

Estimation of Socio-Economic Development in Hilly States*

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SUMMARY

The level of development of hilly states of the country has been estimated with the help of composite index based on optimum combination of socio-economic indicators. The states of Arunachal Pradesh, Assam, Himachal Pradesh, Jammu & Kashmir, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, Tripura and Uttaranchal has been included in the study. The data for the year 2000-2001 on seventeen socio-economic indicators have been used. Out of seventeen indicators included in the study, five indicators are directly concerned with agricultural development and the rest twelve indicators describe the level of development in infrastructural service sector. The level of development has been separately estimated for agricultural, infrastructural and overall socio-economic fields.

In case of overall socio-economic development, the State of Mizoram has been ranked first and the State of Arunachal Pradesh is ranked last. Positive significant association is found between the developments in infrastructural facilities and overall socio-economic fields. Literacy rate is also influencing the level of development in the positive direction. For bringing about uniform regional development, potential targets for various indicators have been estimated for low developed states.

Key words : Composite Index, Level of development, Potential target, Developmental Indicators, Regional disparities.

1. Introduction

Development has been appropriately conceptualized as a process, which improves the quality of life. The programmes of development have been taken up in the country in a planned way through various Five Year Plans. The main objective of these programmes is to enhance the quality of life of people as well as effecting improvement in their social and economic well-being. The economic growth and uniform regional development are the basic objectives of

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developmental programmes. The Green Revolution in agricultural sector and commendable progress in the industrial front have certainly increased the overall total production in the country, but there is no indication that these achievements have been able to reduce substantially the regional inequality in the level of development.

A seminar was organized jointly by the Planning Commission, Government of India and State Planning Institute, Government of Uttar Pradesh from April 22 to 24, 1982 for focusing the attention of the scientists, planners, policy makers and administrators regarding the levels of disparities in economic development of various states in the country. 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 data on socio-economic variables of major 17 states of the country had been critically analyzed for the years 1971-72 and 1981-82 (1991, 1992) and wide disparities in the level of development were observed by different regions. It was therefore, felt necessary to make a deeper analysis for evaluating the level of development using the district level data on socio-economic variables. The district level data had so far been analyzed for the states of Orissa (1992, 1993), Andhra Pradesh (1994), Kerala (1994), Uttar Pradesh (1995), Maharashtra (1996), Karnataka (1997), Tamil Nadu (2000) and Madhya Pradesh (2002). Evaluation of inter-district variation in economic development was made for the districts of southern region of the country (1999). Disparities in the crop productivity were estimated by analyzing the yield data at tehsil level in Uttar Pradesh (2001). It is found that the entire areas of the low developed districts are not backward but some parts are middle level or high level developed. Keeping this in view, a study was made for evaluating the socio-economic development at taluka level in the State of Karnataka (2003). This year, the study is undertaken to quantify the levels of socio-economic development of hilly states. The States covered under the study are Arunachal Pradesh, Assam, Himachal Pradesh, Jammu & Kashmir, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, Tripura and Uttaranchal. These eleven states together cover about 19% of the total area and 6% population. A knowledge of the level of development will help in identifying where a given state stands in relation to others. The study also throws light on the relationships of socio-economic development with the agricultural development and infrastructural facilities. Improvements required in the developmental indicators of the low developed states have been suggested.

2. Developmental Indicators

Development is a multidimensional process. Its impact cannot be evaluated fully by any single indicator. A number of indicators when analyzed individually do not provide an integrated and easily comprehensible picture of reality. Hence, in the present study, index of development has been built up for different states

on the basis of optimum combination of various indicators. The data on seventeen developmental indicators for the year 2000-2001 are utilized in the analysis. Each state faces situational factors of development unique to it as well as common administrative and financial factors. Indicators which are common to all the states have been included in the analysis for evaluating the level of development. The composite indices of development have been calculated for different states by using the data on the following developmental indicators.

1. Productivity of total cereals
2. Productivity of pulses
3. Productivity of oilseeds
4. Per capita cereal production
5. Number of agricultural enterprises (rural)
6. Number of banks per lakh population
7. Credit/deposit ratio
8. Decadal growth rate of population
9. Population density
10. Sex ratio
11. Literacy rate (male)
12. Literacy rate (female)
13. Total literacy rate
14. Population below poverty line (%)
15. Birth rate
16. Death rate
17. Infant mortality rate

These indicators may not form an all inclusive list but these are the major interacting components of development in the State. Out of these indicators, five indicators are depicting the progress of agricultural development and the rest twelve indicators are concerned with the infrastructural facilities.

3. Estimation of Level of Development

Values of developmental indicators are not quite suitable for simple addition in combined analysis because these are recorded in different levels of measurement and they also come from different population distributions. For obtaining the composite index of development, the values of indicators are transformed as follows.

Let X_{ij} be the value of j th indicator for i th unit, $i = 1, 2, \dots, n$ and $j = 1, 2, \dots, k$. X_{ij} is transformed to Z_{ij} as follows

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

where \bar{X}_j = mean of j th indicator and

S_j = S.D. of j th indicator

The best value of the transformed variables for different indicators (with maximum or minimum value depending upon the direction of the impact of indicator on development) is identified and the squares of the deviations of the transformed variables from their best values are obtained. The inverse of the coefficient of variation of the original variables is used as weight for obtaining the pattern of development. The statistical technique given by Narain *et al.* (1991, 1999) is applied to construct the composite index of development for different states. The composite indices have been worked out separately for agricultural, infrastructural and overall socio-economic fields. The value of the composite index lies between zero and 1. A value close to zero indicates high level of development and a value near to one indicates poor level of development. The association between the levels of development of different sectors of economy have been worked out. For low developed states, improvements needed in various indicators are also presented.

4. Results and Discussions

4.1 The Level of Development

The composite indices of development have been worked out separately for agricultural sector, infrastructural service sector and overall socio-economic sector for different states and given in Table 1. The states have also been ranked on the basis of level of development.

It may be seen from the table that in case of agricultural development, the state of Himachal Pradesh is ranked first and the State of Uttaranchal is ranked last. The composite indices of development vary from 0.51 to 0.88 in case of infrastructural facilities. The State of Mizoram is found to be on the first position and the State of Arunachal Pradesh is ranked last. The composite indices vary from 0.27 to 0.78. In overall socio-economic development, the State of Mizoram is ranked first and the State of Arunachal Pradesh is ranked last. The composite indices of development vary from 0.37 to 0.78.

Table 1. Composite Index of Development

S. No.	State	Agriculture		Infrastructure		Socio-economic	
		C.I.	Rank	C.I.	Rank	C.I.	Rank
1	Arunachal Pradesh	0.54	3	0.78	11	0.78	11
2	Assam	0.70	9	0.67	9	0.73	9
3	Himachal Pradesh	0.51	1	0.53	5	0.57	4
4	Jammu & Kashmir	0.64	6	0.59	6	0.65	6
5	Manipur	0.65	7	0.43	2	0.52	2
6	Meghalaya	0.81	10	0.66	8	0.76	10
7	Mizoram	0.58	4	0.27	1	0.37	1
8	Nagaland	0.70	8	0.64	7	0.71	8
9	Sikkim	0.58	5	0.67	10	0.70	7
10	Tripura	0.53	2	0.50	4	0.55	3
11	Uttaranchal	0.88	11	0.44	3	0.59	5

4.2 Different Stages of Development

For relative comparisons among the states with regard to the level of development, it appears appropriate to assume that the states having the composite indices less than or equal to (Mean-SD) are highly developed whereas the states having the composite indices greater than or equal to (Mean+SD) are low developed. States with composite index lying between (Mean) and (Mean-SD) are medium level developed and the states having the composite index in between (Mean) and (Mean+SD) are at developing stage. On the basis of this classification, states are put in four categories of development, high, medium, developing and low. Table 2 presents the classification of states lying in different levels of development along with percentage area and population.

In case of agricultural development, the states of Himachal Pradesh, Tripura and Arunachal Pradesh are found to be better developed as compared to other hilly states. These three better developed states occupy about 25% area and 16% population of hilly states covered under the study. The states of Mizoram, Sikkim, Jammu & Kashmir and Manipur are middle level developed covering about 45% area and 22% population. The states of Nagaland and Assam are in the developing stage. These states cover about 15% area and 45% population. The states of Meghalaya and Uttaranchal are observed to be in the low developed category. These states cover about 15% area and 17% population.

Infrastructural facilities include medical, banking, educational and overall economic enterprises available to the people in hilly states. The positions of various states regarding the availability and use of the above facilities for the people are assessed by the composite index. It may be seen from the table that the states of Mizoram and Manipur having about 7% area and 5% population are better developed as compared to the rest of the hilly states. The states of Uttaranchal, Tripura and Himachal Pradesh are middle level developed in infrastructural facilities. These states cover about 22% area and 28% population. Five states namely Jammu & Kashmir, Nagaland, Meghalaya, Assam and Sikkim are at the developing stage. These states together cover about 58% area and 65% population. Arunachal Pradesh with 13% area and 2% population is low developed.

Table 2. Area and population in different levels of development

Level of Development	Name of States	Area %	Population %
AGRICULTURE			
High	H.P., Tripura, A.P.	25	16
Middle	Mizoram, Sikkim, J&K, Manipur	45	22
Developing	Nagaland, Assam	15	45
Low	Meghalaya, Uttaranchal	15	17
INFRASTRUCTURE			
High	Mizoram, Manipur	7	5
Middle	Uttaranchal, Tripura, H.P.	22	28
Developing	J&K, Nagaland, Meghalaya, Assam, Sikkim	58	65
Low	A.P.	13	2
SOCIO-ECONOMIC			
High	Mizoram, Manipur	7	5
Middle	Uttaranchal, Tripura, H.P.	22	28
Developing	J&K, Sikkim, Nagaland, Assam	54	61
Low	Meghalaya, A.P.	17	6

A.P. = Arunachal Pradesh

H.P. = Himachal Pradesh

J&K = Jammu & Kashmir

Regarding overall socio-economic development, the states of Mizoram and Manipur are better developed as compared to other hilly states. These two states cover about 7% area and 5% population. Three states namely Uttaranchal, Tripura and Himachal Pradesh covering about 22% area and 28% population are found to be middle level developed. The states of Jammu & Kashmir, Sikkim, Nagaland and Assam are at the developing stage and these four states cover about 54% area and 61% population. Two states Meghalaya and Arunachal Pradesh are low developed. These states cover about 17% area and 6% population.

4.3 Inter-relationships among the Development of Different Sectors of Economy and Total Literacy

The level of development in various sectors of economy should be in proper direction which may improve the level of living of the people. The literacy status of the people plays an important role in enhancing the level of development. The correlation coefficient between agricultural development, infrastructural facilities, overall socio-economic development and literacy rate are given in Table 3.

Table 3. Correlation coefficients

Factors	Agricultural development	Infrastructural development	Socio-economic development	Total literacy rate
Agricultural development	1.000	-0.003	0.255	-0.193
Infrastructural development		1.000	0.966**	-0.793**
Socio-economic development			1.000	-0.816**
Total literacy rate				1.000

** Significant at 0.01 probability level.

It is observed that agricultural development and overall socio-economic development are not associated in hilly states. Literacy rate is also not associated with the agricultural development. Infrastructural facilities in respect of banking, medical, educational and other economic enterprises are also not found to be associated with agricultural development but these facilities are very highly associated with the overall socio-economic development and the total literacy. Overall socio-economic development is very highly associated with the total literacy.

4.4 Potential Targets for Low Developed States

For bringing out uniform regional development among the hilly states, it is important to examine the nature of improvement required in the developmental indicators in low developed states. This information is useful for readjusting the resources in reducing the level of disparities in development. Potential targets of various developmental indicators for the low developed states have been determined by taking the best value among the hilly states. The state of Meghalaya is found to be low developed in overall socio-economic and agricultural sectors. The state of Arunachal Pradesh is low developed in infrastructural facilities and overall socio-economic development whereas the state of Uttaranchal is low developed in agricultural field. Table 4 gives the value of various important developmental indicators along with the potential targets in respect of these three states.

Table 4. Potential targets of low developed states

S. No.	Development Indicators	Meghalaya	Arunachal Pradesh	Uttaranchal	Potential Target
1.	Productivity of total cereals	1.5	1.1	1.5	2.3
2.	Productivity of pulses	0.6	1.0	0.5	1.7
3.	Productivity of oilseeds	1.0	1.0	0.5	1.1
4.	Per capita cereal production	8	19	15	22
5.	Ag. enterprises (R)	0.83	0.90	0.58	0.96
6.	No. of banks/lakh population	7.8	6.0	9.9	12.8
7.	Decadal growth rate of population	30	26	19	16
8.	Total literacy	63	55	72	88
9.	Birth rate	29	22	20	12
10.	Death rate	99	6	7	5
11.	Infant mortality rate	56	43	52	19

It may be seen from the table that the values of the developmental indicators are very low as compared to the potential targets. In case of indicators like decadal growth rate of the population, birth rate, death rate and infant mortality rate, which influence the level of development in negative direction, the values achieved by these three states are higher than the corresponding potential targets. In case of Meghalaya, decadal growth rate, birth rate and infant mortality rate are very high in comparison to the corresponding potential targets. Improvements needed in the level of development in these three states are as follows.

MEGHALAYA

This State is low developed in agricultural and socio-economic fields. Per capita availability of cereals from the State production is very low. Improvements in forest production should be made.

Birth rate is very high. Medical facilities should be created in the State and literacy rate should also be enhanced.

UTTARANCHAL

The State is low developed in agricultural field. Steps should be taken to enhance the production of horticultural and forest crops.

ARUNACHAL PRADESH

The State is low developed in infrastructural facilities and overall socio-economic fields. Improvements in banking facilities, literacy rate both for male and female population, medical facilities for controlling birth rate and infant mortality rate should be made.

5. Conclusions

The broad conclusions emerging from the study are as follows

- (i) With respect to overall socio-economic development, the states of Mizoram and Manipur are found to be highly developed. The states of Uttaranchal, Himachal Pradesh and Tripura are middle level developed. The states of Jammu & Kashmir, Sikkim, Nagaland and Assam are at the developing stage. These states are making fast improvement in their level of development. The states of Meghalaya and Arunachal Pradesh are found to be low developed. These states require special care in implementation of developmental programmes.
- (ii) In agricultural field, the states of Himachal Pradesh, Tripura and Arunachal Pradesh are found to be better developed and the states of Meghalaya and Uttaranchal are low developed.
- (iii) Socio-economic development is highly associated with infrastructural facilities and literacy rate. Agricultural development does not influence the socio-economic development. Infrastructural facilities are highly associated with literacy level.
- (iv) Wide disparities in the level of development have been observed between different states.

REFERENCES

- Narain, P., Rai, S.C. and Shanti Sarup (1991). Statistical evaluation of development on socio-economic front. *J. Ind. Soc. Agril. Statist.*, **43**, 329-345.
- Narain, P., Rai, S.C. and Shanti Sarup (1992). Evaluation of economic development in India. Souvenir of 11th Economic Development Conference in "Complementarity of Agriculture and Industry in Development". Instt. Trade & Industrial Development, New Delhi, 67-77.
- Narain, P., Rai, S.C. and Shanti Sarup (1992). Classification of districts based on socio-economic development in Orissa. *Yojana*, **36(23)**, 9-12.
- Narain, P., Rai, S.C. and Shanti Sarup (1993). Evaluation of economic development in Orissa. *J. Ind. Soc. Agril. Statist.*, **45**, 249-278.
- Narain, P., Rai, S.C. and Shanti Sarup (1994). Regional dimensions of socio-economic development in Andhra Pradesh. *J. Ind. Soc. Agril. Statist.*, **46**, 156-165.

- Narain, P., Rai, S.C. and Shanti Sarup (1994). Inter-districts disparities in socio-economic development in Kerala. *J. Ind. Soc. Agril. Statist.*, **46**, 362-377.
- Narain, P., Rai, S.C. and Shanti Sarup (1995). Regional disparities in the levels of development in Uttar Pradesh. *J. Ind. Soc. Agril. Statist.*, **47**, 288-304.
- Narain, P., Rai, S.C. and Shanti Sarup (1996). Dynamics of socio-economic development in maharashtra. *J. Ind. Soc. Agril. Statist.*, **48**, 360-372.
- Narain, P., Rai, S.C. and Bhatia, V.K. (1997). Regional pattern of socio economic development in Karnataka. *J. Ind. Soc. Agril. Statist.*, **50**, 380-391.
- Narain, P., Rai, S.C. and Bhatia, V.K. (1999). Inter district variation of development in Southern Region. *J. Ind. Soc. Agril. Statist.*, **52**, 106-120.
- Narain, P., Sharma, S.D., Rai, S.C. and Bhatia, V.K. (2000). Regional disparities in socio-economic development in Tamil Nadu. *J. Ind. Soc. Agril. Statist.*, **53**, 35-46.
- Narain, P., Sharma, S.D., Rai, S.C. and Bhatia, V.K. (2001). Regional dimensions of disparities in crop productivity in Uttar Pradesh. *J. Ind. Soc. Agril. Statist.*, **54**, 62-79.
- Narain, P., Sharma, S.D., Rai, S.C. and Bhatia, V.K. (2002). Dimensions of regional disparities in socio-economic development in Madhya Pradesh. *J. Ind. Soc. Agril. Statist.*, **55**, 88-107.
- Narain, P., Sharma, S.D., Rai, S.C. and Bhatia, V.K. (2003). Evaluation of economic development at micro level in Karnataka. *J. Ind. Soc. Agril. Statist.*, **56**, 52-63.
- Rai, S.C. and Bhatia, V.K. (2004). Dimensions of regional disparities in socio-economic development of Assam. *J. Ind. Soc. Agril. Statist.*, **57** (Special Volume), 178-190.
- Regional Dimensions of India's Economic Development. Proceedings of Seminar held on April 22-24, (1982) sponsored by Planning Commission, Govt. of India and State Planning Institute, Govt. of U.P.
- Statistical Handbook – Assam (2002), Directorate of Economics & Statistics, Assam, Guwahati.