OCCASIONAL PAPERS

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NIEPA Occasional Paper

(4)

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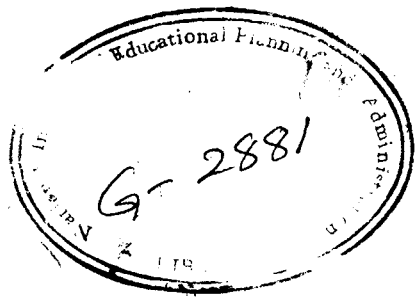

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INEQUITIES IN THE LEVELS OF LITERACY IN INDIA: THE REGIONAL DIMENSION

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Abstract

Since the dawn of civilisation, education and development have been intrinsically linked through bi-directional causality. Inequalities between the educational levels of different groups have been both the cause and the effect of the differentials between their levels of socio-economic development. This is specially true of the levels of literacy, which provides the essential pre-condition for educational development.

With a view to unreval the complexities in the process of diffusion of literacy, the analysis in the present paper is concerned with the identification, measurement and explanation of inequities in territorial distribution of literacy. In this endeavour, we have proposed a new method for measuring intra-regional inequities between different binomial elements of the regional space. The analysis is based on districtwise data on literacy for the year 1981 and an attempt has been made to explain its relationship with disparities in literacy rates and economic base characteristics.

The analysis has shown that the continuing low levels of literacy, particularly in rural areas and the persistence of high level of inequities partly reflect the failure to achieve the goals of universal primary education. More than half of the districts in India still continue to have significantly high level of disparities.

The examination of casual relationships corraborates the finding that the economic base of a region exerts a strong impact on the spread of literacy; and the processes of urbanization and industrialization strongly influence the levels as well as the inequities in the distribution of literates. A vicious circle of underdevelopment incorporating these characteristics has been proposed.

leads to the accentuation of the structural disequilibrium which constrains growth itself. The social concern for the two can be handled together, sustaining and sustained by each other.

An attempt has been made in this paper to examine the different aspects of inequities which have acted as impediments in the path of educational development of the third world countries in general, and that of India, in particular. With a view to unravel these complexities, the issues relating to the identification, measurement and explanation of inequities in the territorial spread of literacy in India have been examined with the help of districtwise data.

Since, the measurement of inequalities in the growth of literacy rates constitutes a crucial step in our methodology, these have been discussed at some length in the second section, some of the commonly used indices of inequality have been reviewed, and a new class of measures has been proposed. With a view to delineate the underlying regularities in the complex mass of data and to take our study deeper into the basal stratum of the Indian polity, the district level data on different indicators of inequities in literacy rates have been analysed in the third section. The fourth section focusses attention on the nature of relationship between the levels of and inequites in the literacy rates, on the one hand, and some selected indicators of development, on the other. The findings of our analysis on the basis of district level data have been put together in a system of inter-dependencies and a model of the vicious circle of underdevelopment has been presented in section five. By way of conclusions, some of the major results of the present study have been stated in the sixth section.

1.1 FIVE ASPECTS OF INEQUITIES:

The inequities and distortions embedded in the socio-economic structure in many of the newly independent countries are deeply rooted in their historical processes and particularly in their colonial heritage. Since the dawn of civilisation, education and development have been intrinsically linked through bi-directional causality. Inequalities between the educational levels of different groups have been both the cause and the effect of the differentials between their levels of socio-economic developement. This is specially true of the

levels of literacy, which provides the essential pre-condition for educational development. While in the developed countries of today, the industrial revolution had created conditions wherein the need for a literate workforce had slowly and steadyly led to universalisation of literacy, the accompanying process of the development of underdevelopment in the colonial empires necessitated the persistence of inequalities in the levels of literacy and of illiteracy in the case of the mass of the people.

The requirements of colonial rule thwarted their economic development, acted as an impediment in the path of technological advances in agriculture, did not permit the emergence of a self-reliant industrial sector, and consequently acted as a serious constraint on the inter-sectoral transfer within the work force from the primary to the secondary sector - at best, permitting the development of underdevelopment. While the collapse of the handicraft based secondary sector led to the overburdening of the technologically stagnant primary activities, the needs of colonial administration were met by a bloated tertiary sector, which was divorced from and contemptuous of work. The socio-economic conditions, which had led to the narrowing of the gap between work and education in the developed countries of today in the wake of the Industrial Revolution, were thus not allowed to emerge in the countries of the Third World.

Let us recaptulate the socio-economic context, within which, the present day disparities in the educational system have emerged on the Indian scene. The following five aspects of intra and inter-regional disparities would be of considerable interest in this connection:

i) between scheduled castes and others,
ii) between scheduled tribes and others,
iii) between males and females,
iv) between rural and urban settlements, and
v) between developed and less developed regions.

Let us probe a little into the genesis of these disparities:

First, the disparities between scheduled castes and others emerged as a consequence of the historical separation of work from knowledge and from power. An enquiry in to the distribution of workforce based

on 1971 Census data in India, has revealed that the participation rate in the workforce in the case of scheduled castes and scheduled tribes is quite high as compared to non-scheduled population; it is 36.5 % for scheduled tribes, 36 % for scheduled castes and 31.6 per cent for the non-scheduled population. The problem with the scheduled caste population is, therefore, not that of the low participation in the work force but is that most of them are engaged in the primary sector of the economy as agricultural labourers. The data shows that nearly 80 % of the scheduled caste workers are engaged in the agricultural sector and nearly 52 % of them are agricultural labourers. The corresponding share for the non-scheduled population is 65 % and 20 per cent respectively. It is well known fact that most of the agricultural workers are illiterate and live under miserable conditions and continue to be below poverty line. Another interesting aspect of the distribution of work force is that the share of scheduled caste workers in the organised manufacturing sector is only 3.5 % as compared to nearly 7 per cent for the non-scheduled workers. In the organised sector, because of their low levels of education, they are usually engaged as semi-skilled workers.

The persistence of disparities in literacy between scheduled castes and others is also evident from 1971 Census data. A comparative study of the literacy rates was carried out by considering those districts, wherein the share of rural scheduled castes to total rural population is 5 % or more. Out of a total of 350 districts in the country, 286 districts satisfied this criterion and were labelled as predominantly scheduled caste districts. It is interesting to observe that the scheduled caste literacy rate was less than 12 % in as many as 131 districts as compared to the fact that there was no district which had less than 12 % literacy for non-scheduled population.

Second, the disparities between scheduled tribes and others are rooted in the continued isolation of some tribal communities within cul-de-sacs and blind alleys in the hilly, forested or arid terrains. The low levels of educational development, regional strains and stresses that still persist are the consequence of the different levels of development between the tribal and the adjacent non-tribal communities and the strains can be eliminated only be minimizing such disparities. The 1971 Census results show that the overall literacy rate among the scheduled tribes was only 11.30 % as compared to 29.45

% for India as a whole. Among the scheduled tribes the rural female literacy rate for 1971 was only 4.65 % as compared to 37.09 % for urban males.

Third, the disparities between male and female educational development are rooted in the persistence of some attributes of the spurious modernization of the colonial era. This expresses itself quite sharply in the denial of educational oppurtunities to the women. The relative depriviation of women in the field of education was particularly significant because it underlined all other attributes of depriviations. The scheduled castes were deprived, no doubt, but the scheduled castes women were more deprived than their men-folk. The doors of the educational institutions were closed to women as an integral part of the backward looking colonial policy of buttressing the obscurantist male chauvinistic tendencies in the polity. The persistence of low level of female literacy is evident from the fact that it increased from 0.60 % in 1901 to only 7.3 % in 1941. The rural population was deprived, no doubt, but rural women were more deprived than their men-folk. The rural scheduled caste female literacy , even after 25 years of independence, was less than 1 per cent in as many as 75 districts and less than 2 per cent in 116 districts out of a total of 200 districts with rural scheduled caste population more than 5 % of total rural population. A movement for womens education in the Indian social context, is, therefore, very much more than a movement for women's education. It strikes at the very roots of the passive system of social inequities intertwining the Indian polity, continuously sucking the out its life blood and renuering it an anaemic and weak. women's education is an instrument of liberation of not only of women but of Indian society as a whole.

Fourth, the persistence of disparities in rural-urban continuum can be traced to the spatial organization of underdevelopment. The colonial process which not only affected the qualitative but the quantitative attributes of educational development as well, was embedded in the space economy. It is only by correcting the spatial distortions introduced and or strengthened during the colonial era that the limitations and infirmities of the present day development programmes can be properly understood. The colonial process of spatial articulation, which were strongly embedded in the space economy, effected both the qualitative and quantitative attributes of

urbanization. In the educational sector their ability to play this dominant role was considerably influenced, firstly, by creating educational oppurtunitie which formed the basis for the adoption of the modern means of production, and secondly by creating a variety of job oppurtunities in productive sectors of the economy located therein. A reference may be made in this context to the fact that in 1931, the literacy rate in the largest 34 cities was 34.6 for males and 14.9 for females as compared to 13.3 and 2.5 rspectively for India as a whole. The literacy in rural areas would thus be very much less than the all Indian figures as quoted above.

Fifth, the persistence of regional imbalances and inter-regional disparities are reflected in a constricted industrial base and proliferation of the tertiary sector, which by and large is non productive. The relationship between the vertical shifts in the work-force, on the one hand, and of its horizontal mobility, on the other, is of crucial significance in the development process. The exogenous imposition of modern industry on the traditional economy was almost entirely concentrated in a few large cities - generally in port conurbations, which acquired the character of islands in a vast ocean of technological backwardness in the country side. The port towns, unlike their counterparts of the ancient and medieval perious, served as the focal points of a suction mechanism and became the centres for the export-import oriented commodity flows. These processes have led to the emergence of regional disparities in educational development as well. The 1961 literacy rate varies from 6.94 % in the case of East Kameng in Arunachal Pradesh to 61.65 % in Kottayam district of Kerala.

It is significant to note that all these factors do not operate separately.They are intrinsically inter-twined in the thick rope of the socio-economic opression which ties down the social system.As we move down from high caste,male and urban in relatively developed regions to scheduled caste as well as tribes,female and rural in relatively less developed regions, the inequities become more and more sharp.

The results of the 1971 Census show that the literacy rate varies from 78.22 % for non-scheduled caste, urban male population in Kottayam district of Kerala to 0.09 % for scheduled, rural female population in the Jaisalmer district of Rajasthan. It has also been

observed that urban scheduled caste literacy in 1971 was as low as 0.29 per cent in the Tikamgarh district of Madhya Pradesh. The pyramid of the inequities at the aggregate level is shown in Figure 1.

1.2 INEQUITIES IN THE LEVELS OF LITERACY : THE REGIONAL DIMENSION

It follows from the above that inter-regional disparities in literacy may be examined either in terms of variations in the general level or in the magnitude of a selected measure of intra-regional inequities. The analysis of the variations across regions in the literacy rate of the rural females or of the rural males, for example, would no doubt, focus attention on inter-regional disparities in literacy rate of rural females or of the rural males, as the case may be, but it would not reveal anything about the nature and magnitude of intra-regional inequities as between male and female literacy in the rural areas.

With a view to examine these multi-faceted and complex phenomena, it is, therefore, desirable to define the binomial elements in terms of which the inter-regional variations in intra-regional disparities may be analysed. It may be of considerable interest, for example, to probe into the nature and magnitude of inter-regional variations in the level of intra-regional disparity between male and female literacy rates. The first stage in such analysis would, thus, relate to the measurement of the gap between male and female literacy rates for each region. This would then be followed by an examination of inter-regional variations in the measured values.

It is significant to note that a rise in the level of literacy rate does not necessarily result in the narrowing down of intra and inter-regional disparities therein in the different stages of development. The variations in the magnitude of inequities between binomial elements of a region may follow the path of 'divergence-stability-convergence' in relation to the different stages of rise in literacy rate. One should be cautious in generalising this dynamic relationship and should not draw normative generalisations from historical behaviour. It may also be noted that the exact shape of the curve would vary from situation to situation and each of these would call for a different set of policy measures in educational

HIERARCHY OF INEQUITIES IN LITERACY

INDIA: 1971

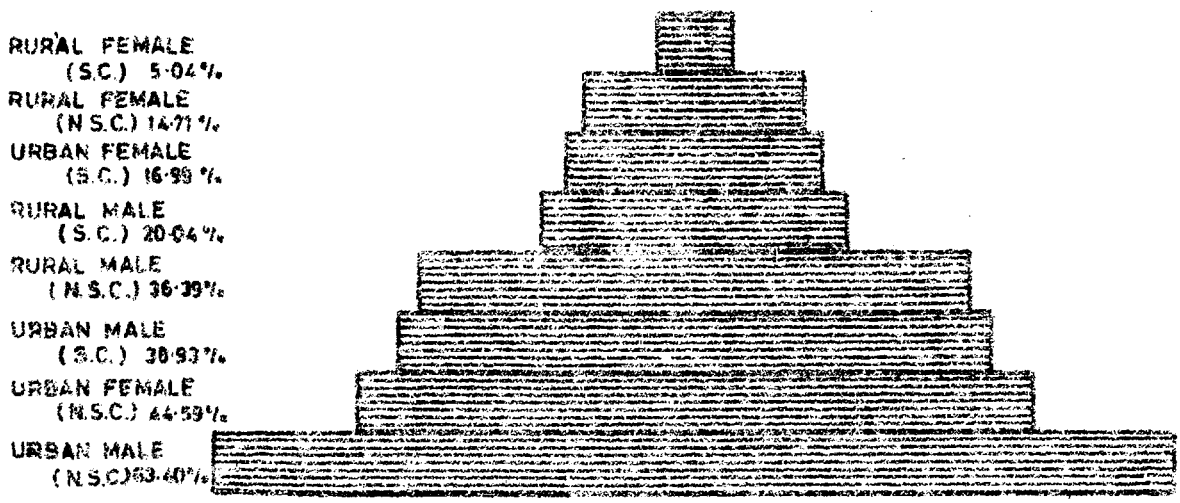


FIG 1

planning and resource allocation. Whether literacy is looked upon as an input in the development process or as its consequence, the crucial step in the analysis of its spread across national space, therefore, does not consist of the futile search for an ideal growth curve, but rather of the identification and explanation of the inter and intra-regional differentials in its levels.

It is, therefore, surprising that these aspects of identification, measurement and explanation of the inequities in the sphere of education have not been adequately probed either by the social scientists or by educational planners. Concerned scholars have been almost entirely pre-occupied with the socio-economic correlates of disparities in a wonderland without space; and its regional dimension has not been duly recognized. This is particularly unfortunate because the problems of inequities are deeply rooted in the regional sub-system of interdependencies and can, therefore, be satisfactorily analysed and remedial action for their minimization can be effectively undertaken only within a regional frame.

It is only during the recent past that a few halting steps have been taken in this direction. A systematic attempt to measure the nature and patterns of regional disparities in education was made in a series of studies sponsored by the International Institute of Educational Planning (Gabriel & Ngoc,1980). The relationship between intra as well as inter-regional disparities in education and the process of socio-economic development was illustrated with the help of specific case studies, which made use of a number of innovative tools in the diagnosis of the exisitng malaise. A comparative study of male and female illiteracy in the world has shown that the magnitude of disparities between the sexes in regard to literacy is very high in some cases and that this attribute would continue to persist. Reference may be made to the fact that in a number of countries-Chad, Ethiopia, Mali, Niger, Somalia and Upper Volta in Africa as well as Afghanistan, Saudi Arabia and Yeman in Asia - literacy rate was close to the zero mark as late as in 1971 (UNESCO, 1980).

Kyba (1979) examined the territorial aspects of educational inequality on a world scale by considering educational provisions in relation with educational achievements. He showed that territorial inequalities may be noticed at every scale of analysis and that these

have tended to persist over time. Williamsons (1977) study on the patterns of educational inequality in West Germany validated the hypothesis that educational inequalities are deeply rooted in the social milieau and continue to constrain development even in the otherwise developed countries of Europe.

A number of studies on the nature and the patterns of inequities in the context of Indian literacy have been undertaken by scholars during recent years. Based on the results of 1961 Census, Gosal (1964) has brought out the essential characteristics of inter-state variations in different components of literacy. A comparative study on the nature and patterns of inequities in literacy rates between 1961 and 1971 has been undertaken by Kundu & Rao (1982). The study is based on the state as the unit of analysis. Inter-state differences in the rural-urban literacy rates have been examined for the year 1981 (D'Souza, 1982). The study has probed into the nature of association between rural-urban disparities with urbanisation, on the one hand, and with industrialization, on the other. Ahmad (1982) has examined inter-district inequities in literacy rates of tribal population of Bihar for the year 1971. These studies have noted converging trends and the narrowing down of disparities in literacy rates.

Usha Rao (1982) has studied the intra-state disparities in literacy rates for the scheduled caste population in Karnataka. A probing study into variations in the literacy rates of Gujarat and some of the economic correlates of the same has shown that the proportion of agricultural workers in the rural work-force exerts a significantly strong influence on literacy rates in the selected villages (Shah M., 1981). It may thus be noted that the studies undertaken in the Indian context have noted converging trend and narrowing down of disparities in literacy rates of different regions as well as different strata of the society.

One of the serious limitations of the studies on India referred to above, lies in the fact that the disparities have been examined either with states as the unit of analysis or within the districts or similar sub-regions of only one state. It may be noted that the state as a unit of analysis for examining different aspects of regional disparities would be quite unsuitable because of their heterogeniety both in terms of elements of diversity and disparity. It may not give

any meaningful result if we club Chota Nagpur Plateau with the North Bihar Plains or Gujarat Plains with Saurashtra. Quite a few of the studies undertaken by economists assume away these diversities, which render their conclusions to be of doubtful validity. The same can be said with equal force about the magnitude of disparities within the boundaries of a state. How does one, at any level of rationality, club together Jaisalmer and Jaipur, Burdwan and Siliguri, Bangalore and Gulbarga, Hyderabad and Mahboobnagar or Meerut and Ghazipur ? The only alternative is, therefore, to consider the district as the unit of analysis. The district, as an administrative unit of the Indian polity has a particular vitality which is the function of its sociological homogeniety, dialectal uniformity and historical continuity. It is at the this level that the macro processes get rooted into the micro worlds providing the unity in diversity of the Indian ethos. It is at this level that the emphasis shifts from the system of vertical linkages of sectoral planning to the system of horizontal linkages of regional planning. This is particularly true of the sphere of educational development, wherein specificity and universality are intrinsically linked together.

It must, however, be recognized that these pioneering studies have brought out the need for and showed the path towards detailed emperical investigations at a disaggregated level. As a response to this need, an attempt is being made here firstly, to examine the pattern of inequities in the spread of literacy, and secondly, to examine the inter-relationships betwen economic base, levels of literacy and different types of inequities in literacy rates on the basis of a cross-section of districtwise data.

2. DATA BASE AND FRAMEWORK OF ANALYSIS:

A comprehensive set of data pertaining to literacy and some related aspects of socio-economic development are collected every ten years on a Census basis in India. The present study makes use of this valuable source. The nature and patterns of inequities in literacy rates, have been examined for district level cross-section for 1981(Census of India,1981).

The first stage in the analysis related to the selection of

binomial elements, in terms of which disparity had to be measured. In the light of data availability, we have identified the following six groups for the measurement of disparities in literacy rates.

i) male-female
ii) rural (male-female)
iii) urban (male-female)
iv) rural-urban
v) male (rural-urban)
vi) female (rural-urban)

The second stage of analysis related to the choice of a suitable measure of disparity. The review of literature revealed that both absolute and relative measures have been used to measure disparities (Sen, 1973). However, the major difficulty with all these measures is that the disparity between alphas and non-alphas is not the same as between non-alphas and alphas. To overcome this difficulty, Sopher has proposed an alternative measure which gives the same value in the two cases mentioned above (Sopher, 1974). Sopher's index has been further modified so that it satisfies all the axioms which are normally used for the evaluation of any inequality measure. These axioms are additive and multiplicative monotonicity, redistribution and repetitive transfers (Kundu & Rao, 1982). In the present exercise, we have proposed an alternative formulation of the Sopher's disparity index and the new index which satisfies all the above stated axioms has been defined as follows (Raza & Aggarwal, 1982).

$$w = \log (L_2/L_1) + \log [(100+I_1) / (100+I_2)]$$
$$L_2>L_1$$

where L_1 and L_2 are the literacy rates and I_1 and I_2 are the corresponding illiteracy rates for the two elements between which the disparity index is to be calculated.

The third stage of analysis related to the selection of suitable indicators so as to examine the nature of relationships between the literacy rate, the disparity indices and the socio-economic characteristics. Keeping in view the framework of the present study and the availability of data, the following attributes of the economic base of the district have been selected:

X_1= Percent total literacy
X_2= Disparity index of male-female literacy
X_3= Disparity index of rural(male-female) literacy
X_4= Disparity index of urban(male-female) literacy
X_5= Disparity index of rural-urban literacy
X_6= Disparity index of male(rural-urban) literacy
X_7= Disparity index of female(rural-urban) literacy
X_8= Percent agricultural labourers
X_9= Percent cultivators
X_{10}= Percent other workers
X_{11}= Percent rural literacy
X_{12}= Percent urban literacy
X_{13}= Percent urban population

It may be noted that the definitions of the variables X_6, X_9, X_{10}, X_{11}, X_{12} & X_{13} are the same as in the Census of India,1981.

The relationships of disparity indices with literacy rates, on the one hand, and with economic base indicators, on the other, have been examined through regression analysis. By using the rate of urbanization as an explanatory variable, it became possible to draw some interesting conclusions about the difference between the urban and rural areas with regard to the levels of literacy as well as to inequities in the incidence of literacy.

While interpreting the findings of the study, a few limitations of its data base and methodology should be borne in mind. Firstly, unless otherwise stated, this study is based on literacy rates for all age groups. Secondly, the districtwise data, in the case of 1981 Census, was not available for two states i.e. Assam and Jammu & Kashmir; its findings, therefore, relate to the remaining 386 districts of India. Thirdly, inspite of its many positive features, the proposed measure of disparity(w) suffers from two major limitations: it does not take into account the base level of literacy; and the solution arrived at is not a unique solution. As a consequence, the index may in some circumstances take the same value for even highly disparate levels. It is hoped that inspite of these limitations this study would contribute to the sharpening of our understanding with respect to an important aspect of social reality in

India: the inequities and disparities in literacy rates.

3. SPATIAL PATTERNS OF DISPARITIES IN LITERACY:

The results of the Fourth All India Educational Survey have revealed that in 1978 about 93 % of rural population has primary educational facilities either in their own habitation or within a distance of 1 Km (NCERT, 1980). It is thus clear that the accessibility to educational facilities, even in rural areas, may not now be considered to be a major constraint in achieving the target of cent % enrolment. With a view to cover the out of school population, the Directorate of Adult Education has also been operating a number of schemes for more than a decade. Inspite of these efforts to eradicate illiteracy, we find that the situation continues to be highly unsatisfactory.

It was in this context that the First Five Year Plan recognized the equitable distribution of educational opportunities as one of the important objectives of educational planning in India (Govt. of India, 1951). The successful implementation of these promises would have at the same time resulted in reducing regional disparities in literacy to the zero level. The reality, however, is quite different. The Sixth Five Year Plan has specifically recognized the continued persistence of intra and inter-regional disparities at all the levels of educational pyramid(Govt. of India, 1980). The UNESCO (1978) projections have shown that even by the year 2000 A.D., India would not be able to achieve 100 % literacy. Projecting the trends for the period 1901-1981, it has been estimated that the literacy rate is likely to increase to about 55 per cent by 2000 A.D.(UNESCO, 1978). These projections further reveal that the overall gap in literacy rate of males and females would fall only marginally and consequently, the intra-regional disparities may even continue to persist upto the year 2000 A.D. The policy of growth with equity acquires significance in this context for the countries of the third world. Such a policy is an imperative not only on ethical, moral or philosphical grounds, but more importantly on pragmatic grounds just as there would be little equity without growth, there would be little growth without equity. This is the only strategy to come out of the existing morass of underdevelopment. To achieve these objectives, the identification,

measurement and explanation of intra and inter-regional disparities becomes a necessary pre-requisite.

A plan of action, for example, for the achievement of cent per cent literacy can not be based on an analysis at the aggregated level but on a highly disaggregated system of diagnosis and prescription. A district with a high concentration of tribal or rural population would, for example, call for a different set of incentives, of school mapping techniques, of teacher deployment and hostel arrangements than a district with a high concentration of non-scheduled or urban population. The following analysis on the basis of the district level data has been done with such an end in view. It may be noted that the analysis in this section has been undertaken on the basis of the incidence of different types of disparities as measured through the indices outlined in section 2.

Before examining the inter-relationships among the six indices of intra-district disparities in literacy rates it would be advisable to consider the extent of their variations across different districts. Table 1 gives the mean, standard deviation and co-efficient of variation for each of these six indices.

TABLE 1

COEFFICIENT OF VARIATION FOR DISPARITY INDICES: 1981

Sr.No.	Disparity index	Mean	S.D.	C.V.
1.	male-female	.400	.163	.4076
2.	rural(male-female)	.482	.211	.4377
3.	urban(male-female)	.222	.086	.3946
4.	rural-urban	.344	.161	.4687
5.	male(rural-urban)	.268	.141	.5247
6.	female(rural-urban)	.515	.255	.4957

It may be noted from Table 1 that the coefficient of variation for disparity indices involving rural-urban components show high values as compared to those of male-female disparities. With the rural-urban disparities, the highest value of coefficient of variation has been

observed for male (rural-urban). It follows from the above that the spatial variations are more marked between different components of rural-urban sector rather than within rural or urban segment.

We now turn to the task of interpreting the under-lying patterns which emerge from the factor analysis of the disparity indices using the factor loadings as input variables and factor scores for all 386 districts as the observation set. The examination of the factor loadings for each factor would permit a more succint description of the territorial patterns in the incidence of intra-regional disparities. An examination of factor scores, which represent the behaviour of individual districts with respect to various factors, would bring out the spatial patterns, described by more significant factor loadings. The calculation of factor scores weights the original variables in proportion of the strength of their association with the factor, which is measured by their respective loadings. Consequently, the emerging spatial profiles would allow us to bring into sharp focus some of the broad features of the regional structure of educational development in India.

For purposes of the present analysis, factors have been ordered according to their descending contribution to total variance following the method of varimax rotation. The factor structure was limited to two factors, which explained more than 91 % of the total variance. The communalities vary from 0.77 to 0.99 and are mostly greater than 0.90. The high values of communalities thus clearly show that a large proportion of the variations in each of the six disparity indices is being explained by the two factors. It may also be noted that for both the factors, the factor loadings of the individual variables have the positive sign. This suggests that in the regional space, all the six indicators of disparities covary in the same direction. The detailed rotated factor loadings and communalities corresponding to each variable are given in Table 2. The results corresponding to the analysis of the first two factor loadings are discussed below.

TABLE 2

ROTATED FACTOR LOADINGS

Sr.No.	Disparity index	Factor 1	Factor 2	Communalities
1.	male-female	.950	.240	.9221
2.	rural(male-female)	.884	.366	.9154
3.	urban(male-female)	.840	.254	.7697
4.	rural-urban	.309	.944	.9803
5.	male(rural-urban)	.198	.960	.9613
6.	female(rural-urban)	.538	.816	.9555
	Eigen Value	2.76	2.73	
	Cumulative % variance explained	46.30	91.60	

3.1 FACTOR 1 : DISPARITIES IN MALE-FEMALE LITERACY RATES

The first factor on rotation accounted for more than 46 % of variance, and the factor loadings for the three variables corresponding to male-female disparities were found to be greater than 0.80. Thus the first factor may be taken to represent the territorial pattern of the disparities between male and female literacy rates.

With a view to examine the pattern of spatial distribution of disparities, the factor scores for all the districts were calculated and classified into six mutually exclusive groups.(1) The state-wise distribution of districts into these categories is presented in Table 3. It was also considered desirable at this stage to examine the spatial distribution of these groups. This was done with a view to bring out the significance of the spatial clusters of districts having similar patterns of intra-district disparities especially when these cut across different state boundaries.

Figure 2 presents the spatial distribution of districts based on the factor scores corresponding to the factor representing the disparities in male-female literacy rates. The following points emerge from a close look at the table and the map prepared on the

TABLE 3

DISTRIBUTION OF DISTRICTS CLASSIFIED BY TYPE OF MALE-FEMALE DISPARITY IN LITERACY RATES-1981*

Sl. No.	States/U.T.	No. of districts with disparities						
		Extremely high	Very high	high	Middle	Low	Very Low	Total
1	2	3	4	5	6	7	8	9
1.	Andhra Pradesh		2	14	4	2	1	23
2.	Bihar		7	24				31
3.	Gujarat			2	13	4		19
4.	Haryana			5	7			12
5.	Himachal Pradesh			2	6	4		12
6.	Karnataka			5	9	5		19
7.	Kerala					2	10	12
8.	Madhya Pradesh	1	20	23	1			45
9.	Maharashtra			5	17	3	1	26
10.	Manipur				3	3		6
11.	Meghalaya				1	4		5
12.	Nagaland			1	1	4	1	7
13.	Orissa		3	6	4			13
14.	Punjab				3	9		12
15.	Rajasthan	4	21	1				26
16.	Sikkim			1	3			4
17.	Tamil Nadu				12	2	2	16
18.	Tripura				2	1		3
19.	Uttar Pradesh		15	32	9			56
20.	West Bengal			3	9	3	1	16
21.	Arunachal Pradesh			4	3	2		9
22.	Chandigarh					1		1
23.	Dadra & Nagar Haveli				1			1
24.	Delhi					1		1
25.	Goa, Daman & Diu				2	1		3
26.	Lakshadweep					1		1
27.	Mizoram				1	2		3
28.	Pondicherry				1	1	2	4
29.	A & N Islands				1	1		2
	TOTAL	5	68	126	113	56	18	386

* Excluding Assam and Jammu & Kashmir

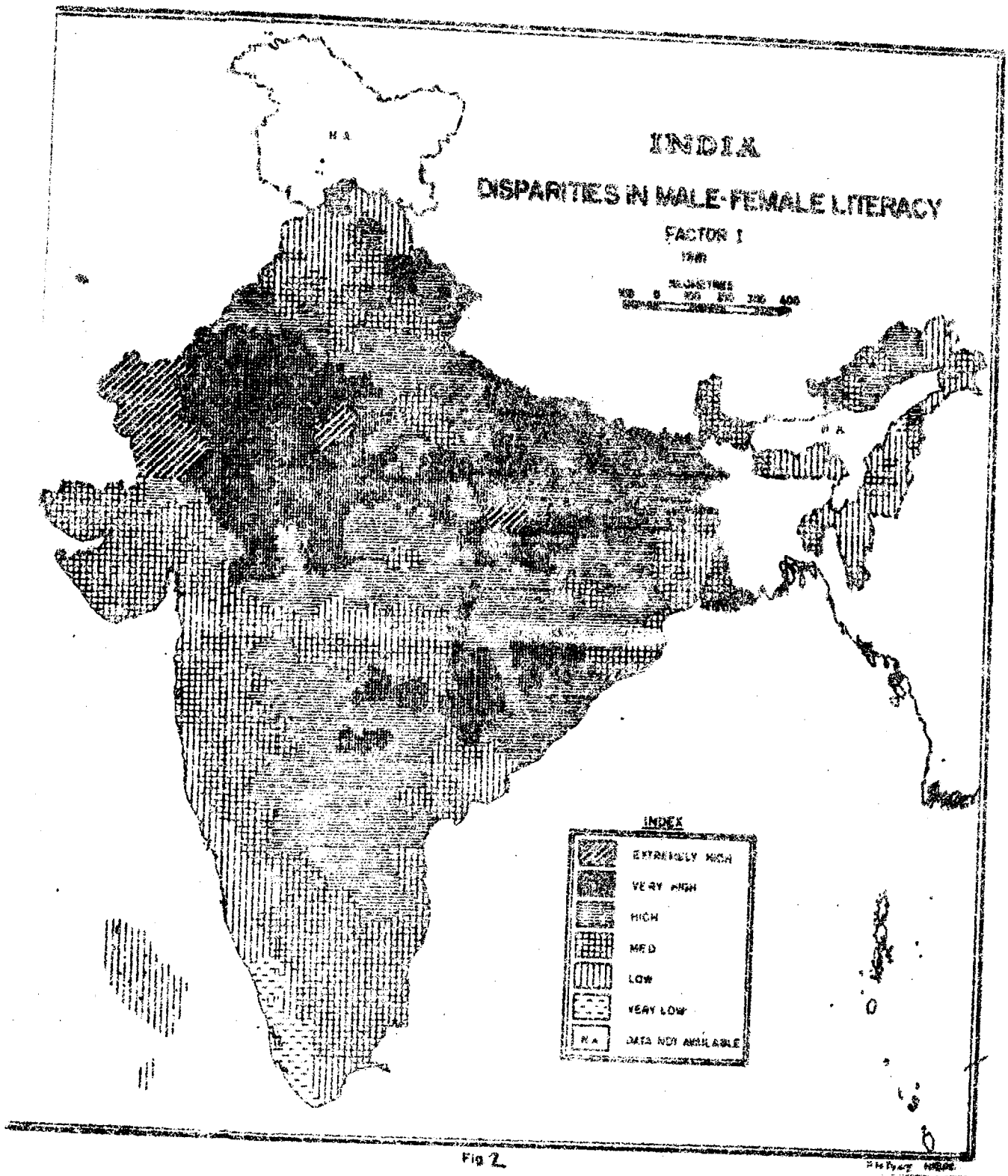

INDIA
DISPARITIES IN MALE-FEMALE LITERACY
FACTOR I
INDEX
EXTREMELY HIGH
VERY HIGH
HIGH
MED
LOW
VERY LOW
N.A.
DATA NOT AVAILABLE

Fig 2.

basis of the factor scores corresponding to factor 1:

i) It may be observed that even after thirty years of planned development the disparities in male-female literacy, in all its facets have continued to be fairly high over a large part of the country, so much so that they have significantly high values in nearly half the number of districts in the country.

ii) The statewise distribution of districts in different classes is highly skewed. Normally, the patterns of intra-district disparities for a large number of districts in a state are of similar nature. For example, in Kerala 10 districts out of a total of 12 have very low level of disparity which is in contrast to the situation in Rajasthan where 25 out of 26 districts have either very high or extremely high order of male-female disparity in literacy rates.

iii) Row-wise examination of Table 3 reveals that a large number of districts of educationally backward states of Andhra Pradesh, Bihar, Madhya Pradesh, Rajasthan and Uttar Pradesh continue to have high order of male-female disparities. On the other hand, a large number of districts in the state of the Punjab, Meghalaya and Nagaland have low levels of disparity.

iv) Column-wise examination of Table 3 reveals that out of a total of 73 districts with very high and extremely high order of disparity, 61 districts lie in the contiguous states of Madhya Pradesh, Rajasthan and Uttar Pradesh.

v) An examination of Figure 2 reveals that districts corresponding to a particular level of disparity tend to cluster in national space and that these clusters cut accross state boundaries. The first cluster of districts corresponding to very high levels of disparities extends from Western Rajasthan to Central Bihar. Contiguous districts from Rajasthan, North Madhya Pradesh, Eastern Uttar Pradesh and South Orissa are included in this cluster. Similarly, the spatial distribution of districts according to the disparities in male-female literacy takes the form of two major clusters which are not contiguous. The first cluster in this category comprises of the districts from South Central India and the second corresponds to the districts from Central Madhya Pradesh, Northern Orissa, Northern and

Southern Bihar and extends all along the Gangetic plains. The cluster corresponding to medium type of disparities forms a U shaped pattern and extends from the west coast to the districts along the east coast. On the west coast it includes districts from Gujarat, Maharashtra, Karnataka and Tamil Nadu and extends upto Krishna district along the east coast. The districts with low levels of disparities are very few and most of these are along the Western coast. The analysis has thus clearly shown that districts with high disparity index do not exist in isolation but take the form of homogeneous clusters which cut across many state boundaries.

3.2 FACTOR 2 : DISPARITIES IN RURAL-URBAN LITERACY RATES

The second interaction factor, representing 45.3 per cent of total variance, represents a pattern involving rural-urban disparities in literacy rates. The significance of rural-urban disparities is indicated by high factor loadings of all the three variables corresponding to rural-urban phenomenon. The explanatory power, of the second factor is approximately equal to that of factor 1. The explanation lies in the fact that, in the Indian context, both the factors i.e. male-female and rural-urban disparities continue to be of high order and are equally significant.

The factor scores for all the 388 districts were calculated using the factor loadings for the second factor and were classified into six mutually exclusive groups(1). The spatial distribution of the clusters corresponding to these groups is shown in Figure 3 and the state-wise distribution of districts is presented in Table 4. The following may be deduced from this table:

i) It may be noted that in the case of rural-urban disparities, while more than 50 % of districts have high to extremely high levels of disparity, there are only 22 districts with very low rural-urban disparities. It may bot noted that these 22 districts include those districts also which have either rural or urban population only. For these districts the rural-urban disparity would naturally be zero; and, hence, such districts have been included in the category of districts with very low disparity index. The number of such districts being 14. In the true sense, only the remaining 8 districts have very

TABLE 4

DISTRIBUTION OF DISTRICTS CLASSIFIED BY TYPES OF RURAL-URBAN DISPARITY IN LITERACY RATES - 1981*

Sl. No.	STATE/U.T.	No. of Districts with Disparity					
		Extremely high	Very high	High	Middle	Low	Very low	Total
1	2	3	4	5	6	7	8	9
1.	Andhra Pradesh		6	11	5		1	23
2.	Bihar		7	20	4			31
3.	Gujarat			2	12	4	1	19
4.	Haryana			7	5			12
5.	Himachal Pradesh		1	3	3	3	2	12
6.	Karnataka			5	11	3		19
7.	Kerala					3	9	12
8.	Madhya Pradesh	3	18	21	3			45
9.	Maharashtra			4	18	3	1	26
10.	Manipur				1	5		6
11.	Meghalaya		1	1	2	1		5
12.	Nagaland		1	1		3	2	7
13.	Orissa		2	5	4	2		13
14.	Punjab				6	6		12
15.	Rajasthan	6	13	7				26
16.	Sikkim			1	3			4
17.	Tamil Nadu			2	10	3	1	16
18.	Tripura			1	2			3
19.	Uttar Pradesh		7	28	21			56
20.	West Bengal		1	5	8	1	1	16
21.	Arunachal Pradesh		2	3		3	1	9
22.	Chandigarh					1		1
23.	Dadra & Nagar Haveli			1				1
24.	Delhi					1		1
25.	Goa, Daman & Diu				2	1		3
26.	Lakshadweep					1		1
27.	Mizoram				2	1		3
28.	Pondicherry				1	1	2	4
29.	A & N Islands					1	1	2
	TOTAL	9	59	126	123	47	22	388

* Excluding Assam and Jammu & Kashmir

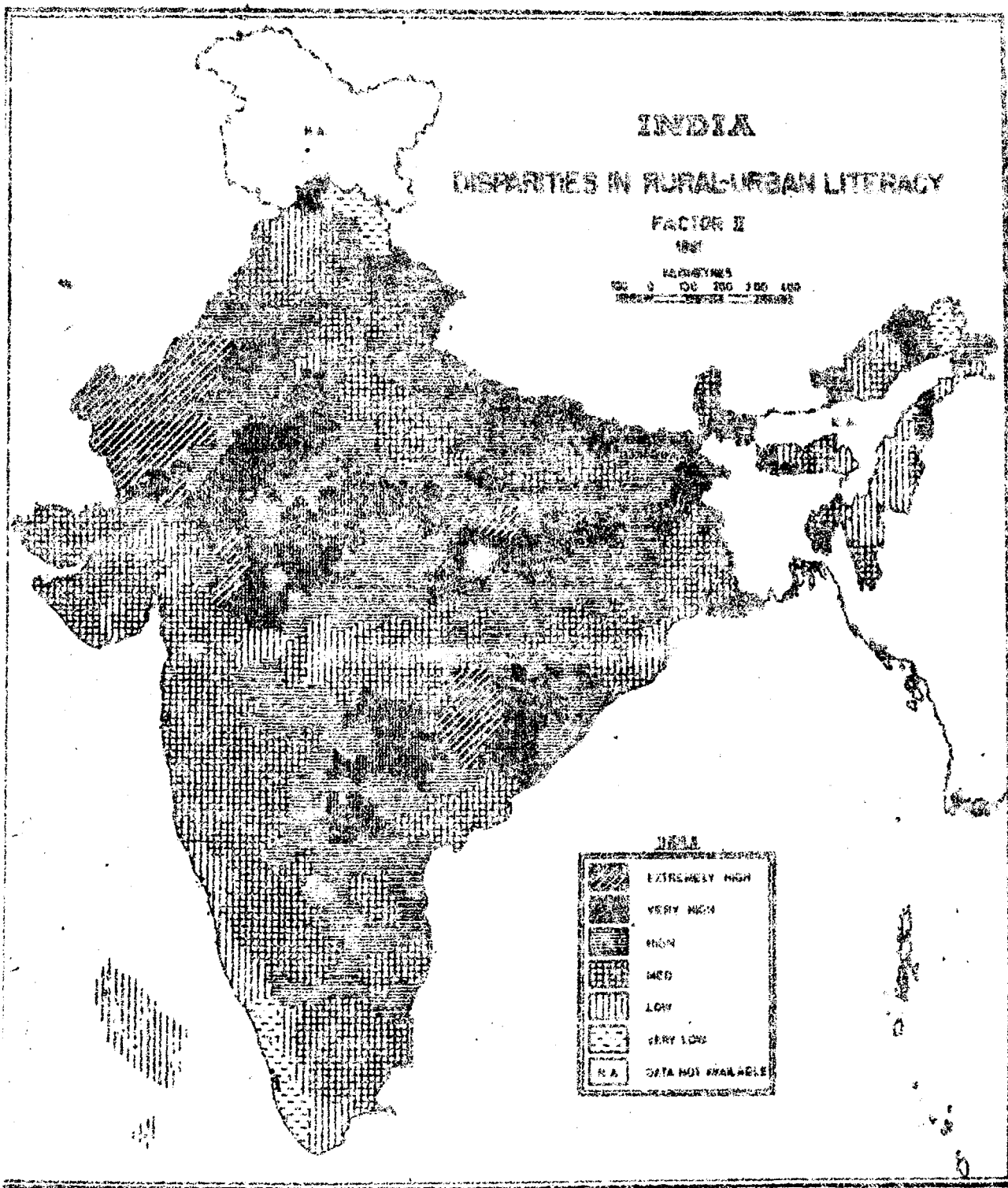

INDIA
DISPARITIES IN RURAL-URBAN LITERACY
FACTOR II
1981
KILOMETRES
0 100 200 300 400
INDIA
EXTREMELY HIGH
VERY HIGH
HIGH
MED
LOW
VERY LOW
N.A.
DATA NOT AVAILABLE

Fig 3

low rural-urban disparities.

ii) The broad patterns of rural-urban disparities are almost the same as observed for disparities in male-female literacy. In this case, it is the rural population which suffers from the inequities in the spread of literacy. The comparison of the maps representing the two components of disparities reveal that there are some districts which have shifted from one category to another because of their being on the margin of cut-off points. The other reason for a slight shift in spatial patterns could be the variations in the composition of rural-urban population. The analysis clearly reveals that most of the districts of Bihar, Andhra Pradesh, Haryana, Madhya Pradesh, Rajasthan and Uttar Pradesh happen to have high level of rural-urban disparities.

In view of the above discussion, it would be permissible to conclude that more than 50 % of districts in India still continue to have high level of disparities in the rural-urban as well as male-female literacy rates. This is so inspite of the fact that balanced regional development of the country and equitably sharing the benefits of development among different social groups has been one of the objective of planning during the last thirty years.

4. REGIONAL DISPARITIES AND CHARACTERISTICS OF THE ECONOMIC BASE:

It is evident from the foregoing analysis that most of the districts in the country are characterised by the existence of a significantly high magnitude of intra-regional disparities in literacy rates between different binomial elements therein. It may be recalled from the earlier discussion that the factors which give rise to the disparities do not operate in isolation from each other but are instrinsically inter-twined with the historical processes wich have resulted in a distorted socio-economic structure of the national space.

Planning in independent India has been aimed at altering this structure through massive public investment in vital sectors of the economy. However, even after 30 years of planned development, the inherited regional structure of underdevelopment has continued to persist in many of its essential characteristics. A systematic

understanding of these relationships is of crucial significance not only for regional planners of the educational sector alone but of economic development as a whole. This is particularly so if we recognise that education is bidirectionally linked with the development process. We will make some exploratory investigations into the nature of these relationships in this section. The relationship of disparity indices with the levels of literacy, as well as with economic base indicators, would be examined in some depth. The choice of variables has already been discussed in section 2. A preliminary exploration into the nature of these relationship has been attempted through the examination of a correlation matrix which is presented in Table 5. Some important conclusions that emerge from a study of this table are as follows:

i) It is obvious that the level of literacy is significantly and negatively associated with all the six types of disparity indices. In view of the negative association, the districts with low levels of literacy tend to have high level of disparities and vice versa. These inter-relationships further reveal that, in the Indian context, the diffusion of literacy has been accompanied by a corresponding reduction in the magnitude of disparities. It follows that there is no contradiction betweeen equity and growth. In the case of educational development growth has thus been by and large accompanied by equity.

ii) In view of the rural dominance in the population of the country, rural literacy emerges as the major determinant of the level of over-all literacy and is also significantly related to different types of disparity indices. The correlation coefficient between total literacy and rural literacy is 0.843 as compared to 0.552 with urban literacy. It may thus be noted that in the Indian context, the growth of overall literacy has been essentially constrained by the slow progress made in the diffusion of literacy in rural areas.

iii) A close association has also been observed between the indices of literacy and the economic base of a district. An examination of Table 5 shows that the correlation coefficient between the literacy rate and the proportion of cultivators is both negative and significantly high (-0.605). Thus, the districts which are mainly dependent on agriculture have low levels of literacy. This evidence clearly shows that literacy among rural masses is of crucial

TABLE 3

INTER-CORRELATION TABLE

	X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9	X_{10}	X_{11}	X_{12}	X_{13}
X_1	1.000												
X_2	-.805	1.000											
X_3	-.744	.911	1.000										
X_4	-.622	.757	.728	1.000									
X_5	-.695	.519	.612	.496	1.000								
X_6	-.667	.420	.492	.457	.957	1.000							
X_7	-.718	.686	.816	.606	.934	.856	1.000						
X_8	-.040	-.003	-.062	.165	.008	.037	-.052	1.000					
X_9	-.605	.526	.439	.275	.361	.324	.389	-.464	1.000				
X_{10}	.713	-.605	-.468	-.461	-.422	-.399	-.416	-.251	-.707	1.000			
X_{11}	.843	-.674	-.668	-.540	-.664	-.635	-.697	.063	-.353	.398	1.000		
X_{12}	.552	-.455	-.352	-.256	.044	.034	-.064	.002	-.290	.316	.440	1.000	
X_{13}	.525	-.449	-.282	-.215	-.240	-.224	-.200	-.115	-.622	.771	.096	.204	1.000

X_1 = Percentage total literacy

X_2 = Disparity index of male-female literacy

X_3 = Disparity index of rural (male-female) literacy

X_4 = Disparity index of urban (male-female) literacy

X_5 = Disparity index of rural-urban literacy

X_6 = Disparity index of male (rural-urban) literacy

X_7 = Disparity index of female (rural-urban)

X_8 = Percentage agricultural labourers

X_9 = Percentage cultivators

X_{10} = Percentage other workers

X_{11} = Percentage rural literacy

X_{12} = Percentage urban literacy

X_{13} = Percentage urban population

significance in the process of modernization of the agricultural sector and diversification of the rural economy.

iv) The correlation coefficient between proportion of workers engaged outside the traditional combination of primary activities and household industries is significantly and positively related to the levels of literacy on the one hand, and negatively associated with the different types of disparities, on the other. The inherited economic base of low technology production processes is essentially inadequate and incapable of either generating and supporting processes of social change through increase in literacy or the narrowing of the inequity gaps therein.

v) Urbanization contributes to the raising of literacy rates and the lowering of the disparities therein. This may be attributed to the fact that there is a stronger tendency amongst the literates to migrate from the rural to the urban areas and to the strong urban bias in the provision of facilities for the formal as well as non-formal education. The exact nature of the magnitudes of these relationships, however, need to be examined in greater detail.

vi) The value of correlation coefficient between different indices of disparities and rural literacy is higher than the corresponding values for urban literacy. This may be attributed to the fact that the intensity of social inequities particularly those of the caste system and of male dominance is higher and more deeply entrenched in the rural ethos than in the urban.

It follows from the above, that there are strong associations between the indicators of literacy, disparities and the economic base characteristics of a district and are intrinsically inter-twined. On the basis of these findings, it was considered desirable to probe deeper and to examine the causal relationships between the indicators of regional disparities and those of economic base with the help of simple linear regression analysis. The disparity indices and literacy rates have been considered as the dependent and the indicators of economic base as the independent variables. The causal relationship between literacy rate as the independent and the disparity indices as the dependent variables have also been examined in a similar manner. The main findings of the analysis are presented below.

4.1 LITERACY, DISPARITIES AND ECONOMIC BASE CHARACTERISTICS:

The percentage share of workers engaged in activities other than those of the traditional sector of primary production in symbiosis with household industry, and particularly that of the modern manufacturing constitutes the economic base indicator which significantly explains variations in total literacy. It is the strength of the non-primary sector of the economic activity which emerges as the major determinant of the literacy rate. The estimated regression equation is as under:

$$X_1 = 19.23 + 0.544X_{10} \qquad R^2 = 0.509$$

The total explanatory power of the equation described above is about 51 per cent and the positive sign of the regression coefficient indicates that the level of literacy and the proportion of workers in non-primary sector of the economy covary in the same direction. It may, however, be noted that the relationship between literacy and the economic base is quite complex. After all literacy alone may not be an important measure of all the technical skills required in different sectors of the economy. Nevertheless, the regression results clearly show that there is a high degree of correspondence between the processes of modern organised manufacturing and level of literacy.

The relationships between the variables relating to the magnitude of the intra-district disparities and the corresponding levels of literacy in a district have been examined in this section. For the purpose of the present analysis, literacy has been considered as an independent and the disparity indices as dependent variables. The analysis resulted in two significant regression equations, which bring out the relationship of male-female and rural-urban disparity index with the level of total literacy. The estimated regression equations are as under:

$$X_2 = 0.74997-0.010\ X_1 \qquad R^2 = 0.648$$

$$X_3 = 0.64229-0.005\ X_1 \qquad R^2 = 0.484$$

It may be noted that the regression coefficient in these equations is negative. This indicates that the character of both male-female and rural-urban disparities are essentially similar in nature. In view of the fact that the literacy rates and the disparity indices always take positive values, the districts with high levels of literacy tend to have low disparities. Stated in other words, the analysis has shown that with the spread of literacy, disparities tend to narrow down. This may be so in view of the fact that the new gains would mainly accrue to the lower strata as the others would have already achieved higher rates of literacy in the earlier phase.

In view of the negative value of the regression coefficient in both the equations, it is possible to find a critical value of overall literacy when the inequities in male-female and urban-rural literacy rate tend to converge to zero. This is evident from the following regression equation which shows a significant fall in male female disparities as a consequence of a rise in rural and urban literacy.

$$X_2 = 0.65233 - 0.009\ X_{11} \qquad R^2 = 0.454$$

$$X_2 = 0.70530 - 0.006\ X_{12} \qquad R^2 = 0.207$$

It is interesting to observe that male-female disparity is reduced to zero level when the rural literacy approaches 72.5 per cent, while it continues to persist even when the urban literacy reaches 100 per cent. This clearly indicates the relative importance of rural literacy in reducing the intra-regional disparities between male and females to a zero level. While interpretting these results, it is significant to note that the results are based on the cross-sectional data and has limited use for projection purposes. Inspite of its limitataions, the equations have broadly captured the trend.

The foregoing results clearly reveal that the existence of high order of inequities has considerably constrained the diffusion of literacy across different districts of the country. It is in this context, that the concept of growth with equity has acquired greater significance in the development strategies in the developing economies. In the Indian context, the objectives of growth with equity would essentially mean a more effective strategy oriented towards the education of the females especially in the rural areas and

those of the deprived sections of the society.

5. THE VICIOUS CIRCLE OF UNDERDEVELOPMENT:

With a view to understand the nature of inter-relationships between inequities and economic base indicators as well as between literacy and economic base indicators, use has been made of Stepwise Regression Analysis to analyse the districtwise data. The analysis has shown that the economic base of a region is significantly related to the levels of literacy, which in its own turn is associated with different segments of inequities in literacy rates. Some of the important results are presented below:-

$$X_1 = 15.35 + 0.572\ X_{10} + 0.145\ X_8 \qquad R^2 = 0.55$$

$$X_2 = 0.40673 - 0.004\ X_{13} \qquad R^2 = 0.20$$

$$X_2 = 0.61788 - 0.006\ X_{10} \qquad R^2 = 0.37$$

$$X_{13} = 49.39 - 0.460\ X_8 - 0.542\ X_9 + .212\ X_{10} \qquad R^2 = 0.61$$

The regression results presented above, give ample and unambiguous evidence to confirm the hypothesis that with social modernization and economic diversification of the economic activities (non-primary activities), the levels of literacy tend to rise and, as a consequence, the inequities at the basal stratum of the multi-level educational pyramid tend to narrow down.

The regression results also reveal that urbanisation is the composite effect of the economic base characteristics of the district. The value of R^2 in this case is .61. An examination of the regression equation reveals that the processes of urbanisation are accompanied with the modernization and the industrialization of the economy.(2) It is thus evident that the persistence of inter-regional disparities and the attributes of fragmentation of the socio-economic structure are intrinsically inter-twined. The above regression results further reveal that urbanization, to some extent also helps in reducing male-female disparities.

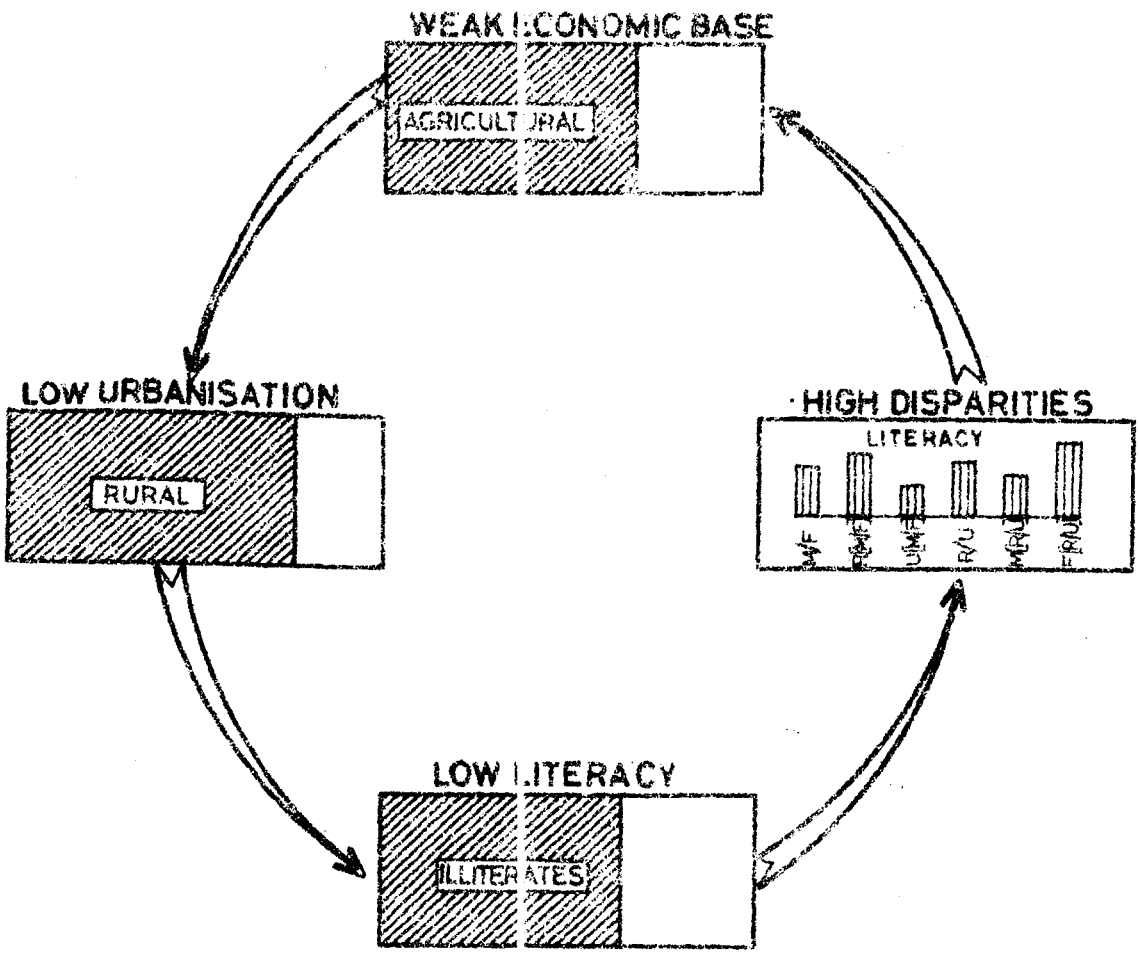
Following the gross features emerging from the inter-relationships between economic base characteristics and educational development indicators as reflected through inequities and levels of literacy rates, we now proceed a step further in our analysis and propose a model of the vicious circle of underdevelopment incorporating the basic elements and characteristics of the regional structure of the Indian economy which continue to inhibit the development processes even after more than thirty years of planned development. The vicious circle of underdevelopment is presented in Figure 4.

A close examination of the proposed model reveals that in view of the predominantly agricultural base of the Indian economy, a large part of the population lives in rural areas constituting a hierarchy of the system of settlements which reflect the continuance of some distortions of the inherited fragmentation of the settlement continuum along the rural-urban interface, which in its turn is associated with the emergence of disparities between rural and urban areas. It is through these infirmities of the spatial organization of underdevelopment that the economic space gets transformed into a highly differentiated field and as a consequence imbalances and inequities emerge across different regions as well as between different social groups. These mechanisms are crucial particularly in the developing economies as the persistence of high inequities and regional imbalances constrain and are themselves constrained by low industrialization and low urbanization leading firstly, to a weak, inadequate and distorted non-primary sector and secondly, to a primary sector which is characterised by low productivity and mass poverty. Thus, the reasons for educational backwardness in India are essentially rooted in the inadequacies and infirmities of its economic base, which in its turn is characterised by the persistence of the distortions embedded in the system during the colonial period and of the infirmities and limitation of the current development strategies.

6. CONCLUSIONS

With a view to unreval the complexities in the process of diffusion of literacy, the foregoing analysis was essentially concerned with the identification, measurement and explanation of inequities in territorial distribution of literacy. In this endeavour, we have proposed a new method for measuring intra-regional

VICIOUS CIRCLE OF UNDER DEVELOPMENT



P N Tyagi

Fig 4

inequities between different binomial elements of the regional space. The analysis was based on districtwise data on literacy for the year 1981 and an attempt was made to explain its relationship with disparities in literacy rates and economic base characteristics. From the foregoing discussion, we can conclude the following:

i) the continuing low levels of literacy, particularly in rural areas and the persistence of high level of inequities partly reflect the failure to achieve the goals of universal primary education and calls for a system of territorial resource distribution of a fundamentally different kind than the present one.

ii) With a view to pin point the regions which require special remedial measures to raise their levels of literacy, the study has identified the districts with varying degrees of inequities in the distribution of literacy. The analysis has shown that more than half of the districts in India still continue to have significantly high level of disparities.

iii) The examination of casual relationships corraborates the finding that the economic base of a region exerts a strong impact on the spread of literacy, and the processes of urbanization and industrialization strongly influence the levels as well as the inequities in the distribution of literates. A vicious circle of underdevelopment incorporating these characteristics has been proposed.

The findings of the present study have serious policy implications for educational policy and evidently point to the need for a different strategy for educational development. The analysis has highlighted the fact that universalization of alphabetization is intrinsically linked with the development process as a whole and a narrow sectoral approach of educatonal planning would not go in for achieving national objectives.

NOTES

1. The cut-off points have been determined from the factor scores in the following manner:

Extremely High		>	Mean + 2 S.D.
Very High	Mean + 1 S.D.		Mean + 2 S.D.
High		Mean	Mean + 1 S.D.
Medium	Mean - 1 S.D.,		Mean
Low	Mean - 2 S.D.,		Mean - 1 S.D.
Very Low		<	Mean - 2 S.D.

2. It may be noted that the three variables relating to the economic base of a district (i.e. X_8, X_9, X_{10}) do not add to give the total work force. We have not considered the % workers in the household sector as a separate variable.

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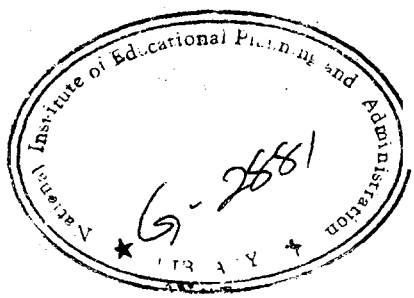

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