CHAPTER IV

Human Resource Development, Infrastructure and Rural Development in Orissa

The central theme of the present study is to determine the influence of human resource development and available infrastructure facilities on the level of rural development. It is hypothesised that rural development is directly associated with the adequacy of human resource development and available infrastructure facilities. In keeping with the basic objective, the present chapter proposes to investigate the influence of the latters on the former by using cross-section data of 77 C.D. blocks in two points of time i.e., 1971 and 1981. Before doing that, effort is made to have an idea as to what the term, rural development is intended to mean in the present study. Thus, the Chapter is presented in three sections,- the first section deals with the meaning and the problem of measurement of rural development, the second discuss the impact of human resource development and available infrastructure facilities separately on rural development, as well as assesses the joint impact of the two explanatory variables on the dependent variable, and the last section attempts to classify the blocks on the basis of their relative level of development and to identify some important indicators of human resource development and available infrastructure facilities in the process of rural development.

1. Meaning of Rural Development

Until recently, the term, rural development is used
to be often considered synonymous with agricultural development.[1]
In a country like ours, agricultural development is undoubtedly
basic to not only rural development, but/development of the
economy as a whole. However, now-a-days, the term is used with
a very wide connotation. It is equated with the far reaching
transformation of social and economic structure, institutions,
relationship and processes in the rural areas. Thus, the term
in its wider connotation implies not simply agricultural
development, but social and economic development. The long
range goals of rural development are, therefore, considered
to be the generation of new-employment opportunities through
technological break-through and creation of complementary
facilities, equitable access to arable land, equitable
distribution of income, wide spread improvement in health,
nutrition and housing, broadened opportunities for all
individuals to realise their fullest potential through education
and a strong voice of the rural people in shaping the decisions
and action that affect their lives.[2]

In defining rural development, the World Bank points
out, "...... rural development programmes or projects are
intended to provide a substantial increase in output and

1. Arora, A.C., Industry and Rural Development, S.Chand
    and Co., New Delhi, 1978, p.34.
2. Coombs Pillip, H., and Ahmed Manzor, Attacking Rural
    Poverty, The Johns Hopkins University Press, Baltimore
    and London, 1974, p.13.

level of living of a significant proportion of rural poor
in a given area ... the focus is on the activities which
either raise incomes directly or at least provide potential
to be more productive."[3] In regard to an integrated approach
to the problem the Bank further adds, "In a broad sense, the
process of rural development must integrate the rural poor
into the social, political and economic life of a country."[4]

However, the term, rural development in the present
study, is specifically related to economic development which
is usually conceived as a process of structural change together
with more employment and output. More precisely, the term
has been confined to the development of economic activities
in the rural areas which include agricultural and nonfarm
activities. In view of the present level of development of
the state economy, such a definition is not unreasonable,
since developmental activities, at present, are confined to
modernisation of traditional agriculture and diverting
workers from the already over-crowded agriculture to nonfarm
sectors in the rural economy. Further, the present study deals
separately with the problem of human resource development and
complementary facilities like infrastructure - the other aspects
of rural development in broader sense, which are treated as
explanatory factors. Thus, our definition of rural development
does not appear to be inappropriate.

3.   World Bank, The Assault on Rural Poverty, Problems of
        Rural Development, Education and Health, Baltimore and
        London, 1975, p. 18.
4.   Ibid, p. 5.

Measurement of Rural Development:

As cited earlier, the problem of measurement of rural
development in a single unit is a formidable task, though not
impossible in a developing economy. It is really difficult to
obtain a single unit of measurement like the G.N.P. per capita
for a spatial macro unit like C.D. block in the rural economy.
Because of non-availability of data for average yield of
different crops even agricultural productivity is not expected
to obtain for the C.D. blocks. The smallest geographical unit
for which the yield per hectare data, are available in India,
is the district. Yield per hectare for different crops, below
the district levels are just not available. Besides, rural
nonfarm activities differ widely and rural people's involvement
in these activities is also widely different. Thus, obtaining
incomes generated in these activities would amount to near
impossibility. In view of these difficulties, option is left
for the next best alternative, i.e., selecting some representative
indicators of development of economic activities in the rural
areas and combining them into single unit through an appropr-
iate method of composite index.

Indicators of Rural Development:

In consideration with the present stage of development
of the economy in the state under study, a good deal of
indicators representing development of economic activities
are difficult to obtain. We have, therefore, selected the
following few indicators which are expected to reflect the
level of rural development. The selected indicators are detailed
below:

i) Cropping intensity i.e., gross cropped area as
percentage of net area sown.

ii) The area under .H.Y.V. paddy as percentage of
total area under paddy.

iii) Fertilizer (N.+P+K) consumption in K.G. per 10
h ctares of gross cropped area.

iv) The area under crops other than food crops as
percentage of total area under crops.

v) The number of workers in non-agricultural activities
as percentage of total workers.[+]

A composite index prepared on the basis of the five
selected indicators would adequately represent the level
of economic development in the region under study. In
selection of the indicators agriculture receives an
absolute weightage of 80% while non-farm activities receive
a weightage of 20%. Apportioning the differential weightage
is well in conformity with the present level of rural
development in the region.

The selected indicators for each of the 77 blocks
for the years, 1971 and 1981, are presented in Table IV-1.
The table indicates that cropping intensity has increased from
127% in 1971 to 151% in 1981 in the region. But the
interesting observation in this regard is the widening gap
of inter-block differences from 1971 to 1981. The cropping

intensity of the blocks in Balasore and Mayurbhanja districts

+ For 1981, total workers imply total main workers as given
in the Census of India, 1981.

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1.	Athagarh	140	176	3	35	21	132	7	12	15	25
2.	Ballikuda	158	175	14	24	22	140	4	10	15	18
3.	Banki	155	188	7	48	30	176	15	15	21	28
4.	Baramba	173	229	14	49	41	213	18	17	22	25
5.	Bamba	153	203	2	23	19	92	9	12	22	31
6.	Buranga	145	183	11	53	53	402	10	8	35	14
7.	Bari	168	188	2	10	10	44	18	19	16	21
8.	Binjharpur	148	182	7	30	22	254	9	15	15	20
9.	Binki	152	182	18	55	41	126	3	9	20	24
10.	Cuttack Sadar	179	189	20	99	53	534	12	14	39	18
11.	Dampada	152	188	11	44	31	190	11	15	18	35
12.	Dasagati	119	170	1	49	3	44	12	14	11	19
13.	Basrathpur	131	191	7	29	25	127	13	5	15	18
14.	Dharmasila	139	174	6	25	26	181	8	15	21	30
15.	Jajpur	130	160	3	7	8	54	3	3	10	13
16.	Jak Pur	157	181	184	88	56	340	6	9	22	25
17.	Jajpur	134	221	5	90	13	225	5	15	20	46
18.	Kantapada	148	259	11	91	52	223	8	26	28	31
19.	Kesl	107	115	3	12	7	78	3	4	41	19

Table-IV-1: Contd.....

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
39. B. Pokhari	116	127	2	7	3	44	2	2	11	12	
40. Nagarai	110	149	6	20	5	141	6	14	11	17	
41. Beoti	110	121	1	21	16	84	5	8	11	16	
42. Chandabali	111	101	1	1	2	23	1	2	9	11	
43. Dharamnagar	126	149	2	20	8	55	3	3	16	18	
44. Jaleswar	113	156	3	23	5	55	7	8	11	11	
45. Khaira	102	115	3	15	5	48	2	4	8	9	
46. Bilagiri	113	129	1	13	2	30	5	21	12	14	
47. Gayada	101	128	1	12	2	17	2	8	13	18	
48. Roman	108	128	1	11	5	52	5	3	16	21	
49. Simlia	109	124	4	35	11	170	1	7	11	14	
50. Goro	106	124	1	10	4	44	1	4	10	18	
51. Tihidi	121	133	2	10	12	96	3	5	12	17	
52. Basasani	111	115	1	15	18	94	5	8	10	16	
53. Dobetos	109	114	1	18	2	19	5	7	18	22	
54. Bangiol. osi	120	115	1	30	7	94	4	11	11	13	
55. Baripada	111	111	1	19	9	47	12	11	22	12	
56. Betnol	105	109	1	18	11	29	2	5	18	17	
57. Bijatia	111	115	1	12	6	39	9	10	16	16	
58. Bisol	118	122	1	11	4	23	8	14	21	15	

(1)	(2)	(3)	(4)	(5)
59. Jamda	112	118	1
60. Josaipur	140	145	1
61. Kaptipada	104	107	1
62. Karanjia	129	145	1
63. Khunta-I	102	115	1
64. Khunta-II	105	113	1
65. Kuliana	109	115	1
66. Kusat	109	128	1
67. Boroda	101	110	2
68. B.B. Pur	111	127	1
69. Baruna	108	136	1
70. R.G. Pur	107	110	1
71. Banaikunta	108	112	1
72.	115	133	1
73.	147	151	3
74. Cullyada	103	113	2
75. T. Manda	109	123	1
76. Tiring	106	121	1
77. Udla	112	121	1
78. Regional Avg.	127	151	5
C.V, %	19	24	30

(Sl. No. 33 to 77) in the table, is found to remain below the regional average. This widening disparities imply that these blocks have further trailed behind. Although, the area under H.Y.V. paddy is noticed to have risen from 5% in 1971 to 24% in 1981; the disparities among the blocks are seen to have increased. One may have similar observation in this regard with that of cropping intensity for the blocks of Balasore and Mayurbhanja districts which are generally laggards. Further, it implies that the pace of modernisation of agriculture in these blocks is also slow. The area under crops other than food crops which stands for cropping pattern has registered a rise from 7% in 1971 to 12% in 1981, and the decline in the coefficient of variation during 1971 to 1981 indicates that interblock disparities in this respect are gradually narrowing. However, a little more attention into the cropping pattern in the region brings out interesting observation. Cropping patterns in the region for 1971 and 1981 are shown in Appendix-Table IV.1. The table shows that the area under paddy has come down from 81% in 1971 to 68% in 1981, while area under pulses has increased from 12% in 1971 to 20% in 1981. Further, it can be seen from the table that the decline in the area under paddy, is all pervasive. This indicates the farmers' rational behaviour in the allocation of land resources in the region. Pulses are regarded as better crops in terms of relative prices. Appendix Table IV - 2. indicates that relative

prices of pulses are higher than that of paddy. In view of
the rise of relative prices of pulses and lack of irrigation
facilities, land is allocated to pulses (which requires
less water). Although fertilizer consimption is seen to
have increased from 18Kg in 1971 to 102Kg in 1981 (per 10
hectares of cropped area) in the region, these figures are
on the lowest side in comparison to all India average
(Chapter II). Thus, it is enough to conclude that agricultu-
ral practice is still, to a large extent, traditional in
the state. The table, further, indicates that inter-block
variations in this respect are still wide, though they are
declining from 1971 to 1981. It is interesting to note that
the blocks of Balasore and Mayurbhanja are laggards in this
respect. The table shows that there is an increase in the
percentage of nonfarm workers from 16.2 in 1971 to 20.6 in
1981 in the region. Non-farm activities started expanding
more or less in all the blocks along with a decrease in the
inter-block differences as seen from the decline in the
coefficient of variation from 38% in 1971 to 35% in 1981.
Thus, it is heartening to note that there is a relative
shift of labour away from agriculture. However, before
going to any further conclusion, it is imperative to
determine the level of economic development in each of
the blocks in the region.

Level of Rural Development :

To obtain the level of rural development, composite
index is constructed by taking into account the 5 selected
indicators. The First Principal Components Method of Factor
Analysis, as discussed in Chapter III, has been applied for this
purpose. The composite index is constructed for the years 1971
and 1981 separately for each of the blocks. The correlation
matrices for 5 selected indicators for years 1971 and 1981 are
shown in Tables IV-2, and IV-3, respectively. The tables indicate
that the selected indicators are positively and significantly
correlated with each other in both the years. This implies that
the composite index prepared on the basis of the above selected
indicators adequately represents the level of development in the
region. The composite indices for rural development for the years,
1971 and 1981, (which are the first principal components of the
selected indicators) are given below in the equation No.1 and
2 respectively.

$$CIR_{71} = .88Z_1 + .82Z_2 + .82Z_3 + .64Z_4 + .78Z_5 \ldots \ldots \ldots (1)$$

$$CIR_{81} = .88Z_1 + .85Z_2 + .80Z_3 + .63Z_4 + .75Z_5 \ldots \ldots \ldots (2)$$

Where CIR denotes the index for rural development with
the subscript for a given year. The largest roots of the equations

⊥ Table IV - 2 ⊥

Correlation Matrix for the Indicators of
Rural Development, 1971.

	X_1	X_2	X_3	X_4	X_5	$\sum \gamma_{x_j x_i}$
	1	2	3	4	5	6
X_1	1.00 ++	0.761	0.556	0.612	0.513	
X_2	.761 ++	1.00 ++	0.677	0.273	0.485	
X_3	.556 ++	.677 +	1.00 +	0.248	0.670	
X_4	.612 ++	.273 ++	.248 ++	1.00 ++	0.375	
X_5	.513	.485	.670	.375	1.00	
$\sum \gamma_{x_i x_j}$	3.442	3.196	3.141	2.508	3.043	15.33
a_{ij}	0.88	0.82	0.80	0.64	0.78	

+ Significant at 5% level
++ Significant at 1% level

X_1 = Cropping Intensity

X_2 = % Area under H.Y.V. Paddy

X_3 = Fertiliser consumption per 10 hectares of cropped land

X_4 = Area under crops other than food crops as % of total cropped area

X_5 = Percentage of workers in nonfarm activities.

: Table IV - 3 :

Correlation Matrix for the Indicators of
Rural Development, 1981.

1	X_1	X_2	X_3	X_4	X_5	$\Sigma \sqrt{}_{x_j x_i}$
1	2	3	4	5	6	7
X_1	1.00 ++	0.756	0.632	0.526	0.531	
X_2	0.756 ++	1.00 ++	0.609	0.445	0.508	
X_3	0.632 ++	0.609 ++	1.00 +	0.235	0.682	
X_4	0.526 ++	0.445 ++	.235 ++	1.00 +	0.244	
X_5	0.531	0.508	0.682	0.244	1.00	
$\Sigma \sqrt{}_{x_i x_j}$	3.445	3.318	3.128	2.45	2.935	15.276
aij	0.88	0.85	0.80	0.63	0.75	

+ Significant at 5% level.

++ Significant at 1% level.

N.B- Notation of the variables is the same as in Table IV -2.

(1) and (2) are 3.1 and 3.14 respectively. This indicates that
the first principal components explain 62% and 63% of the total
variation of the 5 selected variables for the years, 1971 and
1981 respectively.

The computed values of the composite indices for the
years, 1971 and 1981 which reflect the relative level of
development of each of the blocks are given in Table IV-4. The
table also provides the ranks assigned to the blocks in the
descending order of the values of composite index, so that the
block with the highest value of composite index is the block
with the highest level of development and the block with the
lowest value of composite index is the least developed block. The
table indicates that 31 blocks in 1971 and 30 blocks in 1981
remain above the respective regional averages. Of the 31 blocks
which are relatively advanced in 1971, 28 blocks belong to Cuttack
district alone and the remaining 3 blocks belong to
Mayurbhanja district. Further, it is worthwhile to note that
these three blocks of Mayurbhanja district (Sl.Nos. 60, 62, and 73)
are found to remain towards the lower end of the group in rank
order. Strikingly, Balasore district does not have a single block
in this group. Of the 30 blocks that are relatively advanced in
1981, 29 blocks belong to Cuttack district and the lone one viz.
the block, Baliapal belong to Balasore district. Interestingly,
the district, Mayurbhanja does not have a single block in this

1	2	3	4	1	2	3	4	1	2	3	4
1.	Athagarh	9.2 (29)	10.8 (26)	17.	Jajapur	9.2 (29)	13.0 (12)	33.	Bahanga	5.9 (69)	7.2 (47.5)
2.	Banki	11.0 (21)	9.7 (28)	18.	Kantapada	12.5 (10)	17.7 (1)	34.	Balasore Sadar	6.5 (62)	7.8 (41)
3.	Buxi	12.3 (12)	12.9 (13)	19.	Korai	6.7 (55)	6.4 (62)	35.	Ballapal	7.2 (44.5)	10.1 (27)
4.	Bagaon	14.7 (5)	11.1 (7)	20.	Kujanga	10.5 (24)	10.2 (26)	36.	Basta	7.0 (48.5)	7.1 (49)
5.	Barama	10.2 (27)	11.3 (22.5)	21.	Mahanga	10.6 (23)	12.6 (16)	37.	Basud	5.8 (70)	5.8 (72)
6.	Baranga	14.4 (7)	14.2 (3)	22.	Narasingpur	11.5 (17)	12.8 (14)	38.	Bhadrak	7.3 (38)	8.4 (37.5)
7.	Bari	11.1 (20)	9.6 (29)	23.	Nugaon	10.8 (22)	11.4 (21)	39.	B. Pok	6.2 (67)	5.6 (74)
8.	Biajharpur	10.4 (24)	11.5 (20)	24.	Niali	11.4 (18)	13.1 (11)	40.	Bhograi	7.3 (42.5)	8.2 (39)
9.	Birldi	12.8 (9)	13.2 (10)	25.	Nischintakoil	15.3 (2)	13.4 (8)	41.	Basta	6.5 (62)	7.2 (47.5)
10.	Cuttack Sadar	17.7 (1)	17.6 (2)	26.	B.N. Pur	14.9 (3)	14.7 (5)	42.	Chandab	5.1 (76)	4.1 (77)
11.	Dampada	12.0 (15)	12.5 (17)	27.	Rasulpur	12.4 (11)	11.3 (22.5)	43.	Daar	7.5 (41)	6.8 (52)
12.	Dangadi	7.9 (36.5)	10.8 (25)	28.	Salepur	14.5 (6)	14.8 (4)	44.	Jaleswar	6.6 (58.5)	7.6 (45)
13.	Dasarathpur	10.3 (26)	9.5 (30)	29.	Sukinda	7.9 (36.5)	9.1 (32)	45.	Khaira	5.6 (72.5)	5.7 (73)
14.	Dharmsala	11.2 (19)	11.9 (18)	30.	Tangi	11.6 (16)	11.8 (19)	46.	Nilgiri	5.2 (77)	6.7 (54.5)
15.	Erasma	6.3 (66)	6.3 (65)	31.	Tigiria	12.1 (13.5)	14.2 (6)	47.	Oupada	5.7 (74)	6.6 (57)
16.	J.a. Pur	13.6 (8)	13.3 (9)	32.	Tirtol	12.1 (13.5)	12.7 (15)	48.	Remuna	5.8 (70.5)	8.6 (36)

category in 1981. Thus, it can be, undoubtedly, concluded that the rural regions in Cuttack district are more advanced than those in the rest two. Relative position of the blocks in the level of development does not appear to have changed from 1971 to 1981, since the rank correlation coefficient between the composite index of 1971 and 1981 is worked out to be +,87. Moreover, the better offs are found to have furthered their level of development from 1971 to 1981, because the coefficient of variation of the development index is noticed to rise from 33% in 1971 to 35% in 1981.*

The observation that three blocks in 1971 and none in 1981 in Mayurbhanja district among the advanced blocks, is really interesting. Does it imply that the process of rural development has not started in these two districts before 1971? Is the observation of three blocks in Mayurbhanja district among the developed group in 1971 accidental ? In other words, the process of rural development, has been initiated in these two districts during the decade from 1971 to 1981. Balasore district which has been observed (in Chapter III) to be relatively developed in regard to human resource and available infrastructure facilities

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* We are aware of the limitation that the above composite indices prepared on the basis of the First Principal component method do not facilitate further comparision.

has probably registered a little higher rate of progress and therefore, one of its blocks in 1981 is found to be in advanced group of blocks. Since Mayurbhanja district is seen to trail behind in human resource development and available infrastructure facilities, it lags in the process of rural development. Therefore, none of its blocks in 1981 is seen to be in advanced group.

To examine the above proposition, the blocks are divided into quartile groups in the descending order of value of the composite development index for 1971 and 1981. The quartile distribution of the blocks for each of the three districts for 1971 and 1981 is presented in Table IV-5. The table shows that all 19 blocks in the first quartile belong to Cuttack district in both the years. Of the 19 blocks, in the second quartile in 1971, 11 blocks belong to Cuttack district, one block, to Balasore district and 7 blocks to Mayurbhanja district, while of the 19 blocks in the second quartile in 1981, 11 blocks belong to Cuttack district, 3 blocks, to Balasore district and 5 blocks, to Mayurbhanja district. Thus, the district Balasore that had only one block in Q_2 in 1971 is seen to have three blocks in Q_2 in 1981. But Mayurbhanja district having 7 blocks in the second in in 1971 is seen to reduce the number to 5 in 1981. Similarly, the third quartile, while Balasore district is seen to increase the number of the blocks from 7 in 1971 to 11 in 1981, Mayurbhanja district is found to decrease the number from 12 in 1971 to 9

in 1981. In the last quartile, Balasore district is seen to
reduce the number of blocks, and Mayurbhanja district is found to
increase the number from 1971 to 1981.

Thus, it appears that the process of rural development
has started in these above two districts during the decade from
1971 to 1981, and Balasore district is seen to proceed a little
faster than Mayurbhanja district in respect to rural development
in 1981. The level of rural development in Cuttack district needs
no further elaboration. But, why is this differential level of
development ? Does it imply that the differential level of
development of human resource and available infrastructure
facilities which have been observed earlier, influence it ?
Before, jumping over to any further conclusion, it appears
necessary to examine the impact of the latters on the former.

: Table IV - 5 :

Quartile groups of the Blocks for composite
Development Index in 1971 and 1981.

District	Q_1		$Q2$		$Q3$		Q_4		Tot.
	1971	1981	1971	1981	1971	1981	1971	1981	
1	2	3	4	5	6	7	8	9	10
1. Cuttack	19	19	11	11	1	2	1	-	32
2. Balasore	-	-	1	3	7	11	11	5	19
3. Mayurbhanja	-	-	7	5	12	9	7	12	26
Total	19	19	19	19	20	22	19	17	77

N.B.: Q_1 = First Quartile
Q_2 = Second Quartile
Q_3 = Third Quartile
Q_4 = Fourth Quartile

2. Effects of Human Resource Development and Available Infrastructure Facilities on the level of Economic Activities in Rural Orissa.

The present section is devoted to examine the impact of human resource development and infrastructure facilities on the level of economic activities in the rural regions. As pointed out earlier a positive impact of the formers separately and jointly on the latter is hypothesised. Besides, each of the indicators of human resource development and available infrastructure facilities, are expected to influence each of the indicators of rural development directly. The hypotheses are tested through correlation analysis and analysis of variance technique. The cross section data of 77 C.D. blocks, pertaining to the three aspects are used at two points of time i.e., 1971 and 1981. The level of human resource development, available infrastructure facilities and rural development are represented by the respective composite indices constructed earlier.

Impact of Human Resource Development on the Level of Rural Development:

A correlation matrix showing the relationship between human resource development index and each of its indicators on the one hand and rural development index and each of its indicators on the other is presented in Table IV - 6. The Correlation coefficients are indicative of the impacts of human resource development on the level of economic activities. As observed

from the table, human resource development index is positively
correlated with rural development index and each of its indicators
in both the years, and its the correlation coefficients with each
of the latters, are significant at the very high level of confidence
except the area under non-food crops in both the years and
non-agricultural activities in [+] 1971. The nonsignificant impact
of human resource development on the area under nonfood crops does
not appear to be unreasonable. Jute is the important cash crop
grown in the region in the Khariff season. The fall of relative
price of jute in terms of rice[++], inadequacy of irrigation and
uncertainty in rainfall together with the introduction of short
duration H.Y.V. paddy are likely to reduce the area under jute.
Excessive rainfall, during Khariff season, does not create
conditions favourable for growing any other type of cash crop

in the region. Allocating land to cash crops during rabi season
is conditioned by availability of irrigation which is inadequate.
The problem of marketing the products, storage and warehousing
facilities are also responsible for the slow increase in the area
under those crops.

The table further indicates that almost all the
indicators of human resource development are positively correlated
with the development index and each of its indicators in either
one or both the years. The correlation of each of the formers

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[+] The nonsignificant impact on off-farm activities is discussed
subsequently.

[++] Appendix Table IV-2. may be seen.

separately with each of the latters in many cases is also seen
to be significant. However, a few cases of surprising observations
are to be noted. Some indicators of human resource development,
viz., student enrolment, village agricultural workers, etc, are
found to have negative correlation separately with development
index and a few of its indicators. The coefficients are
nonsignificant in most cases and one should, therefore, avoid
making comments. However, assigning reasons for a few cases
appears to be interesting. Student enrolment, for example, has
indicated negative correlation with development index and area
under H.Y.V. paddy (in 1981), and area under nonfood crops and
nonfarm activities (in both the years). Enrolment of students
signifies rate of human capital formation. This represents the
annual turnout of developed human resources who are expected to
join the labour force and participate in the economic activities.
Consequent upon the emphasis put on human resource development
through education, a significant increase in the enrolment of the
students in the rural areas within the decade under study, has
been   observed. It is reasonable to infer that these young
people are not able to join the labour force just after coming
out of schools and perform economic activities as efficiently as
expected, because our education system does not impart job
orineted instructions. Therefore, time lag involved in joining
their labour force and raising their productive efficiency. The
table, further, shows that providing village agricultural workers

In terms of cultivators does not appear to be as effective as providing
them in terms of area in influencing economic activities.
This may be examined from the magnitude of correlation coeffi-
cients of the two indicators separately with development
index and each of its indicators in both the years. Moreover,
the nonsignificant (negative and positive) correlation of
village agricultural workers with the area under nonfood crops
supports our conjecture that agricultural extension system at
present in the region does not provide enough information for
cultivating cash crops.

Thus, positive contributions of developed human resources
on the level of economic activities are asserted from the above
analysis. The nonsignificant and negative contribution of
some of the indicators of developed human resources appear to
be a very short period phenomenon. Indeed, developing human
resources and reaping its advantages on the level of economic
activities cannot be expected in a traditional society in a
very short-period. The process involves time lag.

Effect of Available Infrastructure Facilities on Rural Development:

To understand the impact of available infrastructure
facilities on rural development, correlation between infrast-
ructure index and each of its indicators on the one hand, and
development index and each of its indicators onthe other are
obtained and are presented in a matrix form for the years,

1971 and 1981, in Table IV-7. The table shows that
infrastructure index is positively correlated with each of
development index and its indicators for both the years. Its
relationship is noticed to be significant with all except area
under crops other than food crops. The table also indicates that
each indicator of infrastructure index is almost positively
correlated with each of development index and its indicators.

Interestingly, each of infrastructure index and its
indicators are either positively or negatively related to the
area under crops other than food crops in both the years.
However, in most of the cases the correlation coefficients are
nonsignificant. It is enough to conclude from this and foregoing
analysis that growing cash crops does not appear to be much
encouraging and promising at present in the State as well as in
the region. The probable reason for such phenomenon have already
been discussed earlier. But in order to uplift farmers' economy
in the State, what is needed is to introduce and popularise
growing of cash crops suitable in the State. However, the recent
trend of thought assumes that the difference between cash crops
and food crops is one of degrees. Any crop produced for the
market which fetches a remunerative return to the farmers may be
treated as cash crop. Considered from this view point, growing
short duration H. Y.V. paddy may be regarded as a promising
crop in raising farmer's economy. However, insufficiently
available irrigation is one of the major bottlenecks for allocating
more land under H.Y.V. paddy. Moreover, a process of multiple
cropping through raising a given crop in succession does not

1	2	3	4	5	6	7	8	9
1.	Infrastructure index	+.612++	+.696++	+.564++	+.635++	+.705++	+.575++	+.655++
2.	Net irrigated area as % of N.A.S.	+.721++	+.599++	+.647++	+.529++	+.837++	+.549++	+.777++
3.	Road length per 100 sq. km. of area.	+.203	-.041	+.256+	+.039	+.157	+.197	+.120
4.	Village electrified as % of total inhabited villages.	+.592++	+.033	+.407++	+.104	+.595++	+.313++	+.539++
5.	Primary and Middle schools per 100 sq. km. of area.	+.524++	+.539++	+.596++	+.595++	+.616++	+.473++	+.486++
6.	Hospitals etc. per 1000 sq. km. of area.	+.066	+.401++	+.076	+.354++	+.218	+.346++	+.143
7.	Veterinary institutions per 1000 sq. km. of area.	+.555++	+.863++	+.558++	+.633++	+.635++	+.542++	+.616++
8.	Bank Offices per 1000 sq. km. of area.	+.434++	+.672++	+.229	+.532++	+.407+	+.550++	+.442++
9.	Bank Offices per lakh population.	+.321++	+.008	+.223	+.045	+.249+	+.303++	+.307++
10.	Members Cooperative Societies as % of cultivators.	-.061	+.286+	-.096	+.171	+.050	+.119	+.082
11.	Post Offices per 100 sq. km.	+.278+	+.084	+.336++	+.191	+.453++	+.322++	+.353++
12.	Post Offices per lakh population.	-.350++	-.374++	+.386++	-.340+	-.193	-.062	+.156
13.	Fertilizer depots per 1000 sq. km. of area.	+.398++	+.574++	+.301+	+.526++	+.365++	+.457++	+.434++

+ Significant at 5% Level.
++ Significant at 1% Level.

N.B.:- Computed on the Basis of the Tables. III.- I -

ensure scientifically an efficient crop culture practice. Such
a practice would also expedite the process of incapacitating
the land for crop production. Thus, crop rotation is essential
to maintain soil nutrient and ensure a system of sound multiple
cropping. Introducing new and improved varieties of cash crops
is an essential need for raising farm family income in the
process of modernising agriculture, besides maintaining soil
nutrients. In fact, growing cash crops may be popularised by
providing extension informations, field demonstration, a system
of marketing, grading and storage facilities, etc.

The correlation matrix is further indicative of many
interesting phenomenon expected to occur, in the process of
rural development. A few instances are given below. Irrigation
is found to be positively and significantly correlated with
non-agricultural activities. Irrigation raises agricultural
productivity and hence, agricultural income. The incremental
income from agricultural sector appears to have been diverted
to non-agricultural sector for its expansion. Road expansion at
present does not appear to be much effective in the process of
rural development in the State. Road length shows non-significant
correlation with development index (even with a negative sign
in 1981) and each of its indicators. It implies that quantitative
improvement in road length with disregard to its quality does
not enhance transportation efficiency. The impact of rural
electrification on development index and individually on some of
its indicators are found to be positive and significant in 1971

and nonsign ficant in 1981. The increase in rural
electrification during the decade has not been reflected in
having expected impact on rural development ro ably due to
gradual electrification of relatively small villages. The proxy
indicator for cooperative infrastructure is seen to be
significantly correlated (with expected signs) with development
index, fertilizer consumption and non-agricultural activities in
1981, while it is negatively correlated with development index
and positively with other two, but non-significantly with all
in 1971. Thus, cooperative practices among the people appear
to be improving and assisting in the process of development.
Raising fertilizer consumption thr ugh cooperative credit is not
unreasonable to infer. Does its significant impact on nonagricultural
activities signify that co-operative credit obtained for

agricultural purposes is being diverted for the expansion of
nonagricultural activities? The relatively procedural ease with
which co-operative credit is obtained and po sibility of a high
rate of returns from the investment in nonfarm activities do
not exclude the possibility of such diversion. It may further
be seen from the table the impact of bank and post offices in
terms of population are not as effective as their impact in
terms of area. Thus, it supports the assertion made earlier that
providing certain infrastructure facilities in consideration
with space factor for rural development appears to be more

appropriate. One may also draw several like inferences from the relationship shown between the independent and dependent variables in the correlation matrix.

Impact of Human Resource Development and Available Infrastructure Facilities on Rural Development:

The present study assumes that rural development is directly associated with the level of development of human resource and available infrastructure facilities. In keeping to this basic objective, the present section proposes to assess the impact of the latters together on the former. In doing so, the composite indices prepared in Chapter-III in determining the level of human resource development and available infrastructure facilities in each of the blocks for the years, 1971, and 1981, are used as explanatory variables and the level of rural development determined through the composite index constructed in the first section of the present chapter has been used as dependent variable for both the years. Besides, efforts are also made to assess the joint impact of the above explanatory variables on each of the indicators of rural development as it has been hypothesized that each of the indicators is positively associated with the level of development of human resource and available infrastructure facilites.

Before determing the aforesaid impact, it will not be out of place to have a little reflection on level of

development of the explanatory variables as well as the
dependent one as observed earlier. Cuttack district is seen to
be leading in the region in regard to human resource
development and available infrastructure facilities, as well
as rural development. Balasore district appears to be relatively
more advanced than Mayurbhanja district in the level of human
resource development and available infrastructure facilities.
With respect to rural development, Balasore district is seen
to be progressing faster than Mayurbhanja district. In addition,
the level of human resource development and available
infrastructure facilities are noticed to be associated directly .
It appears from the above that the level of human resource
development and available infrastructure facilities have a
positive and important bearing on rural development.

However, to understand clearly the joint impact of the
two explanatory variables on rural development and each of its
indicators, analysis of variance technique is pursued. As
discussed in Chapter II for the application of the technique,
the dependent variable is required to be divided into
subsamples and thus, by using the average of the two
explanatory variables, the dependent variables (i.e., rural
development index and each of its indicators) are separately
divided into three subsamples in both the years, 1971 and 1981.

The result of analysis of variance test can be seen from
Table IV-8 for the years, 1971 and 1981. The table indicates
that variations in the level of rural development and most of

its indicators like cropping intensity, area under H.Y.V.
paddy, fertiliser consumption in both the years and workers
in non-agricultural activities in 1981 are accounted for by the
level of development of the two explanatory variables. The
observed F-value in each case is found to be statistically at
a very high level of significance. However, the level of non-
farm activities in 1971 and area under non-food crops in both
the years are observed not to be influenced by the explanatory
variables.

The reasons attributed to the negative influence of human
resource of development and available infrastructure facilities
on the area under nonfood crops earlier, appears to hold true
and therefore, no further explanation is needed. The non-
sginficant influence of the two explanatory variables on the
level of non-agricultural activities in 1971 appears to be quite
reasonable. It has been observed earlier that the region is
almost in the early stage of development in the beginning of
seventies. Nonfarm activities during early seventies had
probably not gained much popularity among the people. Besides ,
the scope for the expansion of these activities were also
limited during that period, since most of the critical infra-
structure facilities essential for the expansion of these
activities, like bank offices, rural electrification, etc., were
seen to be too much inadequately available in the region in
1971. Human resources were also not as developed in 1971 as
they are in 1981. Only after bank branch expansion, a higher
rate of village electrification, the various technical
consultancy programmes introduced by the

government, etc., during seventies people have started switching
over to non-farm activities.

3. Classification of Blocks.

The proceeding section assess the impact of human
resource development and available infrastructure facilities on
the level of rural development. In the present section, attempt
is made to bring out a classification of blocks in regard to
their relative level of development in economic activities
together with the level of development of human resource and
infrastructure facilities. Such a classification is not
inappropriate because it provides a better understanding in the
relative level of development of the rural regions of the three
sample districts. Besides, it enables us to determine the
indicators of human resource development and infrastructure
facilities, the inadequacy of which reduces the effectiveness
of other adequately available indicators in influencing economic
activities. Thus, in the present section blocks are divided
into five groups on the basis of the averages of the three
composite indices, i.e., rural development index, human resource
development index and infrastructure index for both the years,
1971 and 1981. A block with equal or above average value of the
three indices is in Group I. Thus, the group I blocks are highly
developed blocks (in a relative sense). Group II consists of the
blocks with equal or above average value of economic development
index and below average value either in the remaining two indices

or in any one of them. These blocks are relatively developed
blocks. Group III comprises the blocks associated with equal
or above average value of human resource development and
infrastructure index and below average value of economic
development index. These blocks are acquiring potential
for economic development, and during the initial period,
because of inadequacy of some of the indicators of the two
explanatory variables viz., developed human resources and
infrastructure facility, their pace of economic development
is slow and halting. The blocks in Group IV are associated
with equal or above average value of any one of human
resource development and infrastructure index and below
average value of the remaining two indices. These blocks
are not only less developed in economic activities but also
found to lag behind in acquiring potential for economic
development and therefore, are termed as as backward. In
Group V , the blocks are with below average value of the
three indices, and thus, they are highly backward blocks.
These blocks are neither developed economically nor gaining
potential for faster economic development. For analytical
convenience the Group II and Group IV blocks are again
divided into three and two subgroups respectively. The
grouping of the blocks (along with the subgroups) is given
in the following notations:

i) Group I (IA, IIA, IIIA),

ii) Group II$_a$.(IA, IIB, IIIA),

       b. (IB, IIA, IIIA),

       c. (IB, IIB, IIIA),

iii) Gorup III (IA, IIA, III B)

iv) Group IV(a) (IA, IIB, III B)

       (b) (IB, IIA, IIIB)

v) Group V- (IB, IIB, IIIB).

Where A stands for equal or above average and B stands for below average, I stands for the level of human resource development, II stands for the level of infrastructure development and III stands for the level of economic development.

Thus, the blocks in Group I(IA, IIA, IIIA) are highly developed blocks, because they are not only developed with respect to growth promoting factors like developed human resources and infrastructure facilities, but also developed economically. The blocks in Group II are termed as developed since in regard to the level of economic development they are found to remain above (or equal to) the average standard of the region. However, in regard to growth potential, some of these blocks are found to be developed in human resources (IA) and less

developed in infrastructure facilities (IIB), and
therefore, all such blocks are brought under a subgroup
(in Group II) denoted by Group II's' (IA, IIB, IIIA). A
few of the blocks in Group II are seen to be developed
in infrastructure facilities (IIA) and less developed in
human resources (IB) and thus, they are put in a subgroup
(in Group II) captioned as Group II 'b' (IB, IIA, IIIA).
The remaining blocks in Group II are neither developed
in human resources nor in infrastructure facilities and
as such, they are brought in a subgroup with notation Group
II 'c' (IB, IIB, IIA). The blocks in Group III(IA, IIA,IIIB)
are problematic, since they are found to remain economically
less developed although they are found to acquire growth
potential. The Group IV blocks are economically less
developed but they are either developed in human resources
or in infrastructure facilities and therefore, they are
called as back-ward blocks and brought under two subgroups,
such as, group IV's' (IA, IIB, IIIB) (which includes the
blocks developed in human resources and less developed in
infrastructure facilities as well as in economic activities),
and Group II'b' (IB, IIA, IIIB) (which includes blocks developed
in infrastructure facilities and less developed in human
resources as well as in economic activities). The Group V
(IB, IIB, IIIB) blocks are highly backward blocks consisting
of those which are less developed in all the three respects.

Tables IV-9 and IV-10 provide the grouping of the
blocks for the years 1971 and 1981 respectively. The tables
indicate that of 21 blocks, 20 in 1971 and all the 20 blocks
in 1981 in Group I belong to Cuttack district alone. The lone
block, Sukruli belongs to Mayurbhanja district in 1971. Of
the 10 blocks in Group II in both the years, 1971 and 1981,
8 in 1971 and 9 in 1981 belong to Cuttack district and 2 in
1971, namely, Jashipur and Karanjia in Subgroup 'C' and 1 in
1981, namely, Baliapal in Sub-group, 'a' belong to Mayurbhanja
and Balasore district respectively. In Group III there are
11 and 7 blocks in 1971 and 1981 respectively and all of them
are in Balasore district. The number of blocks stick to 7
in both the years in Group IV. Of the 7 blocks, 3(in subgroup
'b' Sl.5 to 7) in 1971 and 1 (in subgroup 'a' Sl.No.4) in
1981 belong to Mayurbhanja district, and the remainings
belong to Balasore district . In Group V, there are 28
blocks in 1971 and 33 blocks in 1981. In this group, Cuttack
district is found to have reduced the number of blocks from
4(Sl. No.1 to 4) in 1971 to 3 (Sl. No. 1 to 3) in 1981. The
number of blocks of Balasore district in this group has
increased from 4 (Sl. No. 5 to 8) in 1971 to 5 (Sl.No.4 to 8)
in 1981. The remaining 20 blocks in 1971 and 25 blocks in 1981
belong to Mayurbhanja district.

The classification of the blocks discloses very
interesting observations. The district, Cuttack appears to
have improved its performance in economic activities from

Tabl.I-IV-3 1

Sl. Group.IV (a) (IA, IIb, IIIb)		(b) (IIA, IIIA, IIIB) (um)			Group.V		Sl. No.		(IIA, IIb) (um)		
No.						Sl. No.					
1. Bülópá (a)	17.7	10.6	7.2		1. Eráda		18.6	11.9	6.3		
2. Banta (a)	18.9	9.2	6.5		2. Kerai	15.1	7.8	6.7			
3. Khaira (a)	16.7	10.5	5.6		3. Donegali B	12.8	6.8	7.9			
4. Hiisirie (c)	16.9	8.3	4.2		4. Sarinder	18.6	6.5	7.9			
5. Botnett * (b)	14.6	11.6	6.8		5. Chandeli	13.3	6.7	5.1			
6. Khataili * (b)	16.5	11.0	6.0		6. Oupada	15.2	6.3	5.7			
8. Udta * (b)	15.6	12.7	6.8		7. Homma	14.6	9.6	6.9			
					8. Tihiri	14.3	7.6	7.0			
					9. Badsani*	14.2	9.5	6.7			
					10.Bondne*	13.2	5.7	7.1			
					11.Browne*	13.6	9.6	6.6			
					12.Saripana *	12.2	7.6	8.7			
					13.Bijatan *	12.2	6.9	7.6			
					14. Bisti *	12.2	5.0	8.2			
					15. Joma *	12.9	5.9	6.5			
					16. Kaptipana	13.6	5.3	5.5			

1. Alipore (a)	15.9	13.6	10.9	
2. Ashine (b)	16.7	13.8	12.8	
3. Bangaon(a)	14.5	14.5	11.6	
4. Bation (a)	16.3	16.2	10.1	
5. Basi (b)	13.8	15.7	11.8	
6. Bassina(a)	15.2	14.6	14.1	
7. Barnta (a)	15.3	16.0	11.3	
8. Bangaon(c)	11.3	13.5	12.5	
9. Bangain(a)	11.6	10.4	10.8	
10. Bangaon(c)	15.7	15.1	11.9	

1. Bshange	18.5	16.1	7.2
2. Barts	18.1	17.8	7.1
3. Bhaura	18.3	18.8	8.4
4. B. Pokhari	22.3	21.1	5.6
5. Bhagrani	19.0	16.7	8.2
6. A. Kapar	20.0	18.8	6.3
7. Bamun	16.2	16.9	8.6

Notes: i) Blocks having * mark against their names are blocks with high percentage of S.C. and S.T. population.

ii) The notations 'a', 'b' and 'c' against the blocks indicate that they belong to sub-group 'a', sub-group 'b' and sub-group 'c', respectively.

	3.	4.	5.		1.	2.	3.	4.	5.
	13.7	9.5	6.3	18. Kaptipada*	15.6		8.1		5.5
	12.4	12.3	6.4	19. Karanjia*	12.7		9.8		9.1
	5.1	7.3	9.1	20. Khunta-I*	12.9		11.4		6.4
	15.5	12.6	7.2	21. Kuliana*	12.8		9.6		6.9
	11.2	8.4	5.1	22. Kusumi*	12.3		9.3		8.4
	15.6	11.3	5.7	23. Moroda*	14.8		11.8		6.5
	12.5	9.9	6.6	24. A.B. Pur*	13.3		11.6		8.7
	14.5	13.2	6.8	25. Raruan*	15.8		12.2		9.1
	14.7	14.1	6.7	26. S.O.Pur*	15.0		13.6		6.3
	11.6	9.4	6.1	27. Samakhunta*	13.9		10.2		5.3
	11.2	12.5	7.6	28. Baripada*	13.4		10.7		6.8
	12.6	11.9	6.5	29. Sukruli*	15.4		14.1		7.9
	14.9	12.3	6.2	30. Gallapada*	13.2		10.3		7.8
	9.5	7.4	6.3	31. T. Munda*	7.8		6.7		7.6
	10.1	6.8	6.7	32. Tiring*	12.0		10.6		6.6
	11.1	7.5	6.2	33. Udala*	15.0		13.7		5.9
	12.1	8.9	8.8						

1971 to 1981. While it maintains its position in Group I, it has improved its position in Group II by reducing one block from Group V. It is worthwhile to note that Cuttack district does not have a single block in Group III and Group IV. The process of rural development appears to be more slow in Balasore and Mayurbhanja districts. Of the two, the situation in Mayurbhanja is worse. One of the blocks of Balasore district has gone to Group II, in 1981 in which it has none in 1971. The increase in growth potential of Balasore district appears to be encouraging, since majority of its block, are in Group III and Group IV. The district, Mayurbhanja appears to lag further behind from 1971 to 1981. While it has one block in Group I and two in Group II in 1971, it has none in those groups in 1981. In Group IV, it has seen to have reduced the number of blocks from three in 1971 to one in 1981. Almost all of the blocks of the district, Mayurbhanja (25 out of 26) in 1981 are in Group V. Thus, even the rise of growth potential of the blocks in the district appears to be very slow.

The blocks with high percentage (above the regional as well as state average) of Scheduled caste and scheduled tribes population are shown in the tables (IV.9 and 10) with star marks against their names. It is seen from the tables that almost all such blocks barring a few are in Group V. Thus, these blocks lack the necessary growth

potential for accelerating economic activities.

The classification of the blocks further indicates
that although Group III blocks are relatively advanced in
the availability of developed human resources and infrastructure
facilities, their economic performance is not satisfactory.
Inadequate availability of some indicators of the above two
explanatory variables in expected to cause such phenomenon.
In order to examine the above hypothesis, the available
indicators of human resource development and infrastructure
facilities in Group I blocks are compared with the those in
Group III blocks. The Group I blocks are highly advanced
blocks. The available indicators of human resource
development and infrastructure facilities are sufficient
to carry forward the process of development in those blocks.
Therefore, the comparison of available indicators between
the blocks of Group I and Group III will identify the
inadequately available indicators in the latters.

In doing so, the available indicators of human
resource development and infrastructure facilities for
Group I and Group III blocks in 1981 are presented in
Tables IV-11 and IV-12, respectively. The selection of the
year, 1981 instead of both the years, 1971 and 1981, appears
to be appropriate owing to the increasing availability of
these indicators in the said year. The tables indicate that
except rural electrification, hospitals, post offices (in
terms of population), student enrolment and doctors, Group III

	3	4	5	16	17	18	19	10	11	12	13
1. Babanga	3	54	62	67	12	5	27	39	88	12	35
2. Basta	6	72	64	99	21	4	28	89	77	21	54
3. Bhadrak	51	71	67	63	13	8	31	42	68	13	32
4. Bhandaripokhari	40	80	118	157	21	10	21	57	87	21	36
5. Bhogorai	4	68	76	156	21	2	30	89	42	21	40
6. D. Nagar	19	76	100	89	17	4	21	42	88	17	32
7. Remuna	5	63	49	96	10	4	16	44	87	10	27
8. Group Average	18	69	77	103	16	5	25	53	76	16	37

1	2	3	4	5	6	7	8	9	10	11	12	13
1.	Balikuda	52	68	98	203	18	3	23	61	52	13	22
2.	Baranga	59	73	59	141	21	5	22	86	90	13	30
3.	Banki	30	48	55	99	29	6	18	67	93	12	27
4.	Bari	07	85	96	66	17	3	17	152	83	20	33
5.	Binjharpur	14	80	84	90	14	2	15	44	93	18	32
6.	Biridi	27	72	86	83	27	5	27	125	91	22	22
7.	Cuttack Sadar	42	82	107	105	98	15	34	136	88	14	22
8.	D. S. Pur	35	38	105	97	17	5	20	50	84	41	32
9.	J. S. Pur	48	38	116	124	38	5	16	119	71	20	31
10.	Jajpur	33	72	82	132	35	6	15	50	76	24	22
11.	Kantapada	40	58	92	91	43	7	43	86	81	14	45
12.	Kujanga	9	52	74	72	30	6	16	84	57	8	24
13.	Mahanga	77	71	107	177	24	4	33	72	60	18	16
14.	Niali	25	42	85	131	24	4	15	69	56	14	28
15.	N. Koili	42	71	115	202	29	4	24	83	61	18	26
16.	R.N.Pur	90	93	91	105	27	4	21	65	80	16	28
17.	Nasulpur	22	49	96	227	26	5	26	39	80	14	23
18.	Salepur	70	100	102	175	29	5	29	112	89	16	19
19.	Tigiria	15	87	78	80	35	7	21	67	84	11	17
20.	Tirtol	42	76	89	135	8	3	27	103	80	15	20
21.	Average	39	68	92	127	29	5	23	84	77	17	26

blocks are lagging in regard to all other indicators.
Significantly, irrigated area is only 18% in Group III
blocks as against 39% in Group I blocks. Further, student
enrolment in Group III blocks is 230 (per 1000- Population)
as against 189 in Group I blocks. But school facilities and
teachers available in Group III blocks are less than those
available in Group I blocks. It would result in quality
deterioration in human capital formation and thereby,
affecting the process of development adversely. The inadequacy
in the availability of bank offices, Veterinary institutions,
fertilizer depots, veterinary presonnel, and nurses may also
be noticed from the tables. In regard to rural electrification
it would suffice to say that the electrified villages in
Cuttack district which is densely populated are expected to
be larger (in regard to population) than those of Balasore
district which is not as densely populated as Cuttack district.
Therefore, the electrified villages of Group III blocks of
Balasore district, though greater in percentage are not able
to make as much impact as the large sized electrified
villages of Cuttack district on development process.

Moreover, to have a better understanding of the
problem, the available indicators of human resource
development and infrastructure facilities in 1971 for Group
I and Group III blocks of 1981 are presented in Tables IV-13
and IV-14 respectively. In regard to the availability of

1	2	3	4	5	6	7	8	9	10	11	12	13
	1. Bulldana	49	5	66	62	0	0	17	22	62	9	19
	2. Baroona	38	9	51	72	7	2	15	44	44	9	23
	3. Basti	1	1	48	40	0	0	6	88	75	9	25
	4. Bari	0	0	67	31	0	0	15	82	65	11	27
	5. Binjarpur	11	9	63	29	0	0	22	33	59	11	27
	6. Birial	11	13	64	35	5	8	7	33	47	8	19
	7. Cuttack Sadar	38	63	78	32	20	4	6	21	78	10	17
	8. D. O. PWD	27	9	70	55	0	1	5	22	64	12	28
	9. J.O. PWD	34	1	88	80	0	1	17	33	57	15	31
	10. Jajpur	0	6	72	47	2	0	4	49	54	18	22
	11. Kantapada	34	5	52	24	0	0	19	44	62	9	22
	12. Kanyana	22	7	84	78	0	0	10	44	27	6	18
	13. Khanage	62	3	82	43	0	0	12	42	50	33	11
	14. Kulai	19	2	88	44	0	0	12	42	54	10	22
	15. K. Kolli	38	19	89	39	1	1	12	22	77	11	22
	16. Nilgiri	62	9	65	95	0	0	10	28	78	10	25
	17. Remalpur	0	7	78	50	5	1	22	12	72	11	25
	18. Ranpur	63	22	47	49	0	0	11	21	72	5	17
	19. Tigiria	1	2	73	53	0	0	11	11	22	12	21
	20. Tirtol	11	9	66	51	0	0	12	12	52	11	18
	22. Group Average	20	9									23

of these indicators, the observations in both the years are
strikingly similar. However, it is interesting to note that
while in Group I blocks irrigation facilities have increased
by a little less than two times and electrified villages have
increased by 7½ times from 1971 to 1981, in group III blocks
irrigation facilities have increased by over 9 times and
electrified villages by over 17 times during the same period.
The tables also indicates the increases in some other
indicators are relatively higher in Group III blocks. Thus,
Groups III - blocks have witnessed a relatively high rate
of expansion of some indicators during the period 1971 to 1981,
and thereby, they are expected to face the problem of time lag.
The inadequately available developed human resource and
infrastructure, facilities coupled with the problem of time
lag may explain the slow economic progress in Group III blocks.

The classification of the blocks, further induces us
to investigate as to why Group II blocks are associated with
better economic performance than Group III blocks, although
the letters have an advantage over the formers in regard to
human resource and infrastructure development. We have
confined our analysis, firstly, to entire Group II and then,
we have proceeded to the subgroups. The better economic
performance of Group II blocks is expected due to the
increasing availability of some important indicators of

developed human resource and infrastructure facilities
in which Group III blocks are lagging. To understand the
proposition, the indicators of developed human resource and
infrastructure facilities for the year 1981, in Group II
blocks are presented in Table-IV-15. In comparison of
available indicators between Group II and Group III blocks
indicates that Group III blocks are leading in the availability
of a good deal of indicators except irrigation, fertilizer
depots and veterinary institutions. Although the differences
appear to be marginal one cannot deny easily their contribution
to in generating differences in economic activities. However,
to have a better understanding into the problem, we have
compared the availability of the said indicators in 1971 for
Group II and Group III blocks in 1981. Table IV-16 provides
human resource development and infrastructure facilities in
1971 for Group II blocks of 1981. It is observed (from Table
IV-1# and IV-16) that in regard to irrigation, rural
electrification and road development Group II blocks, have
an edge over Group III blocks in 1971. Group III blocks
have experienced a faster rate of expansion of irrigation
facilities and rural electrification during the decade from
1971 to 1981. Besides, demonstration effect appear to have
a role in better economic performance of the Group II blocks.
These blocks belong to Cuttack district where the highly
advanced blocks of the region are located while all the Group
III blocks belong to Bala-sore district.

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.
1.	Athagarh(a)	19	8	45	78	16	7	14	45	79	6	26
2.	Narasinghpur(a)	38	60	49	132	14	4	15	33	49	4	27
3.	Baugan(a)	22	45	81	175	17	3	17	59	44	15	11
4.	Ballapal(a)	4	56	56	129	12	4	22	32	69	12	30
5.	Subgroup Average	21	43	58	129	15	5	17	42	60	9	24
6.	Tangi(b)	57	67	52	95	19	6	8	25	83	8	17
7.	Barchana(c)	29	92	51	97	15	4	11	51	70	7	24
8.	Baramba(c)	2	67	52	86	16	4	12	52	76	5	12
9.	Dampada(c)	20	91	39	16	9	3	4	26	87	7	27
10.	Damagadi(c)	9	60	27	51	4	3	4	39	68	4	24
11.	Dharmsala(c)	3	75	56	128	8	4	27	33	47	7	17
12.	Sub-Group Average	13	78	45	76	13	4	12	40	70	6	21
13.	Average of all Sub-Groups	20	63	51	99	14	4	13	40	67	8	23

1	2	3	4	5	6	7	8	9	10	11	12	13
1.	Atingam(a)	10	7	35	24	20	1	9	10	61	4	23
2.	Hazaringapur(a)	11	0	45	38	0	0	6	15	31	2	24
3.	Haugan(a)	8	0	64	69	0	0	8	26	30	9	5
4.	Ballapal (a)	0	7	42	39	0	0	45	19	46	9	29
5.	Sub-group Average	5	4	47	48	5	0	10	18	42	6	20
6.	Tangi(b)	25	12	31	33	30	1	6	11	57	6	13
7.	Barciana(c)	27	9	39	23	20	1	4	13	47	6	22
8.	Barraba(c)	1	0	48	35	0	0	8	12	44	2	4
9.	Demapada(c)	3	13	21	14	0	0	4	12	68	5	21
10.	Depunti(c)	1	3	20	15	0	0	4	7	53	2	19
11.	Dhamsala(c)	1	6	38	37	0	0	12	18	39	5	16
12.	Sub-group Average (c)	7	6	33	27	0	0	6	12	50	4	16
13.	Average of all Sub-groups.	8	6	38	36	0	0	8	14	48	5	17

To have a better understanding about the availability
of developed human resource and infrastructure facilities
and their impact on economic activities, the Group II blocks
of 1981 are divided into three subgroups as shown in table
IV-15 and IV-16 and available developed human resource and
infrastructure facilities of each subgroups are compared
with those of Group III blocks. Although it is difficult
to draw something conclusively from this exercise because
of limited number of observations in each subgroup, it
may provide a broad idea regarding the problem. The
subgroups (a) in group II blocks of 1981 consists of 4
blocks which are developed in human resources and economic
activities but not developed in infrastructure facilities.
It is quite interesting to note that in these blocks,
irrigation facilities, road development and availability
of veterinary institutions are more than those in Group III
blocks in 1981. In regard to rural electrification, the
earlier logic that relatively smaller villages in Group III
blocks are electrified as against relatively big villages
in subgroup 'a' blocks, and so that its impact is not as
significant on Group III blocks as it is on subgroup 'a'
blocks. To support our observations we have compared the
available infrastructure facilities and developed human
resources of sub-group 'a' blocks (Table IV-16) with those
of Group III blocks (Table IV-14) in 1971. Interestingly,
findings are more or less similar.

Thus, it appears that Human resource development
cannot alone be able to get the process of rural development
underway without the availability of infrastructure facilities.
Infrastructure facilities which appear to be important for
rural development are irrigation, road development and rural
electrification. In supplying electricity to the rural areas
the objective should be to cover too many consumers rather
than too many villages.

The subgroup 'b' blocks in Group II (which are
developed in infrastructure facilities and economic
activities but not developed in human resources) has not
been taken into account since there is a single block in it.
It is interesting to observe as to how the sub-group 'C'
blocks (in Group II) have fared well economically while they
are backward in human resource development and available
infrastructure facilities. The subgroup 'c' consists of
5 blocks belonging to Cuttack district. The comparison of
available developed human resources and infrastructure
facilities in subgroup 'c' blocks of 1981 with those of Group
III blocks of 1981 for both the years, 1971 and 1981, indicate
that in infrastructure facilities like electrified villages,
veterinary institutions and fertilizer depots in 1981, and
irrigation and electrified villages in 1971, the subgroup 'c'
blocks have enjoyed an advantage. In addition, demonstration
effect and enjoying the services of certain developed human
resources and facilities of certain available infrastructure
from adjoining blocks may explain their better performance.

To have a further insight into the problem of rural development, we have compared the available developed human resources and infrastructure facilities in subgroup 'c' blocks in Group II (IB, IIB,IIIA) (Tables IV-15 and IV-16) with those of Group $\underline{V}$ (IB, IIB, IIIB) blocks. Tables IV-17 and IV-18 present the indicators of developed human resources and infrastructure facilities for Group V blocks of 1981 for the years, 1971, and 1981 respectively. The comparision reveals that barring a few indicators like read, post offices, etc, subgroup 'c' blocks (in Group II) have an edge over Group $\underline{V}$ blocks in regard to the availability of developed human resources and infrastructure facilities. Notable among them are irrigation, rural electrification, veterinary institutions, intensity of co-operative infrastructure, fertilizer depts, rural literacy, etc. Thus, the better economic performance of subgroup 'c' blocks in Group II is almost self-evident.

The above analysis indicates that Cuttack district is far ahead in the process of rural development, while Balasore and Mayurbhanja districts are lagging. Of the latters, Mayurbhanja district is relatively more backward. It is further worthwhile to note that all the blocks having high percentage of population of backward communities are noticed to trail with respect to economic development. These blocks are also observed to be relatively backward in human resource development and infrastructure facilities. The relatively high level of development of Sundargarh and Sambalpur districts (as observed in Chapter II) which are unequally

having high percentage of backward population asserts
further than caste factor may not be the cause of
backwardness of a region. However, a separate study appears
to be necessary to ascertain whether caste factor deters
economic development. The analysis in addition, reveals that
although human resource is developed, inadequately available
infrastructure facilities would create bottlenecks in the
process of development. Among the available infrastructure
facilities, inadequacy of irrigation, road development and
power supply through electrification may inhibit the process
of rural development.