CHAPTER IV

VARIATIONS IN DISTRICT PER CAPITA INCOME : REGRESSION
ANALYSIS

1. INTRODUCTION

In Chapter Two it was observed that, though there
was a convergence of district per capita income towards
the state per capita income from 1961 to 1975, such a
trend was not without substantial inequalities. It is
generally argued that wide differences in per capita product
are accompanied by wide differences in the characteristics
of economic and social structure. The number of factors
determining the magnitude and structure of economic activity
in a given region is obviously large. In the words of
Professor Simon Kuznets : " The structural characteristics
associated with the level of per capita product ranging
from the purely economic, such as education of the labour-
force and mechanical energy available per capita or
distribution of labourforce and production among major
production sectors or consumption of final goods, ranging

from 'necessities' to 'luxuries' to non-economic
processes and characteristics, such as the demographic
rates of births, deaths and migration ; or to conditions
of life reflected in the extent of urbanisation, literacy
of population etc."[1] Hence, an attempt may be made to
describe some hypotheses in regard to factors of variations
in per capita product. Section Two deals with this aspect.
Section Three describes the specification of the variables
and sources of data. The Multiple Regression Models and
the results are discussed in Section Four. Section Five
brings out the growth rates of explanatory factors.
Conclusions are given at the end.

2. SOME HYPOTHESES

i) Worker Participation Rate : One can visualise two ways
of defining the worker participation rate for a region.
One, it may be defined as the proportion of workers to
total population. This is a direct measure of the level
of labour input. Two, it may be defined as the proportion
of workers to the total population which is exclusive of
the population in the age group of 0 - 9. The justification
for the exclusion of the age group 0 - 9 population from the

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1 S.Kuznets, "The gap, concept, measurement, trends" in
  Gustav Ranis; (Ed), "The gap between the rich and poor",
  International Economic Association Publication,
  MacMillan, 1972, pp 11.

denominator is that one would not expect a child to work up to the age of, at least, nine. To make the distinction between the two, the latter may be called the "effective worker participation rate". It is argued that regions with identical averages of service income per worker in industry as a whole may differ in per capita product, because, they differ in the distribution of the population between the number of workers and the number of dependents. Hence, it may be said that, the region which has a higher percentage of total population in the labourforce will also be the region with high per capita product, given the productivity of labour. One would also anticipate a close positive relationship between the degree of manpower utilisation and the corresponding level of per capita product.

ii) **Productivity** : Productivity is regarded as a prominent source of variations in per capita product between regions. Productivity may be measured in terms of product per worker (which may be called labour productivity). It is observed that differences in the levels of regional development are reflected in labour productivity differences among the regions. The higher the labour productivity of a region, the higher is its level of development. Therefore, it can be hypothesised that there will be a close and positive association between the product per worker and per capita income, given the labour participation rate.

iii) <u>Degree of Industrialisation</u> :   The degree of

industrialisation may be defined as the proportion of the

labourforce engaged in the non-agricultural sector to the

total labourforce. The degree of industrialisation, as a

factor of regional income differences, may be considered

on the ground that, "Service income per worker in   non-

agricultural industry is   generally higher than   in

agriculture and differences among   regions in the distribu-

tion of   the labourforce between low income agriculture and

high income non-agricultural industry will therefore give

rise to regional differences in per capita income, even in

the absence of differences in income per worker within each

industrial sector."[2] Thus, it is expected that a high

degree of industrialisation is positively associated with

a high level of per capita income.

iv) <u>The Active Population</u> : . The active population (or

the age composition of the population) indicates the

potential contribution of human resources to the economy.

Generally, two variants of active population are considered:

one , the percentage of population in the age group of

15-59 years to the total population; two, the percentage

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2 R. A. Easterlin, "Interregional differences in per
   capita income, population and total income, 1840-1950,"
   in NBER : Trends in the American Economy in the 19th
   Century, Studies in Income and Wealth, Vol. 24, 1960,
   pp 80-81.

of population in the age group of 20 - 59 years to total
population. The above variants are based on the assumption
that, at these ages, persons contribute or contribute most
effectively to income production. The persons not in the age
groups tend to either the too young (below 15 years) or
to those in the formative stage (between 15 to 20 years)
or to the too old (above 60 years) to participate fully
in productive activities. It is argued that the age criteria
appear to account for the principal demographic factors in
regional income differentials. In other words, the regions
with high percentage of total population in this productive
age group are expected to have a higher per capita product
than that in the regions with the lower percentage of the
total population in the productive age roup. Further, it
can also be argued that, the differences in the ratios of
male to female, in the active population, do result in
differences in productivity between the regions. However,
among the regions, variations in the ratios of male to
female population in the active population are found to be
insignificant.

v) <u>Degree of Urbanisation</u> : Urbanisation is measured as
the percentage of urban population to the total population
of the region concerned. In most of the advanced countries
it is observed that there has been a continuous decline in
the proportions of total population living in rural areas

and marked increase in urban population over the past
many years. This significant change has accompanied
the industrialisation of those nations. Similar trends
are also observed in the underdeveloped countries to-day.
The percentage of the urban population in these countries
is swelling gradually. The increase in urbanisation is
also associated with the industrialisation of the develop-
ing nations. It may be further argued that urbanisa-
tion provides better educational facilities, more
opportunities for non-agricultural work, more of basic
amenities, among other things. Thus, urbanisation offers
a better climate and environment for higher levels of
development of regions. To S. H. Robock, " urbanisation
appears to be an inevitable concomitant of economic growth"[3].
Therefore, it can be said that differences in the degree of
urbanisation brings about differences in the levels of
regional development. The higher the degree of urbanisa-
tion, the higher is the expected level of development of
a region. Hence, it is hypothesised that the high degree
of urbanisation is positively correlated to the high per
capita product.

vi) <u>Education</u> : Education has both economic and non -
economic dimensions. Available evidence suggests that

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3 Robock, Stefan H., "Strategies for regional economic
  development", in David. L. McKee, Robert D.Dean,William
  H.Leahy, (Eds), "<u>Regional Economics, Theory and Practice</u>",
  Collier-MacMillan, Ltd, London, 1970, pp 252.

the high educational standards possessed by the population
in general and the labourforce in particular are signifi-
cantly associated with the relatively high levels of
income. Though it is difficult to assess the causal
relationship between education and the level of income,
it can be said with same confidence that, in no country,
the illiterate peasants and untrained workers forged the
modern industrial society. Highly educated persons are
not only supposed to be more efficient in their respective
sphere of activity but also to serve as "change agents"
in a society. Therefore, the education is frequently
considered as a variable contributing to interregional
income disparities. The education level of a region may
be measured as the percentage of literate population in
the total population of the region. But, a more useful
index is the effective literacy rate, as this reflects
the proportion of literates among persons who ought to
have attended the education system in the normal course.
This index can be obtained by calculating the proportion
of the literate to the total population in the age group
of five and above. Then, it goes without saying that
regions with high literacy rates will have higher per
capita product than those of regions with low literacy
rates. Thus, one would obviously expect a definite and
positive correlation between literacy rate and per
capita product.

vii) <u>Infrastructure Facilities</u> : The economic
development of any region depends, inter-alia, on the
existence of a highly developed 'infrastructure' .
Though the term 'infrastructure' has been widely used
in different contexts, it has no precise definition.
It is also observed that the terms ' infrastructure '
and 'social overhead capital' are used inter changeably.
However, a World Bank expert defines 'infrastructure'
as "the basic services on public utilities which are
necessary to the commodity producing sectors of the
economy ".[4] According to Northam Shah," the infrastructure
comprises all those facilities and activities, the basic
rationale of which is the sustenance which they provide
to income generation and production in the rest of the
economy rather than income generation and production
within infrastructure enterprises themselves."[5] He
includes nearly eight items, viz., power, irrigation,
transport, communications, education, research and develop-
ment, health and other facilities like banking and insurance,
under the head 'infrastructure'. In a way, the items which

4 Quoted, Prabhakar Rao, "Cost of urban transportation",
   in Vadilal Dagli ; (ed), "Infrastructure for the Indian
   Economy." Vora and Co., publishers private, Ltd.,
   Bombay, 1970, pp 129.

5 Narottam Shah," Infrastructure for the Indian economy "
   in Vadilal Dagli, (ed), op. cit., pp 12.

are labelled as 'infrastructure' are said to form the
basis of development. They themselves are not a factor
bringing about the development. They are complementaries,
needed to assure smooth economic development. If these
overheads are unevenly distributed among regions, they
will result in inequalities in the economic development of
regions. The higher the level of infrastructure facilities
available in a region, the higher is the level of
economic development and vice versa. Hence, the factor
'infrastructure' assumes importance in the study of
regional income inequalities. To study the regional pattern
of the availability of infrastructure facilities, for each
of the regions, a 'comprehensive index of infrastructure'
(or composite index of infrastructure) may be prepared
in relation to the average position for the state economy
as a whole. One would expect that the high composite
index of infrastructure is positively associated with the
high per capita income.

In fact, the above factors have been considered, in
several studies, as the important sources of regional
income differentials. J. S. Williamson finds that, "labour
participation rates in part contribute regional income per
capita differentials".[6] M. D. Choudhary's study reveals

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6 J.S.Williamson, "Regional inequality and the process of
   national development : A description of the patterns".
   Economic Development and Cultural Change, Vol.XIII(4),
   Part II, July 1965, pp 44.

that, "nearly 50 % of the relative differences between provincial incomes in Canada during 1961 are accounted for by age composition of population, labour participation rates, level of schooling of working population and under-employment."[7] According to R. A. Easterline, "the components like agricultural and non-agricultural income per worker, labourforce industrialisation, participation rates and property income per capita contributed to the narrowing of per capita income differences of states in U.S.A. between 1880 - 1950."[8] H. S. Perloff and others pointed out that, "among the important determinants of per capita product in a region, the following stand out- percentage of population employed, average earning of employed persons, place of residence, types of industrial employment, marginal labour productivity and capital per worker".[9] V. H. Woodward argues that, "the regional variations in GDP per head arise to a considerable extent for differences in the economic composition of the regional populations".[10]

7   M.D.Choudhary, "Economic distance among regions - A Statistical analysis", Economic Development and Cultural Change, Vol.,19(4), July 1971, pp 544.

8   R.A.Easterline, op. cit., pp 95-96.

9   H.S.Perloff, EdgarS. Dunn,Jr,Eric E. Lampered, Richard F. Muth., "Regions, Resources and Economic Growth" Resources for the Future I.N.C. Baltimore, 1961, pp 605.

10 V.H. Woodword", Regional Social Accounting for U.K.", in N.I.E.S.R. : Regional papers I,The syndices of the Combridge University Press, London, 1970, pp 78.

Woodword's study reveals that, for U.K., in 1961, the
regional income variations were accounted for by differences
in age   structure, the size of labourforce actually at work
and productivity per person in work. Monteks Ahluwalia, in
his size distribution of income analysis, attributes about
half of the   observed variations in income shares accross
countries to variables like, level of per capita income and
the share of agriculture in GDP , rate of growth of the
economy, the rates of enrollment in primary and secondary
schooling and the   rates of growth of population.[11]

There are also studies which have examined the sources
of interregional income difference   in terms of the invest-
ment in human resources, migration and size of the regions.
R. B. Hughes Jr. argues that, " differential investment in
human capacities (i.e., investment in education and health)
do result in regional differences".[12] This hypothesis
hints at the point that, regional income differences are
the results of differences in investment in human resource
development in the past. And, hence, it is difficult to

.11 Monteks. Ahluwalia, "Income, inequality : Some dimensions
     of the problem", in H. Chennery, M. Ahluwalia, Bell ,
     John. H. Duloy, R. Jolly, "Redistribution with Growth",
     Oxford University Press,/ 1975, pp 16-17. /_ London

12   R. B. Hughes, Jr., "Interregional income differences :
     Self perpetuation", The Southern Economic Journal,
     Vol. XXVIII(4), July 1961, pp 41-45.

establish the causal relationship between the current
investment in human resource and the current level of per
capita product. On the basis of the selective age,
Gunnar Myrdal asserts that the mobility widens inequality.[13]
But, "any general statment, such as Myrdal's conclusion,
that migration widens regional inequality, based as it is
only on age selectivity, is not valid".[14] Further, although
J. S. Williamson finds that there is a positive association
between the size and regional inequalities for the United
States,[15] however, size really makes no difference if
areas are homogeneous.[16]

At this stage, it may be noted, that the importance
of population growth is extensively discussed in the context
of poverty and regional inequality, because of its immediate
impact on per capita income levels. But its relationship
to regional inequality has not yet been systematically
studied. However, it is contended that regions which

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13 G. Myrdal, "Economic Theory and Underdeveloped Regions",
    London, 1957, pp 27.

14 B. Okun Richards, W.Richardson, "Regional income
    inequality and internal population migration", Economic
    Development and Cultural Change, Vol.IX(2), Jan.1961,
    pp 143.

15 J. S. Williamson, op, cit., pp 18-20.

16 Heston, A., "Regional income differences in India and
    'Historical' Pattern", The Indian Economic Journal,
    Vol.IX(2), Oct. 1967, pp 227.

experience a higher rate of growth of population will

face lower levels of economic development on account of

the inherent problems, namely, unemployment, under

employment, increased pressure on land, massive rural

out migration, growth of urban slums, resource realloca-

tion in favour of production of mass consumption items,

among other things, associated with the growth of population.

But, S.Kuznets finds that, on the basis of the inter-country

data, "in general, there is a positive association between

rates of growth of population and total product".[17] It

implies that, whenever there is growth of population, it also

results in the growth of worker participation ratio. This

in turn will enhance the total product. However, Kuznets

further argues that there is nothing of mechanical

association. Therefore, it appears difficult to visualise

the definite relationship between the growth of population

and the level of per capita product.

Thus, on the whole, regional differences in worker

participation rates, product per worker, degree of industri-

alisation, proportion of active population, degree of

17 S. Kuznets, "Quantitate aspects of the economic growth
    of nations-I, Levels of variability of rates of growth",
    Economic Development and Cultural Change, Vol.5(1),
    Oct. 1956, pp 28.

urbanisation, literacy rates and 'infrastructure' are reflected in levels of regional development differences. More specifically, it can be said that regions with high levels of the factors mentioned above are positively associated with the high per capita product. It should, however, be noted that some of the above factors, although important from the view point of explanation of variations in per capita product, might not be exclusively independent but related to one another. The degree of industrialisation, for example, will be highly correlated to the degree of urbanisation and literacy rate. Therefore, it is necessary to eliminate the correlated explanatory variables and focus attention on strategic variables which play a crucial role in the explanation of variations in per capita product.

3. SOURCES OF VARIATIONS IN PER CAPITA INCOME

It is evident that there exist significant inter - district income inequalities in Karnataka State in the past as well as at present (see Chapter Two, Section Two). This phenomenon leads the researcher to probe into the sources of variations in the district per capita incomes of Karnataka. In the present work an attempt is made to examine the influence of the factors, namely,(a) the effective

worker participation rate, (b) productivity of labour, (c) degree of industrialisation, (d) proportion of active population, (e) degree of urbanisation, (f) literacy rate, (g) infrastructure, on the inter-district income differences in the state. The selection of the factors, however, is based on the theoretical explanation given earlier and the availability of suitable data. The analysis is conducted on the cross-sectional data at the two points of time, i.e., 1960-61 and 1970-71. The Correlation and Multiple Regression Techniques are employed for the aforesaid purpose.

A. SPECIFICATION OF VARIABLES AND SOURCES OF DATA

i) Per capita income (or District per capita product)(Y) — It is calculated by dividing the District Net Domestic Product by the District Total Population. After obtaining the data on the Net District Domestic Product and Population from the Bureau of Economics and Population Census Reports, respectively, the per capita income of districts for the years 1960-61 and 1970-71 are worked out at the 1960-61 prices.

ii) Effective worker participation rate (X_1) — It refers to the proportion of workers to the total population which is exclusive of the population in the age group of 0-9 years.

The effective worker participation rates for the period
1970-71 are calculated on the basis of workers and
population given in the Population Census Reports of 1971.
For the period 1960-61, the effective worker participation
rates are worked out by using the adjusted workers of 1961
and the population figures of the 1961 Census Report.
The adjusted workers for 1961 are estimated by the
investigator (see Chapter Three, Section Two).

iii) <u>Productivity of labour (or productivity)</u> (X_2) —
Productivity refers to product per worker. Productivity for
each district is obtained by dividing the district Net
Domestic Product to Total Workers in the respective districts.
Productivity of labour for both the periods are worked out at
the 1960-61 prices. For 1961, the denominator is the total
adjusted workers.

iv) <u>Degree of industrialisation</u> (X_3) — The degree of
industrialisation is measured as the percentage of non -
agricultural workers to total workers in each district. The
sum of 1971 Census worker classifications in IV to IX ,
constitutes the non-agricultural workers in each district
for the year 1970-71. Then, the percentage of non-agricul-
tural workers to total workers, for each of the districts,
is worked out. For the year 1961, the adjusted workers in
the nine industrial categories, which are comparable to the

1971 classification, are estimated in Chapter Three,
Section Three. On the basis of these data, percentage of
non-agricultural workers to total workers is calculated
for the period 1960-61.

v) <u>Active population</u> (X_4) — In the present study, the
active population of a district refers to the percentage
of population in the age group of 15-59 to the total
population of the district. This age composition selection
is made, partly, on the account of physiological and socio-
economic conditions prevailing in the country ; and ,
partly, on the basis of the nature of data availability.
The two decennial Population Census Reports on Karnataka
State provide the population figures in different age
groups. The 1971 Census provides, the distribution of
population in the eight age groups, viz., 0-14, 15-19,
20-24, 25-29, 30-39, 40-49, 50-59, 60 + and age not stated.
By addingup the population in the age groups of 15-19 to
50-59, the total population of each district in the age group
of 15-59 is obtained . Then the percentage of the popula-
tion in the age group of 15-59 to the total population in
each district is worked out and used for the period
1970-71. The 1961 Census gives the distribution of the
population in four age groups i.e., 0-14, 15-34, 35-59, 60 +
and the age not stated. By taking the total population in
the age group of 15-59, from the 1961 Census Report, the

percentage of the active population to the total population for each district is worked out and used for the period 1960-61.

vi) <u>Degree of urbanisation</u> (X_5) — The degree of urbanisation is measured as the percentage of urban population to the total population in each district. The data are obtained from the two Population Censuses, viz., 1961 and 1971. Though, there is a slight difference in the definition of urbanisation between the 1961 Census and 1971 Census, such a difference does not affect significantly the results of the present study.

vii) <u>Literacy rate</u> (X_6) — Literacy rate is defined as the percentage of literate population to the total population which is exclusive of the population in the age group 0-4 years. Literacy rates are calculated for all the districts for the two reference periods by obtaining the necessary data from the Census Reports.

viii) <u>Infrastructure facilities</u> (X_7) — In the present analysis, the term 'infrastructure' or 'social over heads' includes the items, namely, road mileage, railway mileage post-offices, hospitals, dispensaries and public health centres, financial institutions, primary schools and colleges, rural electrification and the registered vehicles. To quantify the availability of infrastructure facilities,

the researcher has prepared the 'composite index of infrastructure' , in each of the districts for the periods 1960-61 and 1970-71. To prepare the district-wise 'composite index of infrastructure', the data on the aforementioned items are obtained from the state Bureau of Economics and Statistics. The basic data are given in Appendix Table 4.1 for the years 1960-61 and 1970-71. These absolute figures were further processed to derive some comparable indicators for each element of the infrastructure. Such processed data are presented in Appendix Table 4.2 for the two reference periods. From the processed data, the investigator worked out the percentage index for each item , keeping the average of the aggregate as 100 in each case for Karnataka State. Then, the district-wise 'composite index of infrastructure' were constructed by calculating the mean values of the sum of percentage index of all the items.[18] The

18. The similar method was employed to prepare the various composite indices of development. See

   i) Report on <u>Block Development Plan For Jabugam,</u> <u>Vadodara District,</u> M.S.University of Baroda, May 1977, pp 4,

   ii) Report on <u>Block Development Plan for Chotaudepur</u> <u>Taluka , Vododara District,</u> M.S.University of Baroda, Sept. 1980, pp 18.

indices of the different items and the 'composite index of infrastructure', thus worked out, for each of the districts of Karnataka are given in the Appendix Table 4.3 for the periods 1960-61 and 1970-71. The table reveals that the degree of relative dispersion among the different indices in a given category of infrastructure is rather high . The last row of the table shows the coefficient of variation for each head of the infrastructure. The results indicate that the highest degree of relative dispersion is found in registered vehicles in both the periods. The least dispersion is found in post-offices in 1970-71 as against that for primary schools in 1960-61.

The relevant data, on all the variables, are given in Table 4.1 for the years 1960-61 and 1970-71. Throughout the analysis, the per capita income will be considered as the dependent variable and the others as the explanatory variables.

It is evident, from the data, that there are wide variations in some of the explanatory variables at both the periods. To get an idea about the extent of variations in the variables, between the districts, the coefficient of variations were calculated and are indicated in the last row of Table 4.1. It can be observed, from the results given in the table, that the

TABLE 4.1 : Sources Of Variations In District Per Capita Income, Karnataka : 1960-61 and 1970-71

Sr. No.	Districts	Worker participation rate (in %)		Effective worker participation rate (in %)		Productivity per worker (in Rs.)		Degree of industrialisation (in %)		Active population (in %)		Degree of urbanisation (in %)		Effective literacy rate (in %)		Level of infrastructure (composite index)	
		1960-61	1970-71	1960-61	1970-71	1960-61	1970-71	1960-61	1970-71	1960-61	1970-71	1960-61	1970-71	1960-61	1970-71	1960-61	1970-71
1	Kodagu	39.71	40.40	57.13	55.65	1816	2385	25.75	27.81	55.31	54.07	13.22	15.51	42.83	51.12	152	135
2	Shimoga	33.80	32.01	49.71	46.30	1633	1564	35.05	26.07	52.43	49.55	25.59	23.61	33.40	42.98	111	112
3	U. K.	34.44	33.68	49.51	47.54	1661	1358	31.12	30.93	52.49	51.58	17.53	17.12	23.46	47.32	90	107
4	Chikmagalur	35.94	34.61	52.34	49.25	1224	1762	21.64	24.30	52.81	50.94	14.98	15.62	32.72	40.68	140	114
5	D. K.	37.96	38.61	54.71	54.34	832	1052	31.26	41.14	49.61	50.42	17.93	20.27	38.22	50.63	131	125
6	Bellary	38.78	37.99	55.00	53.74	781	1096	26.58	25.81	53.36	51.82	22.57	27.15	24.37	29.30	92	106
7	Hassan	32.05	31.75	46.51	44.65	933	1108	13.81	19.58	51.34	50.57	12.00	13.55	28.79	35.73	111	106
8	Tumkur	33.99	34.02	48.19	47.75	825	785	14.50	18.52	51.68	51.07	10.16	11.71	26.32	33.96	85	84
9	Chitradurga	37.54	37.17	54.19	52.99	724	948	20.94	23.17	51.12	50.30	17.38	20.25	29.46	26.61	97	96
10	Belgaum	35.29	35.48	50.60	50.30	719	823	21.04	24.87	51.53	51.43	18.02	20.54	30.67	26.06	82	86
11	Mysore	33.40	33.61	47.25	46.89	769	1155	24.83	29.09	52.73	52.47	24.83	25.47	24.80	29.71	111	105
12	Mandya	33.02	32.56	47.48	46.46	715	960	13.31	17.42	51.72	50.00	11.13	13.76	20.33	26.34	108	110
13	Dharwad	35.55	35.50	51.28	50.19	717	863	25.92	29.46	51.24	50.91	26.90	31.51	39.55	45.13	98	104
14	Bangalore	30.76	31.58	43.46	43.79	826	1159	46.26	57.22	52.96	54.38	54.20	55.44	39.86	49.41	178	179
15	Kolar	35.07	34.91	49.63	49.18	673	724	17.74	20.20	52.60	51.72	22.73	20.65	24.72	31.30	111	101
16	Raichur	38.13	37.22	54.40	52.43	590	1049	21.52	20.86	53.58	51.66	14.59	15.36	18.35	23.84	58	67
17	Gulbarga	35.62	34.94	50.43	50.52	620	931	25.04	26.29	52.96	51.30	16.18	17.78	17.18	22.29	59	71
18	Bijapur	36.21	35.56	51.75	50.62	556	702	22.23	24.91	52.37	50.85	18.88	21.21	28.84	32.34	71	78
19	Bidar	33.67	33.02	47.87	48.25	586	795	21.82	25.61	51.16	49.47	12.25	14.46	16.96	23.97	60	72
	Karnataka	34.97	34.74	49.33	49.13	857	1028	25.08	29.17	52.01	51.45	22.33	24.31	29.80	36.83	100	100
	Coefficient of variation(%)	6.69	6.98	6.84	6.60	42.74	37.00	32.28	33.54	1.93	2.52	50.03	46.13	27.52	26.02	31.23	25.24

Note : For computational procedure see the Text, Section 3.

Source: Computed from 1) Appendix Tables 3.2, 3.4, 2.1, 2.2. 11) Census of India - 1961, Vol.XI, Mysore,Part II(1),
Statement No.C-II, iii) Census of India - 1971, Series-14, Mysore, Part II C(1ii) Table No.C-II, iv) Census of
India - 1961, Vol.XI, Mysore, Part II I(1). Table B-1, v) Census of India - 1971, Series 14,Mysore, Part I-A,
Vol.II, Statement No.10.27, vi) Census of India - 1961, Vol.XI, Mysore, Part II-A, pp.17, vii)Census of India-1971,
14, Mysore, Part II-A,pp 41, viii) Census of India-1971, 14 Mysore, Part I-A,Vol.II,pp.615, ix)Appendix Table 4.3.

highest and lowest variations were found in the degree of

urbanisation and in the proportion of active population,

respectively, during both the periods of analysis. The

variations are not insignificant in respect of productivity

of labour, degree of industrialisation, rate of literacy

and the composite index of infrastructure in the reference

periods. The significant variations in some of these

factors will be seen to throw some light on the differring

levels of development of districts in Karnataka. It is also

to be noticed that the variations in the active population

and degree of industrialisation have increased from 1960-61

to 1970-71 , whereas in respect of effective worker

participation rate, labour productivity, degree of urbani-

sation, literacy rate and composite index of infrastructure

the decline was observed during the same period.

B. INTERRELATIONS BETWEEN THE VARIABLES

Since the purpose of the study is to know the associ-
ation of District Per Capita Income (D.P.C.I.) with each
of the factors taken singly, the coefficients of determina-
tion (R^2) between District Per Capita Income and each
of the variables, viz., effective worker participation
rate, productivity, degree of industrialisation, active
population, degree of urbanisation, literacy rate, composite
index of infrastructure, are worked out for the years

1960-61 and 1970-71. The results are given in the last rows of the correlation matrix, Table 4.2.

The results indicate that the high District per Capita Income is positively associated with the high levels of productivity, literacy rate and infrastructure in Karnataka. The R^2 between the District Per Capita Income and each of the three factors, viz., productivity, literacy rate and infrastructure, in 1960-61, turned out to be 0.97, 0.22 and 0.21 respectively. However, in 1970-71, District Per Capita Income showed positive and significant correlation with productivity and literacy rate only. The R^2 between District Per Capita Income and productivity, District Per Capita Income and literacy rate, were 0.96 and 0.28 respectively. Since the R^2 between District Per Capita Income and other factors, namely, effective worker participation rate, degree of industrialisation, active population, degree of urbanisation, are not found to be significant at 5 % level, no definite conclusion can be drawn about their association. In fact, D.M. Nanjundappa's time series analysis reveals that there is a positive and significant correlation between education and economic development of Karnataka.[19]

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19 D.M. Nanjundappa, "Dynamic factors in Economic Development", Economic Advisers Division, Planning Department, Government of Karnataka, 1977.

TABLE 4.2 : Coefficient of Correlation Matrix of Variables of Inter-District Income Variations, Karnataka : 1970-71.

Variables		X_1	X_2	X_3	X_4	X_5	X_6	X_7
1 Effective Worker Participation rate	(X_1)	1.0000						
2 Productivity	(X_2)	0.1958	1.0000					
3 Degree of Industrialisation	(X_3)	-0.1234	0.1460	1.0000				
4 Active Population	(X_4)	0.0819	0.4040	0.5175*	1.0000			
5 Degree of Urbanisation	(X_5)	-0.2691	-0.0482	0.8226**	0.5269*	1.0000		
6 Literacy Rate	(X_6)	0.0631	-0.5405*	0.5960**	0.3420*	0.3821	1.0000	
7 Index of Infrastructure	(X_7)	-0.2145	0.4913	0.7310**	0.5616*	0.6647**	0.7415**	1.0000
District Per Capita Income 1971	(Y)	0.3758	0.9784**	0.1188	0.4416	-0.0933	0.5265*	0.4386
		(0.1412)	(0.9573**)	(0.0141)	(0.1950)	(0.0087)	(0.2721*)	(0.1924)
District Per Capita Income 1961	(Y)	0.3519	0.9849*	0.2937	0.2152	-0.1027	0.4688*	0.4589*
		(0.1238)	(0.9701*)	(0.0862)	(0.0463)	(0.0105)	(0.2198*)	(0.2105*)

** Significant at the 1% level.   * Significant at the 5% level.

Note: i) Figures in brackets are R^2.

ii) The results given in the last row are obtained on the basis of the 1961 year data for the variables.

Source: Calculated from Tables 2.1 and 4.1 .

The Multiple Regression Technique may be employed to explain the variations in per capita income. But prior to that, it is also necessary to check interrelations between different explanatory variables. Such an exercise helps to solve the problem of multi-collinearity. However, in the present work, an attempt has been made to solve the problem of multi-collinearity with reference to the year 1970-71. The coefficient of correlation matrix of all the variables under examination is given in Table 4.2 .

The correlation matrix reveals that the effective worker participation rate (X_1) is not at all correlated with any of the variables. The productivity (X_2) is correlated with literacy rate (X_6) and composite index of infrastructure (X_7). The degree of industrialisation (X_3) is correlated with active population (X_4), degree of industrialisation (X_5), literacy rate (X_6) and composite index of infrastructure (X_7). The active population (X_4) is correlated with the degree of industrialisation (X_5) and composite index of infrastructure (X_7). The degree of urbanisation (X_5) is correlated with the composite index of in frastructure (X_7). Finally, literacy rate (X_6) is found to be correlated with the composite of index of infrastructure (X_7). Thus, after eliminating the intercorrelated

variables, only three variables, viz., the effective worker participation rate, productivity of labour and degree of industrialization, are left.

C. THE MULTIPLE REGRESSION MODELS

The different hypotheses developed in the earlier section predict that the District Per Capita Income will be positively associated with the effective worker participation ratio, productivity of labour and degree of industrialisation. The functional relationship between the above variables may be expressed as follows,

$$Y = f(X_1, X_2, X_3, u),$$

where, Y = District Per Capita Income (in Rs.), X_1 = effective worker participation ratio, X_2 = product per worker (in Rs.), X_3 = degree of industrialisation (ratio), u = error term, which represents the combined effect of all other factors.

The explanation in the variations in the dependent variable (Y), then, is sought by fitting the Multiple Regressions. The possible theoretical multiple regression models have been specified

as follows ,

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + u \ldots \ldots \quad (1)$$

$$Y = \alpha + \beta_1 X_1 + u \qquad \ldots \ldots \quad (2)$$

$$Y = \alpha + \beta_2 X_2 + u \qquad \ldots \ldots \quad (3)$$

$$Y = \alpha + \beta_3 X_3 + u \qquad \ldots \ldots \quad (4)$$

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + u \qquad \ldots \ldots (5)$$

$$Y = \alpha + \beta_1 X_1 + \beta_3 X_3 + u \qquad \ldots \ldots (6)$$

$$Y = \alpha + \beta_2 X_2 + \beta_3 X_3 + u \qquad \ldots \ldots (7)$$

where, Y = District Per Capita Income, (Rs.),

X_1 = effective worker participation ratio, X_2 = Productivity of labour (Rs), X_3 = degree of industrialisation (workforce in non-agriculture sector/total workforce in all the sectors), u = stochastic term and α's and β's are the coefficients to be estimated. To estimate the coefficients, the Method of Least Squares may be employed .

D. RESULTS OF THE REGRESSION

The multiple regressions have been fitted to the cross-section data for the years 1960-61 and 1970-71. The results are given in Table 4.3.

TABLE 4.3   Sources of Inter-District Income Variations, Karnataka : Regression Coefficients, 1960-61 and 1970-71

(Dependent Variable : District Per Capita Income)

Year	Constant α	Regression Coefficients of Independent Variables			R^2	$\bar{R}^2$	F-Ratio
		β_1	β_2	β_3			
1960-61	-340.18	672.646** (85.18)	0.3567** (0.007)	-10.564 (36.992)	0.99	0.99	889.24**
"	-431.27	1498.590 (966.832)			0.12		2.40
"	-12.77		0.3680** (0.0154)		0.97		570.64**
"	192.96			552.518 (436.14)	0.08		1.60
"	-344.01	676.854** (81.491)	0.3559** (0.007)		0.99	0.99	1415.82**
"	-644.50	1324.38 (937.66)		616.768 (413.97)	0.23	0.13	2.39
"	-1.343		0.3720** (0.0167)	-62.691 (84.494)	0.97	0.96	269.47**
1970-71	-512.89	974.795** (115.62)	0.3768** (0.0091)	9.726 (41.373)	0.99	0.99	677.03**
"	-553.15	1911.11 (1141.67)			0.14		2.80
"	-44.69		0.3023** (0.020)		0.95		382.92**
"	334.72			217.28 (440.37)	0.01		0.24
"	-508.58	970.534** (110.77)	0.3772** (0.008)		0.99	0.99	1079.24**
"	-684.36	2008.79 (1163.2)		306.826 (419.92)	0.17	0.07	1.62
"	-34.16		0.3937** (0.0207)	-44.956 (94.77)	0.96	0.95	182.14**

(Figures in brackets are standared errors of coefficients)

** Significant at 1% level.

The regression results (Equation 1) suggest that, the effective worker participation ratio and productivity are the only significant variables to explain the variations in District Per Capita Income of Karnataka State. The regression coefficients of the two factors, with expected signs before them, turned out to be highly significant in both the cross-section studies. It is also observed that the degree of industrialisation seems to have no significant impact on per capita income inequalities. The regression coefficient has positive sign before it in 1970-71, whereas it has a negative sign before it in 1960-61. Such a negative sign in 1960-61 is quite opposite to the view expressed by the hypothesis formulated earlier. However, the values of regression coefficients of degree of industrialisation are not at all significant, at 5 % level, in both the years. Hence, there is no serious concern about the hypothesis advanced. On the whole, the multiple regression models fitted to the data suggest that, the selected variables explain most of the district income inequalities in Karnataka for the periods 1960-61 and 1970-71. The overall fit, measured by the values of $\bar{R}^2$, turned out to be highly significant at 1% level of significance.

However, to know the extent to which each factor i.e., X_1, X_2 and X_3, is individually significant in explaining the variations in

per capita income and how for they are significant,
for the same purpose, when associated with each
other alternatively, step regression equations
(Equations 2 to 7) have been fitted to the 1960-61 and
1970-71 data.

The results, presented in Table 4.3, indicate
that the productivity of labour turns out to be a
highly significant factor, individually, in explaining
the district income variations (Equation 3). β_2 is
found to be significant at 1 % level in both the periods.
It also turns out to be significant when associated with
either effective worker participation ratio or degree
of industrialisation in both the cross-sectional analysis
(Equation 5 and 7).

It was also found that, neither the effective
worker participation ratio nor the degree of industria-
lisation is individually significant to explain the
district income differences (Equation 2 and 4). However,
the effective worker participation ratio turns out to
be significant when associated with productivity in
the periods under examination. The effective worker
participation ratio, and productivity of labour together
explain 99 % variations. But the effective worker
participation ratio turns out to be insignificant when

associated with the degree of industrialisation. These two factors together explain only 13 % and 7 % variations in 1960-61 and 1970-71 respectively (Equation 6). Though, the degree of industrialisation and productivity together explain 96 % and 95 % variations in 1960-61 and 1970-71 respectively, β_3 has negative sign before it in both the periods. Since β_3 is not statistically significant at 5 % level, no decisive conclusions can be drawn about its influence on District Per Capita Income inequalities.

4. GROWTH OF FACTORS

Since the growth inequalities of some strategic variables implicitly explain the differing levels of economic development between the regions, the everage growth rates of all the factors are worked out for the decade 1961 to 1971 and are presented in Table 4.4 . The table reveals many facets of regional changes in the factors of income variations in Karnataka between the two bench-mark years. Considering the state's growth rate as the dividing line between the high and low growths, the high growth of District Per Capita Income is found to be associated with the low growth of the total workforce, workforce in the non-agriculture sector, active population and literates in Bijapur district only between the years

TABLE 4.4 : Average Growth Rates of Sources of Inter-District Income Differences, Karnataka : 1960-61 to 1970-71.

(Decadal Growth Rates in %)

Sr. No.	Districts	District Per Capita Income	Total Work-force	Labour Product-ivity	Workers in S + T Sectors	Active Popula-tion	Urban Popula-tion	Litera-tes	Change in composite index of infrastru-cture
1	Kodagu	25.13	19.24	23.86	22.21	15.86	27.26	30.14	-17
2	Shimoga	-14.17	21.15	-08.25	-10.96	17.28	15.28	40.11	1
3	U. K.	-25.16	20.41	-22.31	16.47	17.35	19.69	33.19	17
4	Chikmagalur	22.13	18.75	24.97	25.02	15.93	22.25	36.09	-26
5	D. K.	13.66	26.13	11.41	39.76	20.65	28.69	39.97	-8
6	Bellary	27.16	20.16	28.74	14.29	16.06	32.23	32.13	14
7	Hassan	15.06	21.88	15.79	42.08	17.49	28.03	35.27	-5
8	Tumkur	-05.24	19.14	-05.09	34.30	15.00	27.08	35.22	-1
9	Chitradurga	22.72	26.42	23.63	28.47	20.41	32.79	37.55	-1
10	Belgaum	09.59	22.81	08.99	31.15	17.97	28.19	30.66	-4
11	Mysore	33.76	60.91	33.41	65.62	19.55	21.57	33.11	-6
12	Mandya	18.21	26.59	19.27	36.94	19.41	36.98	40.10	2
13	Dharwad	16.94	19.94	16.92	26.94	16.13	28.91	27.89	6
14	Bangalore	30.60	37.96	28.73	41.41	27.53	27.24	40.19	1
15	Kolar	06.71	17.01	07.04	25.00	13.48	06.38	33.05	-10
16	Raichur	42.31	25.55	43.76	17.78	19.45	26.14	39.72	9
17	Gulbarga	32.00	21.92	33.40	21.88	16.93	26.79	36.78	12
18	Bijapur	19.60	17.46	20.80	24.07	13.89	25.59	25.62	7
19	Bidar	25.09	21.86	26.29	30.12	16.98	31.82	41.76	12
	Karnataka	17.93	23.39	22.67	31.24	18.50	26.05	35.13	-
	C.V.(%)	100.68	40.89	92.19	53.98	17.55	26.37	13.09	-

Source : Same as the sources of Table 4.1.

1961 and 1971. The high growth of District Per Capita
Income and productivity are associated with the low
growth of labourforce in the non-agriculture sector
in as many as eight districts, viz., Kodagu, Chikmagalur,
Chitradurga, Raichur, Gulbarga, Bijapur and Bidar. This
is indicative of the insignificant contribution of
industrialisation to the growth of these districts.
Perhaps, the high growth of productivity in the Primary
Sector may explain the high growth of income and the
overall product per worker in the above districts. Further,
it is to be noted that the low growth of District Per
Capita Income and productivity are associated with the
high growth of total workforce, workforce in the agricul-
ture sector, active population and urbon population in
Dakshina Kannada. It seems the high density and growth of
population in the district may show such an association.

The coefficients of variation given in the last row
of Table 4.4, reveal that there are wide variations in the
growth rates of product per worker, workers in the non-
agriculture sector, and total workforce, the coefficients
of variation being 92.19 % , 53.98 % and 40.89 %
respectively. The least variations are observed in the
growth rates of literates between 1961 and 1971.

5. **CONCLUSION**

i)   Significant variations are found in some of the
strategic factors of inter-district income differences in
Karnataka for the periods 1960-61 and 1970-71.
However, it is observed that the variations in the
active population and the degree of industrialisation
have increased from 1960-61 to 1970-71, wheareas,
there has been a decline in respect of effective worker
participation rate, labour productivity, degree of
urbanisation, literacy rate and composite index of infra-
structure during the same period.

ii)   The correlation analysis revealed that ·the high
District Per Capita Income is positively associated with
the high levels of labour productivity, literacy rate
and infrastructure in Karnataka. However, there seems to
be no definite association between the District Per
Capita Income and the factors like, effective worker
participation rate, degree of industrialisation, active
population and urbanisation.

iii)   The Multiple Regression Analysis, conducted for the
cross-sectional data for the years 1960-61 and 1970-71,
indicates that the effective worker participation rate and
labour productivity are the only significant variables to
explain the inter-district income differences in Karnataka

Though, the degree of industrialisation was included in the multiple regression analysis, its coefficients were not found to be significant in both the periods of study. The selected variables explained almost all the District Per Capita Income variations in Karnataka for the years under examination.

iv) The growth rates, for the decade 1960-61 to 1970-71, exhibit wide variations in respect of productivity of labour, workforce in the non-agriculture sector, and total workforce as compared to the variations in the other factors.

APPENDIX TABLE 4.1 : Basic Data For Building Up The Indices For The Districts of Karnataka : 1960-61 and 1970-71.

Sr. No. Districts	Railway length in K.Ms 1960-61	1970-71	Post Offices (Nos.) 1960-61	1970-71	Hospitals, Dispensaries & P.H. Centers (Nos.) 1960-61	1970-71	Financial Institutions (Banks+Co-ops) (Nos.) 1960-61	1970-71	Primary Schools (Nos.) 1960-61	1970-71	Colleges (all types) (Nos.) 1960-61	1970-71	Villages and towns electrified (Nos.) 1960-61	1970-71	Registered vehicles (Nos.) 1960-61	1970-71
1 Kodagu	-	-	97	158	48	44	12	53	332	361	2	2	10	66	1173	2130
2 Shimoga	113	113	220	388	102	86	28	83	1683	1891	3	11	363	915	1515	5450
3 U. K.	40	40	124	300	77	52	34	75	1350	1486	3	6	4	276	876	1830
4 Chikmagalur	97	97	120	257	92	59	23	70	1137	1248	4	4	225	543	907	1810
5 D. K.	16	16	637	694	58	126	106	225	1471	1584	20	28	145	369	3447	13350
6 Bellary	209	209	245	421	40	51	18	56	972	1283	4	8	101	364	1168	4097
7 Hassan	137	137	240	356	94	73	10	47	1641	1855	9	7	166	528	660	2376
8 Tumkur	89	89	261	504	70	73	11	52	2335	1584	4	8	510	878	657	1474
9 Chitradurga	121	121	238	421	77	76	17	52	1567	1664	9	15	262	723	663	2479
10 Belgaum	217	217	367	615	53	74	78	167	1952	2076	12	20	8	235	2537	8412
11 Mysore	121	121	251	508	116	117	28	97	2088	2225	21	30	341	703	2485	7112
12 Mandya	64	64	124	395	68	61	5	48	1352	1494	4		230	543	461	1313
13 Dharwad	306	306	393	516	52	93	89	179	1812	1852	20	27	40	592	1802	7742
14 Bangalore	290	348	241	496	122	168	82	254	2773	3341	37	54	843	1160	16064	51465
15 Kolar	241	241	138	342	96	86	13	50	2015	2172	3	7	814	135	1837	2316
16 Raichur	105	105	271	425	26	52	14	54	1098	1409	5	5	12	317	821	3295
17 Gulbarga	225	225	375	534	31	66	11	40	1354	1558	10	12	5	312	637	3023
18 Bijapur	201	201	354	645	44	61	57	99	1889	1953	6	16	9	299	987	2693
19 Bidar	89	89	175	245	17	23	4	24	619	715	4	4	5	187	275	887
Karnataka	2699	2757	4669	8208	1248	1341	640	1695	28630	32630	175	274	4193	10461	39072	123259

Sources : i) Mysore at glance, 1962, Bureau of Economics and Statistics, Government of Karnataka, Bangalore - 1,
ii) Karnataka at a glance, 1971 Bureau of Economics and Statistics, Government of Karnataka, Bangalore-1.

Note : Wherever the figures for the exact reference year are not available, the near by year figures are taken and presented for the reference period.

APPENDIX TABLE 4.2 : Particulars Of Various Indicators For The Districts of Karnataka : 1960-61, and 1970-71.

Sr. No.	Districts	Road length in K.M. per 100 sq.K.M. area 1960-61	1970-71	Railway length in K.M. per 100 sq.K.M. 1960-61	1970-71	Number of Post Offices Per Lakh of population 1960-61	1970-71	Number of Hospitals & dispensaries & Health Centres per lakh of Population 1960-61	1970-71	1960-61	No. of total institutions per lakh of population 1970-71	1960-61	No. of ...ges per lakh 1970-71	1960-61	...per lakh of population 1970-71	1960-61	Number of towns & villages electrified as % of total T.& 1970-71	1960-61	Number of registered vehicles per lakh of population 1960-61	1970-71
1	Kodagu	27	27	-	-	30.0	41.8	14.9	11.7	3.7	14.0	10	95	0.	0.5	0.5	0.5	5	358	562
2	Shimoga	29	41	1.07	1.07	21.6	29.8	10.0	6.6	2.8	6.4	16	145	0.	0.8	20.8	0.8	5	149	419
3	U. K.	23	33	0.39	0.37	17.7	45.7	6.1	6.1	4.9	8.8	19	175	0.	1.1	0.3	1.1	2	127	216
4	Chikmagalur	30	36	1.34	1.35	20.1	34.9	15.4	8.0	3.9	5.8	19	169	0.	0.5	23.2	0.5	5	152	246
5	D. K.	25	35	0.19	0.19	40.7	35.8	5.7	5.5	6.8	1.6	9	82	1.	1.4	21.3	1.4	5	220	688
6	Bellary	13	22	2.11	2.11	26.8	37.5	4.4	4.5	2.0	5.0	10	114	0.	0.7	17.1	0.7	6	138	365
7	Hassan	34	52	2.01	2.01	15.6	22.3	10.5	6.6	1.1	4.3	7	168	1.	0.6	7.2	0.6	2	74	216
8	Tumkur	31	37	0.84	0.84	19.1	31.0	5.1	4.5	0.8	3.2	17	159	0.	0.5	20.8	0.5	35	48	91
9	Chitradurga	21	26	1.12	1.12	21.7	30.1	7.0	5.4	1.6	3.7	14	119	0.	1.1	21.0	1.1	57	61	177
10	Belgaum	20	29	1.62	1.62	18.5	25.4	2.7	3.1	3.9	5.9	9	86	0.	0.8	0.7	0.8	21	128	347
11	Mysore	31	47	1.01	1.01	15.0	24.5	6.9	5.5	1.7	4.7	12	107	0.	1.4	22.4	1.4	41	149	342
12	Mandya	76	102	1.28	1.29	13.8	25.6	7.6	5.3	0.6	4.2	15	129	0.	0.6	17.1	0.6	40	51	114
13	Dharwad	24	29	2.23	2.23	20.1	22.0	2.7	4.0	4.6	7.6	9	78	1.	1.2	2.9	1.2	41	92	330
14	Bangalore	35	45	3.63	4.35	9.6	14.7	4.9	5.0	3.3	7.6	11	99	1.	2.8	36.4	2.8	46	641	1529
15	Kolar	30	34	2.92	2.93	10.7	22.6	7.4	5.7	1.0	3.3	15	143	0.	0.5	29.5	0.5	47	142	153
16	Raichur	10	18	0.74	0.75	24.6	30.0	2.4	3.7	1.3	3.8	10	100	0.	0.4	0.9	0.4	22	75	233
17	Gulbarga	6	16	1.37	1.39	26.8	30.7	2.2	3.8	0.8	2.3	97	90	0.	0.7	0.4	0.7	25	46	174
18	Bijapur	18	26	1.18	1.18	21.3	22.5	2.6	3.1	3.4	5.0	114	98	0.	0.8	0.7	0.8	22	59	136
19	Bidar	7	25	1.62	1.63	26.4	29.7	2.6	2.8	0.6	2.9	9	87	0.	0.5	0.8	0.5	31	41	108
	Karnataka	23	33	1.40	1.44	19.8	28.0	5.3	4.6	2.7	5.8	121	111	0.	0.9	15.8	0.9	36	166	421

Sources : i) Road development in Karnataka State (Sixth Edition), Government of Karnataka, 1979, pp 70-

ii) Computed from Appendix Table 4.1 .

APPENDIX TABLE 4.3 : The Indices Of Various Indicators Of Infrastructure And The 'Composite Index Of Infrastructure' For The Districts Of Karnataka : 1960-61 and 1970-71.

Sr. No.	Districts	Road length		Railway length		Post Offices		Hospitals, Dispensaries, P.H.Centres		Financial Institutions		Primary Schools	
		1960-61	1970-71	1960-61	1970-71	1960-61	1970-71	1960-61	1970-71	1960-61	1970-71	1960-61	1970-71
1	Kodagu	117	112	-	-	152	149	281	252	137	241	85	86
2	Shimoga	126	124	76	74	109	106	187	143	104	110	136	131
3	U. K.	100	100	28	27	89	163	115	133	181	152	162	158
4	Chikmaglur	130	109	98	94	102	125	291	174	144	117	157	152
5	D. K.	107	106	14	13	206	128	70	141	252	200	78	74
6	Bellary	57	67	151	147	135	134	83	98	74	86	88	103
7	Hassan	148	158	144	140	79	115	198	143	41	74	151	151
8	Tumkur	135	112	60	58	96	111	96	98	30	55	141	143
9	Chitradurga	91	79	80	78	110	108	132	117	59	64	118	107
10	Belgaum	87	85	116	113	93	91	51	67	144	119	81	77
11	Mysore	135	142	72	70	76	88	130	122	63	81	103	96
12	Mandya	330	309	91	90	70	91	143	115	22	72	124	116
13	Dharwad	104	88	159	155	102	79	51	87	170	131	77	71
14	Bangalore	152	137	259	302	48	53	92	109	122	131	98	89
15	Kolar	130	103	209	203	54	81	140	124	37	57	129	129
16	Raichur	43	55	53	52	124	107	45	80	48	66	83	90
17	Gulbarga	26	48	84	97	135	110	42	83	30	40	80	81
18	Bijapur	78	79	84	82	108	116	49	67	126	86	94	88
19	Bidar	30	76	116	113	133	106	49	61	22	50	77	78
	Karnataka	100	100	100	100	100	100	100	100	100	100	100	100
	C.V. (%)	58.34	51.50	58.29	63.67	34.66	23.58	64.15	38.42	68.52	51.75	27.51	27.46

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Contd...

APPENDIX TABLE 4.3 : (Contd..)

Sr. No.	Districts	Colleges		Towns & Villages electrified		Registered vehicles		Composite Index of Infrastructure	
		1960-61	1970-71	1960-61	1970-71	1960-61	1970-71	1960-61	1970-71
1	Kodagu	88	56	22	56	336	127	152 (2)	135 (2)
2	Shimoga	43	89	132	134	90	99	111 (6.5)	112 (5)
3	U. K.	57	122	2	54	77	51	90 (13)	107 (7)
4	Chikmagalur	100	56	147	141	92	58	140 (3)	114 (4)
5	D. K.	186	156	135	140	133	163	131 (4)	125 (3)
6	Bellary	57	78	108	156	77	87	92 (12)	106 (8.5)
7	Hassan	143	67	46	58	45	51	111 (6.5)	106 (8.5)
8	Tumkur	43	56	132	102	29	22	85 (14)	84 (15)
9	Chitradurga	114	122	133	147	37	42	97 (11)	96 (13)
10	Belgaum	86	89	4	51	77	82	82 (15)	86 (14)
11	Mysore	186	156	142	113	90	81	111 (6.5)	105 (10)
12	Mandya	57	67	108	104	31	27	108 (9)	110 (6)
13	Dharwad	143	133	18	112	55	78	98 (10)	104 (11)
14	Bangalore	214	311	230	120	386	363	178 (1)	179 (1)
15	Kolar	29	56	187	122	86	36	111 (6.5)	101 (12)
16	Raichur	71	44	6	58	45	55	58 (19)	67 (19)
17	Gulbarga	100	78	3	61	28	41	59 (18)	71 (18)
18	Bijapur	57	89	4	59	36	32	71 (16)	78 (16)
19	Bidar	86	56	5	81	25	26	60 (17)	72 (17)
	Karnataka	100	100	100	100	100	100	100	100
	C.V.(%)	54.86	62.61	89.64	37.50	106.01	97.07	31.23	25.24

Note : The figures in the parenthesis are ranks in descending order.
Source : Appendix Table 4.2 .