CONCLUSION
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The district of Allahabad lies between latitudes of 24° 47' N to 25° 47' N and longitudes of 81° 30' E to 82° 21' E. The area of Allahabad district is 5482 sq. km. and its population is 4936110 according to Census, 2001. The northern boundary of Allahabad district is formed by district of Pratapgarh and Jaunpur while on the east lies the district of Varansi, on the south-east lies Mirzapur district, on the south, the state of Madhya Pradesh and on the west that of Pratapgarh.

On the basis of administrative structure, Allahabad district has been divided into 08 tahsils, 20 development blocks, 218 judicial panchayats and 1425 village panchayats. There are 2802 habitable villages and 262 nonhabitable villages. It has been divided into 2 parliamentary constituencies and 11 assembly constituencies. There are 13 townships, one principal corporation, one cantonment area, eight Nagar Panchayats and two Census towns. Allahabad district has reputation of being an educational centre with two Universities and 53 degree colleges, 3 Industrial Training Institutes, 617 intermediate colleges, 1585 higher secondary schools and 2932 primary schools.

Geologically the district presents a greater complexity. The whole Trans-Ganga Tract, the greater portion of Doab is composed of gangetic alluvium. The alluvial detritus of Vindyas is found in the southern part of the Doab. The Trans-Yamuna Tract, the Vindhyan detritus merges in the gangetic sand and silt.

The district may be divided into the three distinct physical parts, the Trans-Ganga plain, Trans-Yamuna tract and the Doab which are formed by the Ganga and its tributary, the Yamuna. The Yamuna joins the Ganga at Allahabad, the confluence being known
as ‘Sangam’.

The rivers of the district belong to the main system of the Ganga and comprise several sub-systems of which the most important are the Yamuna and the Tons.

The climate of Allahabad district is characterized by a long and hot summer, a fairly pleasant monsoon and cold seasons. The winter usually extends from mid-November to February and is followed by the summer which continues till about the middle of June.

The south-west monsoon then ushers in the rainy season which lasts till the end of September. October and the first half of November constitute the post monsoon season.

The district has 8 rain gauge stations. The rainfall of Allahabad district generally decreases from the south-east to the north-west. About 88 percent of the annual rainfall is received during the monsoon season. July and August are the months of maximum rainfall.

There is one meteorological observatory in the district. From about the middle of November, the temperatures begins to fall rapidly and in January (the coldest month) the mean daily maximum temperature becomes 23.7°C. Temperatures rise rapidly after February. May, usually, is the hottest month of the year with the mean daily maximum temperature at 41.8°C. and the mean daily minimum at 26.8°C.

The climate is marked by the high relative humidity i.e. 70 to 80 percent during monsoon after which there is progressive decrease in humidity. During the monsoon season the skies are heavily clouded but during the rest of the year they are clear except for short spells due to western disturbances.

Winds are generally light throughout the year with some
increase in force in the summer and during the south west-monsoon season.

The reserved forest area under the state forest department in the district is 19839 hectares of which nearly 98 percent lie in Trans Yamuna region in two sub-divisions Meja (14832 Hect.) and Bara (4806 Hect.). Phulpur and Karchhana have no forest cover. The chief varieties of trees found in these forests are Dhak, Kakor, Aonla, Kahwa, Jharberi, Kanju, Mahua, Semal, Salai, Khair, Harra, Chiraunji, Bahera and Babul.

The wild life of the district has depleted considerably owing to the destruction of forest and reckless shooting in the past. The number and species of wild animals are much greater in trans-Yamuna tract and along the banks of the Ganga than elsewhere in the district. The tigers visit the district from Mirzapur or Madhya Pradesh. The main animals found in the district are bear, chinkara, sambar, hyaena, Indian black buck, boar, nilgai or blue bull, fox, hare and Sahi or Indian porcupine.

Minerals wealth of the district has great significance in terms of socio-economic prosperity and economic base. The mineral products that are commonly found in the district are glass sand, building stones, Kankar, brick earth and reh.

Increase in the population of city of Allahabad due to rapid urbanization has expanded the city beyond its corporate limits evolving an area of mixed land use i.e. rural urban fringe.

The rural- urban fringe is defined as the land surrounding the town which is not considered as a part of it but whose use is influenced directly by the town. It is extension of urban values, urban functions and urban land uses into the country side land. A zone of frontier or discontinuity between city and country side in which rural and urban land uses are intermixed and absence of clear
break- rural and urban conditions-is feature of the modern city. This zone of frontier is known as rural-urban fringe.

T.H. Smith (1937) used the 'urban fringe' for the first time for the built-up area of city in the study of population of Louisiana. Salter (1940) defined urban fringe as "a mixture of land-uses, rural and urban" Wehrwein (1942) described the fringe in USA as an 'institutional desert' because of controlled locations of unpleasant and noxious establishments such as slaughter houses, junkyards and whole sale of oil storage and of utilities such as sewage plants and cemeteries. Mayers considers the urban fringe as the zone between the country and the city while to Andrews the rural-urban fringe is "that area adjoining the inner fringe outward from the economic city in which there is an intermingling of characteristically agricultural and characteristically urban land uses" According to Dickinson the urban fringe is an area "on the outer borders of the city, between the area of urban and rural land use, an intermediate zone which shares the characteristics of each"

Historically the trend of development has been characterized by different secondary causes or impulses. The main impulse has been the rapid growth of the core city. In Western countries mainly transportation has induced the expansion of cities to the outlying rural areas. The insatiable thrust of city for space and easily available means of transportation private or public resulted in development of residential areas and economic activities along highways in the fringe area. Absence of land use restrictions and cheapness of land set a trend to shift city based industries to the fringe area. In addition, recreational needs of city have also focused the fringe.

Although the impulses and forces generating the physical outgrowth of city in the west may not be applicable with equal
intensity to cities in India, yet one can not detract from the generally valid logic of the process. This is evident from the similarity in the trend and pattern of development of fringe of Allahabad city and other cities of the West. The location of industries, sewage plant, ware houses, air strip etc. in Allahabad, to a large extent, confirms to the observations made by Dickinson with regard to western cities. Indian geographers have also studied fringe and observed the same pattern of fringe development.

The land use in the study area deals with the spatial aspects of all human activities on the land and with the way in which the land surface is adopted or could be adapted, to serve the human needs. The land use pattern keeps on changing to meet the variable demands of land by the society in its new ways and conditions of life. The demand for new use of land may be inspired by a technological change or a change in the size, composition and requirements of community. The land use shifts from agricultural uses to residential, industrial, transportation, neighbourhood retail and service activities due to urbanization. Land use is mainly influenced by physical - geology, relief features, climate, soil and vegetation - and cultural i.e. economic and institutional factors.

The discussion on the land use pattern is divided into two parts. One deals with the land related to agriculture and the other part deals with all categories of land use other than agriculture. Following categories of land use have been recognized in the present study:

(i) Forest,
(ii) Barren and Uncultivable Land,
(iii) Land Put to Non-Agricultural Uses,
(iv) Culturable Waste Land,
(v) Permanent Pasture and Other Grazing Land,

(vi) Land Under Miscellaneous Trees and Groves,

(vii) Current Fallow Land,

(viii) Other Fallow Land,

(ix) Net Sown Area.

The main fringe area has very scanty forest which is almost negligible or 0.01 percent due to deforestation for other economic activities. In the fringe areas percentage of forest could be increased from 1.0 to 2.0 percent if some parts of the fallow land and culturable waste land could be used for social or energy forestry. A green strip of trees (10m. wide) could be developed on both sides of road.

Land put to non-agricultural uses have increased continuously over the past four decades in Allahabad Fringe Area due to conversion of land uses i.e. to develop transport network, expansion of built up area and institutions etc. It was 20.51 percent in 1980-81 which in increased to 29.81 percent in 2006-07.

The barren and uncultivable land in the study area have decreased form 6.68 percent in 1985-86 to 2.57 percent in 2000-01 but it increased to 4.59 percent in 2006-07 due to excessive exploitation of land with modern technology and increasing salinity and land pollution.

Culturable waste land is significantly high with varying percentage in different segments of the fringe. It increased from 3.37 percent in 1980-81 to 6.71 percent in 1996-97 and started decreasing afterward to become 4.01 percent in 2006-07. These culturable waste lands are either disputed land or piece of land deposited by a thick layer of soil not suitable for agriculture and unirrigated land.
Permanent pasture and other grazing land in the study area are almost negligible with a share of 0.01 percent presently. Land under miscellaneous trees and groves have decreased from 2.01 percent in 1980-81 to 0.81 percent in 2006-07 because of encroachment of urban activities and built-up area.

Current fallow land is comparatively high. It remained almost 10 percent from 1980-81 to 1990-91 which increased to 11.90 percent in 1996-97 and become 13.01 percent in 2006-07 due to plotting of land which remained uncultivated.

Other fallow land also increased from 7.25 percent in 1980-81 to 9.11 percent in 2006-07. This category of land shows non-enterprise. There should not be a category of fallow land and agricultural waste land. If the cultivation is not possible, then it could be converted into area for social forestry or developed as pasture and other grazing land.

Net sown area into fringe has decreased continuously from 52.85 percent in 1980-81 to 38.59 percent in 2006-07 due to transfer of agricultural to non-agricultural purposes.

Cropping patterns are representative of interaction among different sets of socio-economic landscape. The distinction in cropping pattern lies in the facts of differences in physical, economic, social and institutional factors in different regions.

Paddy and wheat are the main cereal crop of the study region. Paddy is the mono-season crop in the fringe as it is grown once a year which is Autumn rice harvested in October. Paddy cultivation has decreased from 38.02 percent in 1980-81 to 30.79 percent in due to shifting interest of farmers to other commercial crops and uncertainty of monsoon as it requires regular irrigation.

Wheat is significant crop of Ravi cropping season. It is
cultivated in winter seasons when there are no rains or traces of rains. Therefore, it totally depends on irrigation. Total cultivation of wheat has increased from 44.41 percent in 1980-81 to 48.72 percent in 2006-07 due to improvement in irrigation facilities to bring new areas under wheat cultivation. Wheat cultivation under irrigation has increased from 88.40 percent in 1980-81 to 92.69 percent in 2006-07.

**Barley** has been the third important coarse grain crop of the fringe in the past. It is grown in the same season as of wheat. Total barley cultivations have decreased from 9.23 percent in 1980-81 to 1.03 percent in 2006-07 due to shifting of area to the wheat cultivation and other commercial crops. Barley cultivation under irrigation has decreased from 21.82 percent in 1980-81 to 2.00 percent in 2006-07.

**Pulses** are used as supplementary of diet in India. Vegetarians have only source of proteins in the form of pulses. Pulses are leguminous plants which enhance the soil fertility. Total pulses cultivation in the fringe have decreased from 20.56 percent in 1980-81 to 9.53 percent in 2006-07 due to low productivity and high susceptibility to the pests and animals. Pulse cultivation is almost rain-fed and area under irrigation is only 15.59 presently.

Cultivation of **oil seeds** is very low in fringe areas because of under developed state of oil- processing industries and low oil content in the seeds.

**Sugarcane** is the cash crop cultivated in the fringe. It’s cultivation has decreased from 0.30 percent in 1980-81 to 0.09 percent in 2006-07 because of long gestation period and small holdings. Sugarcane cultivation is totally under irrigation.

**Potato** is an important vegetable in Indian diet. Potato cultivation increased from 5.06 percent in 1980-81 to 8.00 percent in 1996-97 but decreased to 5.24 in 2006-07 due to supply of potato
from rural areas at lower price and shift of farmers to cultivate other vegetables.

The production of crops need more water in addition to rain water. Modern techniques of production, use of fertilizers and pesticides fail to give result in absence of irrigation facilities. The main sources of irrigation in the fringe are tube wells especially private tube wells. Irrigation by private tube wells is as high as 96.54 percent while government tube wells account only 3.68 percent presently. Other sources of irrigation are insignificant.

Fertilizer is the key input for increasing agricultural production. In the fringe, use of fertilizer has been increasing but their balanced and proportionate application has not been reported. Use of nitrogen increased from 1590 MT in 1980-81 to 5931MT in 2006-07 while phosphate increased from 320 MT in 980-81 to 2279 MT in 2006-07. Use of potash is comparatively low. It increased from 110 MT in 1980-81 to 243 MT in 2006-07 while total fertilizer used increased from 2020 MT to 8453 MT during same period.

The extent of mechanization has increased in the fringe. The number of tractors, plough machines, sprayers and threshing machines etc. have increased while wood plough have decreased during the last 20 years.

Livestock render extremely useful service in transport and agriculture. In the fringe, livestock are domesticated with commercial purposes. Dairy farming and poultry farming are main features. Total numbers of livestock have decreased except cows, pigs and poultry.

The advancement in the landscape of area is materialized by effective specialization from a self contained subsistence economy. The essence of urban character is service for a tributary area. A town owes its growth to such specialized resource oriented functions. All these aspects of urbanism are related to the transformation of the
rural urban fringe with mixed landscape of urban and rural elements. The real spirit of these activities lies in the service centres developed in the contiguous area of the city and procedure for their investigation needs extensive study.

Christaller has demonstrated that there is strict ordering whereby each settlement serves its own hinterland and an area of population equivalent to the hinterlands of two other settlement n addition hence it has been called ‘the rule of three’ using the constant ‘K’ to express this. K=3 denotes marketing principle, K=4, the transport principle and K= 7, the administrative principle.

The principle of general interaction was, for the first time, applied by Reilly as ‘The Law of Retail Gravitation’ to analyse the interaction among major cities.

Origin of marketing centres comes to fore due to sequential development of economy as a system. The periodic markets evolve in order to meet the requirements of local society in less developed countries or developing countries as most of the population is engaged in agricultural activities of primary sector and more or less they depend on periodic markets to fetch their daily needs. The process of marketing had been developed very early period in Allahabad around the city. Naini and Phaphamau are old marketing centers. Other important marketing centers are Katahula Gauspur, Akbarpur, Marham Uparhar, Mahrudin, Lakanipur and Bhagipur. These marketing centers established direct relationship with Allahabad city and lead to the extension of city with special characteristics called the fringe.

**Socio-economic landscape** is the reflection of progress of human civilization. The process of developments brings about changes in social and economic realities of any region i.e. in demographic profile, settlement profile and trend of urbanization,
occupational structure and distribution of landholdings. The population of the fringe has increased about four times during the last four decades. It was 98525 in 1971 which increased to 394942 in 2001. The growth rate of population has been more than 50 percent during the last three decades due influx of rural as well as urban population in the fringe. The maximum percentage of the population of the fringe lies in age group 15-59 years.

Total population of scheduled castes in the fringe was 53128 including 28547 males and 24581 females while the total population of scheduled tribes was 202 including 115 males and 87 females according to census 2001. SCs constitute about 13 percent of the population in the fringe.

Sex ratio in the fringe was 848 in 2001 while sex ratio in SCs was 861 during the same period.

Literacy in the study area was 60.05 percent in 2001.

In the occupational structure of the fringe, percentage of cultivators have decreased from 35.89 percent in 1981 to 21.97 percent in 2001. Agricultural labourers have also decreased from 22.73 percent in 1981 to 11.76 percent in 2001.

The worker in household industry increased from 6.04 percent in 1980-81 to 8.52 percent in 2006-07. In the category of other workers, it was 35.34 percent in 1980-81 which increased to 57.75 percent in 2001. Thus, the percentage of agricultural labourers has decreased but that of workers household industry and other workers have increased during the past two decades in the fringe.

Pattern of distributions of landholding affects the agricultural returns. Average size of landholdings in fringe areas was 0.71 hectare in 1995-96. The percentage of landholdings below 1 hectare was 79.63 percent of total number of landholding which accounted
for 32.50 percent of area in 1995-96. Landholdings between 1 to 2 hectares were registered to be 6.87 percent and with 21.78 percent area in 1995-96 while the landholdings between 2 to 4 hectares were 6.87 percent in number and 21.78 percent in area in 1996-97. Landholdings above 10.0 hectare were 0.31 percent but it accounted for 6.81 percent area in 1996-97. Therefore, maximum percentage of landholdings belong to small and marginal farmers but area was less i.e. about 90 percent of landholdings and 50 percent of area. This is due to transfer of small landholdings to medium and big farmers.

The **residential areas** have increased at rate of 35 percent per decade in the fringe which is an obvious shoot off in population which will have serious implication for land use planning in coming decades. Presently the most of the **industries** around Allahabad city are located in the fringe of Naini, Bamrauli, Phaphamau and Jhusi.

The growth of Allahabad Fringe Area is not uniform in all the directions around the city. Therefore, it needs **planning** at different levels. The focus on preparation and analysis of **land use plan** for the development the fringe have been two fold:

- (a) Land use plan related to agricultural land
- (b) Land use plan related to land put to non-agricultural uses.

Land use plan related to agricultural land includes rationalizations of landholdings, net sown area, cropping pattern, cropping intensity, productivity, irrigation facilities, use of fertilizers and pesticides, extent of mechanization and livestock. Many of the factors inhibiting the growth of agriculture in the fringe like lack of resources, capital deficiency, right marketing techniques, problems of water logging, the problem of salinity and pollution of underground water etc. need to be given special focus.

As an effective planning, the first step is to protect the best

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land for agriculture. The land that is most suitable for crops should be protected for agriculture. Fringe Land Management Committee and local authorities should be entrusted with responsibility to ensure that these policies be implemented. There is need of restructuring of production process in such a way to serve the interest of small and marginal farmers. For this purpose societies and self help groups should be formed. A corporate farming society should be formed for better storage, transportation and marketing syndicates. There is also need of crop diversification i.e. that is cultivation of vegetables, cash crops, plants like Jatropha, Popular and eucalyptus etc. Dairy farming, bee farming and sericulture should be promoted.

Land use planning other than agricultural land mainly focuses on the categories of land as recognized by revenue department.

(i) Forest,

(ii) Land put to non-agricultural uses,

(iii) Barren and uncultivable land,

(iv) Culturable waste land,

(v) Permanent pastures and other grazing land,

(vi) Land under miscellaneous trees and groves.

The focus of planning for these categories has been many folds:

(a) Agricultural land should not be transferred for other uses.

(b) There should be increase in area of forest, miscellaneous trees and groves; and area under pasture and grazing land.

(c) Use of culturable waste land and fallow land for above purposes.

(d) Industries, buildings and other institutions should be developed on barren and uncultivable land.
(e) There should be regulation of land use along the road side.

(f) The conversion of land should be checked by effective law and there should be heavy fine for such practices.

The planning in the fringe should be three-tier (macro, meso and micro) to address problem at different level. This will ensure proper development of the fringe.