# Regional Disparities in the Levels of Development in Uttar Pradesh*

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## SUMMARY

The level of development of various districts of Uttar Pradesh was estimated with the help of composite index based on optimum combination of thirty eight economic indicators. All the sixty three districts of the State were included in the study. The data for the year 1991-92 on thirty eight economic indicators were used. Eighteen indicators were directly concerned with agricultural development, seven indicators depicted the progress of development in industrial sector and the rest thirteen indicators presented the level of development in infrastructural service sector.

The level of development was examined separately for agricultural, industrial and overall socio-economic sectors. The district of Ghaziabad was found to rank first and that of Chamoli was the last in the overall socio-economic development. Wide disparities in the level of development has been observed among different regions of the State and the western region had been found to be better developed as compared to other regions of the State. Positive significant association was found between the levels of development in the agricultural and industrial sectors indicating that the growth and progress of agriculture and industry had been going hand in hand in the State. Six districts covering about 9 per cent area and little more than 10 per cent population of the State, were found to be better developed whereas twenty three districts having 41 per cent area and 35 per cent population were categorised as low developed districts.

For bringing about uniform regional development, potential targets for various indicators had been estimated for poorly developed districts. The study revealed that the low developed districts required improvements of various dimensions in most of the indicators for enhancing the level of overall socio-economic development.

*Key words* : Composite index, Development indicators, Model districts, Potential target, Regional disparities.

## Introduction

Uttar Pradesh is primarily an agricultural state. The total foodgrains production of the State during 1989-90 was of the order of 338 lakh tonnes

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as against 249 lakh tonnes achieved during 1980-81. Commercial crops occupy about 1/5th of the total cropped area in the State. According to 1991 population census, the population of Uttar Pradesh is about 13.9 crores which is 16.5 per cent of the total All India population. The growth rate of population from 1981 to 1991 is of the order of 25.4 per cent. About 80 per cent people of the State live in the rural areas. The estimated annual birth rate per 1000 population in the State is 37.0 which is much above the all India level. The crude death rate in the State is 12.6 which is higher than the corresponding death rate at all India level. The life expectancy of the people is about 52.3 years for males, 49.6 years for females as against 55.9 years at all India level. The literacy rate in the State is about 41 per cent which is much below the all India level of 52 per cent. The State is categorised among the most backward states of the country with respect to literacy rate. About only 1/4th of the female population in the State is literate.

Economic planning has been used in the country as an instrument for bringing about uniform regional development because one of the main objectives of India's developmental programmes has been a progressive reduction in regional disparities in the pace of development. Although resource transfers are being executed to the backward regions through a number of instruments like subsidies and central assistance, it has been noticed that the regional disparities in terms of development in different sectors of economy is not declining over time. The present study deals with the evaluation of the levels of development in agricultural, industrial and overall socio-economic sectors by constructing the composite index of development at district level in the State of Uttar Pradesh. It would be of interest to measure the level of development at district level since there has been a growing consensus about the need of district level planning. A knowledge of the level of development at the district level in various sectors will help in identifying where a given district stands in relation to others. The study also throws light on the relationships between the levels of development in different sectors. On the basis of distances and composite indices of development based on the various indicators, model districts have been identified for fixing up the potential targets of different indicators for poorly developed districts.

## 2. *Method of Analysis*

Socio-economic development is not a pre-determined state but it is a continuous process of improvement of levels of living. Development is a multi-dimensional process and its impact can not be captured fully by any single indicator. Moreover, a number of indicators when analysed individually, do not provide an integrated and easily comprehensible picture of reality. Hence there

is a need for building up of a composite index of development based on various economic indicators combined in an optimum manner. For this study, districts have been taken as the unit of analysis. All the sixty three districts of Uttar Pradesh have been included in the analysis. The study utilises data for the year 1991-92 on thirty eight socio-economic indicators out of which eighteen indicators are directly concerned with agricultural development, seven indicators depict the progress of development in industrial sector and the rest thirteen indicators present the level of development in infrastructural and service sectors.

### 2.1.   Development Indicators

Each district faces situational factors of development unique to it as well as common administrative and financial factors. Factors common to all the districts have been taken as the indicators of development. The composite indices of development for different districts have been obtained by using the data on the following developmental indicators :

1. Percentage of cropped area to total agricultural land.

2. Cropping intensity.

3. Fertiliser application in kg/ha. cropped area.

4. Total value of crop production per hectare (fixed price) in '00 Rs.

5. Number of agricultural mandis per 10 lakh hectare of cropped area.

6. Cropped area per rural person (hect.).

7. Average production of foodgrains (Q/ha).

8. Percentage of Banjar and other land unsuitable for agriculture.

9. Percentage of forest area and other uncultivable land.

10. Per capita foodgrains production (kg.).

11. Number of animals per thousand population.

12. Number of animals per veterinary hospital ('000).

13. Number of milch animals per thousand population.

14. Percentage of commercial crops to total cropped area.

15. Percentage of agricultural labours to total labour force.

16. Percentage distribution of electricity in agriculture.

17. Percentage of Irrigated area to total cropped area.

18. Percentage of area damaged by flood to total kharif cropped area.

19. Per capita value of industrial production (Rs.)

20.   Number of factories per lakh population.

21.   Average value of production per industrial worker.

22.   Number of factory workers per lakh population.

23.   Percentage distribution of major and medium factories.

24.   Percentage of industrial workers to total workers.

25.   Percentage distribution of electricity in industry.

26.   Population growth (Percentage 1981-91).

27.   Population Density per square k.m.

28.   Urban population as percentage of total population.

29.   Number of hospitals per lakh population.

30.   Percentage of villages having no medical facilities.

31.   Literacy Percentage.

32.   Road length per thousand k.m. of area (in k.m.).

33.   Percentage of electrified villages.

34.   Number of post offices per lakh population.

35.   Number of banks per lakh population.

36.   Credit-Demand Ratio.

37.   Percentage of main workers to total population.

38.   Gross Domestic Products (Fixed Price 1980-81).

A total of thirty eight developmental indicators have been included in the analysis. These indicators may not form an all inclusive list but these are the major interacting components of socio-economic development.

## 2.2.   Estimation of Composite Index of Development and Fixation of Potential Targets

Variables in respect of different indicators have been standardised and their standardised values are used to build-up the composite index of development. The best district for each indicator (with maximum/minimum standardised value depending upon the directions of the indicator) is identified and the deviations of various indicators from the corresponding best values are obtained for each district. The statistical techniques presented by Narain, Rai and Sarup [1] are applied to construct the composite index of development for each district. The composite indices have been obtained separately for agricultural, industrial and overall socio-economic developments for different districts. The value of composite index thus obtained is non-negative and lies

between 0 and 1. A value close to zero, indicates higher level of development where as a value close to one indicates lower level of development.

The development distances based on all the indicators have been obtained for each pair of districts and model districts have been identified. The model districts will have better level of development in comparison with the poorly developed districts and the developmental distances between them will be within the limit of critical distance. The best value of different indicators among the model districts will be taken as potential targets for poorly developed districts.

## 3. *Results and Discussion*

### 3.1. The Level of Development

The composite indices of development have been worked out for different districts separately for agricultural, industrial and overall socio-economic sectors. The districts have been ranked on the basis of development indices. The composite indices along with the district ranks are presented in Table 1 separately for agricultural, industrial and overall socio-economic sectors.

**Table 1.** Composite Index of Development

| Districts | Agriculture | | Industry | | Overall Socio-economic | |
|---|---|---|---|---|---|---|
| | Com-posite index | Rank | Com-posite index | Rank | Com-posite index | Rank |
| 1. Allahabad | 0.91 | 53 | 0.78 | 18 | 0.89 | 35 |
| 2. Azamgarh | 0.89 | 46 | 0.87 | 47 | 0.94 | 56 |
| 3. Mau | 0.79 | 24 | 0.83 | 29 | 0.88 | 26 |
| 4. Ballia | 0.92 | 56 | 0.87 | 46 | 0.94 | 55 |
| 5. Baharaich | 0.87 | 41 | 0.89 | 54 | 0.95 | 59 |
| 6. Basti | 0.82 | 32 | 0.86 | 42 | 0.93 | 52 |
| 7. Sidharth Nagar | 0.85 | 38 | 0.88 | 50 | 0.95 | 57 |
| 8. Deoria | 0.86 | 39 | 0.84 | 34 | 0.93 | 50 |
| 9. Faizabad | 0.80 | 26 | 0.84 | 35 | 0.89 | 32 |
| 10. Ghazipur | 0.83 | 34 | 0.85 | 38 | 0.90 | 38 |
| 11. Gonda | 0.83 | 35 | 0.86 | 40 | 0.93 | 49 |
| 12. Gorakhpur | 0.90 | 47 | 0.80 | 22 | 0.92 | 47 |
| 13. Maharajganj | 0.84 | 37 | 0.85 | 36 | 0.92 | 45 |
| 14. Jaunpur | 0.81 | 31 | 0.88 | 51 | 0.92 | 48 |

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| Districts | Agriculture | | Industry | | Overall Socio-economic | |
|---|---|---|---|---|---|---|
| | Composite index | Rank | Composite index | Rank | Composite index | Rank |
| 15. Mirzapur | 0.87 | 43 | 0.68 | 5 | 0.85 | 13 |
| 16. Sonebhadra | 0.91 | 54 | 0.74 | 9 | 0.91 | 43 |
| 17. Pratapgarh | 0.91 | 51 | 0.89 | 55 | 0.95 | 60 |
| 18. Sultanpur | 0.88 | 45 | 0.88 | 49 | 0.93 | 51 |
| 19. Varanasi | 0.87 | 42 | 0.78 | 17 | 0.88 | 27 |
| 20. Almora | 0.97 | 59 | 0.88 | 52 | 0.90 | 40 |
| 21. Pithoragarh | 0.92 | 55 | 0.91 | 61 | 0.90 | 39 |
| 22. Dehradun | 0.87 | 40 | 0.77 | 13 | 0.82 | 11 |
| 23. Garhwal | 0.98 | 61 | 0.86 | 41 | 0.91 | 42 |
| 24. Chamoli | 0.99 | 63 | 0.92 | 62 | 0.97 | 63 |
| 25. Nainital | 0.69 | 3 | 0.64 | 4 | 0.72 | 2 |
| 26. Tehri Garhwal | 0.99 | 62 | 0.90 | 60 | 0.93 | 53 |
| 27. Uttar kashi | 0.95 | 57 | 0.93 | 63 | 0.94 | 54 |
| 28. Banda | 0.90 | 49 | 0.90 | 57 | 0.95 | 58 |
| 29. Hamirpur | 0.96 | 58 | 0.90 | 56 | 0.96 | 62 |
| 30. Jalaun | 0.81 | 30 | 0.90 | 59 | 0.90 | 37 |
| 31. Jhansi | 0.91 | 52 | 0.77 | 14 | 0.87 | 21 |
| 32. Lalitpur | 0.91 | 50 | 0.90 | 58 | 0.96 | 61 |
| 33. Agra | 0.77 | 22 | 0.74 | 10 | 0.81 | 9 |
| 34. Mainpuri | 0.71 | 5 | 0.87 | 43 | 0.86 | 17 |
| 35. Firozabad | 0.79 | 25 | 0.80 | 21 | 0.86 | 16 |
| 36. Aligarh | 0.76 | 17 | 0.83 | 27 | 0.87 | 18 |
| 37. Bareilly | 0.84 | 36 | 0.80 | 19 | 0.88 | 24 |
| 38. Badaun | 0.72 | 6 | 0.89 | 53 | 0.90 | 36 |
| 39. Bulandshahar | 0.65 | 1 | 0.82 | 25 | 0.82 | 10 |
| 40. Etah | 0.75 | 15 | 0.87 | 45 | 0.88 | 30 |
| 41. Etawah | 0.76 | 18 | 0.87 | 44 | 0.88 | 29 |
| 42. Farukhabad | 0.74 | 10 | 0.85 | 39 | 0.87 | 19 |
| 43. Mathura | 0.77 | 20 | 0.73 | 7 | 0.79 | 6 |
| 44. Meerut | 0.73 | 9 | 0.73 | 6 | 0.79 | 5 |

| Districts | Agriculture | | Industry | | Overall Socio-economic | |
|---|---|---|---|---|---|---|
| | Com-posite index | Rank | Com-posite index | Rank | Com-posite index | Rank |
| 45. Ghaziabad | 0.76 | 19 | 0.33 | 1 | 0.71 | 1 |
| 46. Moradabad | 0.74 | 13 | 0.80 | 20 | 0.86 | 15 |
| 47. Pilibhit | 0.74 | 11 | 0.84 | 31 | 0.88 | 25 |
| 48. Rampur | 0.75 | 16 | 0.83 | 28 | 0.88 | 31 |
| 49. Muzaffar Nagar | 0.70 | 4 | 0.76 | 12 | 0.81 | 8 |
| 50. Saharanpur | 0.67 | 2 | 0.74 | 8 | 0.78 | 3 |
| 51. Bijnore | 0.74 | 14 | 0.78 | 16 | 0.83 | 12 |
| 52. Haridwar | 0.72 | 8 | 0.78 | 15 | 0.81 | 7 |
| 53. Shahjehanpur | 0.72 | 7 | 0.84 | 33 | 0.86 | 14 |
| 54. Barabanki | 0.80 | 28 | 0.81 | 23 | 0.88 | 28 |
| 55. Fatehpur | 0.78 | 23 | 0.84 | 32 | 0.87 | 22 |
| 56. Hardoi | 0.80 | 27 | 0.87 | 48 | 0.92 | 46 |
| 57. Kanpur (Urban) | 0.97 | 60 | 0.63 | 2 | 0.87 | 23 |
| 58. Kanpur (Rural) | 0.74 | 12 | 0.63 | 3 | 0.79 | 4 |
| 59. Kheri | 0.77 | 21 | 0.84 | 30 | 0.89 | 33 |
| 60. Lucknow | 0.90 | 48 | 0.75 | 11 | 0.89 | 34 |
| 61. Rae Bareli | 0.81 | 29 | 0.82 | 24 | 0.87 | 20 |
| 62. Sitapur | 0.82 | 33 | 0.85 | 37 | 0.91 | 44 |
| 63. Unnao | 0.87 | 44 | 0.82 | 26 | 0.91 | 41 |

It may be seen from Table 1 that out of 63 districts of the State, the district of Ghaziabad was ranked first and the district of Chamoli was ranked last in the overall socio-economic development. The values of composite indices varied from 0.71 to 0.97. A simple ranking of the districts on the basis of composite indices would be sufficient for classificatory purposes. A suitable fractile classification of the districts from an assumed distribution of the mean of the composite indices will provide a more meaningful characterisation of different stages of development. It appears appropriate to assume that the mean has a Beta distribution in the range (0, 1). Let $(0, Z_1)$; $(Z_1, Z_2)$ and $(Z_2, 1)$ be linear intervals such that each interval has the same probability weight of 0.33. The fractile groups can be used to characterise the various stages of development. For relative comparison, the districts with composite indices $\leq 0.80$ may be put in category I as developed districts. The districts with

composite indices between 0.81 to 0.90 may be taken in category II as developing and with composite indices ≥ 0.91 as poorly developed districts. We observe from the Table that according to this classification, in over all socio-economic development, the districts of Ghaziabad, Nainital, Saharanpur, Kanpur (Rural), Meerut and Mathura fall in category I and these may be taken as developed districts. The districts of Haridwar, Muzaffar Nagar, Agra, Bulandshahar, Dehra Dun, Bijnore, Mirzapur, Shahjehanpur, Moradabad, Firozabad, Mainpuri, Aligarh, Farukhabad, Rae Bareilly, Jhansi, Fatehpur, Kanpur (Urban), Bareilly, Pilibhit, Mau, Varanasi, Barabanki, Etawah, Etah, Rampur, Faizabad, Kheri, Lucknow, Allahabad, Badaun, Jalaun, Ghazipur, Pithoragarh and Almora are put in category II and may be classified as developing districts. The remaining 23 districts of the State are in category III and these are taken as poorly developed districts.

It will be quite interesting and useful to examine the levels of development of different districts separately for agricultural and industrial sectors. The composite indices varied from 0.65 to 0.99 in agricultural sectors and from 0.33 to 0.93 in industrial sector. In respect of agricultural development, the district of Bulandshahar was found to be on the first position in the State whereas the district of Chamoli was on the last rank. Similarly in the case of industrial development, the district of Ghaziabad was on the first rank in the State and the district of Uttar Kashi was on the last rank. Twenty eight districts were observed to be in category I in respect of development in agricultural sector. These districts are developed districts and producing bulk of agricultural produce in the state. Twenty one districts were found to be in category II and these districts are having tendency to make improvements in the level of the development in agricultural sector. The remaining fourteen districts were in category III with very poor level of development in agriculture. In the case of industrial development, the district of Ghaziabad was found to be very highly developed and all districts were far below the level of Ghaziabad. However, twenty two districts were in category I, thirty eight districts were in category II and three districts were in category III. The variation in the level of development in industrial sector is found to be of higher order as compared to agricultural sector.

### 3.2. Relative Share of Area and Population – Regional analysis

An important aspect of the study is to find out the relative share of area and population affected under different levels of development in various regions of the State. The State of Uttar Pradesh has been divided into five broad regions – Eastern Region, Hilly Region, Bundelkhand Region, Western Region and Central Region. The Eastern Region is situated in the eastern part of the State

**Table 2.** Area and Population under different levels of development.

| Sectors | Levels of Development | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | High | | | Medium | | | Low | | |
| | No. of districts | Area % | Popula-tion % | No. of districts | Area % | Popula-tion % | No. of dis-tricts | Area % | Popula-tion % |
| | | | | EASTERN REGION | | | | | |
| Agriculture | 2 | 2.44 | 3.10 | 13 | 19.30 | 27.30 | 4 | 7.42 | 7.50 |
| Industry | 5 | 9.16 | 11.20 | 14 | 20.00 | 26.70 | - | - | - |
| Socio-economic | - | - | - | 6 | 9.14 | 13.10 | 13 | 20.02 | 24.80 |
| | | | | HILLY REGION | | | | | |
| Agriculture | 1 | 2.31 | 1.20 | 1 | 1.05 | 0.70 | 6 | 14.00 | 2.40 |
| Industry | 2 | 3.36 | 1.90 | 3 | 5.16 | 1.50 | 3 | 8.84 | 0.90 |
| Socio-economic | 1 | 2.31 | 1.20 | 3 | 5.89 | 1.70 | 4 | 9.16 | 1.40 |
| | | | | BUNDELKHAND REGION | | | | | |
| Agriculture | - | - | - | 2 | 4.14 | 2.20 | 3 | 5.85 | 2.60 |
| Industry | 1 | 1.71 | 1.00 | 4 | 8.28 | 3.80 | - | - | - |
| Socio-economic | - | - | - | 2 | 3.26 | 1.90 | 3 | 6.73 | 2.90 |

| Sectors | Levels of Development | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | High | | | Medium | | | Low | | |
| | No. of districts | Area % | Population % | No. of districts | Area % | Population % | No. of districts | Area % | Population % |
| WESTERN REGION | | | | | | | | | |
| Agriculture | 20 | 26.52 | 33.60 | 1 | 1.40 | 2.00 | - | - | - |
| Industry | 11 | 14.07 | 20.40 | 10 | 13.85 | 15.20 | - | - | - |
| Socio-economic | 4 | 4.81 | 7.60 | 17 | 23.11 | 28.00 | - | - | - |
| CENTRAL REGION | | | | | | | | | |
| Agriculture | 5 | 9.28 | 8.30 | 4 | 5.94 | 7.30 | 1 | 0.35 | 1.80 |
| Industry | 3 | 2.95 | 5.30 | 7 | 12.62 | 12.10 | - | - | - |
| Socio-economic | 1 | 1.74 | 1.50 | 6 | 8.29 | 10.00 | 3 | 5.54 | 5.90 |
| TOTAL STATE | | | | | | | | | |
| Agriculture | 28 | 40.55 | 46.20 | 21 | 31.83 | 39.50 | 14 | 27.62 | 14.30 |
| Industry | 22 | 31.25 | 39.80 | 38 | 59.91 | 59.30 | 3 | 8.84 | 0.90 |
| Socio-economic | 6 | 8.86 | 10.30 | 34 | 49.69 | 54.70 | 23 | 41.45 | 35.00 |

containing of 19 districts having about 86 thousand square k.m. of area (29.16%) and about 5.27 crores of population (37.9%). The Hilly Region is situated in the north- western hilly part of the State. This region consists of 8 districts having an area of 51 thousand square km. (17.36%) and about 59 lakh population (4.3%). The Bundelkhand Region is situated in the southern part of the State having 5 districts with an area of about 29 thousand square k.m. (9.99%) and about 67 lakh population (4.8%). The Western Region is situated in the western plane of the state. There are 21 districts in this region. The area and population of the region are 82 thousand square km. (27.92%) and 4.95 crores (35.6%) respectively. The Central region is situated in the central part of the State having 10 districts. The area and population of this region are about 46 thousand square k.m. (15.57%) and 2.42 crores (17.4%) respectively. The area and population covered by the districts falling under different levels of development are presented in Table 2 for various regions of the State.

It is evident from this Table that none of the districts from Eastern Region and Bundelkhand Region falls in category I with respect to overall socio-economic development. One district from Hilly Region covering an area of 2.31 per cent and population of 1.2 per cent of the State belongs to category I in socio-economic development. The Western Region contributes maximum in category I where four districts of the region covering an area of 4.81 per cent with 7.6 per cent of the population of the State belong to the category of better developed districts in socio-economic development. One district from the Central Region having an area of 1.74 per cent with 1.5 per cent of State population belongs to category I. At the State level six districts with 8.86 per cent area and 10.3 per cent population fall in category I in socio-economic development. These districts are found to be better developed. There are four districts of category II at the State level. These districts cover an area of 49.69 per cent and population of 54.7 per cent of the State. Six districts of the Eastern Region having 9.14 per cent area and 13.1 per cent population belong to the category II in socio-economic development. Three districts from Hilly Region with 5.89 per cent area and 1.7 per cent population and two districts from Bundelkhand Region with 3.26 per cent area and 1.9 per cent population belong to category II. The contribution of Western Region to this category of socio-economic development is maximum where seventeen districts with 23.11 per cent area and 28 per cent population belong to this category. Six districts from the Central Region having an area of 8.29 per cent and 10 per cent population fall in this category. The socio-economic development in these districts is at the middle level and they are having tendency to make improvement. Twenty three districts at the State level with 41.45 per cent area

and 35 per cent population belong to category III which are very poorly developed. The contributions to this category of socio-economic development from Eastern Region are thirteen districts with 20.02 per cent area and 24.8 per cent population and from Hilly Region are four districts with 9.16 per cent area and 1.4 per cent population. The Bundelkhand Region contributes three districts with 6.73 per cent area and 2.9 per cent population and Central Region contributes three districts with 5.54 per cent area and 5.9 per cent population to this category. None of the districts of Western region belongs to this category. It is clear that there is a wide disparity in the socio-economic development among different regions of the State. About 35 per cent population of the State belong to the districts having poor level of development and out of this about 25 per cent people come from the Eastern Region.

In agricultural development, 28 districts with an area of 40.55 per cent and population of 46.2 per cent fall in category I of better development. The contribution of Western Region is found to be maximum in this category where 20 districts with 26.52 per cent area and 33.6 per cent population belong to better developed group. From Eastern Region, two districts with 2.44 per cent area and 3.1 per cent population fall in this category whereas from the Hilly Region one district with 2.31 per cent area and 1.2 per cent population belong to this category. None of the districts of Bundelkhand Region falls in this category whereas five districts from the Central Region with an area of 9.28 per cent and population of 8.3 per cent belong to this category. The districts falling in this category are middle level developed. Fourteen districts at the State level covering an area of 27.62 per cent and 14.3 per cent population fall in category III which are very poorly developed districts. Four districts from the Eastern Region with an area of 7.42 per cent and population of 7.5 per cent and six districts from the Hilly Region covering an area of 14 per cent and population of 2.4 per cent belong to poorly developed category. Three districts from Bundelkhand Region covering an area of 5.85 per cent and population of 2.6 per cent and one district from the Central Region with an area of 0.35 per cent and 1.8 per cent of population belong to category III. None of the districts from the Western Region belong to this category. More than 50 per cent population belonging to poor developed districts come from the Eastern Region.

There are 22 districts at the state level covering an area of 31.25 per cent and 39.8 per cent population which belong to better developed category in respect of industrial development. The contribution of Western Region with 11 districts, 14.07 per cent area and 20.4 per cent population to this category is found to be maximum. The Eastern Region contributes five districts with 9.16 per cent area and 11.2 per cent population to this category. Two districts

from the Hilly region with an area of 3.36 per cent and 1.9 per cent population and one district from the Bundelkhand region covering an area of 1.71 per cent and one per cent population belong to this category. Three districts from the Central region with an area of 2.95 per cent and 5.3 per cent population fall in this category. There are thirty eight districts at the state level covering an area of 59.91 per cent and 59.3 per cent population which belong to the middle level developed category. The Western region contributes ten districts with 13.85 per cent area and 15.2 per cent population to this category whereas fourteen districts from the Eastern region covering an area of 20 per cent and 26.7 per cent population in this category. Three districts from the Hilly region with an area of 5.16 per cent and 1.5 per cent population and four districts from Bundelkhand region belong to the middle level developed category. Seven districts of the Central region covering an area of 12.62 per cent and population 12.1 per cent fall in this category. Only three districts at the state level covering an area of 8.84 per cent and 0.9 per cent population fall in category III of poor developed districts and all these districts come from Hilly region. None of the districts from any other region falls in poor developed category in respect of industrial development.

The above analysis throws light on the level of development of different regions of the state and it was found that the Western region is better developed as compared to other regions of the state.

### 3.3.    Inter-relationships among different sectors

For proper economic development and better level of living, it is essential that agriculture and industry must flourish together in the state because industries provide basic inputs for agricultural improvement and use agricultural produce as the principal raw material for preparing finished goods. In order to examine the relationships among agriculture, industry infrastructural service facilities and overall socio-economic developments, pairwise rank correlation have been worked out and presented in table 3.

The correlation coefficients between the rankings of agricultural and socio-economic developments as well as between the rankings of industrial and socio-economic developments are observed to be quite high and these are statistically highly significant. This is expected since agricultural and industrial progress is very much influencing the socio-economic development in the state. The correlation coefficient between agricultural and industrial developments is also highly significant but lower in magnitude than their correlations with over all socio-economic development. The agricultural and industrial rankings are positively correlated which implies that the districts which are agriculturally

Table 3. Pairwise Rank Correlation Coefficients

| Pair of sectors | Correlation Coefficients |
|---|---|
| 1. Agriculture and Industry | 0.38** |
| 2. Agriculture and Infrastructure | -0.06 |
| 3. Agriculture and overall socio-economic development | 0.71** |
| 4. Industry and Infrastructure | 0.03 |
| 5. Industry and overall socio-economic development | 0.80** |
| 6. Infrastructure and overall socio-economic development | 0.32* |

\* Significant at 0.05 level

\*\* Significant at 0.01 level

developed, are mostly developed in industrial sector also and vice versa. The developments in agricultural and industrial sectors seem, therefore, to go hand in hand in the state.

Infrastructural facilities are not influencing the developments in agricultural as well as industrial sectors as their correlations are not significantly different from zero. This indicates that the infrastructural facilities are not being fully used in the development of either agricultural or industrial sectors. The rankings between the infrastructural facilities and overall socio-economic developments are found to be positively correlated which implies that the infrastructural facilities are positively influencing the progress of overall socio-economic developments in the state.

## 3.4.    Potential targets for low developed districts

It would be quite interesting and useful to examine the extent of improvement required in different indicators of the low developed districts. It will also provide avenues to bring about uniform regional development in the state. Such information may help the planners and administrators to readjust the resources to reduce inequalities in the levels of development among different districts of the state. For estimation of potential targets of different indicators, model districts have to be identified for the low developed districts. The identification of model districts has been made on the basis of composite index of development and developmental distances between different districts.

Twenty three districts covering 35 per cent population of the state are observed to be very poorly developed in respect of over all socio-economic development. Thirteen districts from the Eastern region and three districts from the Central region fall in this category. These districts cover about 25 per cent area and 30 per cent population. The density of population in these districts is found to be much higher than the state average of 472 persons per square km. Four districts from the Hilly region with 1.4% population and three districts from Bundelkhand region having about 3 per cent population belong to poorly developed category. None of the districts from the Western region belong to this category. The improvements needed in various indicators are presented below for different regions.

*Eastern and Central regions* : Sixteen districts of these two regions covering more than 30 per cent population of the state fall in the category of low developed districts. These districts require improvements of various dimensions in most of the indicators for enhancing their level of overall socio-economic development. However, major improvements are needed in the following indicators :

a)  Enhancement of cropping intensity

b)  Availability and use of fertilisers

c)  Increase in agricultural mandis

d)  Improvement in agricultural production

e)  Increase in the milch animals and veterinary hospitals

f)  Improvement in flood protection measures

g)  Reduction in population growth

h)  Increase in medical facilities

*Hilly region* : Four districts of this region are very poorly developed. These districts are lagging behind in almost all the indicators and steps are needed to make improvements in all of them. Since these areas are mostly covered by forest and hills, these are not quite suitable for agricultural and industrial developments. However, the hilly districts should be encouraged to make improvements in the production of horticultural crops and forest produce. Industries based on these produce should also be developed in the area.

*Bundelkhand region* : Three districts out of a total of five districts of the region are very poorly developed. Some of the reasons of poor development are lack of proper irrigation facilities, availability and use of fertiliser for crop production, poor cropping intensity, low animal production, literacy and non-availability of proper medical facilities. This area should be developed for

enhancing the production of pulses and oil seed crops which are mostly grown in unirrigated conditions.

Almost all the districts of the state are found to be very poor in the level of literacy. The system of education envisages all-round development of manpower and human resources required for various socio-economic activities. As per 1991 census, the literacy rate at the state level is only 41 per cent and 59 per cent people of the state are deprived of education. Realising the gravity of the situation, effective measures should be taken for enrolment drive and expansion of primary education. Efforts should also be made to do away with drop-out by setting more and more formal and non-formal education centres. The per capita expenditure of Uttar Pradesh on education during 1989-90 was Rs. 150/- as against Rs. 175/-, the average of 15 major states of the country. The state occupies 13th position among these 15 major states. The states of Punjab, Kerala, Maharashtra, Gujarat, Haryana, Tamil Nadu, Karnataka, Andhra Pradesh, Orissa, Assam, Rajasthan and West Bengal have more per capita expenditure than Uttar Pradesh whereas the states of Bihar and Madhya Pradesh have less per capita expenditure.

4. *Conclusions :*

The broad conclusions emerging from the study are as follows :

1) With respect to overall socio-economic development, the districts of Ghaziabad, Nainital, Saharanpur, Kanpur, Meerut and Mathura were found to be better developed as compared to the remaining districts of the state. Twenty three districts of the state have been categorised as low developed districts and the rest thirty four districts have indicated tendency for improvement in their overall development.

2) Regarding agricultural development, the situation in the state has slightly different where twenty eight districts were found to be better developed and fourteen districts were very poorly developed. In the case of industrial development, Ghaziabad was very highly developed, twenty one districts were developed but the level of their development was much below the level of Ghaziabad and only three districts have been observed to have poor development.

3) The overall socio-economic development in the state was positively associated with the developments in agricultural and industrial sectors. The growth and progress in the fields of agriculture and industry are influencing the overall socio- economic development in the positive direction. Agricultural and industrial developments seem to go hand in hand in most of the districts in the state. The infrastructural facilities have positive impact on the overall socio-economic development but

these facilities are not fully used in the growth and development of agriculture and industry.

4) Wide disparities in development among different regions of the state had been observed. The Western region had been found to be better developed as compared to other regions of the state.

5) In order to reduce the disparities in development among different regions, potential targets for various indicators had been estimated for poor developed districts. The districts which are low developed, require improvements of various dimensions in different indicators for enhancing the level of development.

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# ANNOUNCEMENT

The 49th Annual Conference of the Indian Society of Agricultural Statistics which was postponed due to certain unavoidable circumstances, will now be held on 22 and 23 February, 1996 at Lucknow under the aegis of the Government of Uttar Pradesh. The Programme for the Conference will be as follows :

Thursday, 22 February, 1996

Registration
Meeting of the Executive Council

INAUGURAL FUNCTION
Technical Address by     Prof. T. V. Hanurav,
    Sessional President

Presentation of Papers considered for
    Young Scientist Award

"Dr. Rajendra Prasad Memorial Lecture" by
    Dr. R.S. Paroda,
    Secretary, DARE, Government of India
    and Director General, ICAR

Reading of Contributed Papers

General Body Meeting

Friday, 23 February, 1996

Symposium on "Research Priorities in
Agricultural Statistics to meet future challenges"

Reading of Contributed Papers

Symposium on "Role of Statistics in Land Use
    Planning"

"Dr. V. G. Panse Memorial Lecture" by
    Shri. J.S. Sarma

P. R. SREENATH

# OTHER PUBLICATIONS OF THE SOCIETY

## I. SAMPLING THEORY OF SURVEYS WITH APPLICATIONS

*P.V. Sukhatme, B.V. Sukhatme, S. Sukhatme and C. Asok*

It is the third Revised Edition containing all the principal developments in the theory of sampling with examples and exercises.

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## II. STATISTICAL METHODS IN ANIMAL SCIENCES

*V.N. Amble*

The book has been prepared for specially meeting the needs of the students and the research workers in animal sciences wishing to learn the basic principles and the principal procedures of statistics for use in planning investigation and in analysing and interpreting the data. The emphasis in the book is on the principles and procedures with an attempt at elucidating the logic without too much of mathematics. A special feature of the book is the illustrations of the procedures through examples all taken from the field of animal science which would help the research worker in animal science in understanding the applications all the more easily. Only basic knowledge of algebra at elementary level is assumed and the few derivations of procedures from statistical theory given in the book have been presented in such a manner that while they meet to some extent the logical inquisitiveness of a class of readers they could be ommited without loss of a clear understanding of the procedures.

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## VI. STATISTICAL DATA-THEIR CARE AND MAINTENANCE

*David J. Finney*

This bulletin is extremely useful for students and research workers engaged in data collection and analysis. It describes in a lucid manner how data can be scientifically gathered for drawing sound inference. The various topics dealt with are: acquisition of data, design of data gathering, care for data, types and units of data analysis and databases, copying, statistical ethics, data-entry to the computer, data scrutiny, integrity and some illustrations.

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# NEWS AND NOTES

- Prof. Bal B.P.S. Goel has taken over as Director, Indian Agricultural Statistics Research Institute, New Delhi with effect from 12th January, 1996. Before joining this post he was with the Food and Agriculture Organisation (FAO) of the United Nations for more than eleven years. During this period he served in Nepal (Kathmandu) and Zimbabwe (Harare). Prof. Goel left the Institute in September, 1984 when he was Joint Director (Research & Training).

- Prof. C.V. Rao, Department of Statistics, Nagarjuna University, Nagarjuna Nagar (A.P.) attended the Second Spring Research Conference on Statistics in Industry and Technology held at the University of Waterloo, Waterloo, Canada during June 12-14, 1995 and presented a paper on "A Graphical Method for Testing the Equality of Several Variances." He visited Carleton University, Ottawa, Canada as a Visiting Researcher on the invitation of the department of Mathematics and Statistics during June 15 – August 15, 1995 to collaborate with Prof. A.K.Md.E. Saleh.

- Drs. V.K. Bhatia, P.K. Malhotra, Senior Scientists and Shri Balbir Singh, Scientist (Senior Scale), Indian Agricultural Statistics Research Institute, New Delhi attended the training in the field of Computer Science under NARP at Western Michigan University, Michigan, USA for a period of two months w.e.f. June 19, 1995.

# CONDOLENCE

- The members of the Indian Society of Agricultural Statistics deeply mourn the sad demise of Prof. B.P. Adhikari on 23 February, 1995. He was the Sessional President during the 36th Annual Conference (1982) of the Society. Since 1983 he was one of the Vice Presidents. As a Vice President of the Society, Prof. Adhikari took keen interest in the activities of the Society.
  With the demise of Prof. B.P. Adhikari, the country in general and the society in particular lost a renowned statistician. The void left by him would be difficult to fill.

- The members of Indian Society of Agricultural Statistics deeply mourn the sad and sudden demise of Shri P.P. Rao, one of the life members of Society on Monday, 2 October, 1995 in USA. Shri Rao had retired as Scientist, (S.G.) IASRI, New Delhi. He took keen interest in the activities of the Society. With the demise of Shri Rao, the Society has lost a dedicated statistician. The void left by him would be difficult to fill.