



## **Evaluation of Variation in Socio-Economic Development in the States of Eastern Region**

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### **SUMMARY**

The status of development of different states of eastern region of the country was estimated with the help of composite index based on optimum combination of a number of socio-economic indicators. Five major states and seven smaller states of the region are included in the study. The data on various indicators for the year 2001-02 are used in the analysis. The level of development is examined separately for agricultural sector, infrastructural facilities and overall socio-economic field. West Bengal is ranked first among the major states and Mizoram obtains the first position among smaller states in socio-economic development. Wide disparities in the level of development are found among different states. Infrastructural facilities are found influencing the socio-economic development in the positive direction both for major and smaller states. For bringing out uniform regional development, potential targets of different indicators are estimated for low developed states.

*Key words* : Developmental indicators, Composite index, Model states, Potential targets.

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### **1. INTRODUCTION**

Socio-economic development is a process which improves the quality of life. Developmental programmes have been initiated in the country in a planned way through various Five Year Plans with the main objective of enhancing the quality of life of people by providing the basic necessities as well as effective improvement in their social and economic well being. The green revolution in agricultural sector and commendable progress in industrial front have certainly increased the total crop production and manufactured goods but there is no indication that these achievements have been able to reduce substantially the level of regional disparities in terms of development. For focusing the attention of scientists, planners, policy makers and administrators on the problems of estimation of level of development, a seminar was organized jointly by Planning Commission, Government of India and State Planning Institute, Government of Uttar Pradesh during April 1982. Realizing the seriousness and importance of the

problems of estimation of level of development, the Indian Society of Agricultural Statistics conducted a series of research studies in this direction. The level of socio-economic development was estimated for different states for the year 1971-72 and 1981-82 by Narain *et al.* (1991). The study revealed that there were wide disparities in the level of development among different states. For making deeper analysis, the data mostly pertaining for the year 1991-92 were utilized for estimating the status of development at district level. Studies for estimating the level of development at district level have been completed by Narain *et al.* for the states of Orissa (1992, 1993); Andhra Pradesh (1994, 2009); Kerala (1994, 2004); Uttar Pradesh (1995, 2001); Maharashtra (1996); Karnataka (1997, 2003); Tamil Nadu (2000); States of Southern Region (1999); Madhya Pradesh (2002); and Jammu & Kashmir (2005) and Rai *et al.* for Assam (2004). It was found that entire parts of the low developed districts are not backward but some parts are also better developed.

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The present study relates to the estimation of variation in socio-economic development in the states of eastern region of the country. The states of Arunachal Pradesh, Assam, Bihar, Jharkhand, Manipur, Meghalaya, Mizoram, Nagaland, Orissa, Sikkim, Tripura and West Bengal are situated in the eastern part of the country. Out of these twelve states, seven states namely Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim and Tripura are smaller states in area and population. These states cover about 5.6 per cent area and 1.2 per cent population of the country. The states of Assam, Bihar, Jharkhand, Orissa and West Bengal are comparatively major states and they cover about 15.3 per cent area and 24.7 per cent population of the country. The level of development has been estimated separately for major and small states. These states are primarily agricultural states and this sector alone contributes more than 50 per cent of state domestic product and provides employment to about 70 per cent of the total working force. The data on socio-economic variables for the year 2001-02 have been utilized to estimate the level of development. The level of development for agricultural sector, infrastructural facilities and socio-economic field was estimated for different states. The study also throws light on the association of development in different sectors of economy. The improvements required in various indicators for enhancing the level of development have also been suggested.

## 2. DEVELOPMENTAL INDICATORS

Socio-economic development is a continuous process of improvement in the level of living. The level of development cannot be fully estimated by single indicator. Moreover, a number of indicators when analyzed individually, do not provide an integrated and easily comprehensible picture of reality. For this study, states have been taken as the unit of analysis. Each state faces situational factors of development unique to it as well as common administrative and financial factors. The developmental indicators common to all the states have been included in the study. The composite indices of development have been obtained for different states on the basis of following developmental indicators:

01. Yield rate of total cereals (kg/ha)
02. Yield rate of pulses (kg/ha)
03. Yield rate of total foodgrains (kg/ha)

04. Yield rate of sugarcane (kg/ha)\*
05. Per capita foodgrains production (kg.)
06. Fertilizer consumption (kg/ha)
07. Percentage of gross irrigated area to gross cropped area
08. Net area sown per cultivator (ha)
09. Per capita domestic consumption of electricity (KWH)
10. Percentage of agricultural workers to total workers
11. Population density
12. Decennial growth rate of population (1991-92 to 2001-02)
13. Sex ratio
14. Percentage of SC and ST population
15. Percentage of main workers to total population
16. Literacy percentage (male)
17. Literacy percentage (female)
18. Life expectancy at birth (male)\*
19. Life expectancy at birth (female)\*
20. Annual birth rate
21. Annual death rate
22. Infant mortality rate
23. No. of students in primary and secondary schools per '000 population
24. Per capita gross output in industries\*
25. No. of motor vehicles per lakh population
26. Total road length per '00 square km. of area
27. No. of fair price ration shops per lakh population
28. No. of banks per lakh population
29. Per capita bank deposit
30. Per capita bank credits

\*These indicators are not included for the estimation of development in smaller states.

These indicators may not form an all inclusive list but these are the major interacting components of socio-economic development. Out of these 30 developmental indicators, 10 indicators are directly connected with the development in agricultural sector. Remaining 20 indicators demonstrate the level of infrastructural facilities. For smaller states 9 indicators are from agriculture sector and 17 indicators are from infrastructural facilities.

### 3. METHOD OF ANALYSIS

There are several statistical methods which are used for estimation of level of development but most of these methods are having their own limitations. The major limitation arises from the assumptions made about the developmental indicators themselves and their weightage in aggregate index. Keeping in view the limitations of different methods, the following statistical procedures are used in the study.

The variables for different indicators are taken from different population distributions and they might be recorded in different units of measurement. The values of the variables are not quite suitable for combined analysis. Hence, for combined analysis the values of the variables are transformed as given below.

Let  $[X_{ij}]$  be the values of the variables of  $i$ th state and  $j$ th indicator, where  $(i = 1, 2, \dots, n)$  and  $j = (1, 2, \dots, k)$ .

$[X_{ij}]$  is transformed to  $[Z_{ij}]$  as follows

$$[X_{ij}] = \frac{X_{ij} - \bar{X}_j}{S_j}$$

where  $\bar{X}_j$  is the mean of  $j$ th indicator

and  $S_j$  is the standard deviation of  $j$ th indicator.

From  $[Z_{ij}]$ , identify the best value of each indicator. The best value will be either the maximum value or minimum value of the indicator depending upon the direction of the impact of the indicator on the level of development. For obtaining the composite index of development, the statistical procedures given by Narain *et al.* (1991) are applied. The value of composite index is non-negative. Smaller values of

composite indices indicate high level of development and higher values of composite indices indicate low level of development. Based on developmental distances between different states and composite indices of development, model states are identified and potential targets of various indicators are estimated for low developed states.

For classificatory purposes, a simple ranking of the states on the basis of composite index of development is sufficient. However, a more meaningful characterization of different stages of development can be obtained on the basis of Mean and S.D. of composite indices as given below:

It appears quite valid to assume that the states having the composite indices  $\leq (\text{Mean} - \text{SD})$  are in high developed category, the states having composite indices in between  $(\text{Mean} - \text{SD})$  to  $(\text{Mean})$  are in high middle level category; the states having composite indices in between  $(\text{Mean})$  to  $(\text{Mean} + \text{SD})$  are in low middle level category and the states having composite indices  $\geq (\text{Mean} + \text{SD})$  are in low developed category.

## 4. RESULTS AND DISCUSSIONS

### 4.1 The Level of Development

The composite indices of development have been worked out for different states of eastern region, in respect of agricultural sector, infrastructural facilities and socio-economic sector. The levels of development have been estimated separately for major states and smaller states. The states have been ranked on the basis of composite index of development. The composite indices and rank of the major states are presented in Table 1.

**Table 1.** The Composite Indices of Development and Ranks of Major States

S.No.	States	Agricultural Development		Infrastructural Facilities		Socio-economic Development	
		C.I.	Rank	C.I.	Rank	C.I.	Rank
1.	Assam	0.47	3	0.59	3	0.58	3
2.	Bihar	0.50	4	0.65	4	0.63	4
3.	Jharkhand	0.59	5	0.68	5	0.68	5
4.	Orissa	0.47	2	0.49	2	0.49	2
5.	West Bengal	0.09	1	0.31	1	0.28	1

It may be seen from the above table that the State of West Bengal has been ranked first and the State of Jharkhand has been placed on the last position among the eastern states in case of agricultural development. The composite indices varied from 0.09 to 0.59. In case of infrastructural facilities, West Bengal is found to be on the first place and Jharkhand is placed on the last position. The composite indices varied from 0.31 to 0.68. Regarding overall socio-economic development, West Bengal again found to occupy the first position whereas the State of Jharkhand is on the last place. The composite indices varied from 0.28 to 0.68. The State of West Bengal is observed to occupy the first place in respect of agricultural development, infrastructural facilities and overall socio-economic development among eastern states. The State of Jharkhand is on the last position in the above three sectors. The composite index of development for smaller states of eastern region is presented in Table 2. The states have been ranked on the basis of composite index.

In case of smaller states of eastern region, for agricultural sector, Tripura is found to be the best developed state whereas Meghalaya is on the last place. The composite indices varied from 0.57 to 0.86. With respect to infrastructural facilities, the State of Mizoram is on the first place and Nagaland is on the last position. The composite indices varied from 0.44 to 0.78. As regards socio-economic development, the State of Mizoram is found to be on the first position whereas the State of Arunachal Pradesh is on the last place. The composite indices varied from 0.55 to 0.81. When the

status of development of these states were compared with the development of newly formed states of Jharkhand, Chhattisgarh and Uttarakhand, the State of Mizoram was found to occupy the first position in socio-economic development.

#### 4.2 Different Stages of Development

On the basis of system of classification mentioned in section 3, the states are put in four stages of development as high, high middle, low middle and low. Table 3 presents the number of states along with the percentage area and population lying in different stages of development.

There are five major states in the eastern region. These states cover about 5 lakh sq. kilometer of area and about 2535.92 lakh population. Out of these five states, one state is found to be in the high developed category in agricultural sector. About 18 per cent area and 32 per cent population are covered by this state. Out of these five states, four states are found in low middle category of development. The area and population covered by these states are 82 per cent and 68 per cent respectively. None of the states is found in high middle category and low category of development.

In case of infrastructural facilities, one state having about 18 per cent area and 32 per cent population is in high category of development. One state is also found in high middle level developed category. This state is having about 31 per cent area and 14 per cent population. The remaining three states having about 51

**Table 2.** The Composite Indices of Development and Ranks of Smaller States

S.No.	States	Agricultural Development		Infrastructural Facilities		Socio-economic Development	
		C.I.	Rank	C.I.	Rank	C.I.	Rank
1.	Arunachal Pradesh	0.78	6	0.76	6	0.81	7
2.	Manipur	0.60	2	0.56	2	0.60	3
3.	Meghalaya	0.86	7	0.61	4	0.72	4
4.	Mizoram	0.70	4	0.44	1	0.55	1
5.	Nagaland	0.67	3	0.78	7	0.80	6
6.	Sikkim	0.72	5	0.70	5	0.75	5
7.	Tripura	0.57	1	0.56	3	0.59	2

**Table 3.** Number of States, Percentage Area and Population lying under Different Stages of Development

Stage of Development	Number of States		Area (%)		Population (%)	
<b>Agricultural Development</b>						
High	1	(1)	18	(5)	32	(26)
High Middle	–	(2)	–	(21)	–	(34)
Low Middle	4	(3)	82	(62)	68	(21)
Low	–	(1)	–	(12)	–	(19)
<b>Infrastructural Facilities</b>						
High	1	(1)	18	(11)	32	(7)
High Middle	1	(3)	31	(29)	14	(64)
Low Middle	3	(1)	51	(4)	54	(4)
Low	–	(2)	–	(56)	–	(25)
<b>Socio-economic Development</b>						
High	1	(2)	18	(18)	32	(33)
High Middle	1	(1)	31	(12)	14	(18)
Low Middle	3	(2)	51	(16)	54	(23)
Low	–	(2)	–	(54)	–	(26)

**Note.** Details regarding number of states, area and population percentages are given in brackets for smaller states.

per cent area and 54 per cent population are found in low middle category of development. None of these states is found in low developed category.

In case of socio-economic development, one state is in high developed category. The area and population covered by this state is 18 per cent and 32 per cent respectively. One state having about 31 per cent area and 14 per cent population is found in high middle level developed category. The remaining three states having 51 per cent area and 54 per cent population are found in low middle level developed category. None of the states is in low developed category.

West Bengal is the only major state in the eastern region which is found to be in high developed category in agricultural sector, infrastructural facilities and socio-economic sector.

There are seven smaller states in the eastern region. These states cover about 1.83 lakh square

kilometer of area and about 122 lakh population. In agricultural sector, one state having 5 per cent area and 26 per cent population is found in high developed category. Two states are in high middle level developed category. These states are having about 21 per cent area and 34 per cent population. Three states are found to be in low middle level developed category. These states are having about 62 per cent area and 21 per cent population. One state with 12 per cent area and 19 per cent population is found in low developed category.

As regards infrastructural facilities, one state with 11 per cent area and 7 per cent population is found to be in high level category. Three states are found to be in high middle level category. These states cover about 29 per cent area and 64 per cent population. One state with 4 per cent area and 4 per cent population is found in low middle level developed category. Two states having 56 per cent area and 25 per cent population are found in low developed category.

With respect to socio-economic development, two states having about 18 per cent area and 33 per cent population are found to be in high developed category. One state is in high middle level developed category. This state is having about 12 per cent area and 18 per cent population. Two states are found in low middle level developed category. These states cover about 16 per cent area and 23 per cent population. Two states with 54 per cent area and 26 per cent population are found in low level developed category.

#### 4.3 Inter-relationship among Different Sectors of Economy and Literacy Rate

For proper development, it is essential that different sectors of economy should flourish together. Similarly, system of education and literacy rate envisages all round development of manpower and human resources required for socio-economic activities. A large population below an acceptable economic level poses serious problems. Massive poverty in the country characterizes its economy. The correlation coefficients between the development of different sectors of economy and literacy level are given in Table 4.

For major states, agricultural development is found to be positively influenced by infrastructural facilities. Socio-economic development is positively affected by agricultural development. Infrastructural facilities also influenced the socio-economic development in the positive direction. Literacy rates for male and female do not influence the agricultural development and socio-economic development. However, literacy rates for male and female are positively associated among

themselves. Infrastructural facilities do not affect the literacy rate.

In case of smaller states, agricultural development was not influenced by literacy rates for male and female and other infrastructural facilities. It did not influence the socio-economic development also. Infrastructural facilities influenced the socio-economic development and literacy rate for male and female in the positive direction. Literacy rates for male and female were positively associated among themselves.

#### 4.4 Improvement required in Low Developed States

It is quite important and useful to examine the extent of improvement needed in various developmental indicators for the low developed states. This will help the administrators and planners to readjust the resources for bringing about uniform regional development. For estimation of potential targets of developmental indicators of low developed states, model states have been identified on the basis of composite index of development and developmental distances between different states. In case of major states, none of the states is found in low developed category. Three states namely Assam, Bihar and Jharkhand are found in low middle level developed category for overall socio-economic development. In case of smaller states, Arunachal Pradesh and Nagaland are found to be in low category of socio-economic development. List of model states for these low middle level and low level developed states is presented in Table 5.

**Table 4.** Correlation Coefficients

Factors	Agricultural Development	Infrastructural Facilities	Socio-economic Development	Literacy Rate (Male)	Literacy Rate (Female)
Agricultural Development	1(1)	0.94* (0.27)	0.96** (0.53)	-0.64 (-0.61)	-0.72 (-0.25)
Infrastructural Facilities		1 (1)	0.99** (0.96**)	-0.82 (-0.78*)	-0.81 (-0.79*)
Socio-economic Development			1 (1)	-0.79 (-0.86*)	-0.79 (-0.75)
Literacy Rate (Male)				1 (1)	0.93* (0.86*)
Literacy Rate (Female)					1 (1)

Note : Correlation coefficients for smaller states are given in brackets.

\*significant at 0.05 probability level.

\*\* significant at 0.01 probability level.

**Table 5.** Model States for Low Developed States

S.No.	Low Developed States	Model States
1.	Assam	West Bengal
2.	Bihar	West Bengal
3.	Jharkhand	West Bengal and Orissa
4.	Arunachal Pradesh	Manipur, Mizoram and Tripura
5.	Nagaland	Manipur, Mizoram and Tripura

Model states are better developed. West Bengal is found to be model state for middle level developed states of Assam, Bihar and Jharkhand. In case of smaller states, Manipur, Mizoram and Tripura are model states for low developed states of Arunachal Pradesh and Nagaland. The best value of the developmental indicators of model state is taken as potential target of low developed state. The present value of

developmental indicators along with the potential target of low developed states is presented in Table 6.

It may be seen that values of potential targets for some of the indicators are quite high. Suitable action should be taken to achieve the potential target of developmental indicators for enhancing the level of development. For suggesting specific action at various locations in the state, study at district or tehsil/block levels might be conducted. However, broad suggestions for improving the level of development of low developed states are given below:

### 1. Assam

This State is low middle level developed in agricultural sector, infrastructural facilities and socio-economic sector. Yield rates of major crops in the State are quite low. Yield rates should be enhanced by creating irrigation facilities and using high doses of fertilizer. Educational, medical, banking and road transport facilities should be improved in the State.

**Table 6.** Present Value of Developmental Indicators and Potential Target

S.No.	Developmental Indicators	Assam	Bihar	Jharkhand	Arunachal Pradesh	Nagaland
01.	Yield rate of total cereals (kg/ha)	1469 (2488)	1537 (2488)	1359 (2488)	1238 (2398)	1669 (2398)
02.	Per capita foodgrains production (kg.)	144 (192)	128 (192)	103 (192)	215 (215)	196 (215)
03.	Fertilizer consumption (kg/ha)	48 (115)	88 (115)	51 (115)	3 (38)	2 (38)
04.	Gross irrigated area (%)	5 (51)	58 (58)	10 (51)	16 (28)	28 (28)
05.	Net area sown per cultivator (ha)	0.7 (1.0)	0.7 (1.0)	0.5 (1.0)	0.6 (0.9)	0.6 (0.9)
06.	Decennial growth rate of population (1991-92 to 2001-02)	19 (18)	29 (18)	23 (18)	27 (16)	65 (16)
07.	SC and ST population (%)	19 (19)	17 (17)	38 (29)	65 (37)	89 (37)
08.	Percentage of main workers	27 (29)	25 (29)	24 (29)	38 (41)	35 (41)
09.	Literacy rate (Male)	71 (77)	60 (77)	67 (77)	64 (80)	71 (80)
10.	Literacy rate (Female)	35 (60)	33 (60)	39 (60)	44 (87)	61 (87)
11.	Birth rate	25 (17)	30 (17)	27 (17)	23 (15)	16 (15)
12.	Death rate	8.7 (6.4)	8.1 (6.4)	7.9 (6.4)	5.9 (4.1)	3.8 (3.8)
13.	Infant mortality rate	68 (38)	61 (38)	50 (38)	37 (13)	18 (13)
14.	No. of motor vehicles (per lakh population)	2588 (3045)	854 (3048)	4295 (4295)	1842 (4238)	8226 (8226)
15.	No. of fair price ration shops (per lakh population)	123 (123)	57 (103)	31 (103)	91 (104)	21 (104)
16.	No. of banks (per lakh population)	4.2 (5.3)	3.9 (5.3)	5.1 (5.3)	5.9 (8.3)	3.4 (8.3)

Note : Potential target for different indicators is given in brackets.

## 2. Bihar

This State is low middle level developed in agricultural and socio-economic sectors. Infrastructural facilities are also not very good. Crop yields are generally poor. Steps should be taken to enhance the productivity of various crops by applying suitable doses of fertilizers and using irrigation facilities. Literacy rate among male and female is very low. Action is needed to enhance the literacy rate in the State. Educational, medical, transport and banking facilities should be improved in the State.

## 3. Jharkhand

The State is found to be low middle level developed in agricultural sector and socio-economic field. Major improvements are required to improve the crop yield by providing irrigation facilities and suitable doses of fertilizer. Improved technique of dry land farming might also be adopted in the area where irrigation facilities are not sufficient. Infrastructural facilities for transport, medical and banking may be improved. The level of literacy for female is very low. Steps should be taken to enhance the literacy rate among women.

## 4. Arunachal Pradesh

This State is low developed in agricultural sector and infrastructural facilities. Productivity of crops is very low. Steps should be taken to enhance the crop productivity by increasing irrigation facilities and using fertilizers. Literacy rate among female is low which requires improvement. Medical and transport facilities should be improved.

## 5. Nagaland

The State is low developed in socio-economic field and infrastructural facilities. The crop productivity should be improved by irrigation and use of fertilizers. Infrastructural facilities are very poor. Medical, transport and banking facilities should be improved. Literacy rate among male and female population is quite good but steps are needed to make further improvement in it.

## 5. CONCLUSIONS

The broad conclusions emerging from the study are as follows :

1. Among the major states of eastern region, the state of West Bengal is found to be better developed

as compared to the remaining four states of Assam, Bihar, Jharkhand and Orissa in socio-economic field. In case of smaller states, Mizoram and Tripura are found to be better developed as compared to the remaining five states. The state of Arunachal Pradesh and Nagaland are found to be low developed.

2. As regard agricultural development, the state of West Bengal is better developed in comparison to other major states of eastern region. In case of smaller states, Tripura is found to be better developed in comparison to other states. The state of Meghalaya is low developed.
3. Infrastructural facilities regarding education, medical, banking and road transport are found in high category in the state of West Bengal. In case of smaller states, these facilities are better in Mizoram as compared to other smaller states of the region.
4. In case of major states, overall socio-economic development is found to be positively associated with the development in agricultural sector. Infrastructural facilities also influence the socio-economic development in positive direction. For smaller states, infrastructural facilities influence the socio-economic development in the positive direction. These facilities are also found to be positively associated with literacy rates both for male and female. Literacy rates for male and female are found to be positively associated with each other.
5. Wide disparities in the level of development among different states have been observed both among major states and smaller states.
6. For enhancing the level of development of low developed states, model states have been identified and potential targets of important developmental indicators have been estimated.
7. It would be useful to examine and evaluate the level of development at micro level (say district, tehsil or block) for making location specific recommendations.



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