriculture development.

Medium level of agriculture development in the Chandpur tehsil can be attributed to comparatively small size of holdings among scheduled caste and Muslims which constitute a sizeable population in Chandpur tehsil.

During the survey it was found that, small and marginal farmers are exploited by *Kalesar* operators in the tehsils of Bijnor district. During the year 2006-07 the government declared the support price of sugarcane Rs. 140/- quintal. But *kalesar*
operators were paying only Rs. 80/-quintal on hand to hand payment and Rs. 85/-quintal on a delay payment after 15 days. Small and marginal farmers are bound to sell their produce to these Kalesar operators because sugar mills make payment after two to three months. After harvesting the crop farmers need immediate money to purchase seeds and other input and to meet their family’s needs and demands. Government should ensure that the delay in payment should not exceed more than 15 days by sugar mills.

A small Kalesar needs at least 100 workers to run Kalesar. Operators make contact with middlemen (Thekedar) who provides the required labour force. The middlemen is given mere Rs 40 to 50 per day to the labourers and finally gets a handsum amount from the Kalesar operator.

The introduction of mentha crop can brought a more prosperity to the district of Bijnor. The crop of mentha can also be helpful in regaining the exhausted fertility of soil which is caused due to continuous cultivation of sugarcane. It is a remunerating crop as one hectare of produce can generate about Rs. 70 thousands. The crop of mentha has brought a revolution in the agriculture economy of the districts of Moradabad, Rampur, J.P. Nagar and Budaun. The better performance of these districts in agriculture and socio-economic development can be attributed to the crop of mentha. It is a grass which is also known as peppermint from which oil can be extracted through processing. Mentha oil is used as peppermint in the making of tooth pastes, vicks, chewinggums, cough syrups, pain relief medicines. One hectare of land gives about 110 to 120 litters of Mentha oil having a cost which ranges in between Rs. 75,000 and 80,000. This oil is in great demand in the market and farmer gets a return. It is a zaid crop and sown in the months of February-March (when most of fields remain fallow) and harvested in the month of May-June. This crop can be grown only in those areas where irrigation facilities are available, because this crop needs watering twice every week. After processing of mentha, the waste residue can be used as fertilizer which is useful in regaining the fertility of soil. India is the leading producer of mentha oil in the world, and around 85 per cent of the total oil production comes from four districts of Moradabad, Rampur, J.P. Nagar and Budaun. The tehsils of Chandausi and Sambhal of Moradabad district are the major markets of mentha oil. Around 70 per cent of the total business is concentrated in these two markets.
Mentha processing plants are working in almost every village contributing much in the economy of the villages. More importantly, mentha crop can also be grown with other crops like rice, and wheat. The tehsils of Chandausi, Sambhal, Bilari and Moradabad produce mentha oil at a large scale.

A diversified cropping pattern was observed in all tehsils except the Shahabad tehsil of Rampur district. A variety of rice, locally known as *Sharbati Basmati* is grown in the tehsils of Milak and Bilaspur particularly by immigrant Punjabi farmers. Farming done by these Punjabi farmers is more advanced than the local inhabitants. Wheat, sugarcane and sunflower are the other important crops grown by these farmers in these areas. In the tehsil of Suar, the crop of *Shimla mirch*, terner, sunflower and ginger are also grown along with rice, wheat, mentha and sugarcane. In Rampur districtm Shahabad is the only tehsil which falls in low level of agriculture and socio-economic development. Tehsil Shahabad is situated at the junction of rivers of Ramganga, Kosi and Pilakher. During the rainy season the tehsil Shahabad comes under the grip of flood, and therefore, the productivity of crops very badly affected. The problem of waterlogging is also severe in the tehsil of Shahabad.

In the tehsil of Dhanaura and Hasanpur of J.P. Nagar district along with cultivation of mentha, wheat and rice, floriculture is also practiced by the Upper caste farmers. This crop was first introduced by the Muslim farmers of Siyali village of Hasnapur tehsil. The village of Siyali is famous for floriculture in the entire Rohilkhand region. From the village of Gajraula to the village of Manouta, nurseries of flowers were developed by the *Thakurs* and *Brahman* communities among the Hindus, and by the *Pathans* and *Shaikh* communities among the Muslims. The cost of input of this crop is as high as Rs. 4,500 per *begha* but the return is about 4 times of the input cost. Due to high input cost, floriculture is not practiced by other backward and scheduled castes. Government should provide micro financing to the farmers belonging to O.B.C. and S.C. community, because the flowers are in great demand in the cities of Moradabad, Meerut and the capital city of New Delhi, which is not very far from this area. The important advantage of this crop is that it can be practiced small and marginal holdings farmers can ensure higher returns.
During the survey, it was observed, that the farmers of Rohilkhand plain are mostly illiterate and are easily exploited by government officials on matters related to land consolidation, land revenue and irrigation charges.

Land revenue is collected through a person designated as Amin. He issues receipts that do not follow the Gregorian and Hizrior Vikrami calendars, but merely a Fasli years. This calendar and the measurement units were started several hundred years back.

For example, according to the Fasli calendar, the year written is 1414, but how may farmers or others know this? As a result, many farmers do not even know for which year the revenue dues are being collected. The receipts issued are also not of standard size and are without stamp. Since Amins are unfamiliar faces to the villagers, in many cases there is no way to distinguish genuine person and fake person who issue the revenue receipts.

The method of collection of water charges for irrigation from canals, is also realized by the Amin. A person known as Patrawal issues a bill for inflicted amount. If the farmer pays some extra amount, he may even reduce the amount of bill. In the Shahbad tehsil, it was observed that, sometimes, the patrawal issues a general dues bill, calling it sailab (flood irrigation). It is most unfair, since farmers should be exempted from floods and not penalized to pay irrigation charges. Also, the pricing of water for irrigation is made on the basis total area irrigated, and not on the basis of total water consumed.

In fact, there may be a justification to decentralize all such functions, related to land revenue, irrigation charges etc. All such collections should be made by village panchayats to make the procedure safe and simple. Million of rupees are provided by the government to individual panchayat in the villages for various developmental works. The money is deposited by the government into the panchayat's account. Likewise, the amount of revenue collected from the farmers can be deposited in the bank account which may be used for development works. This step is needed to protect many of the farmers from undue exploitation.

During the survey it was observed that in the implementation of National Rural Employment Guarantee Act (NREGH) and Nirmal Gram Yojna the corruption
is rampant. It was reported in many villages that not a single family member and relative of the Pradhan had worked on any site, yet, they all received wages for over 100 days (the minimum guarantee provided by the law) of work. Large amounts of money were being siphoned off in the name of material procurement.

Most persons are unaware of the legal entitlement of the Act. For instance, the Act mandates that any individual holding a job card can apply for work and will be provided an employment within 15 days with the submission of submitting application. If the applicant does not get work, he or she is entitled to unemployment allowance. It was noticed that in most of the villages not a single job application was received.

*Nirmal Gram Yojna* was launched mainly to improve the sanitation conditions, particularly for the construction of toilets in the houses. All the households of the village will get a sum of Rs. 900 from government for this purpose. All the amount is deposited in the joint account of pradhan (headman) and Gram Panchayat Adhikari. It is obvious that a sum of Rs. 900 are not sufficient for the construction of a toilet. Therefore, the owner of the house has to pay Rs. 400 to 500 to construct a toilet. Most of the villagers particularly belonging to OBC and S.C. were not really in position to pay this amount. Thus, pradhan and gram panchayat adhikari give them a sum ranging in between Rs. 500 and 600 for toilet construction just on papers.

Public vigilance and monitoring is the only way to sort out these problems. Social auditing involving activists, academics and policy makers is mandatory requirement. A social audit is a process through which citizens compare state’s reported expenditures of development works with the actual amount spent. Evidences are gathered through interactions with participants in development projects, verification of schemes and interviews with panchayat members and local officials. Findings are than shared with government officials. Social audits are mandatory under the NREGA.

Direct investigations of accounts by social audit can go a long way in identifying the misuse of funds. Moreover, the very act of interacting with labourers and organizing gram sabhas (village councils) on the NREGA and Nirmal Gram Yojna can strengthen awareness about the scheme. Social auditing has a potential to transform governance in Rohilkhand region of Uttar Pradesh.
During the survey it was observed that most of the residences of villages were electrified and on an average in between 60 and 70 per cent households were using electricity. But households were not have electric metres even in a single village. Though supply of electricity was less than 6 hours in 90 per cent villages. Government should develop a mechanism of electric revenue collection at least from farmers having medium and large holdings, and should ensure better electric supply in the villages.

Development block level extensive field surveys are needed in the districts of Rohilkhand plain to identify the potential areas. For instance, the Kaleen and zari work and some other small scale industries can be developed in the villages of Shahjahanpur district with the help of micro-financing to the natives of the villages. The Rohilkhand plain has achieved revolution in farming with the use of HYV of seeds. Now this region needs a soil revolution concurrent attention is needed to soil health care. Soil testing laboratories should be established in all the districts of Rohilkhand plain. Water harvesting technique should be developed particularly in those tehsils where crop of mentha is cultivated. Investment in rural infrastructure, particularly the layering of roads as well as storage and other marketing facilities. Funds are to be generated by abolishing schemes like Kanya Vidhya Dhan Yojuna and reducing subsidies to the farmers. The giving of subsidies are against the market reforms as they distort the market and reduce resource efficiency.

The Rohilkhand region needs building of new organizations like landuse advisory system based on integration of data from meteorological departments marketing advisory boards. In addition to this a market intelligence system is required in every district, which will help to safeguard the interests of farmers.

The use of organic manure can help achieving bumper yield and reducing the input cost. As it has been proved from the study conducted in Kothavasal village of Tiruvarur district in Tamil Nadu that by adopting organic farming cultivation cost of one hectare of rice can be reduced from Rs. 4,000 to 1,500. About 200 kg of farmyard manure and 40 kg of sea algae in one hectare of paddy are applied as manures both in the nursery and in the main field and about 500 ml. of liquid algae diluted in 400 litres of water is given as a foliar spray once in 15 days to the crop.
The paddy grains harvested under organic methods have been found to have better weight compared with chemical farming. The weight of one bag under organic farming has increased up to 60-62 kg, whereas it was 54 kg with chemical farming. Because of the weight increase per hectare land will generate Rs. 3,000 additional income. Therefore, government should formulate a policy on organic farming for farmers.

Government should allow the entry of large organized players like Reliance Retail, ITC, Food Bazar (owned by Hishone Biyani’s Pantaloons) Bharti, Subhiksha (from the Aditya Birla Group) and more for contract farming which will connect farmers with consumers, bypassing the traditional route controlled by multiple layers of middlemen. These companies will give seeds and other inputs to the farmers and will provide insurance facilities in case of crop failure. In return farmer will promise a particular quantity of land to the company. The company will transport the produce directly from the field to the markets. In this way farmer will be protected from the undue exploitation of middlemen and can save in transportation cost. Government should act as a facilitator and participant in the implementation of this policy by providing infrastructural facilities such as roads, canals and power in such a manner that commercial activities in rural areas got a boost.

In few areas public sector organizations must act somewhat like the private sector. Research staff should be hired on a contract basis with pay linked to the research performance. Moreover, salaries for those who performed well should be increased at regular basis.

India needs agricultural development that is measured not just in terms of percentage increase in crop contribution but which goes far beyond so that it can uplift poor farmers from the harassments due to poverty and misery. We need agricultural development that ensures access to basic education, healthcare and shelter to every farmer, so that he may enjoy his fundamental right to live with dignity.