SUMMARY
AND
CONCLUSION
The main focus of the present study has been to assess the level of socio-economic development in relation to the spatial organization of settlement in district Bulandshahr and to work out a strategy of micro regional diagnostic planning for the most backward area in the district with a view to reduce the existing regional disparity to attain balanced regional development. This approach to planning strategy has been opted owing to the failure of sectoral planning on the fronts of balanced regional development, meaning thereby economy grew appreciably in successive planning periods but the growth failed to make benefited every part of the country. Because, every region has its own problem of varying degree and nature and for its development, it needs to be addressed which is not possible through the trickle down effect of planning strategy. Every regions needs a separate treatment. The present work is addressing the aspects of socio-economic development in district Bulandshahr through adopting micro level planning approach for a balanced regional development.

The district although falls in the region of most advanced agriculturally developed regions in Uttar Pradesh India where 81% of the land use is devoted to agriculture, well irrigated, registering high agricultural productivity and considerable contribution to country's food production is not narrating the whole story of the region. It is also one of the regions where the socio-economic indicator like literacy level is below from the national average of both male and female and also rural and urban. Bulandshahar belongs to that band of districts which are educationally backward in the list prepared by Ministry of Education, Govt. of India. The gender gap is very much visible in the district in every respect. The existing socio-economic amenities and facilities are not sufficient enough to the desired level. Besides, it is suffering with the intra-district disparities at block level, at nyaya panchayat level and even at gram panchayat level, which needs to be tackled with, if the dream of a balanced regional development is to be materialized. The district is spread over in an area of 4253 sq. km with a population of 2913122 persons as per 2001 census is consist of 1138 settlements of which 1122 rural and 16 urban settlements varies in size from few hundred to several thousands. As the planning has been done for the socio-economic development of the region concerned and this planning depends upon the socio-economic facilities existing in different settlements and their desired demand and also potentialities of the region to support the facilities. Qualitative and quantitative
methods have been used for the analysis of primary and secondary data like, 'Nearest-neighbour analysis', Mather's model of mean spacing and Gini’s coefficient of concentration techniques have been adopted to analyse the spatial organization of settlements and socio-economic facilities. Z-score and composite mean Z-score techniques have been used to examine the regional imbalances in the levels of socio-economic development. To carry out the different steps of planning process, basic concepts of central place model devised by Christaller (1933) have been followed. Median Population Threshold (MPT) has been estimated on the basis of ‘Reed-Muench’ method and central places have been hierarchically arranged based on centrality score of central places. Complementary region of central places has been delineated on the basis of primary information relating to consumer's traveling behavior to a respective central place to obtain goods and services. Spatio-Functional gap of each facility have been estimated as the ratio of function between Complementary region and area as a whole. Karl Pearson’s technique of coefficient of correlation, student’s 't' test and linear regression technique has been adopted to examine the causal relationship between dependent and independent variables as well as to test the hypothesis. The goal of micro-level planning is achieved by providing adequate facilities to the settlements at economically accessible, socially desirable and environmentally sustainable.

Therefore, analysis of spatial organization of settlements is important for the formulation of planning. Organization of settlement exhibits an uneven distribution of settlement in the district. The district has 3.08 inhabited average settlements at per 10 km² in 2001. It varies from 1.45 to 3.65 settlements /10km² at block level. The highest density of settlements is observed in Gulaothi (3.65 settlements /10 km²), and lowest density of settlement is observed in Lakhaothi, (1.45 settlements/10 km²). The analysis reveals some variation in the density of settlements. It is attributed to the fact that, high and very high density of settlements is characterized by fertile soil, efficient irrigation system and uniform level plain and vice versa. The district has an average size of 3.24 Sq.Km of settlements, with a maximum of 6.72 Sq.Km. in Lakhaothi to a minimum of 2.70 Sq.Km. in Gulaothi. The relation ship between settlement size in terms of area and population both and settlement density has been analyzed, reveals negative correlation meaning thereby, as size of settlement both in terms of area and population increases, density tend
to decrease and vice versa. Also, 6.59 percent settlements are small in size with population of less than 500 persons in each and sharing only 0.80 percent population of the district. Most of the settlements, (about 55 per cent) belong to medium size-category in which population lies in between 500 to 1999 persons and they accommodate 26.70 percent population of the district. Moreover 19.20 percent settlements belong to the range of 2000 to 4999, accommodating 36.79 percent of population of district. The large size villages and towns 72 in number (6.24 percent) accommodate 35.71 percent of total population of study area with a break up of 23.15 percent in urban centre and 12.56 percent in big villages. Gini’s coefficient of concentration of 0.097 indicates the lack of concentration and Rn value of 1.48 reveals an approaching uniform pattern in the distribution of settlements. The district has an average mean spacing of 2.06 km, while the blocks mean spacing lies in between 1.78 km in Gulaothi, to 2.82 km in Lakhaothi. This difference in spacing is attributed to the fact that, high spacing areas are generally found with relatively less fertile infested with usar land and low potentials of irrigation, whereas low spacing has contrary to these factors. The relationship between spacing and size of settlement has also been established, shows a significant positive correlation between the two variables.

Existing 46 socio-economic facilities have been taken into consideration for the study and have been classified into 10 main categories. Among them, lower order facilities like primary school, fair price shop, milk collection centre etc are more uniformly distributed than the higher order services. The distribution pattern of facilities does not fully follow any rational and systematic trend, e.g. most uniformly distributed facility of primary school among the settlement i.e. 1640 units in 1003 settlements should follow at least one principle, that larger size of settlement should have maximum number of this facility and above some size this facility should be witnessed but this is not the case. Out of 1640 primary school units, 1002 units are located in the settlement having population of more than 2000 persons. In the size group of 5000 and more, 13 settlements have single unit, 17 settlement two units, twelve settlements 3 units, and 29 settlements have 4 units and more. Among the urban settlements Bulandshahr town has the largest number i.e. 87 units of primary school followed by Khurja with 41 and Sikandrabad with 30 units. Among the rural settlements Saidpur village of B.B. Nagar block has 9 units of
primary school on a population of 5707 also Gesupur of Sikandarabad block has 8 unit of primary school on a population of 7207. The settlements like Gesupur in Sikandarabad block with a population of 7207 has 9 units, while Tilbegumpur in the same block, with a population of 6683 has single unit of primary school. It is observed that the settlement having population of more than 5000 only assures the existence of primary school units. In other settlement size groups primary school units may or may not exist. As for example in the size group of 2000-4999 one expects the existence of primary school as its MPT is 602 and also the average of population is 1777 for one primary school, but in the mentioned size group there are settlements like Zahidpur in Sikandarabad block, ShahNagar, Nagla Sheikh in Gulaothi block, Nayagaon in Bulandshahr block etc. does not have a single unit of primary school.

The analysis of the levels of socio-economic development brings out explicit disparities in the district at the block level and also within the block at the nyaya panchayat level. Araniya block has emerged as the least developed block in the district Bulandshahar in almost every sector like education, health, communication, transportation, market, agriculture, finance, veterinary and recreation. Followed by Danpur block at individual facility level Araniya block may not be at the bottom but the overall index on the basis of composite Z-score placed it at the bottom in terms of socio-economic development. The facility has been estimated on the basis of Reed-Munich method which is complex but authentic, logical and mathematically sound measures the facility in terms of MPT. This method seeks to find out the location of entry point of population threshold below the limit of which all settlements lacking the function, while above that limit all settlements possess it. MPT varies depending on their importance higher order functions have higher values of MPT and vice-versa. The computed MPT ranges from 602 for primary school to 258620 persons for soil testing centre and district headquarter. it means higher facility has greater MPT and vice-versa. Corresponding to the MPT each facility has been assigned certain functional weightage. The causal analysis reveals that the distribution of population and socio-economic facilities among different size group of settlement are significantly positively correlated. It may be inferred that large number of people use to concentrate at bigger size of settlement mainly due to higher availability of facilities there and vice-versa. The disparities in the
distribution of socio-economic facilities and resultant level of development which is not uniform in the district in different blocks desires a planning to bridge the gap among different blocks and develop them as their potentialities support to its fullest extent. This disparity has further been analyzed in Araniya block, most backward block in the district which is chosen for diagnostic planning. The disparities have been assessed at nyay panchayat level in the model block. To deal with the problem of the unplanned allocation of facilities in disorganized manner among different size group of settlements and the resultant regional disparity in the levels of socio-economic developments and to achieve a balanced, optimum regional development. Christaller's central place theory has been adopted as a tool of planning in somewhat modified form as the basic assumptions i.e. the isotropic surface doesn't exist in reality but the basic ideas like range of goods, threshold population is universally found and at the guiding principles for any kind of development planning. The central places, which provide goods and services, have been identified at 434 places with different hierarchical orders of which 85.71 percent are first order central place. It has been found that both the variables are positively correlated with r-value of 0.9636. Their correlation is significant at 1% level of significance at 432 degree of freedom. Therefore, it implies, higher the centrality score of central place, higher is its population and vice-versa. The identified block for planning purpose is having 26 central places of which 24 being the first order central place and 2, being the second order central place. It is clearly narrating the story of its backwardness as the concerned area is clearly lacking the higher order functions. The central place i.e. Khurja of 6th order, Pahasu of 4th order and Shikarpur of 3rd order lies in the close proximity to the Aranya block and serving it well. These central places of higher order although connected with the transportation network but consumer had to travel a longer distance and also public means of transportation is not very much efficient. The central place provide services and functions to the people of surrounding settlement, while the people of dependent settlement provide demand for the goods and services, which results an interaction pattern between central place and its surrounding area. The area over which the central place exerts influence is referred as zone of influence or Complementary region or hinterland or service area of central place. Thus in a spatial context the area from where people interact with the particular focal point (central place) is known as the service areas of the
central place. The zone of influence or service area is the product of centrality score of the central place. Spatial organization is the outcome of spatial interaction of people with central place. The delineation of service area of central place involves the estimation of population and area dependent on it. It is concerned with the study of consumers traveling pattern and their preference for a central place. The area over which such an interaction is emerged is known as the Complementary region or zone of influence of the central place. The Complementary region of each central place has been delineated on the basis of both quantitative method as well as empirical observation. In the quantitative approach, the Complementary regions have been delineated based on the mathematical equation devised by V.L.S. Prakash Rao (modified method). This does not serve the purpose as some areas get over lapped and others remain unserved, because it draws the circle to delineate Complementary region. The Complementary regions have further been delineated on the basis of field observation, which technically is called as empirical method. In the present analysis the dependent population and area has been estimated according to the census record of 2001, dependent population of each central place has also been estimated for the year 2021 after estimating projected population of each settlement in the Araniya block. Complementary region of first order central places on the basis of consumer traveling pattern have been delineated and their dependent population and area (in sq.km) have also been estimated, two such central places (Muni and Karaura) which are by virtue second order central places, but by providing lower order functions of smaller market range makes smaller (first order) service area. Total population and area of the Araniya block are being served by 26 first order central places among these Muni serves largest number of population of 11,687 persons and area of 21.43 sq.km, which is expected again to serve 15,726 person in 2021 followed by Karaura which is serving 10861 persons in 2001 and expected to serve 14615 persons in 2021. Lowest population of 974 is served by central place Nayesar with an area of 1.55 sq.km. is expected to serve 1311 persons in 2021. It is also observed that the central place Muni scored highest centrality value of 224.20 followed by Karaura with 202.28 while Yusufpur Malgosa remained at bottom with 18.12 among the first order central places.

During field study it has been observed that the first order (lowest order) central place provides lower order functions with an exception of two first order central places
that also provides second order functions like Muni and Karaura. It was surprising that the Block headquarter, which falls in the third order functional hierarchy is located is Araniya Khurd a first order central place, with a centrality score of only 47.63. In the case study block only two second order central places have been identified. Total population and area of the block are not covered by the identified two second order central places. Almost 30% of the area and settlement remained unserved, and do not come under the ambit of any of these two central places, especially of south eastern and north western part of the study block, north western part is served by Khurja a sixth order hierarchy central place, while south eastern settlements are served by Pahasu, a fourth order central place, is very well linked with the transportation network. Also some northern settlements are served by Shikarpur a third order central place. These three central places, namely Khurja, Pahasu and Shikarpur lies outside the study block Araniya. By virtue these three central places are also second order central place. Based on the market range of goods and services or traveling pattern of people to obtain the facilities of second hierarchical order of function at shortest distance with minimum traveling expenditure, dependent population and area of each second order central place has been estimated and their region has been delineated.

Among the second order central places Muni and its Complementary region with highest centrality score of 683.53 serves a total population of 42363 persons including its own population (3398) while it is expected to serve the total population of 56753 persons in the year 2021, covers the largest area of 56.3 sq.km. On the other hand Karaura and its Complementary region with a centrality score of 488.52 serve 40215 persons including its own population of 6414 estimated to serve 54213 persons in 2021. The central place of Khurja serves 15465 people, Pahasu serve 8412 persons and expected to serve 19464 and 11519 persons respectively. While Shikarpur serves 6251 persons in 2001 and expected to serve 8845 persons respectively in 2021. During field study it has been observed that whole the Araniya block is dependent on Khurja a sixth order central place for higher order functions.

In the study region 24 first order and two second order central places serving different socio-economic functions to the inhabitants are located at the mean distance of 3.15 km and 11.36 km. respectively. While nearest neighbour analysis (N-N index) with
Rn value 1.072 of first order central places shows their approaching uniform pattern of
distribution in the block, while second order central places are randomly distributed, with
Rn value of 3.35.

After assessing the dependent population of central places in 2001 and expected
dependent population in 2021; and analyzing the nature of distribution of settlements
being served by these central places, the task remains to evolve a purposeful planning
model for the plausible solution of the problems in the block Araniya. This has been done
through identifying the functional gaps of each individual facility existing in the block, in
the different Complementary regions. The functional gap has been determined on the
basis of functional ratio calculated from the variables related to the population and
centrality score of the Complementary regions with the help of quantitative technique.
Taking the existing facility constant in 2021, the gap is found to increase demands an
addition of facilities in the existing number. The available facilities have been found
inadequate not only in terms of numbers but also distribution, is the testimony of the fact
that the locations of the facilities do not involve any rational planning. Among the
educational facilities, primary school has been found most widely distributed, but the
Complementary region like Naiphal is found inadequately served in 2001 and the gap
further estimated to increase in 2021. While, Gworli Bhojgarhi Complementary region is
adequately served in both the year 2001 and 2021. This is one example of unplanned
distribution and quantum of facilities. This sort of imbalance has been found in almost all
the facilities, requires immediate attention. To bridge the functional gap, additional
facilities have been proposed and optimal locations have been chosen, keeping in view
the accessibility, public preference and median population threshold to achieve the
balanced regional development. 49 primary schools have been proposed at 29
settlements, 19 middle schools at 19 settlements, and like wise where ever and in what
quantity facilities are required have been proposed. Also some facilities like hospital,
cold store etc, which is found absent is proposed for 2021, because the Complementary
region of Muni and Karora have been estimated to sustain these facilities. Muni and
Karora, are the central places best suited for the location of most of the facilities, having
the potential to climb up the hierarchy from the second order central place and make the
future promise for the location of more higher order functions, which the people avail presently through visiting Khurja, a sixth order central place outside the Araniya block.

The proposed model is having wider applicability in spatial planning and is being suggested to all those disciplines which focus on spatial science. The model not only suits to the Araniya block but to every region with the same ecological setting. It is being suggested to every government, quasi government agency, and NGO willing to strive against regional imbalances. Centralized and sectoral planning can yield proper result only if equal emphasis would be given to micro level planning, because micro regional issues can only be addressed through micro level planning.