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SPATIOTEMPORAL ANALYSIS OF INTEGRATED RURAL DEVELOPMENT PROGRAM AT BLOCK LEVEL : A CASE STUDY OF CUTTACK DISTRICT IN INDIA

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ABSTRACT : India is a country having more than 70% of rural population, and has adopted and implemented the Integrated Rural Development Program (IRDP) since 1979. The program has undergone several transformations and it is also now continuing. The aim of this paper is to see the impact of the integrated rural development programs as operationalised within the framework of the District Rural Development Agency. The study is basically focused on spatial dimension of the program components - beneficiary, credit, subsidy and investment at the district level taking block as the micro-level spatial unit. The study finds that the levels of investment is not consistent with the levels of backwardness. The levels of backwardness is identified on the basis of some selected rural development indicators. It is felt that the programs are implemented without much emphasis on the objective of the IRDP.

INTRODUCTION

In recent years, rural development has taken the central stage of development planning in most of the developing countries focusing on the issue of alleviating rural poverty by implementing a large number of programs and projects. The strategy of development gradually shifted from increasing rural production to provide employment and increase income and facilitate to share benefits equitably among the rural poor. India is a country having more than 70% of rural population, has adopted and implemented the Integrated Rural Development Program (IRDP) in 1979 and the program has undergone several transformations and it is continuing as such in present times. The program has spatial, sectoral and target group components. The small and marginal farmers, scheduled castes and tribes (backward class population), rural artisans, landless agricultural and non-agricultural workers, and unemployed youth mostly constitute the target groups. Initially, the development projects were confined to primary sector activities, however the focus changed subsequently to accommodate industrial, service and business components including skill development through training aimed for self employment. The program is usually operationalized through identification of poor households as per the income criteria, selection of the rural development project and provision of credit (cash and kind) to assist poor to expand economic activities for additional employment and income. However, about one third of the total rural population still lives below the current poverty line. The reasons are many.

Cutler (1984:1129) observes that the benefits of the steady rural economic growth have accrued to the better off section of the population so that poverty has grown in relative terms, if not aboslutely. A poverty alleviation programs assessment study by Gaiha (1991:146) suggests that in general the incremental incomes are not large enough to enable the poor to cross the poverty thresholds. Dantawala (1990:2806) very rightly expresses that the perpetual dependence of the poor on the government sponsored public works, their adhoc choice unintegrated with development plans and sporadic nature did not push forward to overcome the poverty situation in India. In terms of allocation of resources, there is a significantly higher degree of leakage to persons outside the target group (Swaminathan, 1990:A18). Dreze (1990:A101-102) concludes in a similar IRDP evaluation study that in large parts of India (with some important exception such as West Bengal) the selection of IRDP beneficiaries is at best indiscriminate and at most biased against the poor and we have no solid evidence on the actual effects that IRDP has on the living standards of the participatory households. Paul Seabright (1989:2208) argues in a similar study connected with the livestock investments under IRDP that even when subsidies are included the benefits to households of investing in livestock through the IRDP have been significantly below those to livestock purchased outside the scheme, principally due to higher prices paid by IRDP participants in the livestock markets, not compensated by higher quality of the animals purchased. Various evaluation studies in India point out that the operational deficiency of IRDP during the Sixth Plan could not yield the expected result (Kuriyan, 1989 : A13).

OBJECTIVES OF THE STUDY

The evaluation studies conducted so far by many researchers on IRDP of India, have not considered the spatial component as such. Therefore, the aim of this study is to make a spatiotemporal analysis of various components of the IRDP as implemented in Cuttack district at the block (micro level unit of development administration in India) level. Specifically the objectives are as follows :

1) To identify the levels of backwardness at the block level on the basis of some selected rural development indicators (concentration of backward class population, incidence of rural poverty, distribution of small and marginal farmers and landless agricultural labors).

2) To compare the pattern of capital investment (allocation of IRDP funds) with the levels of backwardness.

The term backwardness is used here to refer the magnitude of depressing socioeconomic situation, measured by few selected but important indicators specified under the IRD Program. The work is primarily based on the data which was made available from the District Rural Development Agency (DRDA) of Cuttack district. The spatial analysis is done by aggregating data at the block level and a number of choropleth maps have been generated by applying standard deviation grouping technique to highlight different aspects of IRDP.

STUDY AREA

The Cuttack district in the state of Orissa in eastern India is selected for the purpose of study because of two important reasons. First, high proportion of the population fall into the target group of the IRD Program and second, this district is one of the oldest and leading district in the country for implementing IRD programs.

Cuttack is one of the coastal districts of Orissa

with a geographical area of 11,142 Km^2 (Fig. 1). The compound deltaic plain of the Mahanadi-Brahmani-Baitarani rivers constitute the major part of the district bordered by the Eastern Ghat hills in the west. The delta was prone to frequent flooding in the past. In general the soil type is alluvium (silt and loamy) with a narrow strip of saline tract along the coast and laterite soil has occurred closely to the Eastern Ghat range.

The district is characterized by subtropical south-west monsoon climate with average annual rainfall of about 1301 mm which occurs during June to September. The population of the district is 5.5 million as per the 1991 census. The majority of the population (64.19%) are engaged in agricultural sector. The literacy rate is 53.36%. The district has a high population density of 494 persons per sq km of area as against 202, the average situation of the state. The population living in urban area is only 12.3%. The backward class population (Scheduled Castes and Tribes - the bottom section of population of the society in terms of socio-economic parameters, and also constitutionally identified) is about 20.84% of the total population of the district.

TREND OF PHYSICAL TARGET AND ACHIEVEMENT OF CUTTACK DRDA

In the beginning of each year, the DRDA sets the targets of beneficiaries to be assisted and financial (credit and subsidy) outlays to be utilized. This is done by preparing the Annual Plan and subsequently approved by the Governing Body of the DRDA. The targets were the same for five consecutive years during the Sixth Plan period (i.e. 1981-85). In all these years (except the years of 1981, 1982 and 1989), it is observed that the achievement was always greater than the target fixed. The reason for this high physical achievement was due to mainly as a response of the pressure from the top level. The net result is the reduction of financial support per household by increasing the number of beneficiaries.

TREND OF INVESTMENT UNDER IRDP

The investment pattern under the IRDP is not uniform in all the years during 1980-81 to 1990-91. The investment per beneficiary which was only Rs. 1530.00 in 1980-81, increased substantially to Rs. 2796 in 1990-91. This is directly related to the nature of rural development projects assisted and the availability of increased funding in the latter years. The data on sectoral pattern of investment were made available from 1988-89 onwards. It is evidenced very clearly from the data that the focus of investment also shifted from agricultural and allied activities to secondary and tertiary activities. In terms of percentage share in 1990-91, about 63% of total funding was invested in tertiary related activities, followed by 23% in primary and 14% in secondary sector related activities.

SPATIAL DISTRIBUTION OF BENEFICIARIES

The current distribution (1991) of beneficiary in Cuttack district does not reveal any clear cut spatial pattern. Mostly the central and eastern parts of the district have very low concentration except Balikuda block in the south where the concentration is relatively high. Only 6 blocks (15%) have comparatively more number of beneficiaries (4 to 7) per 100 poor households and the rest of the blocks which constitute the vast majority have only 1 to 3 beneficiaries. Twenty four blocks (58%) are below the district average. The blocks having higher number of beneficiaries are mainly observed in and around the district head quarters. This is due to the direct and easy access of the local leaders and officials to the office of the DRDA within a short distance, who mobilize higher funding in

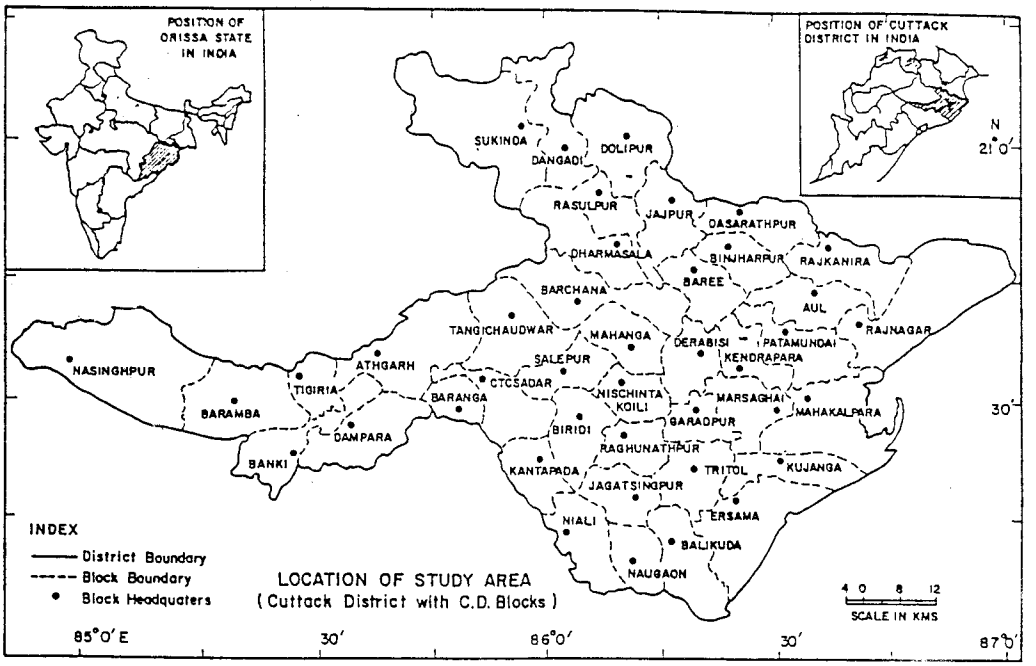


Fig. No. 1

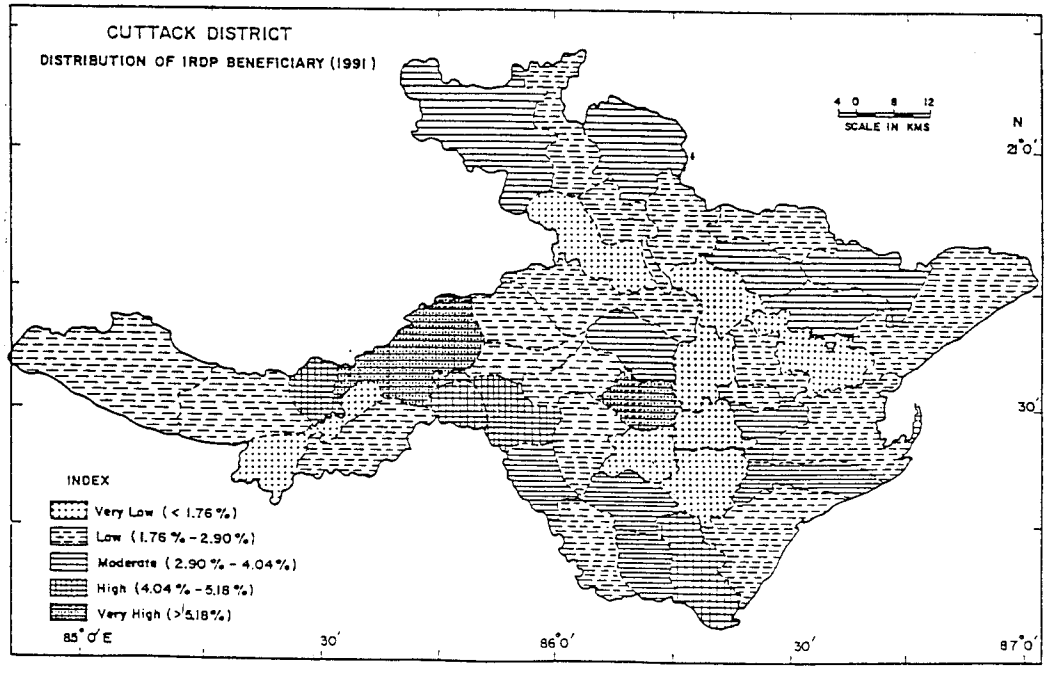


Fig. No. 2

Table 1

Distribution of Beneficiaries from 1980-81 to 1990-91

Percentage of Cumulative Beneficiaries	Number of Blocks		Group (in absolute Numbers)	Number of Blocks	
	F	%		F	%
Very High (>71.68%)	2	4.8	Very High (>12,019)	2	4.8
High (59.54%-71.68%	3	7.3	High (10,487-12.019)	3	7.3
Moderate (47.40%-59.54%)	13	31.70	Moderate (8,955-10,487)	17	41.46
Low (35.26%-47.40%)	17	41.46	Low(7,423-8.955)	10	24.39
Very Low (< 35.26%)	6	14.63	Very Low (< 7,423)	9	21.95
Total	**41**	**100**	**Total**	**41**	**100**

the interest of their blocks. The Nischinta Koil block which has the highest beneficiaries per 100 poor household is situated in the central part of the district. The details of the distribution is shown in Fig. 2.

The real distribution pattern of beneficiaries could be well visualized from the cumulative figures over the last ten years as a percentage of the total households enumerated under the poverty line at the beginning of the program. The percentage of poor households assisted under the IRDP during 1989-81 to 1990-91 varies from 27.73% in Bari block to 83.95% in Tigiria block.The pattern reflects that the uneven distribution could be attributed to the weak motivation factor of the beneficiaries in many blocks coupled with poor diffusion and promotion of the involved organizations - block administration and banking institutions. A very low zone has emerged as a west-east corridor in the northern part. The western part of the district with 8 blocks seems to be well assisted under the program.

INVESTMENT OF CREDIT AND SUB-SIDY COMPONENT

The investment pattern under the IRDP can be divided into two components - the credit and the subsidy. Both the components are very much important for individual programs and category of beneficiary. The feasibility and the success of the program is directly dependent on the amount of credit and subsidy to a great extent. The spatial pattern of credit investment per beneficiary in different blocks is varying and can be clearly seen from Fig. 4. The average credit per beneficiary in the district is about Rs. 4,000. The distribution pattern as observed from the map is very weak in the peripheral blocks of the district. Bari and Garadapur blocks have secured highest position regarding the credit investment of Rs. 6,000 to Rs. 7,000 per beneficiary. It is clear from Fig. 4 that the central part is in a better position regarding the credit investment per beneficiary. The credit distribution is mainly weak in the blocks away from the headquarters such as Rajnagar, Dasarathpur and Dangadi.

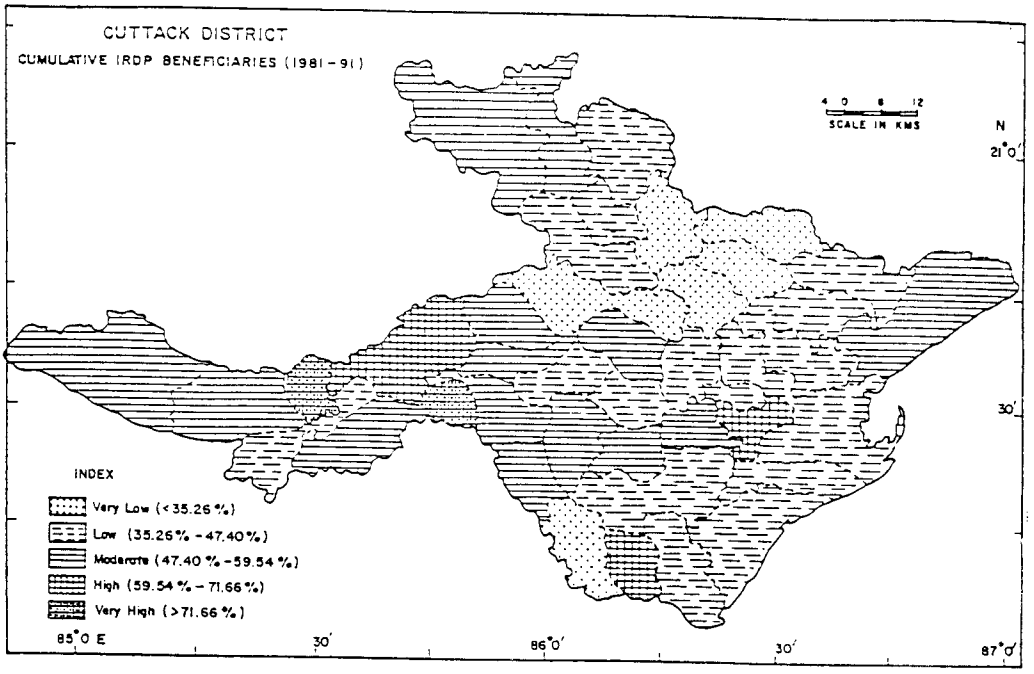


Fig. No. 3

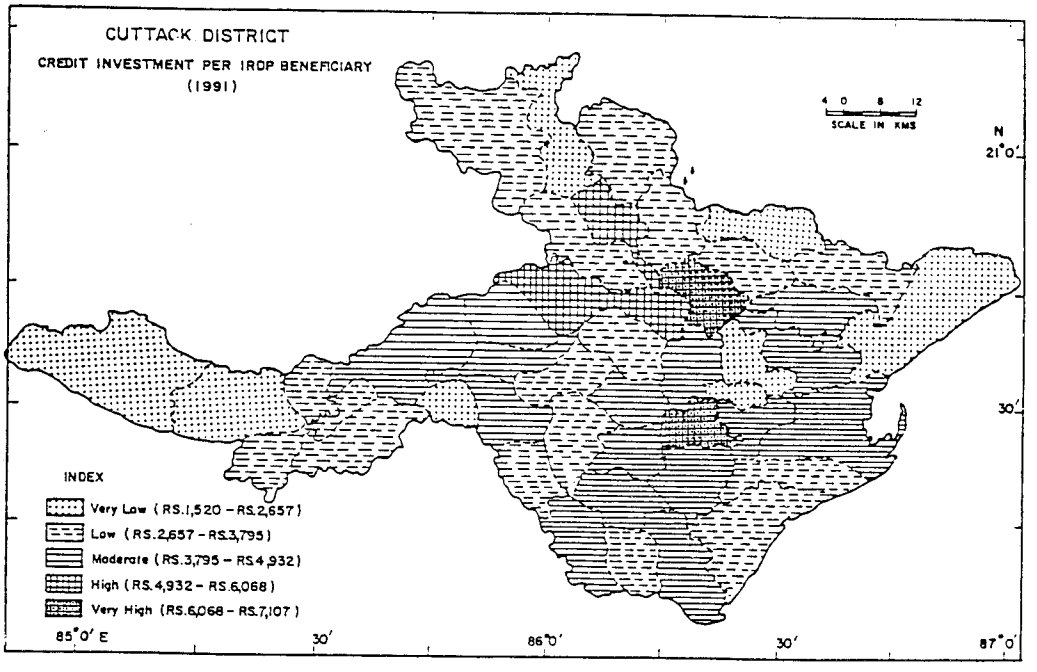


Fig. No. 4

Subsidy is provided by the Central and State Governments in addition to the credit given by the bank for all the programs under the IRDP. Subsidy amount is highest in case of backward castes. The distribution pattern of subsidy is given in Fig 5. In general the distribution pattern of subsidy is not fully concomitant with the distribution pattern of credit, except few exceptions . The upper blocks in the credit ladder have also kept similar positions in the higher share of beneficiaries belonging to backward castes and marginal farmers.

The average aggregate assistance (credit and subsidy) per beneficiary is about Rs. 7,000 The spatial pattern of aggregate assistance as shown in Fig. 6 clearly depicts that the blocks in the periphery of the district have low investment per beneficiary. Only three blocks (Garadapur, Bari and Badchana) have the investment over Rs. 10,000 per beneficiary.

DISTRIBUTION OF BACKWARD POPULATION

The distribution pattern of backward population (scheduled castes and scheduled tribes) is very important in the context of the IRDP as one of the main objectives of this program is to pull them out from the poverty situation. They get more emphasis and privileges under all the programs. The scheduled caste beneficiaries are proportionately more in the district. From Fig. 7 it is seen that the upland region (Sukinda and Dangadi blocks) has the highest concentration of backward class beneficiaries. As discussed earlier, it is ironic that these two blocks are always in the lower end of the ladder with respect to the concentration of beneficiaries, investment and subsidy as compared to other blocks of the district. This is because, firstly due to low motivation of the backward population to avail the opportunity under the IRDP, secondly poor promotional measures by the officials.

DISTRIBUTION OF HOUSEHOLDS BELOW POVERTY LINE

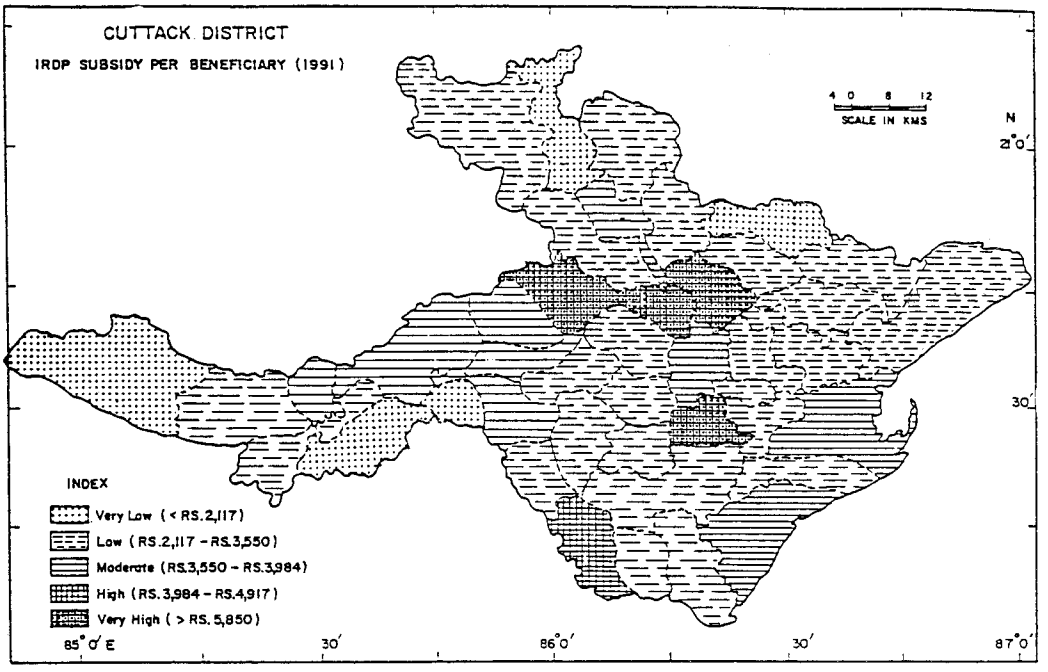
Any family with an average of 5 members and an annual income of Rs. 6400 or less is considered to be below the poverty line. This criteria is continuously used since 1987 until now. The occurence of households under the poverty line is expressed as a percentage of the total households. The spatial pattern of concentration of households below the poverty line is shown in Fig. 8. Raghunathpur block has the highest percenrage of poor households - 90% of the total households. In spite of the nearness to the district headquarters, it has been neglected in terms of beneficiary coverage, subsidy and credit distribution. Although Sukinda and Dangadi blocks are dominated by the backward caste population, yet surprisingly they have a very low percentage of poor households.

DISTRIBUTION OF SMALL AND MARGINAL FARMERS

The distribution of small and marginal farmers in the district also varies from one block to another. In this case central and extreme western parts show a high concentration. As in the case of poor households, Raghunathpur block also tops the list among all the blocks of the district for having more then 98% of the households under the categoy of small land holdings (less than 2.5 acres). Badamba and Dharmasala blocks also have higher proportion of small and marginal framers (more than 80%). Only four blocks have very low concentration. The spatial distribution of small and marginal farmers are shown in Fig. 9.

LEVELS OF BACKWARDNESS BY BLOCKS

The levels of backwardness by blocks have been measured to find out its relationship with levels of investment. This is based on the basis



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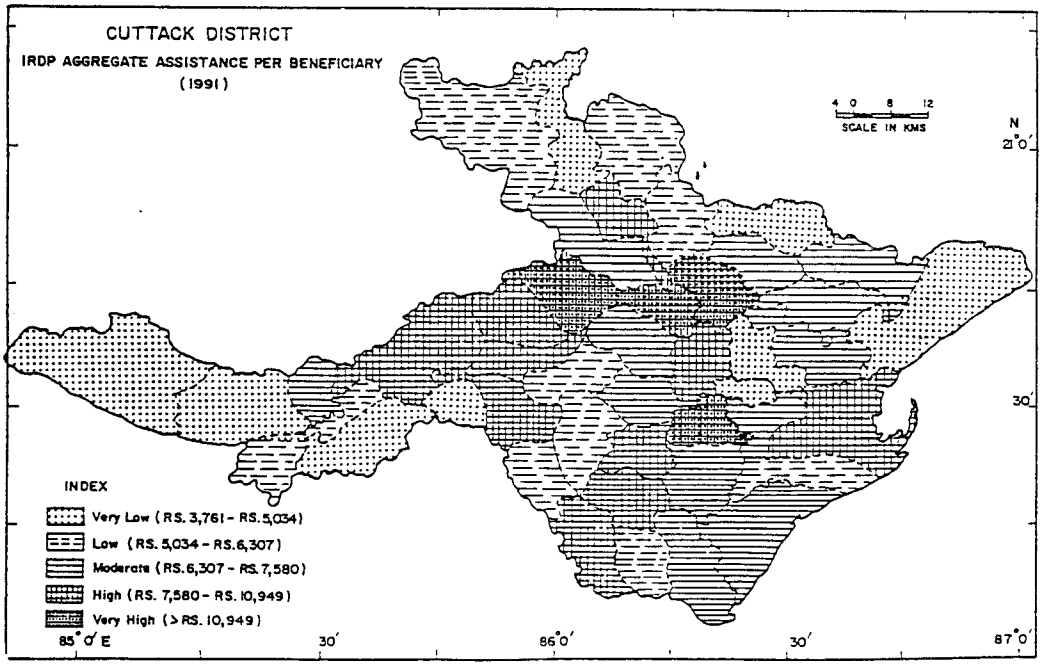


Fig. No. 6

of some selected important indicators addressed under IRDP. The indicators are :

1. Percentage of backward caste households (which comprises scheduled castes and scheduled tribes) to total households,
2. Percentage of households below the poverty line and
3. Percentage of households belonging to the category of small and marginal farmers.

The indicators are ranked individually following the octile method of grouping and fused into a composite index which equals to the summation of all rank values to find out the aggregate status of backwardness for each block. The pattern of backwardness is shown in Fig. 10. The least backward pocket stretches from the south-east to the south west of the district. The eastern most part is under the backward pocket. The blocks nearer to the district headquarters seem to be least backward.

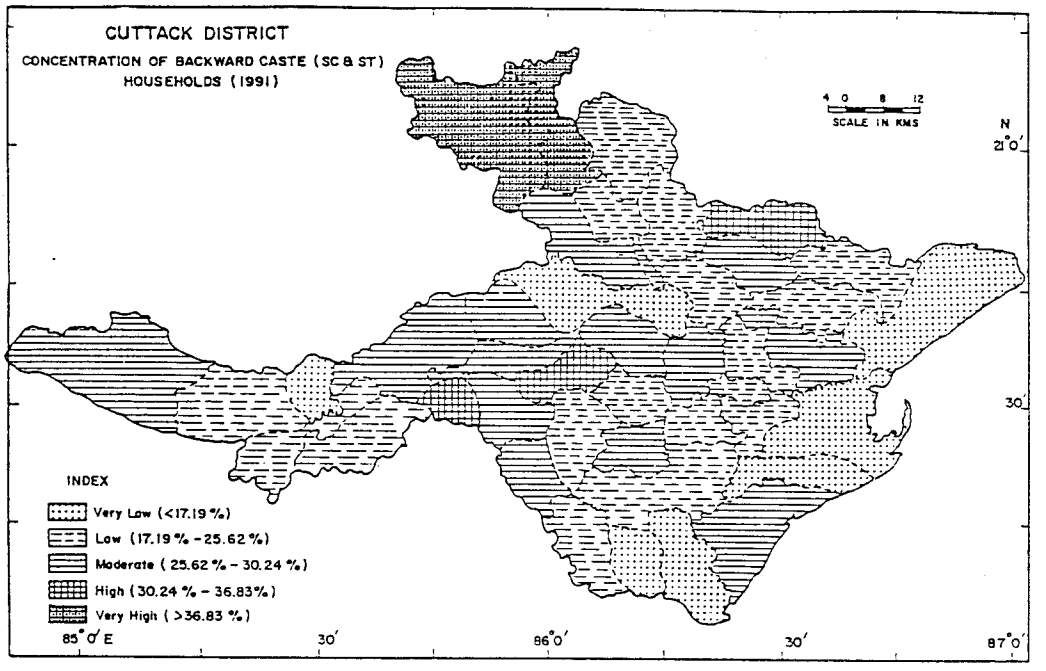
STATUS OF BACKWARDNESS vis-a-vis LEVELS OF INVESTMENT

Levels of backwardness above is compared against the levels of investment. The Spearman's rank correlation coefficient value is found to be -0.201, which shows that the levels of investment is not concomitant with the levels of backwardness. Most of the least backward and less backward blocks (comparatively) have availed more investment under IRDP than the blocks categorized under as very backward and extremely backward. The Table 2 clearly depicts the relationship between the status of backwardness and levels of investment. Cuttack Sadar, Athgarh, Nischinta Koil and Tigiria blocks have received higher investment irrespective of their status of backwardness. It could be concluded that there is no such direct

Table 2

Status of Backwardness vis-a-vis Levels of Investment

Status of Backwardness	Levels of Investment
Extremely Backward RAGHUNATHPUR	*Very High* GARADAPUR, BARI, BADCHANA
Very Backward DHARMASALA, SALIPUR, **TRANGICHOUDWAR**, NARASINGHPUR BADAMBA, JAJPUR, DANGADI,	*High* RASULPUR, NIALI, **TANGICHOUDWAR**, DERABISHI, CUTTACK, SADAR, RAGHUNATHPUR ATHGARH, JAGATSINGHPUR,
Backward BARANG, KENDRAPRADA, DERABISHI, **PATTAMUNDAI**, DASARATHAPUR BANKI, BADCHANA, **MAHANGA** KANTAPADA, SUKINDA, **ERSAMA**,	*Moderate* PATTAMUNDAI, MARSHAGHAI, TIGIRIA, DHARMASALA, AUL **MMAHANGA, ERSAMA,** NISCHINTAKOILI, BALIKUDA, RAJKANIKA, BINJHARPUR, TIRTOL,
Less backward JAGATSINGHPUR, BARI, GARADAPUR, MARSHAGHAI, TIRTOL, KUJANGA, DAMPADA AUL, BALIKUDA, RASULPUR, BINJHARPUR, NIALI, **BIRIDI,NUAGAON, KOREI**, RAJKANIKA,	*Low* SALIPUR, **BIRIDI, KOREI,** **NUAGAON**, KUJANGA, SUKINDA, KANTAPADA, JAJPUR, BANKI,
Least backward ATHGARH, CUTTACK SADAR, **RAJNAGAR,** TIGIRIA, MAHAKALAPADA, NISCHINTAKOILI	*Very Low* BADAMBA, DAMPADA, KENDRAPADA, RAJNAGAR BARANG, DANGAI, NARASINGHPUR, DASARATHAPUR



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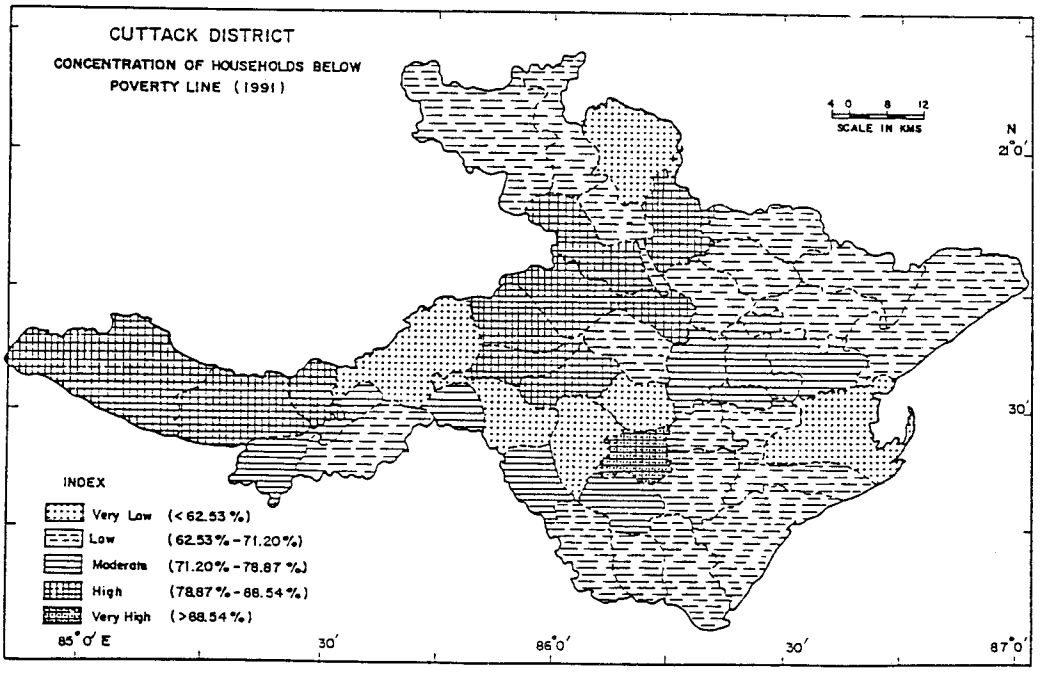

Fig. No. 8

Table 3 :

Statistics for Selected IRDP Components.

Spatial Phenomena	Statistics		
	Mean	SD	CV%
1. Distribution of Beneficiary as a % to the households below poverty line	2.90	1.14	39.31
2. Cumulative Beneficiary as a % to the households below povery line.	47.40	12.14	25.61
3. IRDP credit investment per beneficiary	3794.29	1137.23	29.97
4. IRDP subsidy per beneficiary	3050.38	933.53	30.60
5. Aggregate assistance per beneficiary (Total IRDP investment)	6844.66	2032.36	29.69
6. Distribution of Small and Marginal Farmers	65.20	14.03	21.52
7. Percentage of households below poverty line	71.20	8.67	12.18
8. Percentage of Backward Caste (SC and ST) households	24.05	6.46	26.86
9. Aggregate status of backwardness	15.24	3.65	23.95

relationship between levels of backwardness and levels of IRDP investment at present. In other words, the distribution of IRDP funds is not strictly followed as per the guidelines, principles and contents of the program, thus diluting the focus stated under the plan period.

SPATIAL VARIATION OF POPULATION RATIO BELOW POVERTY LINE AND THE LEVEL OF IRDP ASSISTANCE -

The variation of different phenomena under the IRDP are compared against each other by calculating the coefficient of variation. The coefficient of variation provides a relative measure of variability expressed in percentage as a ratio of standard deviation and the mean The results of coefficient of variation relating to the selected parameters are presented in Table 3.

It is observed that the percentage of households below the poverty line has the least value of coefficient of variation (12.18%) which explains the normal distribution of data by blocks. However the average IRDP assistance per beneficiary shows comparatively higher degree of variation (29.69%) and explains a wider gap between households in terms of availing assistance. Similarly a great gap exists between the blocks in supporting the number of beneficiaries. The results thus obtained are quite useful in strengthening the program in the furture, if taken into account by the agency concerned for implementation.

CONCLUSION

Table. 4 represents various components of IRDP. Two important points have emerged from this piece of study. First, the number of beneifciaries assisted by the IRDP program is not coherent with the concentration of poor households at the block level. Second, the levels of investment are not consistent with the levels of backwardness. These two interrelated and important therefore have a strong influence on the overall impact and success of the program. This type of analysis and inferences

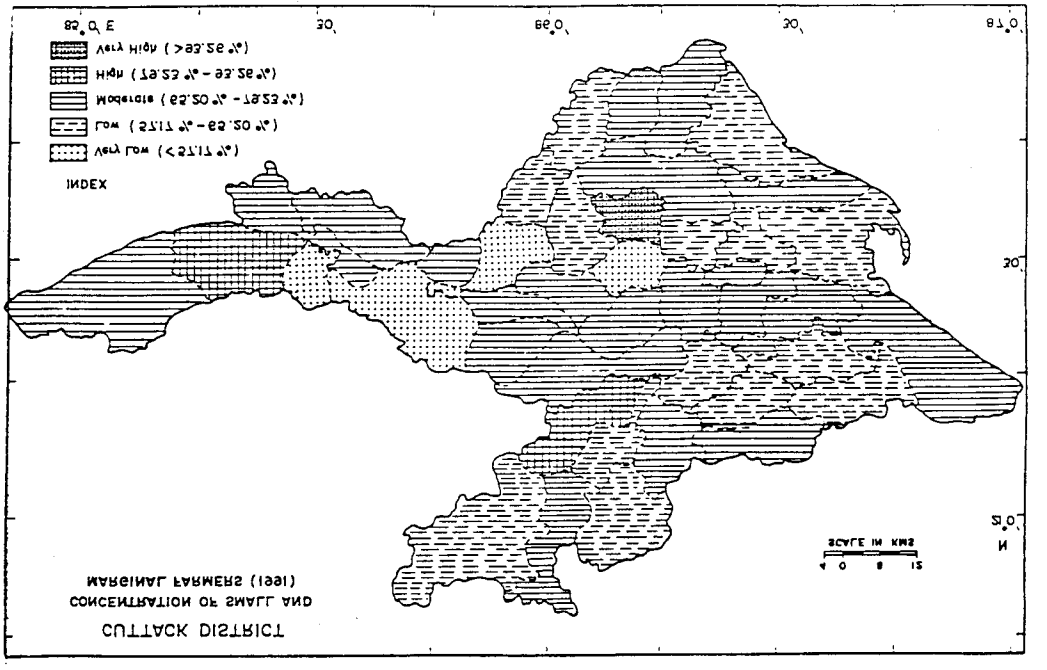

Fig. No. 9

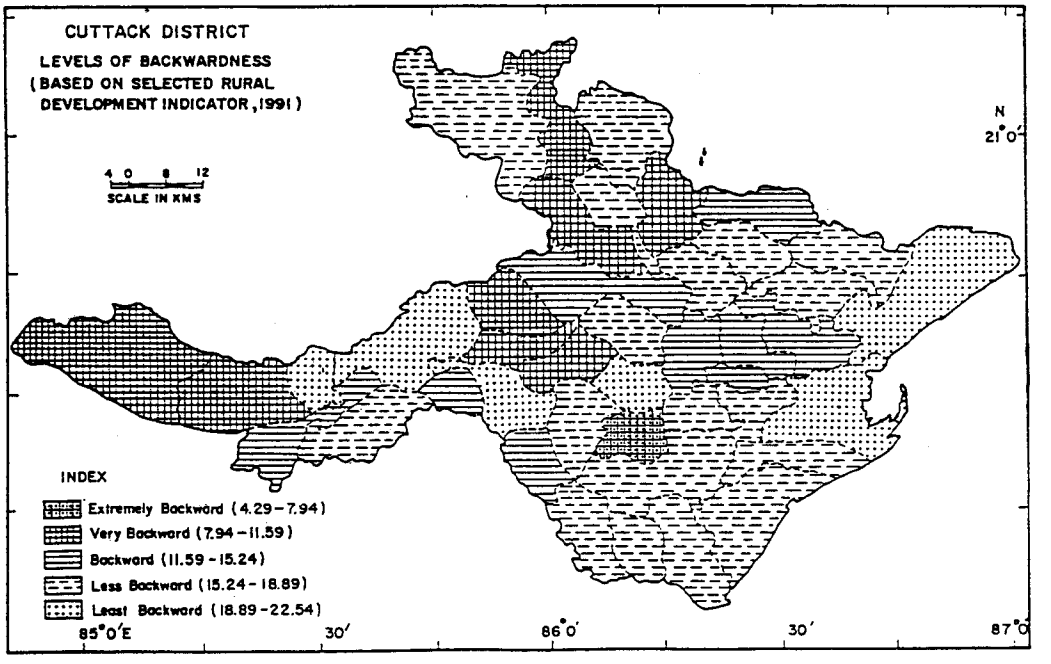

Fig. No. 10

Table 4.

Various Aspects of IRDP By Blocks Cuttack District, 1991

Name of the Block	Concentration of Beneficiary 1991	Concentration of Cumulative Beneficiaries	Credit per Beneficiary	Subsidy per Beneficiary	Investment per Beneficary	Concentration of Backward Households	Concentration of Poor Households	Concentration of SF & MF	Aggregate status of Backwardness
ATHGARH	Very High	High	Moderate	Moderate	High	Moderate	Very Low	Very Low	Least Backward
AUL	Moderate	Low	Moderate	Low	Moderate	Low	Low	Low	LessBackward
BADAMBA	Low	Moderate	Very Low	Low	Very Low	Low	High	High	Very Back Ward
BADCHANA	Low	Very Low	High	Very High	Very High	Very Low	High	Moderate	Backward
BALIKUDA	High	Low	Moderate	Low	Moderate	Very Low	Low	Moderate	Less Backward
BANKI	Very Low	Low	Low	Low	Low	Low	Moderate	Moderate	Backward
BARANG	High	Very High	Very Low	Very Low	Very Low	High	Moderate	Moderate	Backward
BARI	Very Low	Very Low	Very Low	Very High	Very High	Low	Low	Low	Less Backward
BINJHARPUR	Moderate	Very Low	Low	Low	Moderate	Moderate	Low	Low	Less Backward
BIRIDI	Low	Moderate	Low	Low	Low	Low	Very	Low	Less Backward
CUTTACK SADAR	High	Moderate	Moderate	Moderate	High	Moderate	Very Low	Very Low	Less Backward
DAMPADA	Low	Moderate	Low	Very Low	Very Low	Low	Low	Moderate	Less Backward
DANGADI	Low	Moderate	Very Low	Very Low	Very High	Very Low	Low	Moderate	Very Back Ward
DASARATHAPUR	Low	Very Low	Very Low	Very low	Very Low	High	Low	Moderate	Backward
DERABISHI	Very Low	Low	Moderate	Moderate	High	Moderate	Moderate	Moderate	Backward
DHARMASALA	Very Low	Low	Low	Low	Moderate	Moderate	High	High	Very Back Ward
ERSAMA	Low	Low	Low	Moderate	Moderate	Moderate	Low	Low	Backward
GARADAPUR	Very Low	Moderate	Very High	Very High	Very High	Low	Low	Low	Less Backward
JAGATSINGHPUR	Moderate	Low	Moderate	Low	High	Low	Moderate	Moderate	Less Backward
JAJPUR	Low	Very Low	Low	Low	Low	Low	High	Moderate	Very Back Ward
KANTAPADA	Moderate	Moderate	Low	Low	Low	Moderate	Moderate	Low	Backward
KENDRAPADA	Low	Low	Very Low	Low	Very Low	Low	Moderate	Moderate	Backward
KOREI	Moderate	Low	Low	Low	Low	Low	Very Low	Low	Less Backward
KUJANGA	Moderate	Low	Low	Low	Low	Very Low	Low	Moderate	Less Backward
MAHAKALAPADA	Low	Low	Moderate	Moderate	High	Very Low	Very Low	Low	Least Backward
MAHANGA	Moderate	Moderate	Low	Low	Moderate	Moderate	Low	Moderate	Backward
MARSHAGHAI	Moderate	High	Moderate	Low	Moderate	Low	Low	Low	Less Backward
NARASINGHPUR	Low	Moderate	Very Low	Very Low	Very Low	Moderate	High	Moderate	Very Backward
NIALI	Low	Very Low	Moderate	High	High	Low	Low	Low	Less Backward
NISCHINTAKOILI	Very High	Low	Moderate	Low	Moderate	Low	Very Low	Very Low	Least Backward
NUAGAON	Moderate	High	Low	Low	Low	Very Low	Low	Moderate	Less Backward
PATTAMUNDAI	Very Low	Low	Moderate	Low	Moderate	Moderate	Moderate	Moderate	Backward
RAGHUNATHPUR	Very Low	Moderate	Moderate	Low	High	Moderate	Very High	Very High	Extremely Backward
RAJKANIKA	Moderate	Low	Low	Low	Moderate	Low	Low	Low	Less Backward
RAJNAGAR	Low	Moderate	Very Low	Low	Very Low	Very Low	Low	Low	Least Backward
RASULPUR	Low	ow	High	Moderate	High	Low	Low	Low	Less Backward
SALIPUR	Low	w	Low	Low	Low	High	High	Moderate	Very Backward
SUKINDA	Moderat	Moderate	Low	Low	Low	Very High	Low	Low	Backward
TANGICHOUDWAR	Low	Moderate	Moderate	Moderate	High	Moderate	High	Moderate	Very Backward
TIGIRIA	High	Very High	Low	Moderate	Moderate	Very Low	Low	Very Low	Least Backward
TIRTOL	Very Low	Low	Moderate	Low	Moderate	Low	Low	Moderate	Less Backward

help understanding and monitoring the IRDP periodically. For this purpose of monitoring and evaluation, a data base on IRDP is already created in each DRDA, facilitated with the CRISP (Computerized Rural Information System for Planning) software. But no such study attempted before on DRDA data has highligted such issues to gauge the impact of the IRDP. However the impact of IRDP could be further studied in detail by doing a primary survey involving the agency and participants; the IRDP beneficiaries in this case to explore many other facts for strengthening grassroots development.

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