DISPARITIES IN THE LEVELS OF SOCIO-ECONOMIC DEVELOPMENT :

A COMPARATIVE STUDY OF RAJASTHAN AND HARYANA
1971 – 81

Dissertation submitted to the Jawaharlal Nehru University
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C E R T I F I C A T E

This is to certify that the dissertation entitled DISPARITIES
IN THE LEVELS OF SOCIO-ECONOMIC DEVELOPMENT, A COMPARATIVE
STUDY OF RAJASTHAN AND HARYANA 1971-81 submitted by
MR BAJRANG KUMAR TANWAR, in fulfilment of the six credits out
of the total of twenty-four credits for the award of the
degree of Master of Philosophy(M.Phil) of this University,
is a bonafide work to the best of our knowledge and may be
placed before the examiners for evaluation.

CHAIR PERSON

(Dr.SACHIDANAND SINHA)
SUPERVISOR

TO MY PARENTS

&

BROTHER

C O N T E N T S

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(BAJRANG KUMAR TANWAR)

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Chapter I

INTRODUCTION

1. **Statement of the Problem**

There are mainly two kinds of inequalities i.e. inter-personal and inter-regional inequality. It is very difficult to reach inter-personal equality untill or unless regional equality is achieved. Regional equality may be defined as the optimum use of potentialities and resources of a region giving it the benefit of possible economic development in relation to overall economic development. Development may be taken to imply an improvement in the material well-being of the people in a region. Material well-being of a region can be identified with the increase in the employment opportunities, availability of infrastructure facilities, amenities and services, increase productivity and increased rate of investment and consumption and so on. Problem arises that how one may measure the levels of socio-economic development and why there is a need to measure this. One can not examine the levels of socio-economic development without taking the different sectors of economy. It is the productive sectors of an economy which increase the income level resulting a rise in the standard of living. Therefore, in order to make a meaningful study of differences in inter-regional levels of socio-economic development,

one should take into consideration, various physical
indicators reflecting or measuring various levels of sectoral
development and combining all the sectoral indices together
one may measure the levels of socio-economic development.

There exist wide differences in levels of socio-
economic development of rural, urban and metropolitan cities.
Standard of living is generally found high in urban areas
than in rural areas. Disparities in the levels of develop-
ment create frustration, tension amongthe regions.

Disparate Regional Development divides the country
into zones of poverty and prosperity. Wide variation emerge
in terms of per capita income, levels of consumption and
infrastructure for development. The 'back wash effects'
released by the developed zone into under-developed one
further accentuates these trends. Its social implications
are more dangerous than economic. National integration
becames difficult task in face of regional economic in-
equalities, extreme differences in the standard of living,
wide gaps in social services and development opportunities.

In view of the growing emphasis on the objective of
equalisation and reducing disparities, one should first
try to measure the levels of socio-economic development
a region and after that attempts should be made to identify
the backward regions and reasons behind their backwardness.

In keeping this view in mind, an attempt has been made in the present study to measure the levels of socio-economic development by taking a large number of indicators representing different sectors of an economy. This study has been carried out at two stages. At the first stages, composite index of agriculture, industry and socio-economic intrastructure have been constructed and at the second stage, these sectoral indices have been composed into one index of socio-economic development.

1.1 Objectives of the Study

(i) To measure the levels of development of different districts at two points of time (1970-71) and (1980-81) with reference to indicators pertaining to agriculture, industry and socio-economic infrastructure;

(ii) To study and analyse inter-district disparities in the levels of development in the sample states and to observe as to how temporally changes have come about;

(iii) to understand as to how sectoral disparities influence inter-regional and inter and intra district disparities in the levels of socio-economic development.

1.2 Data Base

Because of its very nature   the present study is based on secondary data. Data has been taken from various

publications of Census of India 1971 and 1981 and
Stastical Abstracts of the concerned state. Data
regarding population, literacy, urban population and
industrial classification of main workers has been
taken from Census Publications of 1971 and 1981.
Data regarding agriculture, industry and socio-economic
infrastructure has been taken from state statistical
abstracts.

1.3 Hypothesis

(i)   There exists a positive relationship between
the levels of agricultural development and levels of
industrial development.

(ii)   There exist a positive correlation between
socio-economic infrastructure and agricultural development.

(iii) There is positive relationship between indust-
rial development and development of socio-economic infra-
structure.

(iv)   The level of socio-economic development is
positively correlated with socio-economic infrastructure
development.

(v)   There exists a positive relationship between
literacy rate and levels of development.

(vi)   Urbanisation has a positive relationship
with development.

(vii) Higher the bank deposit per capita, higher
the levels of development.

(viii) There exists a positive relationship between agricultural productivity per hectare and level of development.

(ix) Higher the number of hospitals and dispensaries per thousand sq. Kms, higher the levels of development.

1.4 Methodology

1.4.1 Selection of the Study Area - For any study on regional disparities, there is need to identify an appropriate spatial unit of analysis. There are variety of area level that are taken for various purpose. Two levels, state or a district area considered significant for practically all purposes. Earlier it was decided to conduct this study at tehsil level but due to data constraints at tehsil level for measure indicator of development, district has been choosen as spatial unit for study. In present study, Rajasthan and Haryana state has been choosen for analysing the disparities in the levels of socio-economic development. Haryana is developed state and Rajasthan is less developed in the level of development. These two state has been selected to examine that how the disparity behave in a developed and less developed region. It is not true that in a developed state all its region are developed and in a less developed state all its regions are backward. There are some pockets of backward regions in developed region and

pockets of developed regions in less developed region.
The present study will help in identifying the backward
districts so that some measure can be suggested for
their development and examine the reasons responsible
for their backwardness.

1.4.2 Choise of Indicators - Before making the
choice of indicators of development it is worthwhile
to draw of line of distinction between a variable and
indicator. Statistical hand books generally provide
raw data regarding the variables that may or may not
indicate the relevant phenomena. An indicator, viewed
as a combination of matters (data) and matters of
relation (theory), can be constructed through a
correct seqance between factual and logical order. It
is, therefore, "through an appropriate transformation
of variables (which eliminate the effect of non-essential
factors) within a theoritical formate that an indicator
can be obtained[1].

The term indicator can be understood by observing
the relationship between basic statistics and derived
series. Basic statistics is described as the Primary
data available in Censuses, Sample surveys and

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1. Kundu, Amitabh, ·Measurement of Urban Processes - A
        Study in Regionalisation, Popular, Bombay,
        1980. p.30.

administrative records whereas the derived series are those calculated from the primary statistics and are usually in the form of average, percentages, ratios etc.[2].

The proper choice of indicators constitute the crus of methodology. For it is through which the pertinent questions need to be asked as the data are identified. While selecting variables one should take care of following aspects[3].

(i) One should know the differences between the concept of diversity and disparity.

(ii) One should make the differencebetween indica - tors related to input and output.

(iii) The inclusion of indicators which are not related to process of development should be avoided.

(iv) The indicators should be selected rationally and looking its impact on development.

(v) One should take the care about the overlapping of indicators and under-representation to any one sector which may lead to distorted picture of development.

Now-a-days a majority of developing nations give priorities to reducing the regional disparities and to

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2. <u>Ibid</u>. p.30.

3. Raza Moonis and Bandho Chattopadhaya, "<u>Regional</u>
       <u>Disparities in India</u>," Indian Journal of Regional
       Science. vol. VII. 1975. pp. 1-3.

measures designed to improve the levels of living of people below poverty line. The role of socio-economic indicators in the present context seems to be most crucial because they serves two basis purposes. Firstly, they help in crystalising the goals of planning interms of specific objectives or targets and second they help in measuring the progress made towards the goals in relation to the target fixed.[4]

In the present study, the total thirty indicator have been selected for analyzing the districtwise development at two point of time (1970-71 and 1980-81). Out of these thirty indicators of development, eight indicators have been choosen to portray levels of patterns of agricultural development for different districts. Six indicators have been considered to analyse the levels of industrial development. Since the levels of agricultural development and industrial development are influenced by the availability of socio-economic infrastructure, sixteen indicators of socio-economic, infrastructure has been selected for the present study.

4.2(a) **Indicators of Agricultural Development** - The indicators which are selected to measure the agricultural development are related to input to agriculture. Indicator related

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4. Moser, C., "Social Indicators-Systems, Methods and Problems", Review of Income and Wealth, 1973, pp. 133-143.

to productivity per hectare also has been included to assess the current situation of different districts in terms of output. The following indicators of agricultural development have been selected :--

1. Percentage of irrigated area to gross cropped area (G1)

2. Irrigation intensity (G2)

3. Cropping intensity (G3)

4. Percentage of area under-commercial crops to total cropped area (G4)

5. Number of electric pumpsets per 1000 hectare of Net Sown Area (G5)

6. Consumption of fertilisers per 100 hectare of Gross Cropped Area (G6)

7. Productivity per hectare (Rs.) (G7)

8. Number of Tractors per 100 hectare of Net Sown Area(G8).

Indicators 1 and 2 are related to the irrigation which is the most important input to agriculture because it has multicollinearity with the use of HYV.'s, fertilisers. It helps in enhancing the productivity and stability of agriculture, in increasing cropping intensity, in reclaiming the dry agro-cultural waste land and in rationalizing the cropping pattern[5]. Indicator three, cropping intensity reflects the efficiency of agricultural land use. It increases agricultural production from the same land.

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5. Rao, S.K., "Inter-regional Variations in Agriculture Growth - 1952-53 to 1964-65 - A Tentative Analysis in Relation to Irrigation", *Economic and Political Weekly*, vol. VI, No.30-32, pp.1337-1340.

It also helps in diversification of cropping pattern. Indicator four commercialisation of agriculture indicates the levels of diversification within agriculture from food grains to commercial crops and also shows efficiency of farm management. Indicator 5 and 8 indicate the use of mechanical inputs. Next to water, fertiliser constitute the second vital biochemical input contributing to agricultural productivity[6]. Agricultural productivity (G7) is one ofthe prime measure of agricultural development. It is the outcome of all the inputs in agriculture. The agricultural produce per heetare of net sown area is an index to agricultural efficiency of an area.

.4.2(b) **Indicators of Industrial Development** - The level of industrial development can be measured by using indicators of different kind. We could not include indicator like value added by manufacturing, consumption of power due to data constraints. In present study two points have been considered that is establishment of industrial unit and employment. The selected indicators of industriall development are :-

> 9 percentage of registered factories to total registered factories in the state.
>
> 10 Percentage of employment in registered factory to total employment in registered factories in the state.

6. Gosal, G.S. and Gopal, K., _Regional Disparities in Levels of Socio-Economic Development in Punjab_. Vishal, Kurukshetra, 1984.

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6. Gosal, G.S. and Gopal, K., Regional Disparities in Levels of Socio-Economic Development in Punjab. Vishal, Kurukshetra, 1984.

11. Percentage of worker in industrial sector to total main workers (G11)

12. Percentage of workers in non-agricultural activities to total main workers (12)

13. Percentage of urban population to total population (G13)

14. Percentage of workers in non-household industries to total industrial workers (G14).

Registered industrial units (G9) provide life blood to economic system through their forward and backward linkages in transmitting the growth[7]. Division of labour from agricultural activities to industrial activities indicate the degree of diversification of economy; indicators 11, 12 and 14 consider this aspect. Indicator 13 indicate the degree of urbanisation which reflect the concentration of industrial activities.

1.4.2(c) Indicators of Development of Socio-Economic Infrastructure - In an economy committed to the objective of a 'Socialistic pattern of society' inter-district comparison would remain incomplete without due consideration of distribution of social and economic overhead, like medical, postal, educational transport and communication facilities. There are two aspects which need special attention while discussing availability of infrastructure in a region. First is the level of these services per capita and second is the extent to which the populatioon

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7. Op. Cit., p.32. Kundu, A., 1980

indicate the availability of medical facilities in rural areas. Health is a complex sector and its development depends not only on the availability of health facilities in a region but also on the development of other sector also. Health services and facilities like hospitals, dispensaries, hospital services, medicine, doctors, nurse etc. are the direct indicators of health development.

Indicator from G26 to G30 and G20-21 represent the levels of educational development. Education is an important factor of economic development and social upliftment. With the development of education economic opportunities to mass increases and social barrier get narrowed down. Female education is important in economic development in many ways.

> "An off-repeated aspect of human resource development is the promotion of literacy and education among women. Both infant and child mortality and fertility seem to be inversely related to educa-tion of mothers"[8].

Status of women is positively related with the education. G16 and G17 are related to the development of road facilities. Road have been instrument in breaking the

8. Visaria, Pravin, "Population Growth and Development in India - A Perspective for Eighth Plan". Yojna , Special Number 26, Jan. 10, 1990.

in the region "par take in these services". In present study, we have included 16 indicators of development of socio-economic infrastructure has been selected to measure the levels of development of socio-economic infrastructure. Selected indicators are :--

1. Length of surfaced road per 1000 sq.kms. (G16)

2. Percentage of villages connected by pucca road (G17)

3. Percentage of villages having medical facilities(G18)

4. Percentage of villages having postal facilities(G19)

5. Literacy Rate (G20)

6. Percentage of Female literates (G21)

7. Number of post-offices per lakh population (G22)

8. Number of hospitals and dispensaries per lakh population (23)

9. Number of Bank offices per lakh population (G24)

10. Bank deposits per capita (Rs.) (G25)

11. Percentage of villages having educational facilities (G26)

12. Number of colleges per lakh population (G27)

13. Number of High/Higher secondary schools per ten thousands population (G28)

14. Number of middle schools per ten thousands population (G29)

15. Number of primary schools per 100 population (G30)

16. Number of Hospital and dispensaries per thousands Sq. Kms. (G33).

Indicator G18, G23, G33 have been selected to represent the availability of medical facilities in an area. G18

isolation of rural areas and bringing them in close
contact with urban place. It enhances urban, rural
interaction. G19, G22 indicators represents the
development of communication facilities post-offices
have come to playan important role in the life of rural
people. The major function of the post-offices is to
establish the channel of communication between any
settlement and the most of the world. Banks are vital
financial institutions in any economy. Indicator G24
and G25 has been selected for availability of banking
facilities. Bank offices play a pivotal role in cater-
ing financial needs of the villagers through advancing
loans for agriculture and industrial development.
Despite, mobilisation and credit control are the two
important functions of banks which directly influence
the economic activity of a region.

1.4.3 Construction of Composite Index

Problem arises in composing different indicators
of development into one composite index of development.
Prior to seventies, scholars followed an approach involv-
ing aggregation of ranks of areal units. Ashok Mitra
in his study followed ranking method. In this method
ranks are given to different areal units for different
indicators and then add the ranks of each areal unit.

This method is simple but defective. Some scholars assign equal weights to different indicators based on it's importance in relation to other and scarcity, Since weights are assigned arbitrarily in this method, the biasness resulting from this procedure is unknown. If the weights are not properly derived the resultant index of development would be more dangerous than an unweighted index. An attempt has been made by scholars to overcome these shortcomings through the use of factor analysis technique.

In present study, first principal component technique has been choosen for measuring the levels of development. The principal component analysis, which is a branch of well known multivariate technique of factor analysis, is a relatively straight forward method of transferring a given set of variables or indicators into a new set of composite variables or principal components that are orthogonal to each other. It is designed primarily to synthesize a large number of variables into a smaller number of general component which retain the maximum amount of discriptive ability. Statistically, principal component analysis explicity takes into account of the problem of multicollinearity.

In India, M.N. Pal used first principal component
first time to analyse the level of development. After-
ward many scholars like Hamlata Rao, Mukherjee, K. and
S.K. Rao have used principal component. While construct-
ing composite index of development, it is necessary to
correct the two main problems i.e. removing biasness of
scale and determination of weights. The variables
choosen for working out composite index are measured in
different units and hence in general, not directly
additive. Biasness of scale can be removed by various
methods such as standaridization, division by standard
deviation, normalisation, division by mean and division
by an ideal value.

Principal component analysis technique has been
used at two states in the present study. Indicators
have been divided in subgroups in such a way that
within a subgroup, they have intercorrelation. The
first principal factor obtained from sub-groups and
then these First factor score of sub-groups treated as
a set of new variables and composited at the second
stage to obtain the composite index of socio-economic
development.

1.4.4 **Formation of Districts**

The study has been conducted at two point of time
i.e. 1970-71 and 1980-81. Since there has been changes

in administrative units over a decade so it becomes
difficult to compare the levelsof development. In
Haryana, there were seven districts in 1970-71 and
twelve in 1980-81. Five more districts were created by
dividing the old districts. Districts are generally
formed by extracting areas from one or two old districts.
In an attempt to make data compaable there may be two
methods, i.e. one may either club new districts into old
one or breakup old districts in new districts on basis
of population or area. In the present study, we have
calculated percentage of area added and area subtracted
from the districts during 1971-81. Next to this, values
of each indicator have been broken up according to the
percentage of area extracted or added. There was no
change in the administrative units (districts) in
Rajasthan during 1971-1981.

1.4.5 Classification of districts

For convenient and purposely analysis districts
have been claffified into high, medium, low and very low
category of development in terms of composite index
slabs in descending hierarchy referring to 1970-71.
If A, B, C and D denotes the lower limits of category
in descending order, than value of A and C obtained
as the mean value of the composite indices for districts
falling above and below the state arithmatic mean. The

value ofB obtained as the mean value of composite
indices for district which falls between A and the
state arithmatic mean. The value of D is obviously
the lowest value of composite indices across the
districts. This procedure of dividing districts into
four category of development followed in respect of
agricultural, industrial and socio-economic infra-
structure development. For 1980-81 also the same
category of development have been considered so that
one may analysis upward and downward movement made by
different districts during 1971-81.

1.4.6 Measurement of Regional Disparities

Regional disparities in the levels of socio-
economic development have been measured with the help
of simple co-efficient of variation. Coefficient of
variation (c.v.) has been calculated for the each
indicator of development. Since different indicators
of development have been composed into one index of
devvlopment therefore, disparities in the indicators
of development is a good measure of inter-district
variations. Co-efficient of variation (C.V.) calculated as:-

$$C.V. = \frac{\bar{X}}{\sigma} \times 100$$

$\bar{X}$ = mean value of the indicator

σ = standard dsviation of the indicator.

Co-efficient of variation has been calculated for two points of time i.e. 1971-81 for both state under study. It helps us in arriving at the conclusion that whether disparities decreased or increased over a decade and which state is marked by large disparities.

1.4.7 Limitations of the Study

The indicator selected under each of the three blocks are limited in number specially in case of industrial sector and it wouldn't always be able to articulate the forces underlying the development phenomena in its totality. The one most important problem of coverage or exclusion of different components of socio-economic infrastructure development' lies in the deficiency of the basic quant tative data. By the data available on socio-economic infrastructure one could not assess the impact of these infrastructure facilities on the levels of living of the people of any area. Classification of the districts merely on the basis of existing stock of infrastructure facilities doesn't show welfare of the people. Likewise in agriculture and industrial sector one could not examine that who is benefited by development of agricul ure and industry.

Owing to the changes in administrative units of Haryana during 1971-81.It was difficult to compare the

levels of development at two points of time. The
method applied in disaggregating the data according to
new units is not wholly satisfactory. Another problem
arises due to changes in the definition of workers
duringinter-census period, data regarding workers
is not comparable. Some of the indicators included
in the study are obviously no good substitutes for
direct measurement of economic activities, yet they
seem highly related to levels of socio-economic develop-
ment. There are, therefore, severe limitations on the
conclusionsthat can be drawn. It goes without saying
that further research should improve the finding of the
present study.

1.5 Organisation of the Study

The present study is organised in seven chapters.
Statement of the problem, objectives, hypothesis and
methodology employed are briefly indicated in the
introductory chapter. Introductory chapter also include
the choise of indicators, construction of composite index
and criteria of selection of indicators. The second
chapter consist of theoritical framework of regional
disparities, overview of literature on the topic. The
third chapter describes the special pattern in agri-
cultural development in detail. Spatial pattern of
agricultural development has been examined in relation

to physical and technological basis of agriculture in
the sample scale and composing the indicators of agri-
cultural development in an index of agricultural develop-
ment. An attempt has been made to analysis and compare
the levels of industrial development in Rajasthan and
Haryana in chapter four. In chapter five levels of
development of socio-economic infrastructure has been
examined. Chapter six includes an analysis to identify
the levels of socio-economic development in Rajasthan
and Haryana by composing composite indices of agricul-
tural, industrial and socio-economic infrastructural
development. An attempt has also been made to examine
the temporal, inter-state and intra-state disparities
in the levels of development of agriculture, industry
and socio-economic infrastructure. Some tentative
generalisations have also been sought in this chapter.
Chapter seven indlude the broad conclusions.

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Chapter II

DISPARITIES IN THE LEVELS OF SOCIO-ECONOMIC DEVELOPMENT :
A THEORITICAL DISCUSSION

2.   Introduction

India initiated the process of planned development
more than four decades ago with the First Five Year Plan
in April 1951. "The main purpose of the planning was
identified as to start the process of development which
can rise the standard of living of the mass and open out
new opportunities for a richer and more varied life"[1]
Since the first plan the specific objectives and goals
have been constantly changing or reviewed. However,
"the main objective of our planners has been to bring
about a structural transformation of the economy so that
a high and sustained growth, a progressive improvement in
the standard of living   of masses leading to the eradi-
cation of poverty and unemployment, provide the material
base for a self-relient socialist economy, can be achieved"[2].

Despite the Fourty years of sustained planned develop-
ment, the regional inequalities in the levels of development
have become pronounced in India. This may be attributed to
the fact that our planners in the early stages were more

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1.   Government of India, First Five Year Plan, Planning
        Commission, New Delhi, p. 142.

2.   Government of India, Sixth Five Year Plan, 1980-85,
        Planning Commission, New Delhi, p. 17.

concerned with attaining the higher level of economic
development. The scarcity of resources and producti-
vity of investment often made it imparative for decision-
makers to direct developmental efforts towards such
sectors of economic which were likely to give higher
and quick returns. The consideration of geographic
space as a relevant dimension of planning was cons-
picuous by its absence or one may say was submerged
under the overriding tide of sectoral considerations.
The result was further accentuation of spatial and
sectoral inequalities that India had received as a
legecy of nearly two hundred years of colonial rule.
It was in the third and fourth Five Year Plans that
one may observe attention being paid to develop the
backward and poor regions and initiation of programmes
for the development of weaker section of society and
rural areas. The Sixth Plan conceived of progressive
reduction in regional inequalities in the pace of
development and the diffusion of technological benefits,
besides laying emphasis on rural development.

Indian Planners became more concerned about the
regional inequalities in seventies and eighties, but
even then one has not succeeded in narrowing down the
gaps among the different regions in their levels of

development. India which has a large geographical area
and large population and a federal structure of govern-
ment, the emergence of political identity is natural.
Under such circumstances stubborn persistence of
marked regional inequalities in the levels of develop-
ment and well being is an annoying source of political
tension, as those being observed in certain parts of
India.

Over the years, a large number of regional
groups of people have been demanding separate "home-
land" or states for themselves. Within the state
demand for smaller districts are being made or
attempts are being directed towards redefine or
reorganising the districts boundary on the basis of
ethnicity, religion, language, or similar divisive
criteria. Among other things it may be due to the
increasing inequalities in the levels of development.
The people of backward or poor area feel that they
have been neglected for many years, or they are not
getting due attention as much as they should. The
idea that if they have a separate state or district
it will help in the development of that area as
gained substantial political support. People feel
that by doing so they will be in a position to obtain
their proper share of allocation made by central or

state government for developmental work and can utilise
it usefully. At times such ideas have taken the form
of a popular movements employing both the domestic
means and violence in order to press for the fulfilment
of their demands.

Before discussing some aspects of regional develop-
ment and regional disparities it will be useful to have
a look at what development is. The term development has
been used in different manners by different shholars.
Economists define development as a process whereby real
per capita income of a region increase substantially
over a time period. Economist present different indi-
cators of development such as the Gross Net Product,
per capita income, capital accumulation etc. Other
social scientists perceive development in a different
manner. Development is often referred to as the state
or condition of population defined territarially, and
 in this sense may be considered synonymous to the
concept of standard of living, social well-being or
quality of life. However, development implies improve-
ment, progress or change in a desirable direction.
"Development means improvement in material well-being
with social welfare of human life. This may be
achieved through increased productivity, availability

of infrastructural facilities and an equitable distri-
bution of the fruits of development among different
regions of the country"[3]. Development means creating
the conditions for the realisation of human personality.
Development involves reduction in poverty, unemployment
and inequalities. Development is person specific,
situation specific and time specific. Its specific
meaning undergo changes from time to time and country
to country[4] But generally the meaning of development has
been taken as the outcome of progress made in different
sectors of economy i.e. primary, secondary and tertiary.
Development entails a shift of labour force engaged in
primary sector to secondary and tertiary sector. The
economic activities related to primary sector reflect
their association with the rural living whereas those
of secondary and tertiary exhibits urban living. "The
process of development involves both social and economic
transformation not only at the macrolevel but also at
micro level"[5].

The levels of economic development of a region
has been conceived as the extent of people's command

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3. Misra, R.P., "Development Issues of Our Time,
Concept, New Delhi, 1985, pp.35-36.

4. Seers Dudley, "What are we trying to Measure?"
Nancy Baster (ed) Measuring Development,
The Role and Adequacy of Development
Indicators, Frankcass, London, 1972.

over material and immaterial wealth, which, when
optimally used, random optimal levels of economic
welfare[6]. In other words, it can be said that a
commond over more and more resources or factors of
production may be treated as an indicator higher
level of development. "Social welfare and living
condition of the people in general has been conceived
as well-being of the totality of the people actually
accruing from circumstances of less pressure and more
availability of consumable goods and services[7]. Scope
for choice and less inter-sectional disparities is
actual attainment of economic satisfaction reflect
higher level of welfare. However, higher level of
development does not necessarily reflect high level
of development benefits in terms of welfare since
there may be a wide gap between potentialities and
realisation of well-being resulting from nonoptimal
or sub-optimal distribution of economic opportunities.

The question of inequalities and social justice
can be introduced in a catch-phrase Who Gets What,
where and How. The 'who' refers to the individuals

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5. Tewari, R.T. The Changing patterns of Development
                  in India, Ashish, New Delhi, 1984, p.8.

6. OECD,   Regional Factor in Regional Development, Paris,
            1970, p.4.

7. Ibid, p.6.

or groups whose life experience may be unequal, the
'What' to the goods and bads which positive and negative
aspect of life are unequally distributed and where to
the territorial division upon which the enquiry is
based. The 'how& refers to the process by which the
who gets what where is arrived at"[8]. Individuals differs
from one another in many ways and characteristics
important in the understanding of inequalities will
depend upon the nature of society concerned. Some
societies generates marked distinction among individuals
with respect of economic, polotical and social status
and disturibute income, goods, services accordingly.

Population category for describing and explain-
ing inequality is an important aspect of understanding
the structure of society of the links binding together
individuals, groups and activities[9].

2.1 Spatial Disparities : An Overview of Literature

The question of regional and spatial disparities has
been the major concern of social scientists mainly eccno-
mists and regional scientists for quite sometime. In the

8. Smith, D.M., Geography, Inequality and Society,
       Cambridge University Press, London, 1987,
       pp. 8-10.

9. Op. Cit., pp. 40-45. Mishra, R.P., 1985.

context of developing countries   this concern has

been confronting serious challenges from the capitali-

stic and semi- feudal modes of economic organisation

prevailent them. The idea of regional development

originated with Stalin. Stalin wanted to develop

each region in Russia in such a way that in the event

of an invasion, the occupation of any region by

capitalist power might not cripple the economic

power of the country. So Strategic consideration

prompted Stalin to develop all regions equally.

Regional Development implies the fullest development

of the potentialities of an area according to its

capacity so that the benefits of the overall economic

development are shared by inhabitant of all regions.

Balanced regional development doesn't mean self-

sufficiency of each state of region. Neither it

means equal level of industrialisation nor a uniform

economic development for each region. Rather, it

means wide-spread diffusion of industries in backward

areas so far it is economically feasible.

Regional disparities and regional diversities are

generally being used interchangeably. But these two

terms are quite different in their meaning. "Differences

in initial resources endowments largely of a natural or physiographic character leading to territorial specialisation and division of labour through explotitation of resources, constitute the basis of inter-regional diversity, which is a concomitant of development. Inter-regional disparities on the other hand, denotes the failure of a region of exploit, its potentials of initial resources endowments; its latent comparative and absolute advantage in relation to another region. Consequently, the regional diversity is neither the basis nor the cause of the regional disparities[10].

Regional disparities are created by the spatial organisation of economic activities. Spatial organisat_ion is referred to as inter-connected locations, human (economic) activities in geographical space. Spatial organisation of economic activities is not the every-where. Spatial equalibrium theories are concerned with analysing the nature, mode, levels, evolution, functioning, elements and factors of the organistion of a given space. These theories attempted to present a generalised and probable explanation of the locational and interactional aspect of spatial system.

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10. Raza Moonis and Chattopadhya, B, "Regional Dis-
      parities in India , Analytical Framework
      and Indicators" Indian Journal of Regional
      Science, Vol. VII. 1075. n 1

A number of theoritical model have been developed to explain as to how an inter-locked and coherently arranged pattern of spatial locations evolve and as to how and why interaction take place in a space. Von Thunen was the first man who attempted to present a theoritical model to explain the organisation of agricultural activities in space. On the basis of some assumptions he constructed a model of land utilisation having a number of concentric belt around each town. Transportation cost was the major factor in his model and was proprotional to the distance.

Weber (1929) emphasised the cost factor in the location of industries first time. Christaller (1933) presented the theory of centre-place. His work remains even today unopposed as a coherent model of spatial organisation[11]. He was not much interested about what went on around the towns; he was interested in finding out the general principles which determine the number, size and distribution of human settlement urban and rural.

Losch (1954)[12] taking Christaller theory as a basis, build a hierarchy of centre place starting from

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11. Misra, R.P. Regional Development Planning in India: A New Strategy, New Delhi, Vikas, 1974, pp. 174-176.

12. Ibid, p. 177.

lowest order to higher order. He adopted two factors
in putting his model i.e. market area and market
demand. The effect of differences in market areas
of various goods may be due to variation in trans-
portation cost, possibility of exploiting economies
of scale and because of differences in demand structure,
is therefore, takes case of in a more refined way them
in Christaller's model.

Perrouxe (1955)[13] formulated theory of growth
pole. According to the growth pole theory, a system
of growth poles operate in a regional context. The
theory explains that each point centre has certain
economic activities or industrial establishment which
generate innovation and growth. These industries are
large, possess relatively progressive technology and
are characterised by more rapid growth. These poles
by generating a system of inter-linkage among various
industries cause growth to be generated in their
respective surrounding regions. Hence, these centres
promote economic development of a region and, therefore,
rightly termed as growth poles and growth centres.

Williamson (1963)[14] in his study concludes that
in the initial stage of development, regional inequalities

13. Tiwari, P.C., Regional Development and Planning in
        India, Criterion Pub., New Delhi, 1988,
        pp.6-7.
14. Williamson, J.G.,"Regional Inequality and Process of
        Development" Economic Development and
        Cultural Change, vol. XIII,No.4, 1965,p.1-4

are likely to increase more sharply due to a number of
disequalibrium effects. These disequalibrium effects
include an internal factor flow which tend to increase
regional inequalities. These forces are migration of
labour, capital, central government policy and inter-
national linkages. Hagarstrand (1967)[15] first time
formulated the theory of geographical diffusion of
innovation in order to explain and analyse the trans-
mission and spread of growth impulses in a region.
According to Haggarsstrand the development process
spreads in a region through a net work of different
order settlement arranged in hierarchic system.
Economic growth filter down from a higher order centre
. to lower order one and thus diffuses over entire
area in long run. Information and it's communication
is the key independent variable in the diffusion of
an idea, good or service.

Myrdal[16] studies the problem of geographical
coincidence and spread of economic development. Myrdal
advocated that the mechanism of the cumulative causa-
tion leads to regional disparities. "If things were

15. Op. Cit., pp. 11-12. Tiwari, P.C. 1988

16.. Myrdal Gunna, Economic Theory and Under Developed
Regions, London, 1967.

left to market forces unhamphered by any policy interfer-
ence, industrial production, commerce, banking, insurance,
shopping and indeed all those economic activities which
in a developing economy tends to give a bigger than average
return and is addition science, art, literature, education
and higher culture generally would cluster in certain
locations and regions, leaving the rest of country more
or less in a backward state". Myrdal identified two
types of forces which have advantages and disadvantages
for a region. He named the 'Backwash effects' to these
forces which help in concentrating of economic activit-
ies in some regions that is centripetal forces. He named
centrifugal forces as "Spread effects" which help in
spreading developmental activities outward from the
centre. He argues that economic development operates
in such a way that centripetal forces become stronger
and experience has proved that centrifugal and spontane-
ous transmission of growth doesn't occur.

Hirschman (1969) also dealt the problem in the
similar way as Myrdal did. But Hirschman was of the
view that the 'trickling down' effect ultimately will
gain upperhand over the polarisation forces. Hirschman
believes that the economic growth doesn't appear at every-
where at the same time and that once development starts,

powerful forces would make for a spatial concentration
of economic activities and development to the initial
starting locations[17]. He argued that "there can be
little doubt that an economy, to left itself to a higher
income level must and will first develop within itself"[18].
With the development occurring in geographical growth
points, the forces of pressure, tension and compulsion
will be active which will diffuse the process of economic
growth at subsequent points in the backward hinterland.

All these theories, models, dissussed above
indicate that the regional disparity is inherent
characteristic of process of development. Without
government interference the disparities cannot be
removed. Hence, in order to develop backward areas
a deliberate policy of intervention is necessary to
neutralise backwash effects.

Regional disparities, however, not a natural
phenomena. Rather, it is created by man, a deliberate
outcome of a particular development policy. The funda-
mental weakness of spatial organisation perspective is

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17. Hirschman, A.O., The Strategy of Economic Develop-
ment. Yale Univ. Press, London, 1958.

18. Ibid. p.20.

that, while recognising the importance of inter-depend-
ance of places, it largely fails to identify hww this
has arisen and how it actually function under specific
social, economic and political conditions. The poli-
tical economy perspective seeks fundamental under-
standing of the operation of an economic system and
it's associated political and social struôure. //

2.2 The Indian Situation

India got an uneven economic development at the
time of independence. The British government had deve-
loped only those parts of the country which were useful
in providing raw materials for their home industries
and from where they could rule over the country.₀   .
But after independence India government took steps in
successivp, Five Year Plan to reduce the regional in-
equalities. Before we study the trends in regional
inequalities, it is necessary to know the approach of
our government, towards the regional development under
Five Year Plans.

In the First Five Year Plan, planners expressed
their awareness of regional development problems parti-
cularly disparities in the levels of development but no
specific policy or programme was adopted. The Second
Five Year Plan observed, "In any comprehensive plan of

of development, it is axiomatic that the special needs
of less developed areas should receive due attention.
The pattern of development must be so devised as to
lead to balanced regional development"[19]. But due to
resource constraints no specific programmes were
envisaged in the second plan also. It points out
that " as development proceeds and large resources
become available for investment, the stress of the
development programmes should be on extending the
benefits of investments to underdeveloped regions;
only thus can diversified economy be built up[20].

The Third Five Year Plan's chapter on 'Balanced
Regional Development" may be considered as a major
policy statement on regional development. The Third
Five-Year Plan states that "balanced development of
different parts of the country, extention of the bene-
fits of economic progress to the less developed regions
and wide-spread diffusion of industry are among the
major aims of planned development"[21]. The Fourth Five

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19. Government of India, Second Five-Year Plan,
          Planning Commission, 1956, p. 36.

20. Ibid. p. 36.

21. Government of India, Third Five-Year Plan,
          Planning Commission, 1961, p. 142.

Year-Plan took cognizance of the natural tendency of
gravitating new enterprises and investment toward
already developed and overcrowded metropolitan areas.
A higher allocation of central assistance to backward
areas and promotion of industries were considered to
be the effective instrument of securing balanced
regional development. There was a gradual shift in
strategy of development from 'top down' to 'bottom
up' and industrialisation of backward areas and dis-
tinct planning were taken up on priority basis besides
launching various programmes on the basis of 'Area
Development' and Target Group' approaches. A new
dimension of social justice was added to the basic
objectives of development during the Fifth Five-Year
Plan. The Sixth Five-Year Plan aimed at, "a progress-
ive reduction in regional inequalities in the levels of
development and those in diffusion of technological
beñefits, besides laying emphasis on rural development"[22].

There are a large number of studies conducted by
various scholars. But these studies have been conducted
by using different methods of measuring disparities. Some
studies take per capita income into consideration while

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22. Government of India, Sixth Five-Year Plan,
              Planning Commission, 1980, p. 4.

other included a different method. On the basis of
methods used to measure the regional disparities in
development one may classify different studies into:
(i) income disparity, (ii) regional inequalities in
the levels of development; (iii) sectoral disparities
i.e. agriculture, industry and infrastructure.

2.2.1 Income Disparities : Most of the studies have
taken monetary aspect to measure the regional dispari-
ties. Monetary disparities include, per capita income,
expenditure, investment etc. V. Nath (1970)[23] in his
study made a critical analysis of India's policies
and programmes initiated to reduced the regional dis-
parities under the successive Five Year Plans. The
planners had specifically rejected large projects on
regional development consideration and insisted the
primary criteria for such location should be techno-
economic efficiency (as judged from the point of view
of National Welfare). They visualised that the handi-
caps of backward areas would be removed through expan-
sion of social services and infrastructural facilities,
development of agriculture and irrigation etc. An
analysis of state plan expenditure from which such
developmental work are financed does not show higher

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23. Nath, V., "Regional Development - Indian Planning",
        Economic and Political Weekly. Annual
        Number, Jan. 1970, pp. 242-260.

expenditure in backward areas. Indeed the most recent
trend appears to be towards significantly lower outlays
in poorer, backward states. The reasons for the trend
must be sought partly in area of policy and partly in
that of formulation and implimentation of programmes.

O.P. Mathur (1973)[24] in his study observed that
the regional inequalities increased in the initial
period of development and he supported the Williamson's
hypothesis of inverted 'U' shape of inequality. G.
Majumdar (1976)[25] in his paper found that disparities
in state per capita income have increased gradually or
steadily. The per capita income of Punjab and Haryana
as well as increase in their per capita income have
been much higher than other states and national average.
This had resulted the higher level of co-efficient of
variation as to the increase in the disparities over the
period. R.K. Sampath (1977)[26] in his study by using co-
efficient of variation in per capita income studied the

24. Mathur, O.P. "The Problems of Inter-regional Dispari-
     ties : The Indian Background". The Indian
     Journal of Regional Science, 1973.

25. Majumdar, G., "Inter-State Disparities in Income and
     Expenditure in India". Indian Journal of
     Income and Wealth, Vol.1, No.1, Oct. 1976.

26. Sampath, P.K., "Inter-State Inequalities in Income
     in India 1951-71". Indian Journal of
     Regional Science, Vol.IX, No.2, 1977.

changes of state inequalities in India during 1951-71.
He noted that there was a wide inter-state einequali-
ties in India at the beginning of planning era and
it declined steadily until 1964-65. Since than $u_p$to
1970-71, it increased steadily.

Prof. Raj Krishna (1980) in his G.L. Mehta
Memorial Lecture concludes on the basis of various
studies that inter-state disparities showed a small
decline during 1950s and in 60s and early 70s dis-
parities had been on an increase. He made another
observation of social reality that is the problem of
a few developed urbanised metropolitan regions in a
few states surrounded by a linked periphery and
beyond that the vast areas of backwardness. A.K.
Mathur (1983)[27] observed that after initial decline
there has been a continuous increase in regional
inequalities since 1955-56, though its pace was slow
during 1960s. Trends exhibited by primary and secon-
dary sectors are quite divergent. The agriculture
based primary sector displayed a marked narrowing
down tendency till the early 60s. Thereafter, regional
disparities in agriculture increased at a faster rate.
In case of industrial sector it was reverse to the

27. Mathur, A.K., "Regional Development and Income
        Disparties in India —A Sectoral Analysis

agriculture. Tertiary sector followed the pattern of primary sector. Since primary sector and tertiary sector have both displayed 'U' shaped behaviour and these two sectors account over three fourthof the value added, the aggregate behaviour of spatial per capita income disparities also displayed a broadly 'U' shaped pattern. Mathur's results are contrary to Williamson's hypothesis of inverted 'U' shaped pattern of regional inequalities over time.

R.H. Dholatia (1985)[28] observed in his study that the state product inequalities has increased during 1960-61 to 1979-80 not only in money term but also in real term . K.R.G. Nair (1985)[29] noted in his study that the country is still in the divergent phase of inverted 'U' shaped path. States like Punjab, Haryana, Maharastra, and Gujrat occupy all through the top four places with state of Bihar, Uttar Pradesh, Madhya Pradesh and Orissa being at the bottom. A.K. Singh (1985)[30] observed in his study that all the states of India have registered steady increase im total domestic production,

28. Dholatia, R.H., Regional Disparities in Economic Growth in India.Himalayan, Bombay, 1985.

29. Nair, K.R.G., "Inter-state Income Differential in India, 1970-71 to 1979-81", Misra, G.P. and Joshi, A. (eds) Regional Structure of Development and Growth in India, Ashish, New Delhi, 1985.

30. Ibid. p. 25.

though the difference in the rate of growth were quite
sharp. The entire period (1951-81) marked by high
unstability and variability in growth rates which have
increased over time.

M.V. Kapde (1987)[31] noted "degree of disparity
between poor and relatively better of state have
increased 1:0.7 in 1960-61 to 1:1.8 in 1969-70. The
ratio of the highest and lowest among major states
has increased from 1.9 (1960-61 to 3.14 (1983-84)."
Similarly, the disparity in per capita income of
highest and lowest state increase from Rs. 194 to
Rs. 2517 between 1960-1984.

All these studies show an increase in regional
inequalities in terms of per capita income, expendi-
ture, investment etc. Some differences have been seen
which may be attributed to the different methodology
adopted by different scholars to measure the regional
inequalities. Such type of studies do not reflect real
picture of development. These studies neglected the
very important aspect of development i.e. Distribution,
Welfare of the people also not taken into account.

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31. Kapde, M.V., "Regional Inequalities in India",
    Angrich, A.C. (ed.) Regional Economic
    Planning in India, Twenty First Century
    Pub., Meerut, 1987.

2.2.3 Sectoral Inequalities : Various studies have been conducted by different scholars to analysis and examine the disparities within the sectors of economy. There are large number of studies which have been conducted to analysis the disparities in the levels of agricultural development. We will get here an overview of some of the important studies. P.S. Sharma (1966)[32] by applying multiple regression studies the inter-district avariation in agricultural productivity in India. He finds that five factors are significant in explaining inter-district variation which are- average rainfall, gross area irrigated as percentage of gross cropped area, average size of holding, total cultivated area upto 5 acres and hired workers as percentage of total agricultural workers.

S.K. Rao (1971)[33] in his study identified difference in irrigation facilities in the country is the main reason of differences in agricultural growth. The regions with rich farmers experienced high or favourable growth. This is not so because rich farmers are investing more and bringing about growth, but because they have been able to induce more public investment wherever they are more powerful. C.H. Hanumantha Rao (1975)[34] observed that

32. Sharma, P.S., "Impact of Selected Aspected of Labour and Land in per acre Productivity". Indian Jorunal of Agricultural Economics, Vol. II(a), Jan.-March, 1966, pp. 31.41.

33. Rao, S.K., "Inter-Regional Variations in Agricultural Growth - 1952-53 to 1964-65 - A Tentative Analysis in Relation to Irrigation". Economic and Political Weekly, July 31, 1971.

inter-state disparities in production per hectare and production of major food crops per hectare experiencing technological change have widened, probably the new technology is bias toward promoting inequality among regions due to the emphasis on modern inputs which provide better response in areas having assured irrigation facilities.

G.S. Bhalla and Y.K. Alagh (1979)[35] noted in their study that regional disparities increased during 1960s. R.T. Tewari and N. Singh (1985)[36] by using a number of indicators of agricultural development found the dualistic structure of agricultural development in terms of developed and developing states which existed in India during 1970-71, remained almost same during the year 1980-81. In developing states, the value of agricultural produce per hectare of net sown area recorded was comparatively low on account of improper follow up of technological immavations.

34. Rao, C.H. Hanumantha, Technological Change and Distribution of Gains in Indian Agriculture. McMillan, New Delhi: 1975.

35. Bhalla, G.S. and Alagh, Y.K. Performance of Indian Agriculture - A Districtwise Study. Sterling, New Delhi : 1979.

36. Tewari, R.T. and Singh, N. "Development and Productivity in Indian Agriculture : A Cross Section Temporal Analysis", Indian Journal of Regional Science, Vol. XVII, No.1, 1985.

V.N. Misra (1985)[37] concluded in his study that there was convergence of inter-state disparities in gross value of output during 1962-63 to 1972-73. However, the period 1972-73 to 1980-81 showed the divergent trend.

G.S. Bhalla and Tyagi, D.S. (1985)[38] noted in their paper that north-western state mainly Punjab, Haryana and Western Uttar Pradesh contribute as much as 51 per cent of total incremental output. They observe wide spatial variation with regard to the accrual of additional output in various parts of India. North-eastern regions did worse in terms of incremental output. Green Revolution concentrated in a few regions of India creating large regional variations in agricultural development.

The regional disparities in industrial development are more pronounced in the developing countries because they are in the early stage of industrialisation. This is partly due to the lack of resources and

37. Misra, V.N., "Some Aspect of Inter-State Dispari-
ties in Cross Value of Output per Hectare 1960-61
to 1980-81", Misra, G.P. and Joshi, A. (eds)
Regional Structure of Development and Growth in
India, Ashish : New Delhi, 1985.

38. Bhalla, G.S. and Tyagi, D.S., India : The Emerging
Challenge". Paper presented in the Honour of
Prof. V.K.R.V. Rao at the Institute of Social
and Economic Change, Bombay, 1988.

partly due to the tendency to locate new industries
in the easy areas or in areas which could generate
some pressure on the decision-makers. In India
disparities in industrial developmentare average.
Historically, the cities of Bombay, Calcutta, and
Madras has large industries and this resulted in the
concentration of industries around these cities.
R.S. Bawa and M.K. Sharma (1985)[39] in their study
noted that to reduce industrial variation in indust-
rial development, basic infrastructure is most import-
ant factor followed by government efforts, technical
efforts etc. Basic infrastructure is the most
important factor in explaining inter-district varia-
tions in the industrial development.

B.K. Bajpai (1985)[40] in his study observed that
magnitude of inter-regional disparities in industrial
development which was 73 per cent (in terms of co-
efficient of variation) in 1969 reduced to 67 per cent
in 1977. The range between highest and lowest ratio
whichwas 245.31 in 1969 also decreased to 238.27 in 1977.
The states of Maharastra, West Bengal, Haryana, Gujrat

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39.   Bawa, R.S. a nd Sharma, M.K., "Sources of variations
          in Industrial Development in Punjab". Indian
          Journal of Regional Science, vol. XX, No.2,
          1983, pp. 46-54.

40.   Bajpai, B.K.,   "Inter-regional Industrial Disparities
          in India". Misra, G.P. and Joshi, A., (eds)
          Regional Structure of Development in India,
          vol.I, Ashish, New Delhi, 1985.

and Tamil Nadu which could be designated as industrially
developed state in 1969 are also found to have maintain
their status quo during 1977 also in per capita indus-
trial output.

The infrastructure facilities play a catalytic
role in the process of development. Hence great
emphasis should have been placed on the infrastructural
facilities like power, transport, communication, health
and education etc. in the programmes of economic develop-
ment. "Inspite of various schemes implemented under the
successive Five-Year Plan for the development of the
country, all regions have not attained equal and in
some cases even the minimal standard so far"[41]. B.M.
Joshi (1987)[42] noted wide disparties in the development
of infrastructural facilities in Uttar Pradesh and also
noted close relationship between infrastructural develop-
ment and regional development. Irrigation in case of
agriculture and banking in case of industry turn out to
be the most important factors affecting the levels of
development. S.S. Verma and S.K. Puri (1988)[43] observed

41. Prakash, S., "Regional Inequalities and Economic
     Development with Special Reference to Infra-
     structural Facilities in India". Indian
     Journal of Regional Science, vol· X, No.2, 1973.

42. Joshi, B.M., "Infrastructure and Regional Imbalances
     in Uttar Pradesh : An Inter-district AAnalysis".
     Indian Journal of Regional Development, vol.
     No.2. 1987.

in their study that the impact of the infrastructural
facilities and services is quite high in regional
development. Levels of agricultural and industrial
development are significantly correlated with the
levels of infrastructure development.

2.2.3 Regional Inequalities : There are some studies
which have used a large number of indicators of develop-
ment to measure the inter-state or inter-district levels
of development. One of the first such attempt was made
by Ashok Mitra (1961)[44]. He classified the districts
of India into four categories of development. His study
brings out the fact that the modern manufacturing
activities concentrated in the districts at the top
level of development. Similar differences at district
level were also observed in the field of agricultural
development.

M.N. Pal (1973)[45] used the principal component
analysis in order to measure the level of development

43. Verma, S.S. and Puri, S.K.,"Spatial Pattern of
          Infrastructure Facilities and Regional
          Development - A study of Rohilkhand Plain,
          Uttar Pradesh". Indian Journal of Regional
          Science, vol. XX, No.2, 1988.

  . Mitra, A.,"Levels of Regional Development in India",
          Census of India, 1961, Vol. I, Part 1-A(I).
     Pal, M.N., "Regional Disparities in the levels of
          Development in India", Indian Journal
          Regional Science, vol. VII, 197-

by taking 17 indicators of development. He classified
the districts as developed and less developed. He
concluded that states like Punjab and Kerala were
developed as a result of improvements in the agri-
cultural sector and associated activities such as
agro-industrial projects. Maharastra, Tamil Nadu,
and Gujrat are marked by non-agricultural development
compared to complimentary agricultural development.
All underdeveloped states, in general, had low level
of non-agricultural development. Underdeveloped
states also had low agricultural development except
in some areas in the humid and hilly states of Assam,
Jummu and Kashmir and coastal areas of Orissa.

B.N. Ganguli and D.B. Gupta (1976)[46] have examined
inter-state variations in thelevels of living during
the period 1955-65. ?Their composite indices for 1965
shows a variation from 57.0 in Bihar to 186.3 in Punjab.
According to this study Panjab, Tamil Nadu, Maharastra,
Kerala and West Bengal show highest level of living
while Bihar, Uttar Pradesh, Madhya Pradesh and Andhra
Pradesh indicate the lowest level.

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46.   Ganguli, B.N. and Gupta, D.B., Levels of Living
            In India. S. Chand & Co., New Delhi,
            1976.

S.B. Gaikwad and S.K. Misra (1979)[47] found in
their study that agriculture was not helpful in
improving the levels of living of the people and
industrial development was helpful, fruitful to the
people. They suggested the need of land reforms and
development of industries at different scale in back-
ward areas besides infrastructural development.
Hemlatha Rao (1984)[48] using principal component
analysis technique measured the disparities in the
levels of development in India. She concluded that
the disparities in India are declining.

It has been noted through out the literature
survey of regional inequalities that there exist
intra-stregional or inter-regional in inequalities
in India and it has increased over the time.

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47. Gaikwad, S.B. and Misra, S.K., "Impact of Economic
Development on Welfare and Living Conditions
of People of Madhya Pradesh; An Inter-District
Case Study". Indian Journal of Regional Science,
vol. XI, No.1, 1979, pp. 25-35.

48. Rao, Hemlatha, Regional Disparities and Development
in India. Ashish, New Delhi, 1984.

Chapter III

LEVELS OF AGRICULTURE DEVELOPMENT

. Introduction

The primary objective of this chapter is to analyse the spatial pattern of agricultural development in the sample states for the year 1971-81. In order to measure the level of agricultural development, the following indicators have been selected[1] :

Table III.1

Indicators of Agricultural Development

1. Percentage of Gross Irrigated Area to Gross Cropped Area (G1)

2. Irrigation intensity (G2)

3. Cropping intensity (G3)

4. Percentage of area under commercial crops to Gross Cropped Area (G4)

5. Number of electric pumpsets per 1000 hectare of Net Sown Area (G5)

6. Consumption of fertilizer per 100 hectare of Gross Cropped Area (G6)

7. Productivity per hectare (in Rs.) (G7)

8. Number of tractors per 100 hectare of Net Sown Area (G8).

Among the indicators mentioned above, excepting productivity and area under commercial crops, all are inputs in agriculture. Irrigation may be considered as

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1. The choice and rationale of indicators have been discussed in Chapter I.

the most important input in modern farming practices. Variation in irrigational facilities may be one of the major causes of regional disparities in the levels of agricultural development. Consumption of fertilizer is dependent on irrigation facilities. Productivity per hectare is the end product of all inputs mentioned above, which may also exhibit the performance of agriculture. Commerialisation of agriculture occurs at a relatively later stage in the process of agricultural development, and may be considered to be an important indicator pertaining to the market orientation of agriculture. This may also subsume its linkages with the other sectors of economy such as the manufacturing and tertiary sectors.

Agriculture plays an important role in the process of economic development of a country. Agriculture being a dominant sector of economy in developing countries provides large employment to their population and it accounts a large share in the national income. The process of economic development requires shift of a large number of redundant rural workers to non-agricultural sectors. Substantial industrial development is necessary if the pressure of redundant rural workers is to be taken-off from agriculture so that those who

remain in agriculture are in a position to reorganise their farms into more efficient, large scale mechanised operational units. The poverty in developing countries is a consequence of low productivity of agricultural workers[2].

Some Indian scholars in their studies observe that the process of economic development leads to fundamental changes in the structure of the economy. In the light of the growth of the non-agricultural sector, the proportional contribution of agriculture in the national income declines whereas that of the manufacturing sector increases. The share of service sector either increases slightly or remains constant in the early phase of industrial development and may became the most important sector at a much later stage when development in agriculture and industry has reached their full possibilities of expansion. These changes take place due to income elasticity of demand for food and the nature of technological changes[3]. V.K.R.V. Rao[4] made an attempt to identify the changes in Indian Economy by using National Accounts Date for 27 years. He took data on

2. Nicholas, W.H., "The Place of Agriculture in Economic development". C. Eicher and LIW, Witt (eds) Agriculture in Economic Development, McGraw Hill, New York, 1964, p.40.

3. Kuznet, Simon, Six Lectures on Economic Growth, Free Press of Glencoe, New York , 1961.

constant price for three sub-periods. He concludes that there has been a significant change in the structure of the economy with the share of primary sector to National Domestic Production at constant prices falling in each of the three sub-period covered by the year 1950-51 to 1976-77, while the share of tertiary sector had arisen during all the sub-periods, that of the secondary sector had fallen marginally in the first sub-period and risen in the second and third sub-period.

Agriculture development may contribute in the overall economic development through many ways. But the most important way through which increased agricultural output and productivity contribute to overall development may be summarised in the following four propositions[5].

1. Economic development is characterised by a substantial increase in demand for agricultural products and failure to expand food supply in pace with the growth of demand can be a serious impedement in the process of economic growth.

4. Rao, V.K.R.V., "Changing structure of Indian Economy As been through National Account Data". _Economic and Political Weekly_, Pg·14-50 15 Dec, 1979.

5. These four propositions are mainly taken from Johnson, B.F. and Meller, J.W., "The Role of Agriculture in Economic Development". _Readings in the Economics of Agriculture_. The American Economic Association, London, 1969, pp.359-375.

2. During the early stage of economic development rural
    population form a substantial proportion of the home
    market for industrial goods. Agriculture development
    leads to increase in per capita income of rural
    people which in turn increases the purchasing power
    of rural population for consumer goods.

3. Agriculture beings a dominant sector of economy in
    the developing countries, can make a net contribu-
    tion to the capital required for social and economic
    overheads and expansion of industry. It provides
    ch ap labour for manufacturing and other related
    sectors.

4. Increased agricultural production may be exported to
    other countries and it may be a good source of earn-
    ing foreign exchange in the early stages of develop-
    ment. Nations may find themselves economical in
    importing food products. In case these nations
    develop their agriculture so as to meet their need,
    they can save foreign exchange which inturn may
    become capital for industrial development.

    On the other hand, industrial development also
helps in the development of agriculture. In order to
develop agriculture one may need modern inputs such as

mechinery and implements, fertilizers, pesticide and others which are largely obtained from the industrial sector. Industrial development increases aggregate financial resources and creates more effective financial institutions, some of the benefits of which goes to agriculture.

It is not necessary that agricultural development leads to industrial development. It has been seen that increased agriculture production and thereby increased income led farmers to non-productive expenditure patterns such as in the area of conspicous consumption i.e. spending lavishly on marriage and other social ceremonies etc.

However, one may safely state that under all circumstances, increased agricultural productivity make an important contribution to general economic development and that within considerable limits agricultural development is one of the preconditions which must be established before a take-off stage, only after that self-sustained economic growth they may become possible[6].

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6.   Rostow, W.W., Stages of Economic Growth - A
          Non-Communist Manifesto, Cambridge, London,
          1969.

3.1   Indian Agriculture and the New Farm Technology

Technological innovations generated the process for modernising Indian agriculture. The introduction of new biochemical farm technology around 1966, initiated the phase of transformation of farm economy from subsistence level to commercial farming. However, the pace of modernisation in Indian agriculture has not been uniform in time and space[7]. At the farm level rate of adoption of new techniques shows different response. The reason is not difficult to see while the new technology scale neutral, it is also capital intensive. Therefore, it may be equally productive in farms large or small, but it's adaption by small farmers is constrained by inadequate supply of finance owned or borrowed, to meet the requirement of capital using technology[8].

Desai (1971)[9] and Sen (1974) hypothesized that wheat seed respond better than either rice or jawar to

7.   Sebeastian, M. and Stanislam, W. "New Farm Technology and Income Distribution", Ashok, New Delhi, 1984, pp. 3-4.

8.   Trivedi, H.K. and Joshi, B.H., "New Farm Technology and Income Distribution". Deep & Deep, New Delhi, 1986, p.23.

9.   Desai, Gunvart, "Some observations on Economics of cultivating high-yielding varieties of Rice in India". Artha Vikas, vol. VII, No.2 , 1971.

supporting inputs (such as irrigation and facilizers) which are an integral part of the package of new technology. Desai further claims that Punjab and Haryana adopted the imported wheat strain to local Indian condition, a process facilitated by the geographical concentration of wheat producing states and consequently similar eco.ogical conditions.

The impact of Green Revolution has not been felt uniformly. Even in states such as Punjab, Haryana and Western Uttar Pradesh which were the favoured reciprocal of the package of the new farming technologies, disparities in agricultural development persist. A few scholars have argued that as a result of the green revolution in these states new forms of disparties have emerged while the older ones have not fully perished. It has been suggested by some scholars that Green Revolution has contributed to widening of the disparties in the levels of State Demostic Production of different states. Green Revolution is also responsible for widening the gap in income and wealth among different category of farmers (i.e. large and small)[10].

Increase in the disparities in income distribution among various categories of farmers has been

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10. Bhalla, G.S., Changing Structure of Agriculture in Haryana : A Case Study of Import of Green Revolution 1966-70. Govt. of Haryana, Chandigarh, 1972, p.88.

explained by the fact that large farmers possessed the

necessary resources to adopt new technology and capacity

to be risks and uncertainities involves in shifting to

new varities of seeds and in methods of cultivation in

contrast to small farmers who suffered from inadequacy

of resources and other restraints[11]. "In so far as the

success of HYV's programme depends on the ready and

adequate availability. A credit, access to know how,

market etc..... and in so far as these are positively

related to size of holding, the H.Y.V.'s may benefit

richer farmers to a great extent than the poorers ones"[12].

The New Technology has induced growth rate of

output only in those regions which were already developed

owing to their better resources positions and infrastruc-

tural such as irrigation and transport networks. With-in

these developed regions the benefits of new technology

went to the farmers which were already well-off. It has

also been observed that horizental (regional) disparties

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11. Rapporteur's Report on "Economic Aspect of High
    Yielding Varieties and Programmes". Indian Journal
    of Agricultural Economics, vol. XXIII, No.4,
    Oct.-Dec. 1968.

12. Dandekar, V.N. and Rath, Nilakantha, Poverty in
    India, Indian School of Political Economy, Poona,
    1971, p.65.

has increased more than vertical disparities[13]. Apart
from the differences factor endowment in major and
medium irrigation projects which has a greater effect
in reducing regional disparties, lagged behind the
private investment in well-irrigation which have a
potential for widening regional disparties.

Various studies have been conducted concerning
the employment effect of the Green Revolution. New
technology may be divided in two parts (i.e. biological
and machenical). Biological technology which includes
irrigation, fertilizer, HYV's etc. is labour absorbing
because HYV's mature faster , multiple cropping is
enabled, land clearing, soil preparation and other
field activities need more labour. On the other hand,
some studies have shown that mechnisation leads to
displacement of labour.

Chawala J.S. et al. (1972)[14] noted in their
study that the "employment of family labour increased
at almost the same pace as that of casual labour in

13. Rao C.H. Hanumantha, Technological Change and
       Distribution of Gains in Indian Agriculture.
       McMillan, New Delhi, 1975.
14. Chawala, J.S. et al., "Rural Employment as
       Influenced by Technological Changes". Indian
       Journal of Agricultural Economics, vol. XXVII,
       No.4, pp.198-206.

both the small and large land holdings, but it
increased to a much smaller extent on the medium
holdings where the permanent hired labour appears
to have increased to greater extent than as other
holdings". B.S. Rathor and K.V. Subramanyan (1972)[15]
have attempted to estimate the effect of Green Revolu-
tion on farm employment in Rajasthan with reference
to the past performance and the target for 1973-74
with respect to the introduction of HYV's will increase
the total labour input and that the hired labour input
would increase to a great extent than family labour.

Punjab and Haryana where the new technology
adopted extensively face shortage of labour particu-
larly at peak season. Shortage of labour has caused
rise in real wages causing labour migration from
surplus regions. The new technology might have
generated additional employment through increase in
demand of agricultural inputs specially produced in
non-agriculture sectors as well as increased demand
for rural and goods of consumption following the
increase in farm incomes.

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15. Rathor, B.S., "Farm Employment and Green Revolution
in Rajasthan". Indian Journal of Agricultural
Economics, vol. XXVII, No.4, p.233.

Though it is difficult to analyse the benefits of Green Revolution among different categories of farmers, due to non-availability of sufficient data, studies have indicated that spatial disparities have arisen as a result of adoption of new farm technology which has been differential over space. One may, therefore, state that the regions experiencing green revolution have brought in marked spatial or regional disparities.

3.2 The Physical and Technological Basis of Agricultural Development in Rajasthan

3.2.1 Physiography : Since agriculture development is greatly affected by physical factors such as physiography, climate and soils etc. so it will be useful to obtain the physical characteristics and basis of agriculture in Rajasthan and Haryana.

Rajasthan comprisis mostly of the dry sandy desert. But it has fertile plains, plateaus and forest clad hills. The Araveli system of mountains runs from north-east to south-west almost across the entire state separating the desertic Rajasthan lying to the West of the Aravalis from the eastern plain. South-eastern part of the state is transversed by many rivers, although none of them are perennial. In some parts there are wide fellows, fertile table lands and great streches of soil.

Fig. III.1

RAJASTHAN
ADMINISTRATIVE DIVISION
(1981)

GANGANAGAR

BIKANER   CHURU   JHUNJHUNU

SIKAR   ALWAR

NAGOUR   BHARATPUR

JAISALMER

JAIPUR

JODHPUR

TONK   SAWAIMADHOPUR

BARMER   PALI

BHILWARA   BUNDI

CHITTORGARH   KOTA

JALOR   SIROHI

UDAIPUR   JHALAWAR

DUNGARPUR

BANSWARA

—·—·—·—INTERNATIONAL BOUNDRY
—·—— —·STATE BOUNDRY
················DISTRICT BOUNDRY

kms 50 0   50 100 150kms

Source : Census of India 1981.

Fig.III.2

RAJASTHAN

RELIEF AND DRAINAGE

BOUNDARY, INTERNATIONAL
     „   STATE
RIVER
WATER BODIES

GENERALISED RELIEF

900 (m)
600
300
150

Source : Census of India, Regional Division
of India- A cartographical Analysis
series -I, Vol.XVIII, Rajasthan 1981.

3.2.2   Soil : Distribution of soil in accordance with
their sub-order associations shown in Fig. 3.3 is based
on the soil map of India, published in 1983 by the
National Bureau of Soil Survey and Land Use Planning
(ICAR)[16]. The soil of the state have been grouped into
seven major classes and twenty two sub-order associations
which are given here-under with their characteristics.
Uslalfsochrepis-. In this soil group the soil associations
have high status found in red, brown and shallow black
colors with texture of loamy, sandy and alluvial and
correlate to some extent with the alluvial soils of
northern regions. In Rajasthan it is found only in the
northern part of Nohor Tehsil of Ganganagar District.

(ii) Orthids-Pramments, Orthids-erthents, Orthids-Argids
and Orthids-Fluvents : The soils of these associations
are spread over the parts of the districts of Ganganagar,
Bikaner, Churu, Jhunjhunu, Alwar, Sawaimadhopur, Jaipur,
Sikar, Ajmer, Tonk, Jaiselmer, Jodhpur, Nagaur, Pali,
Barmer, Jalor and Sirohi. The soils are of the arid
region with some development, recently formed with clay
accumulation in lower horizon having texture sandy and

16.   The map showing soil distribution has been obtained
      from Census of Atlas of Rajasthan, 1981.

Fig.III.3 67

RAJASTHAN

SOILS

Source : Census of India, Regional Division of India-
A cartographical Analysis series-I, Vol.XVIII
Rajasthan 1981.

Fig.III.4   6ठ

RAJASTHAN

NORMAL MONTHLY & ANNUAL
RAINFALL

ANNUAL RAINFALL IN MILLIMETRES

	1000
	900
	800
	700
	600
	500
	400
	300
	200

BOUNDARY, INTERNATIONAL — · — · —
STATE — · — · —

Source : Census of India, Regional Division of India-
A cartographical Analysis series-I, Vol.XVIII
Rajasthan 1981.

alluvial. This sort of soils are available in the West of Aravali range from north to south in a large single pocket. Aquentle, Flavents - These soils are observed in chambal revines tract in the east of Dholpur town and in the south of Rajkhra town. These soils pose hydromorphic alluvial texture and are recently formed with recent alluvium.

3.2.3 **Climate :** On the basis of climate conditions one may divide Rajasthan into three parts[17] :

(i) The arid west - Characterized by very low, erratic, large seasonal variations rainfall. The rainfall decreases from weast to west and from south-west to north-east and variability increases in the same direction.

(ii) The Humid East - Comparatively good rainfall which occurs during Monsoon season.

(iii) Semi-aid region - The presence of water bodies in the form of lakes in this region exercise moderate influence over the climate of this region.

On the basis of water resources Rajasthan can be divided into four regions namely (i) the dry belt comprising the district of Churu, Bikaner, Jaiselmer, and parts of Barmer and Jodhpur: (ii) The semi-aid belt comprising of the

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17. Census of India 1981 - <u>Regional Division of India-</u> <u>A Cartographic Analysis, Series-1,</u> vol. XVIII, Rajasthan, p.32.

district of Sirohi, Pali, Sikar, Jhunjhunu, parts of
Barmer and (iii) Hilly tract comprising of the district
of Udaipur, Banswara, Chittorgarh and parts of Kota,
Bundi and Jhalawar and (iv) the central tract compris-
ing of district of Jaipur, Alwar, Bharatpur, Tonk and
parts of Kota[18]. Rainfall is scanty in the western
parts of Rajasthan. In the desert area it is very
low, highly erratic and varies seasonally as well as
yearly. The rainfall decreases from east to west and
from south-west to north-east and variability increases
in the same direction. In the Eastern region of the
state, the rainfall occurs generally during the
monsoon period[19].

Rajasthan remains one of the most backward states
in the country. In terms of contribution of agriculture
to state domestic production, agriculture share has
decline over the time period it was 62.6 per cent in
1973-74 which came down to 59 per cent in 1988-89[20].

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18. Directorate of Economic and Statistics, Rajasthan,
    Twentyone years of Rajasthan Economy, Jaipur,
    1975, p.35.

19. Op. Cit. p. 22. Census of India, 1981

20. National Council of Applied Economic Research.
    "Perspective Plans of Rajasthan 1974-89, vol.II,
    New Delhi, 1980.

The relative beckwardness of Rajasthan may be due
to low rainfall and frequent draughts which affects the
productivity of the land and its people. There are
other social-economic and historical factors which are
also responsible its underdevelopment today[21].

During the period 1960-61 to 1973-74, the net
product of the country grew at an annual compound growth
rate of 3.2 per cent, whereas the State Domestic Produc-
tion of Rajasthan has increased at 2.94 per cent per
annum. The growth rates of different sectors during
later half of the period i.e. 1966-67 to 1972-73, showed
that the overall performance is slightly better than
that of all India. The agriculture sector has shown a
relatively high rate of growth (2.94 per cent) compared
with that of all India (2.13 per cent)[22]. During the
same period, the transport and communication sector
also registered higher rates of growth compared with
that of national economy.

The share of agriculture sector is the State
Domestic Production had decreased from 56 per cent to
52 per cent during the period 1960-61 to 1973-74, and

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21. Ibid. p. 24.

22. Op. Cit., p. 25. NCAER

that of mining and manufacturing sector increased.
Agriculture is one of the primary sources of employ-
ment in Rajasthan. Rajasthan is still backward in
agriculture. The reasons are simple which may be
cited here as age-old fuedal system of land ownership
difficult climatic condition, illiteracy and social
backwardness. Means of irrigation are limited and
cultivation depepds upon mainly on rainfall.

3.2.4 Technological attributes : Well irrigation is
the main source of irrigation in Rajasthan. During
1956-59 about 60 per cent of net irrigate area was
under well irrigation, and 20 per cent was under
canal irrigation (Table III.2). During 1974-77 area
under well irrigation decreased and increased in case
of Canals irrigation. But still well irrigation is
the main source of irrigation.

Table III.2

Rajasthan : Area Irrigated by Source

Source	Area Irri-* gated (1956-59)	Percentage to net irrigated area	Area Irri- gated (1974-77)	Percentage of net irri- gated area
Canal	308.37	21.45	878.35	33.70
Tanks	244.50	17.0	212.53	8.36
Wells	864.30	60.13	1478.86	56.86
Others	19.90	1.90	26.18	1.01.

Districtwise position of irrigated areaa by different sources for 1976-77 is that Ganganagar, Kota, Bikner and Bundi have relatively more than the state average of irrigated area by Canals. Other districts, where canal irrigation is more than 20 per cent of the irrigated from all sources are Swaimadhopur and Tonk. Less than 1 per cent canal irrigation is found in Jaiselmer, Nagaur, Jhalawar and Sikar districts. In respect of area irrigated by tanks, ten districts.viz., Banswara (40.76 per cent), Bhilwara (34.36 per cent), Ajmer (26.88 percent), Dungarpur (37.97 per cent); Udaipur (21.03 per cent), Tonk (13.04 per cent), Sirohi (14.03 per cent), Chittorgarh (14.12 per cent), Pali (21.8 per cent) and Bundi (10.18 per cent), share a greater percentage of tank irrigation than state (6.85 per cent). There is neglible tank irrigation in Bikaner, Churu, Ganganagar and Jaiselmer districts[23].

Jaiselmer has the highest percentage of total irrigated area under tubewell irrigation followed by Bharatpur (17.75 per cent) and Jodhpur 14.31. Other district which has more than state average (1.25 per cent) of tubewell irrigation is Nagaur 2.46 per cent. In all

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23. Statistics mentioned above are largely taken from NCAER, Perspective Plan of Rajasthan, 1974-1989, vol.I, p.40.

except the three districts. Banswara (42.87 per cent),
Bundi (27.56 per cent) and Kota (18.56 per cent), the
percentage of area irrigated by wells was more than
state average of 55.73 per cent. There is no well
irrigation in Bikaner and Ganganagar district.

It is clear from the above districtwise analysis
of irrigated area by source of irrigation that well
irrigation has the highest percentage of total irri-
gated area in Rajasthan followed by canal irrigation
(33.77 per cent); tank irrigation (6.85 per cent) and
tubewell irrigation (1.25 per cent).

3.3 Levels of Agricultural Development in Rajasthan 1971-1981 - An Spatio-temporal Analysis

Before constructing composite index of agri-
culture development of Rajasthan it is necessary to
obtain the patterns of spatial distribution of agri-
cultural inputs. Out of eight indicators of develop-
ment, four indicators have been considered for spatial
distribution of other indicators over space. Table III.3
gives districtwise percentage of irrigated area to
gross cropped area 1981.

Table III.3

Rajasthan : Percentage of irrigated Area to Gross Cropped Area 1981

Percentage of Irrigated Area	Number of Districts	Name of the Districts
40 and above	4	Bundi, Ganganagar, Jaipur, Bhilwara.
40-30	5	Alwar, Ajmer, Pali, Sirohi, Udaipur.
30-20	7	Bharatpur, Sawaimadhopur, Sikar, Tonk, Jalor, Chittorgarh, Bundi, Kota.
20-10	3	Jhunjhunu, Dungarpur, Jhalawar
10 and below	7	Bikaner, Churu, Jodhpur, Nagaur, Jaiselmer, Barmer, Banswara

Analysis of table 3.3, reveals that district Bundi, Ganganagar, Jaipur, Bhilwar, have higher percentage of area irrigated whereas districts Bikaner, Churu, Jodhpur, Nagaur, Jaiselmer, Barmer, Banswara have very low percentage of area under irrigation. District Alwar, Ajmer, Pali Sirohi, Udaipur have 30-40 per cent area under irrigation. The districts having higher irrigated area are mainly those which recieve good rainfall and other districts which have no irrigated area encountered in the North and North-western part of the state, which is of desertic climatic conditions except Ganganagar district.

Table III.4

Rajasthan : Growth of Irrigated Area 1971-81

Growth (per cent)	No. of District	Name of the Districts
240 and above	3	Bikaner, Jhunjhunu, Sikar.
240-120	5	Barmer, Jalor, Nagaur, Churu, Alwar.
120-60	4	Banswara, Jodhpur, Jaipur, Jaiselmer.
60-30	7	Pali, Sirohi, Ganganagar, Sawaimadhopur, Bundi, Kota, Tonk
30 and above	7	Ajmer, Chittorgarh,Jhalwar, Dungarpur, Udaipur, Bharatpur, Bhilwara

In respect of growth irrigated area district Bikaner, Jhunjhunu, Sikar, Barmer, Jalor, Nabaur, Churu, Alwar, experienced high growth. Growth in irrigated area of Bikaner, district is very high because of the irrigation facilities extended by Rajasthan canal. In other districts developments in irrigation facilities may be attributed to increase in number of electric pumpsets. On the other hand,, Ajmer, Chittorgarh, Jhalwar, Dungapur, Udaipur, Bhilwara has experienced low growth during 1971-1981.

Table III.5

Rajasthan : Number of Electric Pumpsets per Thousand hectare of Net Sown Area 1981.

Number of Electric Pumpsets	Number of Districts	Name of the Districts
40 and above	2	Jaipur, Chittorgarh.
40-20	5	Alwar, Sikar, Sirohi, Bhilwara, Udaipur.
20-10	10	Jhunjhunu, Bhartpur, Sawaimadhopur, Ajmer, Pali, Jalor, Dungarpur, Banswara,Bundi, Jhalawa:
10-5	3	Tonk, Nagaur, Kota
5 and below	6	Ganganagar, Bikaner, Churu, Jodhpur, Jaiselm: Barmer,

In respect of number of electric pumpsets Jaipur, Chittorgarh, Alwar, Sikar, Sirohi, Bhilawara and Udaipur, district have comparatively higher number of electric pumpsets. A large number of districts are characterized by a very low number of electric pumpsets. In terms of growth in the number of electric pumpsets Sirohi, Jalor, Jaiselmer, Bundi, Sawaimadhopur, Pali recorded high growth rate. On the other hand, Ganganagar, Churu, and Bikaner district recorded very low growth (see Table IV.6).

Table III.6

Rajasthan : Growth in the Number of Electric Pumpsets per Thousand Hectare of net Sown Area 1981-81.

Number of Pumpsets	No. of Districts	Name of the Districts
More than 1000	3	Sirohi, Jalor,Jaiselmer.
1000-750	3	Bundi, Sawaimadhopur,Pali.
750-500	5	Chittorgarh,Banswara, Sikar, Bhilawara, Udaipur.
500-250	13	Kota, Ajmer, Tonk, Alwar, Nagaur, Dungarpur,Barmer, Jhunjhunu,Bharatpur, Jhalawar, Jodhpur,Jaipur.
Less than 250	3	Ganganagar,Churu,Bikaner.

In respect of consumption of fertilizers Ganganagar, Chittorgarh, Bundi, Kota, Sawaimadhopur, Bhilwara, have high level of consumption of fertilizer in comparison to other districts. Since the use of fertilizers in agriculture is dependent on irrigation facilities so the districts which have higher percentage of area irrigated are also at the top positions in the consumption of fertilizer (Table III.7). According to growth level Nagaur, Bikaner, Jodhpur, Ajmer, Jaipur, Tonk, Dungarpur, Bundi, Banswara and Sikar district fall in the category ofhigh growth level i.e. above 600 per cent. District Udaipur, Ganganagar, Jhunjhunu, Pali, Jhalwar, Kota, Barmer, Churu, Jaiselmer, have recorded very low growth (Table III.8).

Table III.7

Rajasthan : Consumption of Fertilizers per 100 Hectare
of Gross Cropped Area 1981.

Consumption of Fertilizers (nutrient, Tonnes)	No. of District	Name of the Districts
20 and above	4	Ganganagar, Chittorgarh, Bundi, Kota
20-10	2	Sawaimadhopur, Bhilwara
10-5	7	Alwar, Bharatpur, Jaipur Pali, Sirohi, Udaipur, Banswara
5.0-2.5	5	Sikar, Ajmer, Tonk, Nagaur, Dungarpur.
2.5 and below	8	Bikaner, Churu, Jhunjhunu, Jodhpur, Jaiselmer, Barmer, Jalor, Jhalwar.

Table III.8

Rajasthan : Growth in the Consumption of Fertilizers
per 100 Hectare of Gross Cropped Area 1971-81.

Growth (per cent)	No. of Districts	Name of the Districts
1200 and more	3	Nagaur, Bikaner, Jodhpur
1200-600	7	Ajmer, Jaipur, Tonk, Dungarpur, Bundi, Banswara Sikar.
600-300	7	Bharatpur, Sirohi, Sawai-madhopur, Chittorgarh, Jalor, Bhilwara, Alwar.
300-150	6	Udaipur, Ganganagar, Jhunjhunu, Pali, Jhalwar, Kota.
Less than 150	3	Barmer, Churu, Jaiselmer.

Use of tractors is high in the districts Ganganagar,
Alwar, Bharatpur, Jaipur and Pali and low in Bikaner,
Churu, Jhunjhunu, Tonk, Barmer, Dungarpur, Banswara
and Jhalwar. Number of tractors per 100 hectares of
net sown area is given in Table III.9.

Table III.9

Rajasthan : Number of Tractors per 100 Hectares of
Net Sown Area 1981.

Number of Tractors	No. of Districts	Name of the Districts
8 and above	2	Ganganagar, Alwar
8-4	3	Bharatpur, Jaipur, Pali.
4-2	5	Jodhpur, Nagaur, Jalor, Sirohi, Bundi.
2-1	8	Sawaimadhopur, Sikar, Ajmer, Jaiselmer, Bhilwara, Udaipur, Chittorgarh, Kota.
1 and below	8	Bikaner, Churu, Jhunjhunu, Tonk, Barmer, Dungarpur Banswara, Jhalwar.

However, there is an increase in the number of tractors,
in case of each districts. But district Bikaner, Pali,
Jaiselmer, Churu, Jhalawara and Bundi recorded high growth,
Whereas Bhilwara, Alwar, Nagaur, Sikar, Jaipur, Jodhpur,
Kota, Bharatpur, Dungarpur and Banswara has experienced

low growth in the number of tractors. Other remaining

districts have shown average growth (Table III.10).

Table III.10

Rajasthan ı   Growth in the Number of Tractors per
100 Hectares of Net Sown Area 1971-81.

Growth (per cent)	No. of Districts	Name of the Districts
1200 and more	3	Bikaner, Pali, Jaiselmer
1200-600	4	Churu, Jhalwar, Jalor, Bundi.
600-300	9	Chittorgarh, Sirohi, Banswara, Ganganagar,Tonk, A:.mer, Udaipur, Jhunjhunu, Sawaimadhopur.
300-150	7	Bhilwara, Alwar, Nagaur, Sikar, Jaipur, Jodhpur,Kota.
150 and less	3	Bharatpur, Dungarpur, Banswara

It is clear from the above mentioned analysis that all

these variables of agricultural development are concentra-

ted in South and south-east part of Rajasthan except

district like Ganganagar, Sikar and Jhunjhunu which are

situated in Notth and north-east.

Selected eight indicators of agricultural development

have been composed into an index of agricultural development

because independent single indicator doesn't show the complete

picture of agricultural development. Correlation Matrix of

agricultural indicators is given in Table III.11. This table shows that all the variable are positively related to each other except variable irrigation intensity in the both years. However, the relationship of irrigation intensity to other variables, which was negative during 1971 has been approaching toward positive relationship. The reason for negative relationship of irrigation intensity to other variable may be due to the absence of perennial revers and that as well as brakishness of the sub-soil water. The cultivation of crops in Rajasthan depends mainly on rainfall.

Irrigation seems to be a major factor in development of agriculture because it is highly correlated with productivity consumption of fertilizers and significantly correlated with the other variables, other variable which are positively related with productivity per hectare are cropping intensity, commercialization of agriculture and consumption of fertilizers. Since all these variables are input in agriculture, they effect agriculture together not independently.

Table III.11

Rajasthan :   Correlation Matrix (1971 and 1981)

Indica-tors	G1	G2	G3	G4	G5	G6	G7	G8
G1	1.0							
G2	-.22	1.0						
G3	-.47	-.36	1.0					
G4	-.49	-.35	.64	1.0				
G5	.25	-.32	.45	.33	1.0			
G6	.73	-.23	.24	.39	.85	1.0		
G7	.67	-.48	.82	.68	.68	.37	1.0	
G8	.34	-.16	.16	.16	.25	.28	.40	1.0

1980-81

	G1	G2	G3	G4	G5	G6	G7	G8
G1	1.0							
G2	-.24	1.0						
G3	.65	-.24	1.0					
G4	.64	-.31	.27	1.0				
G5	.53	-.24	.64	.27	1.0			
G6	.72	-.17	.32	.41	.25	1.0		
G7	.68	-.37	.80	.40	.43	.71	1.0	
G8	.53	-.22	.23	.46	.12	.35	.50	

Table III.12 shows the relationship of individual variable to the conposite index of agricultural development. Indicator G1, G2, G4, G6 and G7 are highly related to the development index. During 1970-71 first factor explained 48.1 per cent of total variance which has gone upto 52 per cent in 1980-81. It means that the explenatory power of variables have increased in 1980-81. Absolute value of composite index of agricultural development for different districts separately for the year 1970-71 and 1980-81 as given in Appendix I.

Table III.12

Rajasthan : Factor Matrix

	Indicators	1970-71 F1	1980-81 F1
G1	Percentage of gross irrigated area to gross cropped area	.78*	.90*
G2	Irrigation intensity	-.51*	-.43**
G3	Cropping intensity	.79*	.79*
G4	Commercialisation of agriculture	.76*	.64*
G5	Electric pumpsets per 1000 hectare of hot sown area	.51*	.61*
G6	Consimption of fertilizers per 100. hectare of gross cropped area	.64*	.76*
G7	Productivity by per hectare(Rs.)	.92*	.88*
G8	Tractors per 100 hectare of Net Sown Area	.45**	.59*
	Total variance explained	48.11%	52.0%

Note: *, Significant at 1 per cent level.
    ** , Significant at 5 per cent level.

Intertemporal analysis of the table III.13 shows
that there has been no increase in the number of districts
falling in the category of high level of agricultural
development from 1970-71 to 1980-81. There is an increase
in the number of district falling in the medium category
of development from 3 to 5 in 1980-81 with the upward
movement of Pali and Tonk districts from low category.
Nagaur district also shifted in low category from very
low category of agricultural development. Owing to this
reshuffle, the number of districts in very low category
was likely to reduced from 7 in 1970-71 to 5 during
1980-81. Thus, it is clear from the analysis of the
Table 3.13 that there was definite dimportant in the
ranking position of Sirohi. Pali, Tonk and Nagaur
district which showed upward moment from lower category

Table III.13

Clessification of Districts According to Index of Agri-
cultural Development

Value of compo-site Index	1970-71	1980-81
High (.72 and above)	Chittorgarh, Bharatpur, Alwar, Bhilwara, Udaipur, Ganganagar.	Bundi,Ganganagar, Chittorgarh,Alwar, Bharatpur,Bhilwara, Jaipur, Udaipur
Medium (.27-.72)	Kota, Banswara, Swaimadhopur	Sirohi,Sawaimadhopur, Kota, Pali, Tonk.
Low (.99-.-27)	Jhalwar,Sirohi, Dungarpur, Pali Ajmer, Tonk,Jhunjhunu, Sikar	Ajmer, Banswara, Jalor,Sikar, Dungarpur,Jhalawara, Jhunjhunu,Nagaur.

Fig. III.5

RAJASTHAN
LEVELS OF AGRICULTURAL DEVELOPMENT
(1970-71)

HIGH

MEDIUM

LOW

VERY LOW

kms 50   0   50   100   150 kms

Table III.13 (contd.)

Very low (Below -.99)	Jodhpur,Nagaur,Jalor Bikaner, Jaiselmer, Barmer, Churu.	Jodhpur,Bikaner, Jaiselmer, Barmer, and Churu.

to higher one. Banswara district has come down from

its position in medium category to low category during

1970-71 to 1980-81. There was no inter-category change

in the remaining districts. It has been observed that

there was big change in the ranks of district during

1970-71 to 1980-81. Some districts like Bundi, Ganga-

nagar have gone to Ist and 2nd place in 1980-81 which

were on 7t; and 8th position during the year 1970-71.

There was no significant change in the ranking of very

low developed district during the period 1970-1981.

Number of district falling of high and medium category

of agricultural development had gone up by two from 11 to

13. Likewise number of district falling very low category

decrease from 15 in 1970-71 to 13 in 1980-81. This improve-

ment in agriculture of Rajasthan may be attributed to the

development irrigation (in case of Ganganagar), spread of

HYV's and consumption of fertilizers.

Spatial pattern in levels of agricultural develop-

ment is shown in Fig. III.5 and III.6 for the year: 1971

and 1981 respectively. South-Eastern parts of the state

are developed than north-western region. North-western

Fig.III.6   88

RAJASTHAN
LEVELS OF AGRICULTURAL DEVELOPMENT
(1980-81)

HIGH

MEDIUM

LOW

VERY LOW

kms 50 0 50 100 150 kms

parts of the state having arid and Semi-arid climatic
conditions are not favourable for agriculture. Lack
of water is the major constraints in this part of the
state which receive very small amount of the rainfall.
Physiographically south-eastern Rajasthan has favour-
able conditions for agriculture. This region falls in
the wet-zone, and as a result south-eastern and south-
western parts in more productive having superior cropp-
ing pattern and high yield of crops per acre. The dry
region (with annual rainfall less than 50 cm) is
characterised by the predominance of low value crops
like Bajra. It is only because the crops are grown
there only under rainfall conditions.

Table III.14 reveals that the mean value of
selected indicators of agricultural development have
increased except indicator G4 (area under commercial
crops). Indicator G5, G6 and G8 have experienced
significant increase in the mean value during 1971-81.
Number of electric pumpset per 1000 hectare area has
increased from (2.63) in 1971 to (17.94) . in 1980-81.
Likewise there was significant increase in the use of
fertilisers and tractors.

Table III.14

Rajasthan : Mean Value of the Indicators of Agricultural
Development in 1971-1981.

	Indicators	1970-71	1980-81
G1	Percentage of area irrigated to Gross Cropped Area	15.37	23.44
G2	Irrigation intensity	118.02	129.33
G3	Cropping intensity	114.31	117.68
G4	Commercialization of Agriculture	9.92	9.11
G5	Number of electric pumpsets 1000 hectare of net sown area	2.63	17.94
G6	Ue of fertilizers per 100 hectare of Gross cropped area	1.72	8.13
G7	Productivity per hectare	.44	.45
G8	Number of tractors per 100 hectare of net sown area	.59	2.46

Percentage of area irrigated increased from 15.5 per cent
to 23.44 per cent in 1980-81. It may be concluded that
although the use of modern input in agriculture has
increased significantly, the area under commercial crops
have decreased during 1971-1981. This may be largely
because the new farm technology was foodgrain oriented.
Development of agriculture in Rajasthan in 1980-81 may be
partly as a result of good weather and as a consequence
of acceleration in growth rates in productivity due to
the spread of new farm technology.

3.4 The Physical and Technological Bases of Agricultur
in Haryana

The spatial variations of agricultural complexes
in the context of agricultural formation in Haryana are
common and have a distinct landscape or regional charac-
terisation, the stamp primarily of natural and secondly
economic and cultural factors showing in the associated
area differentiation. One may pay particular attention
to the relationship between the physical environment,
viz., the land, the climate, the aid and the agricult-
ural water resources.

Physiographically Haryana can be divided into
three major divisions on the basis of local topography
and the distribution of sandy and calcareous sierozemic
soils. The three major divisions are[24] :--

i) Eastern Haryana Plain covering the districts
of Ambala, Kurukshetra, Jind, Karnal and
Sonepat.

ii) Western Haryana plain covering the districts
Sirsa, Hissar and Bhiwani.

iii) Southern Haryana Plain covering the district
to Mahendergarh Gurgaon and Faridabad.

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24. Census of India, Regional Division of India - A
Cartographical Analysis, series-1, vol.VI,
Haryana, 1981.

Fig.III.7

92

HARYANA
ADMINISTRATIVE DIVISION
(1981)

Source : Census of India 1981.

Fig.III.8   93

HARYANA
Relief and Landform Types

700 m

500 m

300 m

260 m

230 m

200 m

230 m

230 m

230 m

300 m

300 m

300 m

Terrain Types

The High Hills (Over 600 m)

The Low Hills (400-600 m)

The Piedmont Plain (300-400 m)

The Undulating Sandy Plain (230-350 m)

The Flood Plain●

The Chhachhra

The Nardak   (Under 300 m)

The Alluvial Plain

The Sand-Dunes

The Ankol Swamp (Under 200 m)

The Rocky Hills (300-600 m)

● (Bet. Nalli & Khaddar)

30 KM

Source : Singh Jasbir, An Agricultural Geography of Haryana, Vishal, Kurukshetra : 1976.

3.4.2 The climate of the state is semi-arid in the south-west and Gangetic type in the rest of the state, due to its continental location on the outer margin of the monsoon region, between the desert and Himalaya in the north-west of the Indian sub-continent. Monsoon brings rain from July to September. From October to June weather is dry except for a few showers received from wester.ly cyclones. South and south-western Haryana marked with low rainfall and it increases gradually toward the north-east. The contrast between rainfall pattern of eastern Haryana, Western Haryana and southern Haryana has a clear effect on agricultural practices e.g. raising of crops like sugar cane, rice wheat in eastern lains, cotton, oil seeds are grown in western plain and Bajra, gram in southern plain.

3.3 Soil :Haryana's soils can be divided into six category on the basis of agronomic conditions[25] :-

i) The very light soil - In the south-west, where the great Indian Desert makes an entry in to the plains of Haryana severe aridity prevails. The most predominant component in these skretches is desert sand of quartz origin having well . rounded

25. Singh, Jasbir, "An Agricultural Geography of Haryana:" Vishal, Kurukshetra, 1976, pp. 81-96.

Fig.III.9

Soils of Haryana

Category	Nomenclature
I	Sandy and Loamy Sand (Bagar)
II	The Relatively Sandy Loam
	The Sandy Soft Loam (Rohl)
III	Coarse Loam (Dahar and Chaeknote)
	Light Loam (Seotl)
	Loam (Bhangor and Nardak)
IV	Silty Loam (Khaddar)
V	Clayey Silt (Bet)
	Silty Clay (Naili and Chhachhra . Dakar)
VI	Siwaliks (Pahar)
	Piedmont (Ghar and Kandi)
	Rocky Surfaces

30 KM

Source : Singh Jasbir, An Agricultural Geography
of Haryana, Vishal Kurukshetra :1976.

grains with a fair proportion of calcium. The soil
cover is mostly sandy and loamy and lying on the
undulation of Bhiwani, Bagar (Sandy), Western Mahender-
garh districts (Sandy), and Hissar Bajara (Loamy sand).

II. The light soils - The light soils have two sub-
categories, viz. (a) the relatively Sandy loam and (b) the
sandy soft loam. The relatively sandy loam belt stretches
between the sandy soils and loams. It covers the domi-
nantly barani areas of Fatehabad, Hissar, Bawani Khera
and Bhiwani Tehsil. The sandy loam is found in Sirsa
Tehsil south of the Ghajjar silty clayey and clayey silt
belt and in the whole of Dabwali Tehsil.

Medium soils : Medium soils constitutes the major part
of Haryana and comprises soils of widely different nature
resulting from varying physical compositions in terms of
silt, sand and clay proportions. These are of three
types viz. (a) Light loam; (b) Coarse loam; (c) loan
light loamis encountered in Western and Central Ambala
and south Narayangarh Tehsil where sand is the major
constituent light loan covers north Gurgaon, North-west
Nuh and Central block of Rewari also. Coarse loam is
found in the south-eastern parts of Jhajjar, Central Nuh
and Western Firojpur-Zhirka Tehsil. The loam is found in
south-eastern part of Hissar district, whole of Jind

Fig.III.10   97

HARYANA
Annual Rainfall
(Total)

Source : Singh Jasbir, An Agricultural Geography
of Haryana, Vishal Kurukshetra : 1976.

district, major part of Fridabad district, whole of
Rohtak, Gohana and Kaithal tehsil, Western part of
Sonepat, Panipet and Karnal tehsil.

Moderately Heavy Soils -   The category includes the
sility loam which is: locally designated as Khaddar,
Khaddar soil is very inferior, poor, grey colored sandy
loam in the north eastern parts and Sem-boli terrent
extension of Jagadhari Tehsil.

The Heavy Soils and Very Heavy Soils - These soils are
found along the Ghaggar - Markanda seasonal drainage
system. The heavy soil is clayey silt which forms a
good area of alluvium know as Bet. The very loamy soil
consist of silty clay or stiff loam or stiff clay which
is confined to drainage lines of hollows.

The soil on the Siwaliks. The Piedmount Plain and the
Rocky Surfaces ì The Siwaliks are composed entirely of
terrtiary, principally the upper tertiary, sedimentary
river deposits. The Piedmount Plain is mostly covered by
sandy shingly soil much overgrown with thorn bushes and
cut by ravines.... The presence of Rocky surfaces modifies
the soil pattern of the south and south-west. The soil is of
the Rocky cut-crops is coarse, not sufficiently thick and
favourable for crop production.

3.5 Level of Agricultural Development in Haryana : A Spatio-temporal Analysis, 1971-81

Agriculture is the most important sector of Haryana. At the time of re-organisation of the erstwhile Punjab, the region known as Haryana was most backward and underdeveloped in terms of agriculture. The state was in resources. Immediately after the reorganisation, the period of regeneration started, Development plans were prepared and significant improvement could be seen within a few years. Haryana made progress by leaps and bounds in the field of agriculture and soon earned the reputation of the "Green Bowl of India" second only to Punjab.

Table III.15 gives the details of SDP from primary, secondary and the tertiary sector of economy for Haryana. Although the primary sector continued to account for a major share of the total state income (at current prices) during the period 1970-71 to 1980-81, signs of decline could be noticed over the years until 1979-80. The percentage share of primary sector in the SDP declined from 64.8 per cent in 1970-71 to 51.2 per cent in 1979-80, while the share of secondary increased from 15.2 per cent in 1970-71 to 20.5 per cent in 1979-80. Similarly, the tertiary sector also recorded an increase in it's shares from 20 per cent in 1970-71 to 28.3 per cent

in 1979-80. During 1980-81, however, the share of primary sector increased to 54.6 per cent and that of secondary and tertiary sector decreased to 18.6 and 26.8 per cent points respectively.

Table III.15

Haryana : Composition of State Income (SDP) 1970-71 to 1980-81 (at constant prices)

Years	Primary	Secondary	Tertiary
1970-71	69.8	15.2	20.0
1971-72	62.4	16.9	20.7
1972-73	62.0	16.6	21.4
1973-74	64.3	15.4	20.3
1974-75	61.8	15.8	22.4
1975-76	59.8	15.9	24.3
1976-77	58.7	16.5	24.8
1977-78	57.6	17.2	25.2
1978-79	55.7	18.9	25.4
1979-80	51.2	20.9	28.3
1980-81	54.6	18.6	26.8

In respect of irrigated area district Karnal, Kurukshetra occupy the top position.These districts have above 80 per cent of total cultivated area under irrigation.Jind, Hissar and Sonepat and Sirsa districts have between

60-80 per cent area of total cropped area under irrigation. On the other, districts such as Mahendragarh, Bhiwani have very low percentage of area under irrigation because of semi-desert climatic conditions and low ground water (Table III.16).

Table III.16

Haryana ı Percentage of Gross Irrigated Area to Gross Cropped Area, 1981.

Percentage	No. of districts	Name of the Districts
80 and above	2	Karnal, Kurukshetra.
80-60	4	Jind, Hissar, Sonepat, Sirsa.
60-40	4	Ambala, Rohtak, Gurgaon, Faridabad.
40-20	2	Bhiwani, Mahendergarh

Growth in irrigation facilities during 1971-81 was observed to be in Ambala, Mahendergarh, Hissar and Faridabad districts, whereas Rohtak, Gurgaon and Sirsa have experienced low growth. Table III.17 gives the growth in irrigated areas during 1971-81.

Table III.17

Haryana ı ·Growth of Irrigated Area- 1971-81.

Growth (per cent)	No. of district	Name of the Districts
More than 225	1	Ambala
225-150	3	Mahendergarh, Hissar, Faridabad.
150-75	5	Jind, Karnal, Sirsa, Rohtak, Gurgaon, Bhiwani.

In terms of number of electric pumpsets Karnal, Gurgaon,

Kurukshetra have higher number of electric pumpsets. Whereas

Sirsa, Bhawani and Hissar have less number of pumpsets.

Number of electric pumpsets is low in these districts

because of the domination of canal irrigation in these

districts (Table III.18).

Table III.18

Haryanaı Number of Electric Pumpsets Per 1000 Hectares
of Net Sown Area.

Number of Electric Pumpsets	No. of districts	Name of the Districts
120 and above	3	Karnal, Gurgaon, Kurukshetra.
120-60	3	Ambala, Mahendergarh, Faridabad.
60-30	3	Jind, Rohtak, Sonepat.
30-0	3	Sirsa, Bhiwani, Hissar.

Table 3.19 shows that the high growth in the number of electric pumpsets has been observed in Sonepat, Mahendergarh and Kurukshetra which is above 250 per cent. Districts which recorded less than 150 per cent growth are Rohtak, Faridabad, Jind and Bhiwani

Table III.19

Haryana ı   Growth of the Number of Electric Pumpsets
             per 1000Hectares of Net Sown Area, 1971-81.

Growth (per cent)	Number of Districts	Name of the Districts
More than 250	3	Sonepat, Mahendergarh, Karnal
250-200	3	Kurukshetra, Hissar, Gurgaon
200-150	2	Ambala, Sirsa
Less than 150	4	Rohtak, Faridabad, Jind, Bhiwani.

In respect of consumption of fertilizers Karnal, Ambala and Kurukshetra districts rank first, second and third respectively. These are the districts where the Green Revolution measures were initially concentrated (Table III.20). Consumption of fertilizer in other districts have been comparatively very low, particularly in Rohtak, Gurgaon, Mahendergarh and Bhiwani. High growth in the consumption of fertilizers has been seen in Sonepat, Sirsa, Kurukshetra, and Hissar.

Table III.20

Haryana : Consumption of Fertilizers per 100 Hectares
of Gross Cropped Area (in nutrient tonnes).

Consumption of fertilizers	Number of Districts	Name of the Districts
120 and above	1	Karnal
100-50	2	Ambala, Kurukshetra
50-25	5	Jind, Hissar, Sonepat, Faridabad, Sirsa.
5-0	4	Rotak, Gurgaon, Mahendergarh, Bhiwani

Low growth in consumption of fertilizer during
1971-81 was observed in Bhiwani, Jind, Sonepat, Rhhtak,
and Ambala. This may be attributed to very low consump-
tion of fertilizers during 1971 (Table III.21).

Table III.21

Haryana : Growth in the Consumption of Fertilizer per
100 Hectares of Gross Cropped Area, 1971-81.

Growth (per cent)	Number of Districts	Districts' name
More than 300	2	Sonepat, Sirsa
300-200	4	Kurukshetra, Hissar, Karnal, Ambala.
200-100	3	Mahendergarh, Jind, Rohtak
Less than 100	3	Gurgaon, Bhiwani and Faridabad.

Number of tractors per 100 hectare of net sown area is high in Karnal, Sonepat, Kurukshetra, Faridabad and Sirsa and it is low in Ambala, Hissar, Bhiwani and Mahendergarh (Table III.22). Growth in the number of tractors was observed high in Sirsa, Faridabad, Kuruk-shetra and Mahendergarh during 1971 and 1981, whereas it was low in Bhiwani, Jind, Sonepat, Rohtak and Ambala districts (Table III.23).

Table III.22

Haryana : Number of Tractors per 100 Hectare of Net Sown Area

Number of Tractors	Number of Districts	Name of the Districts
20 and above	2	Karnal, Kurukshetra
20-15	3	Sonepat, Faridabad, Sirsa
15-10	3	Jind, Rohtak, Gurgaon
10-5	4	Ambala,Hissar, Mahender-garh and Bhiwani

Table III.23

Haryana : Growth in the Number of Tractors per 100 Hectares of Net Sown Area, 1971-81

More than 600	1	Sirsa
600-450	3	Faridabad, Kurukshetra, Mahendergarh
450-300	3	Karnal, Hissar, Gurgaon
300-150	3	Bhiwani, Jind, Sonepat
Less than 150	2	Rohtak, Ambala

All these indicators mentioned above are concerntra-
ted in eastern part of the state. Value of these indica-
tors have increased significantly during 1971-81 in all
districts. Table III.24 shows the irrigation in Haryana
by source of irrigation in 1981. There are two main
sources of irrigation in Haryana i.e. Canal and Tubewells.
The districts Hissar, Sirsa, Jind and Rohtak are charac-
terised by high percentage of area irrigated by Canals
whereas tubewell are main source of irrigation in Karnal,
Kurukshetra, Gurgaon, Mahendergarh and Ambala districts.

<u>Table III.24</u>

Haryana : Percentage of Irrigated Area by Source
1980-81.

Name of districts	Canal	Tubewells
Ambala	5.94	94.06
Kurukshetra	30.83	69.17
Karnal	26.55	73.45
Jind	79.78	20.22
Rohtak	61.90	28.10
Gurgaon	11.29	88.71
Mahendergarh	2.43	97.57
Bhiwani	71.13	28.83
Hissar	89.75	10.25
Sonepat	51.48	49.60
Faridabad	22.50	77.50
Sirsa	78.94	21.06

* Source: Statistical Abstracts of Haryana, Govt. of
Haryana, 1981-82.

Table III.25 shows the correlation among the
indicators of agricultural development for 1971 and
1981. During 1970-71 percentage of irrigated area to
total cropped area has positive relationship with
productivity per hectare. Other indicators are also
positively related to G1 but the degree of correlation
is not much significant.

Irrigation intensity has significant positive
correlation with G3, G4 and G8. The point which emerges
from the table is that irrigation, cropping intensity
and tractors were highly related to productivity per
hectare. During 1980-81 apart from these indicators,
consumption of fertilizer also positive related with
productivity.

Table III.25

Haryana : Correlation Matrix, 1970-71 and 1980-81

	G1	G2	G3	G4	G5	G6	G7	G8
G1	1.0							
G2	.50	1.0						
G3	.32	.46	1.0					
G4	.48	.57	-.14					
G5	.10	-.21	.37					
G6	.01	-.13	.25			0		
G7	.76	.36	.62			24	1.0	
G9	.43	.41	.74			07	.79	1.0

Table III.25 (contd.)

1980-81

	G1	G2	G3	G4	G5	G6	G7	G8
G1	1.0							
G2	.16	1.0						
G3	.23	.80	1.0					
G4	.09	-.25	-.28	1.0				
G5	.18	.32	.44	-.64	1.0			
G6	.69	.19	.19	-.15	.50	1.0		
G7	.59	.37	.35	0.16	.53	.82	1.0	
G8	.82	.29	-.28	-.43	.75	.61	.09	1.0

Table III.26 showing factor loading of each variables in agricultural development reveals that the first factor explains 42.5 per cent of variance during 1970-71. The variables, which are highly contributory in levels of agricultural developed are irrigation, cropping intensity. tractors and productivity. During 1980-81 the explaintory power of G8, G3 have gone up significantly. The first factor explains 50 per cent of variation. Absolute value of compsite index of agricultural development for different districts separately for the year 1970-71 is given in Appendix II. Classification of districts according index of agricultural development has been shown in Table III.27.

Table III.26

Factor Matrix

Indicators	1970-71	1980-81
G1 Percentage of Gross irrigated area to Gross cropped area	.75*	.69**
G2 Irriation intensity	.61**	.55
G3 Cropping intensity	.78*	.62**
G4 Commericial of agriculture	.26	-.41
G5 Number of Electric Pumpsets per 1000 Hectare of NSA	.34	.74*
G6 Consumption of fertilizers per 100 hectare of GCA	.21	.82*
G7 Productivity per hectare (Rs.)	.93*	.87*
G8 Number of tractors per 100 hectares of net sown area	.85*	.79*
Total variation explained	42.5	50%

Note : *significant at 1 per cent level.
**significant at 5 per cent level.

Inter-temporal analysis of the Table III.27 reveals that district such as Gurgaon and Mahendergarh have improved their position in terms of agricultural development while district Rohtak and Jind came down from their earlier position. Gurgaon district moved from low category to medium category of development. Mahendergarh district moved to low category from very low category of agricultural development during 1970-71 to 1980-81. On the other hand, district

Fig.III.11

HARYANA
LEVELS OF AGRICULTURAL DEVELOPMENT
(1970-71)

HIGH

MEDIUM

LOW

VERY LOW

kms20 0   20 40 kms

Jind came down from high category to medium category of
development and district Rohtak made a downward movement
from medium category to low category. The reasons for
the better performance by Gurgaon and Mahendergarh
district may be attributed to extension of irrigation
facilities through Canal and tubewells and spread of the
new farm technology. By 1970-71 these district primarily
were dominated by low value crops like Bajra, Barley and
Gram etc. During the time period 1970-1981 a significant
change has been recorded in the cropping patterns of these
districts. Kurukshetra and Karnal remained at the top
position in the levels of agricultural development in
1980-81.

Table III.27

Classification of District According Index of Agricultural
Development in Haryana.

	1970-71	1980-81
High (.87 and above)	Kurukshetra, Karnal Jind	Kurukshetra, Karnal
Medium (.45-.87)	Ambala, Sonepat, Rohtak	Gurgaon, Jind, Ambala, Sonepat.
Low (45.-.-.87)	Hissar, Faridabad, Sirsa	Faridabad, Hissar, Mahendergarh, Sirsa.
Very low Below -.87	Bhiwani, Gurgaon, Mahendergarh.	Rohtak, Bhiwani

Fig.III.10

HARYANA
LEVELS OF AGRICULTURAL DEVELOPMENT
(1980-81)

HIGH

MEDIUM

LOW

VERY LOW

kms 20 0 20 40 kms

Spatial pattern in the levels of development is

shown in Fig. III.11 and III.12. It is evident from

the figures that the district lying in north and eastern

part of the state are developed in agriculture. The

part of the state has well developed irrigation net

work. The cropping pattern in irrigated areas is

mainly of high value crops like wheat, oil seeds,

cotton, rice etc. Gram and Bajra are the two import-

ant crops in unirrigated areas. Karnal, Kurukshetra

and Ambala districts have suitable agricultural

conditions, Irrigation facilities and high degree

of mechanisation. A general improvement in aagri-

cultural is discerniable from the Table III.28. The

mean value of each indicator has increased during

Table III.28

Mean value of indicators of Agricultural Development
(1971 and 1981)

Indicators	1970-71	1980-81
G1 percentage of gross irrigated area to gross cropped area	43.02	58.89
G2 Irrigation intensity	141.82	156.80
G3 Cropping intensity	138.58	152.04
G4 Commercialisation of Agriculture	6.74	11.94
G5 Number of district electric pumpsets per 1000 hectare of net sown area	23.18	71.61
G6 Consumption of fertilizers per 1000 hectare of GCA	20.11	42.11

Table III.28

G7	Productivity per hectare (Rs.)	.99	1.19
G8	Number of tractors per 100 hectare of New Sown Area	3.64	14.64

1971-1981. Percentage of irrigated area has increased from 43.02 per cent in 1970-71 to 58.84 per cent in 1980-81. It may be attributed to the development of private irrigation sources such as electric pumpsets and wells. The number of electric pumpsets has increased as much as three fold during 1971 to 1981. Number of electric pumpset was 23.18 per 1000 hectares of net sown area in 1970-71 which increased to 71.61 in 1980-81. Number of tractors has gone up from 3.64 to 14.64 per 100 hectare of net sown area in 1980-81. Consumption of fertilizers also doubled during 1979-1981. Apart from these significant improvement in irrigation intensity, cropping intensity and area under commercial crops have been observed. The area under commericial crops was only 6.78 per cent to total cropped area in 1970-71 which has increased upto 11.94 per cent in 1980-81. It implies that commercialisation of agriculture in Haryana is taking place.

3.6 Summary of the Findings :

Levels of agricultural development in Rajasthan and Haryana analysed in this chapter reveals that geophysical factors play an important role in the development of agriculture. As it is seen in the analysis that south-eastern parts of Rajasthan are relatively agriculturally developed and the parts which lie north of the Araveli mountain system and are deficient in rainfall are less developed. In case Haryana also the districts which have favourable climatic and physical conditions are more developed in agriculture. Sirsa, Hissar, Bhiwani and Mahendergarh bordening the Great Indian Desert are less developed. During 1971-81, a general improvement in the levels of agricultural development has been experienced by all districts in both the states. But these do not indicate any significant change in the positions of the less developed districts.

There is no doubt that Haryana as a whole is agriculturally developed more than Rajasthan. Use of modern farm technology is very much high in Haryana and low in Rajasthan. The use of new farming practices

have increased in Rajasthan during 1971-81 and particularly in the districts of Ganganagar, Alwar, Bharatpur, Jaipur and Swaimadhopur, Bundi. On the other hand, in Haryana the impact of Green Revolution has been seen in south, south-western parts of the state. It may also be noted in both the states that the district having high percentage of area under irrigation are agriculturally developed because other inputs are largely dependent on irrigation. It implies that in order to develop an area, irrigation facilities must be provided first. The district, where canal irrigation is not feasible. Other means of small and medium irrigation facilities should be developed.

Some districts in both the states have made significant improvement in their ranking positions during 1980-9181. Still a large number of districts in Rajasthan continued to be less developed. In Haryana, Mahendergarh and Bhiwani continued to be less developed districts, although district Mahendergarh has show significant improvement during the reference period.

..*.*.*

Chapter IV.
LEVELS OF INDUSTRIAL DEVELOPMENT

4.   Introduction

Industrialisation is considered vital for economic development of a country. But it has different implications for the development of system of regions within a country. Spatial and temporal patterns of industrialisation are influenced in initial stages of development by distributional pattern of economic activities and resources. The degree of importance of industrial resources at national, regional and local level, influences the initial pattern of industrial development and this is dependent on strategy employed at these area levels.

Industrialisation plays an important role in the process of economic development in several ways[1]. It is industralisation through which traditional societies are transformed into modern one. Industrialisation results improvement in the standard of living through more intensive use of resources. Industrialisation helps in development of agriculture by the way of mechanisation of agriculture creating demand for agricultural produce and by reducing pressure as agricultural land resources through a gradual shift of population from agriculture to industry.

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1.   Alan, B. Mountjoy (Ed.), Industrialisation in the
        Third World : Problem and Prospectives, MacMillan,
        London,   1978.

Regional development involves an optimum industrial
activity based on broader economic and strategic considera-
tion.   It lead to an equitable distribution of employment
opportunities and prevent out-migration of skilled labour
and capital and avoids accruals of depressed regions[2].
There is a close relationship between different sectors
of an economy. Development of one sector can not be
thought in isolation from it's relation from others.
Agricultural development goes with the development of
industries, expansion of infrastructure facilities and
the better institutional arrangement. Industries supply
life blood to the agriculture and rest of the economy.
Industrial development leads to betterment of infra-
structural facilities whereas infrastructure is essential
condition for industrial development.

The experience with development in India as else-
where has shown that while the overall growth of indust-
rial sector was reasonably satisfactory. There have been
variations among the states and fluctuations in time.
The uneven growth among different states led the planners
to adopt a strategy of development which would promote an
even development of states. One of the stretegies thought
of was industrialisation of the backward states by locating

2. Papola, T.S. and Misra, V.N., "Some Aspect of Rural
      Industrialisation". Economic and Political Weekly,
      vol. XV, No. 41-43, Special Number, 1980, p.1733.

industries in these states. The rationale for this
was derived from the fact that the location of indus-
tries was not only essential to generate employment
and income in thebackward states, but also that
decentralised industrialisation process was an
important factor in balanced regional development.
But the greatest failure of licensing was in respect
of promoting industries in backward states; in fact,
industries which were set up/the backward regions were
not those which were pushed to such regions but those
which owing to raw material availability or other
consideration, were bound to set up in such regions.

Thus sugar factories have gone into areas where
sugarcane is grown and paper industries are set up in
forest regions where bamboo is available[3].

During the Fourth Five-Year Plan positive step was
taken by constituting two working groups viz. The Pande
working Group on identification of backwarness and The
Wancho working group for the Fiscal & Financial incentives
for starting industries in backward areas. Realising
that one of the impediments towards rapid industrialisa-
tion in backward areas is the absence of infrastructural

3. Phiroze D. Medhora, "Industrial Development : A
        Quarter Century Review", Dagli, Vadilal (ed.),
        Twentyfive Year of Independence - A Survey of
        Indian Economy. Vora & Co. Bombay, 1973.

facilities, it has been decided to assist the state
government to take up infrastructural development
in one or two identified growth centres. Such growth
centres would be endowed with infrastructural facili-
ties as p.r with the best available in the country
in the matter of power, water, telecommunication and
banking. In the recent past, another committee known
as Srinavasan group was set up to look afresh into the
problems of the backward regions.

4.1 Levels of Industrial Development in Rajasthan -
    A spatio-temporal Analysis, 1971-81

Rajasthan is one of the industrially backward
states as identified by the Pandey Committee in 1969.
Out of the total twentysix districts, sixteen have been
classified as industrially backward. Even among the
remaining ten districts, the levels of industrialisa-
tion has been appreciably low in as many as eight.
The exception are Jaipur and Kota only which have a
number of modern industrial units[4].

Industrial growth in Rajasthan has been recent
origin. There were only 207 registered factories at the
time of state formation. However, the rate of growth of

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4. Wanchoo, N.N.,"Fiscal and Financial Incentries for
   starting industries in Backward Area", Report of
   the Working Group, Ministry of Industrial Develop-
   ment, Govt. of India, 1969.

industries has been substantial. From 207 registered
factories in 1948 the number grew to 915 in 1961 and
2239 in 1971 and 5048 in 1981[5]. The development of
industries has been taken place in the eastern part of
the state. The western part which consists of the
desertic districts have very few large industrial
units. This may be mainly due to resource and infra-
structural facilities available in eastern Rajasthan.

In order to augment the process of industriali-
zation in the state, the state government has spelt out
its objectives :- (i) Greater utilisation of resources
so that the advantage of value added is retained in
the state; (ii) Creation of more jobs, blanced regional
development, augmentation of financial resources; and
social and economic justice. Keeping these objectives
in view the Janta Government in 1977 had announced the
industrial policy of the state which aimed at diversi-
fying the industrial composition as well as promoting
the exsisting industries. The industrial base of Raj-
asthan consist of non-ferrous minerals based industries,
textile based industries agrobased industries and some
equipment based industries.

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5. National Council of Applied Economic Research,
   Perspective Plan of Rajasthan - 1974-1989, vol.I,
   New Delhi, 1980.

The main objective of this chapter is to me:

the levels of industrial development in Rajasthai

Haryana at two point of time, i.e. 1970-71 and 1!

In order to measure to levels of industrial deve:

six indicators representing industrial activitie:

been selected. They are given in Table IV.1.

Table IV.1

Indicators of Industrial Developmen?

1. Percentage of regiestered factories
to total registered factories (G9)

2. Percentage of employment in registered
factories   (G10)

3. Percentage of workers in industrial
sector to total main workers (G11)

4. Percentage of workers in non-agricultural
activities (G12).

5. Percentage of urban population (G13)

6. Percentage of workers in Non-household
industries to total industrial employment (G14)

Besides these mentioned above, one may include a

score of other variables also such as value added by

manufacturing sector, consumption of power etc. But

due to non-availability of data for these indicators at

district level, one could not include these indicators

in present study. Number of registered factories

couldbe taken as an indicator of organised initiative

towards generating employment and thereby augmenting
the levels of income. Urbanisation and industrialisa-
ire closely related to each other.

Spatial pattern of Indicators of Industrial
ipment ι It will be better to discuss the level
lustrial development in the light of spatial
.bution of indicators of industrial development.
Table IV.2 and IV.3 shows the distribution of registered
factories in the districts. In terms of percentage of
registered factories, Jaipur accounts for about 21.0
per cent of registered factories in the state, followed
by Ganganagar (10.98 per cent) and Ajmer (9.94 per cent).
Jodhpur and Pali districts also have a little above
8 per cent registered factories during 1981. A large
number of districts have a very low percentage of
registered factories. These districts are Jhunjhunu,
Sikar, Tonk, Jaiselmer, Barmer, Jalor, Sirohi, Dungarpur,
Banswara and Jhalawara.

In respect of employment in registered factories
Jaipur and Kota accounts for 32.096 per cent and 12.17
per cent respectively of total employment in registered
factories. The pattern which emerges from the Table IV.2
is similar to that of Table IV.3. In respect of these
two indicators, one may find that registered factories
and employment is concentrated only in 4 or 5 districts.

Table IV.2

Rajasthan : Distribution of Registered Factories, 1981

Percentage of Registered Factories	Number of Districts	Name of the Districts
16 and above	1	Jaipur
16-8	4	Ganganagar, Ajmer, Jodhpur, Pali.
8-4	3	Bhilwara, Udaipur, Kota
4-2	6	Bikaner, Alwar, Bharatpur, Nagaur, Chittorgarh, Bundi.
2 and below	12	Churu, Jhunjhunu, Swaimadhopur, Sikar, Tonk, Jaiselmer, Barmer, Jalor, Sirohi, Dungarpur, Banswara, Jhalawar:

Table IV.3

Rajasthan : Distribution of Employment in Registered Factories, 1981.

16 and above	1	Jaipur
16-8	2	Ajmer, Kota
8-4	5	Jodhpur, Pali, Bhilwara, Ganganagar, Udaipur
4-2	4	Bikaner, Alwar, Bharatpur, Bundi
2 and below	14	Chittorgarh, Jhunjhunu, Swaimadhopur, Churu, Sikar, Tonk, Nagaur, Jaiselmer, Barmer, Jalor, Sirohi, Dungarpur, Banswara, Jhalwar.

Table IV.4 and IV.5 showing the percentag

distribution of industrial workers and workers i

non-agricultural activities to that of total wor

reveal that district Jaipur, Kota, Ajmer and Pal

the highest percentage of workers engaged in ind

activities i.e. 15.83 per cent, 13.87 per cent,

per cent and 11.68 per cent respectively. On th

hand, the districts such as Churu, Jaiselmer, Ba

Dungarpur, Banswara and Jalor have very low perc

of industrial workers. Workers in non-gagricult

sector also are more concentrated in Jaipur, Bik

Ajmer and Kota.

Table IV.4

Rajasthan : Distribution of Industrial Workers,

Percentage of Industrial workers to total workers	Number of Districts	Name of the l
12 and above	3	Jaipur, Kota,
12-10	1	Pali
10-8	6	Bikaner, Jhuı Sikar, Tonk, Sirohi
8-6	9	Ganganagar, J Bharatpur, Sv Nagaur, Bhilv pur, Bundi ar
6-4	7	Churu, Jiseln Jalor, Chittc Dungarpur, Ba

<u>Table IV.5</u>

Rajasthan : Distribution of Workers Engaged in Non-
Agriculture, 1981

Percentage of Non-Agriculture workers	Number of Districts	Name of the Districts
38 and above	4	Jaipur,Bikaner,Ajmer, Kota
38-32	3	Sikar, Jodhpur,Sirohi
32-26	4	Ganganagar, Jhunjhunu, Alwar, Pali
26-20	7	Churu, Bharatpur,Swai-madhopur, Tonk, Jaiselmer, Udaipur, Bundi
20-14	8	Nagaur, Barmer, Jalor, Bhilawara, Chittorgarh, Dungarpur, Banswara, Jhalawar.

In terms of urban population (Table IV.6) Jaipur, Ajmer, Kota, Jodhpur, Bikaner district are comparatively highly urbanised. Districts such as Jaiselmer, Barmer, Jalor, Dungarpur, Banswara, Jhalawar have very low urban population. Table IV.7 shows the same pattern of distribution of workers in non-household industries as it has been seen in case of urban population.

Table IV.6

Rajasthan : Distribution of Urban Population, 1981.

Percentage of Urban Population	Number of Districts	Name of the Districts
40 and above	1	Ajmer
40-30	4	Bikaner, Jaipur, Jodhpur, Kota
30-20	4	Gangapagar, Churu, Jhunjhunu, Sikar
20-10	13	Alwar, Bharatpur, Swai-madhopur, Tonk, Nagaur, Jaiselmer, Pali, Sirohi, Bhilwara, Udaipur, Chittorgarh, Bundi, Jalawar,
10 and below	4	Barmer, Jalor, Dungarpur, Banswara

Table IV.7

Rajasthan : Distribution of Workers Engaged in Non-Household Industries, 1981

Percentage of Non-household Workers	Number of Districts	Name of the Districts
70 and above	3	Ganganagar, Ajmer, Kota
70-60	10	Bikaner, Churu, Jhunjhunu, Alwar, Bharatpur, Jaipur, Jodhpur, Bhilwara,Udaipur, Bundi
60-50	10	Swaimadhopur,Sikar,Tonk, Nagaur, Jaiselmer, Pali, Sirohi, Chittorgarh, Banswara, Jhalawar
50-40	2	Barmer, Dungarpur
40-30	1	Jalor

4.1.2 Pattern of Industrial Development : In the following part of this chapter an attempt has been made to measure the levels of industrial development and to analysis the spatial pattern in Rajasthan and Haryana at two time of period i.e. 1971-81. Correlation matrix of selected variables of industrial development is given in Table IV.8. Table reveals that there is a high positive correlation among the indicators of industrial development in both years i.e. 1970-71 and 1980-81.

Table IV.8

Rajasthan: Correlation Matrix 1970-71 and 1980-81)

	G9	G10	G11	G12	G13	G14
G9	1.0					
G10	.88	1.0				
G11	.65	.79	1.0			
G12	.60	.64	.83	1.0		
G13	.60	.51	.56	.83	1.0	
G14	.62	.59	.42	.49	.63	1.0

1980-81

	G9	G10	G11	G12	G13	G14
G9	1.0					
G10	.90	1.0				
G11	.71	.74	1.0			
G12	.62	.63	.87	1.0		
G13	.61	.56	.75	.86	1.0	
G14	.61	.51	.54	.64	.72	1.0

Table IV.9 shows the factor matrix. First factor explains
as much as 70.8 per cent of total varians in 1970-71 which
has gone upto 74.3 per cent in 1980-81. It means that
the explanating power of the indicators of industrial
development have gone up. All the indicators have high
positive correlation with development index. The absolute

Table IV.9

Rajasthan : Factor Matrix, 1970-71 and 1980-81

Indicators	1970-71 F1	1980-81 F1
G9 Percentage of registered factories	.86*	.86*
G10 Percentage of employment in registered factories	.88*	.84*
G11 Percentage of workers in industrial sector to total main workers	.85*	.90*
G12 Percentage of workers in non-agricultural sector to total workers	.87*	.90*
G13 Percentage of urban population to total population	.81*	.87*
G14 Percentage of workers in non-household to total industrial workers	73*	77*
Total variance explained	70.8%	74.3%

* significant at 1% level.

value of composite index of industrial development for
different districts for the year 1970-71 and 1980-81

is given in Appendix II. The classification of districts into high, medium, low and very low category of industrial development has been shown in Table IV.10.

Inter-temporal analysis of the Table IV.10 reveals that there was no change in the number of districts falling in the high category of development index during 1971-1981. Jaipur, Ajmer and Kota remained as the top three districts of industrial development. District Ganganagar, experienced an upward movement during the period 1971-1981 as it moved from the low category to medium category. As much as twentyone districts of Rajasthan are characterised as industrially less developed. Alwar district showed upward movement from very low to low category of industrial development during 1971-81. Rest of the districts remained in the same category in 1981 as they were in 1971. However, some changes have taken place in the ranking position of some districts.

Table IV.10

Rajasthan: Classification of Districts According to Index of Industrial Development.

Value of composite Index	1970-71	1980-81
High (1.20 & above)	Jaipur, Ajmer, Kota	Jaipur, Ajmer, Kota
Medium (.64-1.20)	Jodhpur, Bikaner	Bikaner, Jodhpur, Ganganagar.

Fig. IV.1   131

RAJASTHAN
LEVELS OF INDUSTRIAL DEVELOPMENT
(1970-71)

HIGH

MEDIUM

LOW

VERY LOW

kms 50   0   50 100 150 kms

Table IV.10 (contd.)

132

| Low (-.53-.64) | Pali, Ganganagar, Udaipur, Bhilwara, Bundi, Churu, Swaimadhopur, Sirohi, Sikar, Jhunjhunu, Bharatpur, Tonk, Nagaur. | Pali, Udaipur, Jhunjhunu,Sirohi, Sikar,Bundi,Alwar, Tonk, Bhilwara, Churu, Swaimadho- pur, Nagaur. |
| Very low (below -.53) | Alwar, Jhalawar, Chittorgarh, Jiselmer, Barmer, Jalore, Dungarpur, Banswara. | Chittorgarh, Jaisel- mer, Jhalawar, Barmer, Banswara, Dungarpur, Jalore |

As described earlier, three districts namely Jaipur Ajmer and Kota together accounts for as much as 36.79 per cent of total registered factories in the state, and 43.75 per cent of employment in registered factories during 1970-71. In 1980-81 the percentage of registered factories in these districts remained more or low the same but share of employment has increased from 43.75 to55.00 per cent. On the other hand, three districts namely Jalor, Dungarpur, and Banswara accounted for less than 2 per cent of registered factories and less than 1 per cent of employment in regis- tered factories of the state.

Spatially, the factories are very unevenly distributed among the districts. Only three districts, Jaipur, Ajmer and Kota are industrially developed. The development of industries in Rajasthan is handicapped by several factors like lack of chap and adequate power supply, dearth of technical and skilled personnel and obsolescence of machineary in several factories. Apart from these factors

Fig.IV.2   133

RAJASTHAN
LEVELS OF INDUSTRIAL DEVELOPMENT
(1980-81)

HIGH

MEDIUM

LOW

VERY LOW

kms 50 0   50 100 150 kms

shortage of water is a major reason for the low industrial development. Industrial backwardness is one of the factors responsible for the low level of general economic development of the state. A legacy of age old feudal social structure, inadequate development of transport and communication facilities, lack of knowledge about the local resources and paucity of water are responsible for impeding industrial growth in the state. A number of families of top bussinessman and industrialists hailing from Rajasthan have settled in other states and never paid serious attention to the setting up of industries in their home state; may be because of various facilities for such development were lacking.

Table IV.11

Rajasthan : Mean Value of Indicators of Industrial Development

Indicators	1970-71	1980-81
G9 Number of Registered Factories	78	194
G10 Employment in registered factories	3346	5769
G11 Percentage of industrial workers to total worker	6.23	8.25
G12 Percentage of worker in non-agricultural activities	21.91	25.85
G13 Percentage of urban population	16.69	19.27
G14 Percentage of workers in non-household industries to total industrial worker	44.31	59.68

A general improvement in the levels of industrial development is discernible from value of different indicators. Value of all indicators of industrial development have increased during 1971-81. (Table IV.11). Number of registered factories have increased from 78, in 1971 to 194 in 1981. Employment in registered factories also increased from 3346 to 5769 during 1971-81. Employment in non-agricultural activities have increased from 21.91 per cent to 25.85 per cent during 1970-71. Process of industrialisation leads to increase in urban population also. It may be attributed to rural-urban migration.

4.2 Levels of Industrial Development in Haryana : A Spatio-Temporal Analysis, 1971-81

There was little industrial activity at time of formation of Haryana in 1966. Haryana has made commendable industrial progress during last few years. Inspite of It's small size, Haryana attained new heights in industrial growth. The pace of it's industrial growth and development has been accelerated with the development of an excellent infrastructure and provision of attractive incentives to entrepreneurs. Marked industrial development has been recorded at Faridabad- Ballabgarh Industrial Complex, Gurgaon, Sonepat, Rohtak, Bahadurgarh, Hissar, Jagadhari, Panipat and Ambala.

4.2.1 Spatial Distribution of Indicators of Industrial
Development : Distribution of indicators of industrial
development is not uniform over the space. Table IV.12
and IV.13 show the distribution of registered factories
and employment in registered factories. Analysis of these
tables reveal that there are only three districts viz.,
Faridabad, Ambala and Karnal which accounts about 65 per
cent of total registered factories in the state. In
terms ofemployment in registered factories Faridabad,
alone accounts for 46.58 per cent of total employment in
registered factories followed by Ambala(17.18 per cent).
Jind, Kurukshetra, Mahendergarh and Sirsa district have
very low percentage of registered factories and employment
and registered factories.

<u>Table IV.12</u>

Haryana : Distribution of Registed Factories, 1981

Registered Factories	Number of Districts	Name of the Districts
8 and above	3	Faridabad, Ambala,Karnal.
8-4	4	Rohtak, Gurgaon, Hissar, Sonepat.
4-2	3	Kurukshetra,Jind,Sirsa
2 and below	2	Mahendergarh, Bhiwani.

Table IV.13

Haryana : Distribution of Employment in Registered
Factories, 1981.

Percentage of Employment in registered Factories	No. of Districts	Name of the Districts
8 and above	2	Faridabad, Ambala
8-4	5	Karnal, Rohtak, Bhiwani Hissar, Sonepat
4-2	1	Gurgaon
2 and below	4	Kurukshetra, Jind, Mahendergarh, Sirsa.

Table IV.14 and IV.15 show the distribution of
workers in industrial sector and non-agricultural sectors.
As it is evident from the Tables districts Faridabad,
Ambala, Karnal, have high percentage of workers engaged in
industrial sector and non-agricultural sectors. On the other
hand, districts Kurukshetra, Jind, Bhiwani, Sirsa, have
comparatively low percentage of workers in industrial and
non-agricultural sectors. Urban population also high in
Faridabad, Ambala ,andlow in Mahendergarh and Jind district,
(Table IV.16). Workers non-household industries are more
in Faridabad, Karnal, Ambala low in Jind and Mahendergarh
district. District Sirsa, Gurgaon, Rohtak, Hissar, Sonepat
have 15-25 per cent of workers engaged in non-household
industries.

Table IV.14

Haryana : Distribution of Industrial Workers, 1981.

Percentage of industrial workers to total workers	Number of Districts	Name of the District
20 and above	1	Faridabad
20-15	1	Ambala
15-10	5	Karnal,Rohtak,Gurgaon, Mahendergarh, Sonepat
10-5	5	Kurukshetra,Jind,Sirsa Bhiwani and Hissar.

Table IV.15

Haryana : Distribution of Non-Agricultural Workers, 1981.

Percentage of Non-Agricultural workers to total workers	Number of Districts	Name of the Districts
50 and above	2	Faridabad, Ambala
50-40	2	Karnal, Rohtak
40-30	4	Gurgaon, Mahendergarh, Sonepat, Hissar.
30-20	4	Kurukshetra,Jind, Bhiwani, Sirsa.

Table IV.16

Haryana : Distribution of Urban Population, 1981

Percentage of Urban Population to Total	Number of Districts	Name of the Districts
80 and above	2	Faridabad, Ambala
75-80	3	Bhiwani, Hissar, Sonepat
70-75	5	Kurukshetra,Karnal,Rohtak, Gurgaon, Sirsa.
65-70	2	Mahendergarh, Jind.

Table IV.17

Haryana : Distribution of Non-Households Worker, 1981.

Percentage of workers in Non-household to total industrial workers	Number of Districts	Name of the Districts
25 and above	3	Faridabad, Ambala,Karnal
20-25	1	Sirsa
15-20	6	Gurgaon, Rohtak, Hissar. Sonepat, Kurukshetra, Bhiwani.
10-15	2	Jind, Mahendergarh

4.2.2 Patterns of Industrial Development : Selected indicators of industrial development have been composed into one index of industrial development. Table 4.18 gives the correlation among the indicators of industrial development, all the selected indicators have high positive correlation with each other during both time period. Urban population (G13) with highly positively correlated with number of registered factories and workers in non-agricultural sectors. The relationship among the indicators of industrual development have become more significant during 1980-81.

Table IV.18

Haryana : Correlation Matrix, (1970-71 and 1980-81)

Indicators	G9	G10	G11	G12	G13	G14
G9	1.0					
G10	.83	1.0				
G11	.77	.94	1.0			
G12	.89	.86	.90	1.0		
G13	.92	.70	.63	.79	1.0	
G14	.64	.81	.73	.59	.63	1.0

Table IV.18 (contd.)

1980-81

Indicators	G9	G10	G11	G12	G13	G14
G9	1.0					
G10	.88	1.0				
G11	.91	.96	1.0			
G12	.86	.79	.92	1.0		
G13	.96	.89	.90	.84	1.0	
G14	.81	.85	.81	.67	.86	1.0

Table IV.19 shows the relationship of each variable to that of index of industrial development. First factor explains 82 per cent of total variance. All the variable have very high positive correlation with the industrial development index. During 1980-81 first factor explains as much as 88.9 per cent of total variation. During this time period, explainatory power of urbanisation have increased . Absolute value of composite index of industrial

Table IV.19

Haryana: Factor Matrix

Indicators	1971	1981
G9 Percentage of registered factories to total registered factories in the state	.93[*]	.96[*]
G10 Percentage of employment in registered factories	.95[*]	.95[*]
G11 Percentage of industrial workers to total main workers	.92[*]	.97[*]
G12 Percentage of non-agricultral workers to total main workers	.93[*]	.90[*]

Fig. IV. 3   141

HARYANA
LEVELS OF INDUSTRIAL DEVELOPMENT
(1970-71)

HIGH

MEDIUM

LOW

VERY LOW

kms 20   0   20 40 kms

Table IV.19 (contd.)

Indicators	1971	1981
G13 Percentage of urban population to total population	.86*	.96*
G14 Percentage of workers in Non-household industries to total industrial workers	.81*	.88*
Total Variance explained	82.0	88.9%

*Significant at 1 per cent level.

development. Absolute level of composite index of industrial development is given in Appendix II. Classification of districts into high, medium low and very low category of industrial development is given in Table IV.20.

Table IV.20

Haryana: Classification of District According to Index of Industrial Development

Value of Composite Index	1970-71	1980-81
High (1.51 & above)	Ambala, Gurgaon	Faridabad
Medium (1.13-1.51)	Faridabad	Ambala
Low (-.42-1.13)	Mahendergarh, Rohtak, Kurukshetra, Sonepat, Karnal	Karnal, Sonepat, Rohtak, Gurgaon, Hissar
Very below (below -.42)	Sirsa, Hissar, Bhiwani, Jind	Bhiwani, Sirsa, Kurukshetra, Mahendergarh, Jind.

Inter-temporal analysis of the Table IV.20 reveals that there were only three districts which were industrially

Fig.IV.4

HARYANA
LEVELS OF INDUSTRIAL DEVELOPMENT
(1980-81)

HIGH

MEDIUM

LOW

VERY LOW

kms 20   0   20   40 kms

developed in 1970-71. The number of developed districts have decrease from three to two during 1971-81. During 1970-71, Ambala, Gurgaon awere industrial developed followed by Faridabad which was in medium category of development. Faridabad district made tremendous in progress in industrial growth and it occupied Ist position in industrial development in 1980-81. Ambala came down from Ist position in 1970-71 to 2nd during 1980-81. Gurgaon district shifted from high to low category of industrial development during 1980-81. The reason may be attributed to disintegration of Gurgaon district into two districts. It may be possible that during 1970-71 large proportion of value of industrial indicators have gone to Gurgaon, since the method of bifucating district was based on area division. Remaining districts like Rohtak, Kurukshetra, Sonepat, Karnal, Sirsa, Bhiwani and Jind removed in their respective categories as they were in 1970-71. Hissar district have made improvement in it's position from very to low category of industrical development. Downward movement of Gurgaon and Ambala district may be attributed to very high growth experienced by Faridabad district. The absolute value of Faridabad district has gone up significantly in composite index of industrial development affecting the position of other districts. During 1970-71, district accounts for only

10 per cent of total registered factories in the state and
16.46 per cent of total employment in registered factories
which have increased upto 27.95 per cent of total registered
factories and 46.58 percent of total employment in registered
factories. On the other hand, there is no significant change
in share of registered factories and employment in other
districts. Faridabad has favourable conditions for industrial
growth. It may be attributed to it's close proxi mity to
national capital Delhi. Delhi provides big market for
consumer and durable goods produced in Faridabad. However,
all districts of Haryana surrounding Delhi have made
significant improvement in industrial growth but not as much
as Faridabad did. A general improvement in the levels of
industrial development is discernible from Table IV. 21.

Table IV. 21

Haryana :- Mean Value of Indicators of Industrial Development.

Indicators		1970-71	1980-81
G9	Number of Registered factories	121	275
G10	Number of workers in registered factories	7824	15224
G11	Percentage of industrial workers to total main workers	10.04	12.61
G12	Percentate of non-agricultural workers to total main workers	32.87	37.69
G13	Percentage of Urban population to total population	17.38	21.39
G14	Percentage of non-household workers to total main workers	65.24	75.15

As it is evident from the Table IV.21 that value of indicators of industrial development have increased during 1971-81. Average number of registered factories have increased from 121 to 275 during 1971-81. Employment in registered factories also increased. A significant improvement in the values of remaining indicators have been also observed.

4.3 **Summary of findings** : Industrial development in the Rajasthan and Haryana is marked by wide inter-district variation having three or four districts as developed. In Rajasthan these district viz. Jaipur, Ajmer and Kota account a large share in registered factories and employment. Registered factories more or less concentrated in these districts. In Haryana also district Faridabad, Ambala are industrially developed. It has been seen that there was no change in spatial distribution of indicators of industrial development in the both states. In Haryana industrial development took place around Delhi.

There was no change in these positions of less developed district in Rajasthan district Ganganagar and Alwar improved their position during 1971-81. There are as many as ten districts in Rajasthan which account only 4 percent of registered factories and employment in registered factories. In Haryana Jind, Mahendergarh,

Kurukshetra, Sirsa, Bhiwani have been identified as most backward districts. There is great need to decentralise the industrial process and to induce entrepreneur for investing in backward area by various incentives, subsidies etc.

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Chapter V

LEVELS OF DEVELOPMENT OF SOCIO-ECONOMIC INFRASTRUCTURE

5. Introduction

Though the concept of infrastructure has been
extensively used in the literature on economic develop-
ment, yet it has not been explicitly defined in a precise
and universally accepted manner. The term (Infrastruc-
ture' was introduced in early 1950s by the North Atlantic
Treaty Organisation and was subsequently :   adopted by
the development economist. A synonymous for infra-
structure appearing in the literature is the so-called
"Social Overhead Capital", which represent the investment
in basic services that absolutely necessary for the direct
productive activities. According to Hirshman, "The social
overhead capital comprises all public services ... as well
as such agricultural overheads as irrigation and drainage
system[1]. There have been various attempts at defining
infrastructure but some of them could be unambiguous.
Infact, it becomes difficult to draw a clear line of
distinction between infrastructure and the purely economic
or commercial activities providing consumer goods and
services. Taking into account the basic characteristics
of infrastructure, one may define infrastructure as those
facilities which are essential for development, having

1. Hirschman, A.O., "The Strategy of Economic Development",
        Yale University Press, New Haven and London, 1958.

basic characteristics like universal ity of requirement, necessity of their creation ahead of demand, immobility due to the simultaniety of production and use of their services, business and sources of external economies[2].

It has not been possible to measure the relation-ship between availablity of infrastructure facilities and economic development. The difficulty arises firstly at the conceptual level because growth in the infra-structural facilities preced' accompany as well as follow the economic progress. Secondly, availability does not automatically lead to economic development unless they are not available in suitable package and are utilised. Thirdly, the relation between infrastruc-ture and economic development becomes all the more complex because of interdependence between infrastructural facilities among themselves, all of which taken together influence the process of development. But the necessity

sation of the rate of

elfare and the invetable role

y recognised.

ed as necessary prerequisite

ell as critical variable in

lopment. It facilitates and

Development of Economic Uttar Pradesh", An Inter-, Indian Journal of Regional 37.

accelerates the process of economic development
through it's favourable impact on the main determina-
ntes of economic development. The availability of
infrastructural facilities like transport, power,
skilled manpower etc. creats a favourable investment
climate by expanding the size of market and increas-
ing the availability and supply elasticity of the
factors of production. The role of infrastructure
in economic development is expected to undergo a
change with the process of economic development.
Once the economy attains a certain minimum level of
development, the role of infrastructure becomes
supportive and emphasis is on removing occassional
bottlenecks which may crop up from time to time.

Various studies, which have been conducted on
infrastructural facilities in India, dealt with one
single facility in isolation, However, there are some
studies which have tried to include infrastructural
facilities together. Healay (1965)[3] mainly dealt with
the development of overhead capital in India during the
period 1950-60. But this work doesn't take care of the
relative positions of different states in so far as
actual facilities are concerned. Shah (1969)[4] had

3. Healey, J.M., "Development of Social Overhead Capital
   in India, 1950-60, Bombay, 1965.

4. Shah, N., "Infrastructure for Indian Economy", Commerce,
   Annual Number, 1969.

attempted to construct a composite index including all
infrastructural facilities. His work relates to year
1967-68 taking state as unit. He assigned subjective
weights to different infrastructural facilities and
arrived at composite index and rank the states. In
his study no attempt has been made to examine the
impact of infrastructural development an general
economic development. Biplap Dasgupta (1971)[5] classi-
fied Indian districts on the basis of socio-economic
infrastructural facilities. He used the shophisti-
cated technique principal component and arrived at a
composite index of socio-economic development of districts.
He dealt mainly with the stastical problems.

5.1 Levels of Development of Socio-Economic Infra-
     structure in Rajasthan - A spatio-temporal Analysis
     1971-81

     To measure the levels of development of socio-
economic infrastructure sixteen indicators of develop-
ment have been selected for present analysis. Some of
the indicators represent economic infrastructure and
others represent social infrastructure. It is necess-
ary to draw a line of distinction between economic and
social infrastructure. Economic infrastructure includes

5. Dasgupta, B., "Socio-Economic Classification of
         Districts - A Statistical Approach", Economic
         and Political Weekly, vol. VI, No.31, Aug.1971.

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transport, power and communication facilities while

social infrastructure may include education, and

medical or health facilities and financial institutions

etc. Selected variables of socio-economic infrastructure

has been given in Table V.1.

Table V.1

Indicators of Socio-Economic Infrastructure Development

---

1. Length of metaled surfaced road per
    1000 sq. kilometers (G16)

2. Percentage of villages connected by pucca road (G17)

3. Percentage of having medical facilities G18)

4. Percentage of villages having postal facilities (19)

5. Percentage of literates (20)

6. Percentage of female literates (G21).

7. Number of post-offices per lac population (G22)

8. Hospitals and dispensaries per lac population (G23)

9.. Number of bank offices per lac population (G24)

10. Bank deposits per capita (G25)

11. Percentage of villages having educational facilities
    (G26)

12. Number of colleges per lac population (G27)

13. Number of Higher secondary schools per ten thousands
    population (G28)

14. Number of middle schools per ten thousands population
    (G29)

15. Number of primary schools per hundred population (G30)

16. Number of Hospitals and dispensaries per 1000 sq.
    kilometers G33)

)f Socio-Economic Infra-
structure : It will be useful to see spatial distribu-
tion of socio-economic infrastructure before measuring
the levels of socio-economic infrastructure development.
Table V.2 shows the distribution of metalled surfaced
road. District Bharatpur, Alwar, Ajmer have a high length
of metalled surfaced road per 1000 sq. km whereas
there are as many as eighteen districts which are
classified by low length of surfaced road. These districts
are largely desertic and semi-desertic that is why these
districts have very low length of surfaced road. This
may be attributed to the constraints imposed by the
topography. In respect of villages connected by pucca
road, only 30 per cent villages of Rajasthan are connected
by pucca road. Districts of Nagaur, Ganganagar, Jhunjjhunu,
Ajmer, Sirohi and Dungarpur have 25 to 30 per cent of
their villages connected by pucca road. On the other hand,
twelve districts which have 10-20 per cent of villages

mprises of Churu, Jodhpur,
ilawara, Udaipur, Chittorgarh,
Ionk (Table V.3). In respect of
)f Jhunjhunu, Sikar, Barmer,
served whereas Ganganagar,
)war districts are poorly
; (Table V. 4).

Table V.2

Rajasthan : Distribution of Metalled Surfaced Road per 1000 Sq. Kms, 1981

Length of Metalled Road (Kms)	No. of Districts	Name of the Districts
150 and above	4	Alwar, Bharatpur, Ajmer, Dungarpur
120-150	4	Jaipur, Sirohi, Udaipur, Banswara
90-120	11	Ganganagar, Jhunjhunu, Swaimadhopur, Sikar, Jodhpur, pali, Bhilwara, Chittorgarh, Bundi, Kota, Jhalwar.
60-90	5	Churu, Tonk, Nagaur, Barmer, Jalor
30-60	2	Bikaner, Jaiselmer

Table V.3

Rajasthan : Percentage of villages connected by Pucca Road, 1981.

Percentage of villages	No. of Districts	Name of the Districts
30 and above	1	Nagaur
25-30	5	Ganganagar, Jhunjhunu, Ajmer, Sirohi, Dungarpur
20-25	8	Bikaner, Alwar, Bharatpur, Swaimadhopur, Jaipur, Sikar, Barmer, Banswara.
15-20	11	Churu, Jodhpur, Jaiselmer,Pali, Jalor , Bhilwara, Udaipur, Chittorgarh, Bundi, Kota, Jhalawar

Table V..4

Rajasthan : Percentage of village having Postal Facilities - 1981.

Percentage	Number of Districts	Name of the Districts
50 and above	3	Jhunjhunu, Sikar, Barmer
40-50	2	Churu, Nagaur
30-40	8	Bikaner, Swaimadhopur,Ajmer Jodhpur, Jaiselmer, Pali, Barmer, Jalore
20-30	9	Alwar, Bharatpur,Jaipur, Tonk, Bhilwara, Udaipur, Dungarpur, Bundi, Kota
10-20	4	Ganganagar, Chittorgarh, Banswara, Jhalawar.

Table V.5

Rajasthan : Percentage of Village Having Medical Facilities, 1981

Percentage of villages	Number of Districts	Name of the Districts
25 and above	2	Jhunjhunu, Sikar
20-25	3	Churu, Pali, Sirohi
15-20	11	Bikaner, Alwar, Jaipur, Ajmer, Tonk, Nagaur, Jaiselmer, Barmer, Jalore, Bhilwara, Dungarpur.
10-15	7	Bharatpur, Swaimadhopur, Udaipur, Banswara, Bundi, Kota, Jhalawar,
5-10	3	Ganganagar, Jodhpur, Chittorgarh

In terms of medical facilities Table V.5, Jhunjhunu,
Sikar, Churu, Pali and Sirohi districts have 25-30 per
cent of villages having medical facilities. District
Ganganagar, Jodhpur, Chittorgarh have less percentage of
villages with medical facilities. A large number of
districts have 10-20 per cent of their villages with
medical facilities. In respect of number of hospitals
and dispansaries per 1000 sq. kms district Jaipur, Alwar,
Jhunjhunu,. Sikar, Ajmer, Banswara have more number of
hospitals and dispansaries whereas distticts Barmer,
Jaiselmer, Ganganagar, Chittorgarh have less number of
hospitals and dispansaries (Table V.6). High growth in the
number of hospitals and dispensaries has been experienced
by Jalore, Churu, Bikaner, and Banswara district. There
are as many as thirteen districts which have experienced
30-60 per cent growth in number of hospitals and dispan-
saries. Bharatpur, Chittorgarh districts recorded negative
growth rate.(Table V.7).

Table V.6

Rajasthan : Distribution of Hospital and Dispansaries
per 1000 square Kms, 1981.

Number of Hospitals and Dispansaries	Number of Districts	Name of the Districts
10-12.5	3	Jaipur,Alwar,JHunjhunu
7.5-10.0	3	Sikar, Ajmer, Banswara
5.0-7.5	11	Bharatpur, Swaimadhopur, Tonk, Pali, Sirohi, Bhilawara, Udaipur, Dungarpur, Bundi, Kota Jhalawar
2.5-5.0	7	Bikaner,Churu, Jodhpur, Nagaur, Jalor,Chittorgarh,

Table V.6 (contd.)

0-2.5	2	Barmer, Jaiselmer.

Table V.7

Rajasthan : Growth in the Number of Hospitals and Dispansaries, 1971-81.

Growth per cent	Number of Districts	Name of the Districts
More than .90	4	Jalor, Churu, Bikaner, Banswara
60-90	6	Alwar, Barmer, Bhilwara, Bundi, Jhunjhunu, Nagaur
30-60	13	Swaimadhopur, Udaipur, Pali, Jaipur, Tonk, Dungarpur, Ganganagar, Jaiselmer, Ajmer, Sirohi, Jodhpur, Jhalawar, Sikar
0-30	1	Kota
-30 - 0	2	Bharatpur, Chittorgarh

According to the percentages of villages having education facilities districts Jhunjhunu, has the high percentage of villages with education facilities followed by Churu, Sikar, Nagaur, Pali, Barmer and Sirohi. On the other hand, districts of Tonk, Jodhpur, Udaipur, Chittorgarh, Kota, Jhalwar, and Ganganagar, have low percentage of villages with education facilities. A large number of districts have 60-75 per cent villages with education facilities. (Table V.8). In respect of number of colleges per lakh population district Ajmer, Bikaner, Jaipur, and Jhunjhunu have comparatively more colleges. Most of the districts

are characterise with very low number of colleges.

It has been observed that number of colleges is high

in districts which are industrially developed and highly

urbanised.(Table V.9). According to literacy rate Ajmer,

Jaipur, Kota are at the top three positions which have

above 30 per cent literacy. District Nagaur, Jaiselmer,

Bhilwara, Dungarpur, Banswara, Barmer, Jalor have low

percentage of literacy (Table V.10).

Table V.8

Rajasthan : Percentage of Villages Having Educational
Facilities, 1981.

Percentage of villages	No. of Districts	Name of the Districts
90 and above	1	Jhunjhunu
75-90	7	Churu, Sikar, Nagaur, Jaiselmer, Pali, Barmer, Sirohi
60-75	11	Bikaner, Alwar, Bharatpur, Swaimadhopur, Jaipur, Ajmer, Barmer, Bhilwara, Dungarpur, Banswara, Bundi.
45-60	6	Tonk, Jodhpur, Udaipur, Chittorgarh, Kota, Jhalawar
30-45	1	Ganganagar

Table V.9

Rajasthan : Distribution of Colleges per Lakh
           Population, 1981

Colleges per lakh Population	No. of Districts	Name of the Districts
1.50 and above	2	Ajmer, Bikaner
1.20 - 1.50	2	Jaipur, Jhunjhunu.
.90 - 120	3	Sikar, Udaipur, Kota
.60 - .90	6	Ganganagar, Churu, Alwar Tonk, Jodhpur, Jaiselmer
.30 - .60	13	Bharatpur, Swaimadhopur, Nagaur, Pali, Barmer, Jalor, Sirohi, Bhilwara, Chittorgarh, Dungarpur, Banswara, Bundi, Jhalawar.

Table V.10

Rajasthan : Distribution of Districts According to
           Literacy Rates, 1981

Literacy Rate	No. of Districts	Name of the Districts
30 and above	3	Ajmer, Jaipur, Kota
25-30	7	Ganganagar, Bikaner, Jhunghunu, Alwar, Bharatpur, Sikar, Jodhpur
20-25	9	Churu, Swaimadhopur, Tonk, Pali, Sirohi, Udaipur, Chittorgarh, Bundi, Jhalawar.
15-20	5	Nagaur, Jaiselmer, Bhilwara, Dungarpur, Banswara
10-15	2	Barmer, Jalor

In respect of number of primary schoold per
100 population Jaiselmer, Sirohi, Dungarpur, Banswara,
and Bundi district have above .80 school per 100 popula-
tion. On the otherh hand, Ganganagar, Jhunjhunu, Jaipur,
Jodhpur, and Pali district have less number of schools.
Since the number of primary schools are taken in relation
to population, the districts which are high populated are
characterised by less number of primary schools (Table V.11).
High growth in the number of primary schools as been
experienced by district Sirohi, Dungarpur, Jaiselmer,
and Banswara whereas low growth rate observed in the
districts of Chittorgarh, Jhalawar, Jaipur, Bhilwara,
and Ajmer, The districts which have high number of middle
and higher secondary school have low number of primary schools
(Table V.12In terms of growth literacy rate district
Ganganagar, experienced high growth i.e. above 85 per cent,
followed by Swaimadhopur, Jaipur, Jodhpur, Jhalor, Banswara,
and Kota (between 75 to 85 per cent). Low growth in literacy
rate has been observed in Sirohi, Ajmer, and Jhalwar district
(Table V.13). Growth in literacy rate was high in these
districts because of industrialisation and urbanisation
except Jalor and Banwara district. Table V.14 shows the
distribution of districts by bank deposit per capita.
Districts Jaipur, Bikaner, Ajmer, Jodhpur, and Pali have
high per capita bank deposit in comparison to other districts,
High bank deposit per capita in these districts may be

Table V.11

Rajasthan ı Distribution of Primary Schools Per Hundred
Population, 1981.

Number of Schools	Number of Districts	Name of the Districts
.90 and above	2	Jaiselmer, Sirohi
.90 - .80	3	Dungarpur, Banswara, Bundi
.80 - .70	7	Jhalawar, Chittorgarh, Bharatpur, Udaipur, Bhilwara, Barmer, Alwar
.70 - .60	9	Bikaner, Churu, Swaimadhopur, Sikar, Ajmer, Tonk, Nagaur, Jalore, Kota.
.60 - .50	5	Ganganagar, Jhunjhunu, Jaipur, Jodhpur, Pali.

Table V. 12

Rajasthan ı Growth in the Number of Primary Schools, 1971-81

Growth per cent	Number of Districts	Name of the Districts
32 and above	4	Sirohi, Dungarpur, Jaiselmer, Barmer
24-32	4	Ganganagar, Bikaner, Jhunjhunu, Barmer
16-24	6	Bharatpur, Sikar, Jodhpur, Udaipur, Bundi, Kota
8-16	10	Churu, Alwar, Swaimadhopur, Tonk, Nagaur, Pali, Jalor, Chittorgarh, Jhalawar, Jaipur
0-8	2	Bhilwara, Ajmer

Table V.13

Rajasthan ı   Growth in Literacy Rate, 1971-81

Growth (per cent)	Number of Districts	Name of the Districts
More than 85	1	Ganganagar
75 - 85	6	Swaimadhopur, Jaipur, Jodhpur, Jalor, Banswara, Kota
65 - 75	10	Alwar, Bharatpur, Sikar, Tonk, Nagaur, Jaiselmer Pali, Barmer, Udaipur, Dungarpur
55-65	7	Bikaner, Churu, Jhunjhunu, Bhilwara, Chittorgarh, Bundi, Jhalwar
45 - 55	2	Sirohi, Ajmer

attributed to industrial development in case of Jaipur and Ajmer and largely due to business class (Marwari) in Ajmer and Udaipur district. Very high growth in bank deposit has been noted in Jalor, Jaiselmer, Dungarpur, Banswara, Sirohi and Tonk. This may be attributed to very low per capita bank deposit in 1971 in these districts. On the other hand, relatively developed districts such as Jodhpur, Jaipur, Kota experienced low growth (Table V.15). Medium growth has been experienced by Pali, Sikar, Nagaur, Barmer, Jhunjhunu, Churu and other districts.

5.1.2 Patterns of Development of Socio-Economic Infra-
structure - Selected indicators of socio-economic
infrastructure have been composed into one index of
development because it is very difficult to analysis
the pattern of socio-economic infrastructure develop-
ment by taking each variable separately. Correlation
among selected indicators of infrastructural develop-
ment is given in Table V.16 and V.17. As it may be
evident from the tables V.16 and V.17 that in 1970-71
the variable length of surfaced road has positive
correlation with variable G17, G28, G21, G24, G23, G27,
G28, G29 and G23. But it has high positive correlation
with medical facilities (G33). G17 has positive relation
with all indicators except G22, G23, G29 and G30 but
doesn't have significant relationship with none of the
variable. Indicators representing education, medical
facilities and transport are closely related to each
other. Indicator G25 i.e. bank deposits per capita is
positively related with education particularly with
higher education. During 1980-81 relationship among
the different indicators changed. Some variable which
were correlated positively but not significantly in
1970-71 were found to have strong relationship while
relationship of some indicators have become weak.

Table V.14

Rajasthan : Distribution of Bank Deposit per Capita, 1981.

Bank Deposit (Rs.)	Number of Districts	Name of the Districts
600 and above	2	Jaipur, Bikaner
450-600	3	Ajmer, Jodhpur, Sirohi
300-450	3	Ganganagar, Kota
150-300	11	Churu, Jhunjhunu, Alwar Bharatpur, Nagaur, Jaiselmer, Pali, Bhilwara, Udaipur, Chittorgarh, Dungarpur
0 - 150	8	Swaimadhopur, Sikar, Tonk, Barmer, Jalor, Banswara, Bundi, Jhalawar.

Table V. 15

Rajasthan : Growth in Bank Deposit, 1971-81.

Growth (per cent)	Number of Districts	Name of the Districts
1200 and above	6	Jalor, Jaiselmer, Dungarpur, Banswa ra, Sirohi, Tonk
1000-12000	3	Swaimadhopur, Chittorgarh, Bhilwara
800-1000	8	Pali, Sikar, Nagaur, Barmer, Jhunjhunu, Churu, Alwar, Bharatpur
600- 800	3	Bundi, Udaipur, Bikaner
400 - 600	6	Jodhpur, Jhalawar, Ajmer, Ganganagar, Jaipur, Kota

Table V.16

Rajasthan ı Correlation Matrix, 1970-71

Indica-tors	G16	G17	G18	G19	G20	G21	G22	G23	G24	G25	G26	G27	G28	G29	G30	G33
G16	1.0															
G17	.60	1.0														
G18	.05	.17	1.0													
G19	-.23	.25	.85	1.0												
G20	.39	.34	.32	.11	1.0											
G21	.28	.34	.21	.03	.43	1.0										
G22	-.32	▼.01	.08	.36	-.34	-.32	1.0									
G23	-.17	-.16	-.11	-.18	.32	.33	-.-5	1.0								
G24	.23	.09	0.03	-.23	.74	.78	-.45	.35	1.0							
G25	.09	.25	.16	-.0	.77	.85	-.26	.26	.77	1.0						
G26	-.02	.28	.84	.90	.15	.09	.09	-.20	-.25	.02	1.0					
G27	.09	.08	.42	.21	.79	.81	-.20	.15	.58	.75	.23	1.0				
G28	.33	.27	.62	.39	.70	.60	-.22	.09	.26	.57	.44	.69	1.0			
G29	.22	.20	.33	.15	.66	.67	-.42	-.16	.51	.31	.21	.71	.60	1.0		
G30	-.15	-.36	.61	-.57	-.36	-.34	.13	.49	-.23	-.38	-.57	-.43	.37	-.63	1.0	
G33	.84	.43	.30	.06	.50	.34	-.33	-.12	.33	.29	.11	.28	.45	.26	-.31	1.0

Table V.17

Rajasthan :   Correlation Matrix, 1980-81

Indica-tors	G16	G17	G18	G19	G20	G21	G22	G23	G24	G25	G26	G27	G28	G29	G30	G33
G16	1.0															
G17	.27	1.0														
G18	-.08	.30	1.0													
G19	-.32	.32	.80	1.0												
G20	.40	.06	.10	-.16	1.0											
G21	.32	.08	-.03	.45	.92	1.0										
G22	-.43	-.02	.33	.45	-.45	-.47	1.0									
G23	-.39	-.19	.29	.14	.01	.17	.39	1.0								
G24	.16	.25	.29	.08	.27	.35	-.17	.30	1.0							
G25	.19	.22	.08	.06	.68	.82	-.37	.29	.66	1.0						
G26	-.12	.33	.81	.82	-.16	-.27	.40	.24	.22	-.11	1.0					
G27	.09	.12	.36	.20	.76	.81	-.08	.39	.21	.70	.05	1.0				
G28	.30	.14	.53	.26	.69	.57	.05	.21	.21	.39	.20	.75	1.0			
G29	.14	-.04	.07	-.21	-.05	.00	.38	.39	.42	.17	.00	.01	021	1.0		
G30	-.04	-.07	-.10	-.19	-.45	-.39	.63	.36	.07	-.21	.04	-.30	-.14	.73	1.0	
G33	.76	.17	.24	-.15	.50	.39	-.39	-.12	.14	.24	.03	.32	.47	.03	-.23	1.0

Table V.18.

Rajasthan :   Factor Matrix

Indicators		1970-71 F1	1980-81 F1
G16	Length of metaled surfaced road per 1000 sq. kms	.41	.48*
G17	Percentage of villages connected by Pucca road	.43	.24
G18	Percentage of villages having medi. facilities	.62*	≮26
G19	Percentage of villages having postal facilities	.41	.01
G20	Percentage of literates	.87*	.92*
G21	Percentage of female literates	.82*	.91*
G22	Number of post-offices per lakh population	-.35	-.47
G23	Hospitals and dispensaries per lakh population	.82*	.11
G24	Number of bank offices per lac population	.60*	.46
G25	Bank deposits per capita	.71*	.81*
G26	Percentage of villages having educational facilities	.46	.02
G27	Number of colleges per lakh population	.81*	.82*
G28	Number of Higher secondary schools per ten thousands population	.79*	.73*
G29	Number of middle schols per ten thousand population	.78*	.01
G30	Number of primary schools per hundred population	-.68*	-.44
G33	Number of hospitals and dispensaries per thoasands sq. kms.	.57*	.61*
	Total variance explained	40.6%	31.0%

Table V.18 gives the correlation of each indicator with that of composite index of socio-economic infrastructure development. During 1970-71first factor explained 40.6 per cent of total variance which has come down to 31.0 per cent during 1980-81. Composite index is highly correlated with the indicators G18, G20, G21, G23, G24, G25, G27, G28, G29 and G33 which represent the educational, medical and banking facilities. In terms of educational facilities, college education, High and Higher secondary education are highly contributing in explaining the variance of first factor. All the indicators representing medical facilities are positively correlated with development index of infrastructure. During 1980-81, the explainatory power of indicators G18, G23, G26 and G29 have gone down whereas increased in case of G20, G21, G25 and G33. Other indicators which are not contributing in first factor may be contributing in 2nd and 3rd factor because first factor explains only 40.6 per cent in 1970-71 and31.0 per cent in 1980-81 of total variance. Remaining variance must be explained by other factors. Absolute value of composite index for different district for the year 1970-71 and 1980-81 is given in Appendix I. Classification of district into high, medium, low and very low category of socio-economic infrastructural development is given in Table V.19.

Fig.V.1

RAJASTHAN
LEVELS OF DEVELOPMENT OF
SOCIO-ECONOMIC INFRASTRUCTURE

(1970-71)

HIGH

MEDIUM

LOW

VERY LOW

kms 50   0   50   100   150   kms

Inter-temporal analysis of the Table V.19 reveals
that there is an increase in the number of district falling
in medium and high category of infrastructural development,
though it is marginal. Ganganagar district made upward
movement from low to medium category during 1970-71 to
1980-81. There has no change been seen in the number of
high developed district during 1970-71 to 1980-81 but
district Kota shifted to high category from medium
category and Jodhpur district shifted downward from high to
medium category. Within category changes has taken
place in ranking of district at the composite index
level. On the other hand, number of less developed dis-
trict marginally decrease from 5 to 4 during 1971-81
due to upward moment made up Banswara district. Chittor-
garh, Jalor, Jaiselmer and Barmer remained most umder-
developed in socio-economic infrastructural developed.
Ajmer, Jaipur, Jhunjhunu, Bikaner and Kota district are
classified as developed districts. It indicate that
whatever development has taken place, went to the already
developed district. Developed district are marked with
high value of indicators which explains the development
index. These indicators have high literacy rates, higher
education facilities i.e. college and higher secondary
level, high bank deposit per capita and availability of
medical facilities. On the other hand, less developed

districts are deprived of these facilities. Spatial
pattern of the levels of development of socio-economic
infrastructure is shown in Fig. V.1 and V.2 for the
year 1970-71 and 1980-81. There is no special pattern of
development. Most of the less developed district are
surrounded by one or two developed districts.

A general improvement in the level of socio-
economic infrastructural development is discernible

Table V.19

Rajasthan : Classification of Districts According to
Index of Socio-Economic Infrastructural
Development

Value of composite Index	1970-71	1980-81
High (.81 & above)	Ajmer, Jhunjhunu, Jaipur, Bikaner, Jodhpur	Ajmer, Jaipur, Jhunjhunu, Bikaner, Kota
Medium (.30- .81)	Sikar, Kota, Sirohi, Alwar	Alwar, Jodhpur, Sirohi, Ganganagar, Sikar
Low (-.69 - +.30)	Pali, Churu, Ganga-nagar, Bharatpur, Udaipur, Nagaur, Bhilwara, Dungarpur, Jhalawar, Bundi, Tonk, Swaimadhopur.	Udaipur, Bharatpur, Pali, Churu, Bhilwara, Dungarpur, Swaimadho-pur, Bundi, Nagaur, Tonk, Jhalawara, Banswara
Very low (Below -.69)	Chittorgarh, Jalor, Banswara, Barmer, Jaiselmer	Chittorgarh, Jalor, Jaiselmer, Barmer.

from Table V.20. Mean values of sll the indicators
increased during except number of colleges per lakh of

Fig. V.2   172

RAJASTHAN
LEVELS OF DEVELOPMENT OF
SOCIO-ECONOMIC INFRASTRUCTURE
(1980-81)

HIGH

MEDIUM

LOW

VERY LOW

kms 50 0 50 100 150 kms

population and primary school per 100 population.

It may be attributed that population growth exceeded the growth of these facilities. Bank deposite per ca capita increased from Rs. 43.22 to Rs. 263.85 during 1971-81. Literacy rate has gone up from 18.17 percent to22.95 per cent. Significant growth has been observed in the number of high/higher secondary schools, medical facilities during 1970-71 to 1980-81. There was definite improvement in the socio-economic infrastructural development but it was concentrated only in those areas which were already developed (Table V.20).

Table V.20

Rajasthan: Mean Value of Indicators of Socio-Economic Infrastructural Development

Indicators	1970-71	1980-81
G16	76.22	107.99
G17	16.46	20.86
G18	11.50	16.64
G19	21.35	30.75
G20	18.17	22.95
G21	7.90	10.49
G22	31.23	28.41
G23	2.50	5.04
G25	43.22	263.85
G26	54.82	68.06
G27	.86	.72
G28	.33	.71
G29	.69	1.57
G30	.76	.70
G33	4.11	6.00

5.2 Levels of Development of Socio-Economic Infrastructure
in Haryana - A Spatio-Temporal Analysis, 1971-1981

Haryana was poorly served by basic infrastructural
facilities at the time of it's creation in 1966. Immediately
after its constitution planningprocess started and Haryana
made tremendous progress in areas of agricultural, industry,
and development of socio-economic infrastructure. Haryana
has the distinction in India to provide electricity and .
fresh drinking water to all villages. More than 90 per
cent of villages have been connected by pucca roads and
served by educational facilities.

5.2.1 Spatial Distriction of Socio-Economic Infrastructure :
Before going for discussion on levels of development of
socio-economic infrastructure one should examine the
spatial distribution of indicators of socio-economic
infrastructure. Table V.21 shows that Gurgaon district
has the highest length of surfaced road in the state
whereas Sirsa district is marked by low length of metalled
road. Between these two extreme districts there are
districts which have metalled surfaced road above
state average and some districts are at below state
average. In respect of villages connected by pucca
roads Jind, Bhiwani and Sonepat ranked at top three
positions and Faridabad, Sirsa and Ambala at the lowest
level. About 92 per cent of villages of Haryana have the
pucca road facilities. In Rajasthan only 20 per cent
villages are connected by pucca road (Table V. 22)

population and primary school per 100 population.

It may be attributed that population growth exceeded
the growth of these facilities. Bank deposite per ca
capita increased from Rs. 43.22 to Rs. 263.85 during
1971-81. Literacy rate has gone up from 18.17 percent
to22.95 per cent. Significant growth has been observed
in the number of high/higher secondary schools, medical
facilities during 1970-71 to 1989-81. There was
definite improvement in the socio-economic infrastruct-
ural development but it was concentrated only in those
areas which were already developed (Table V.20).

<u>Table V.20</u>

Rajasthan: Mean Value of Indicators of Socio-Economic
Infrastructural Development

Indicators	1970-71	1980-81
G16	76.22	107.99
G17	16.46	20.86
G18	11.50	16.64
G19	21.35	30.75
G20	18.17	22.95
G21	7.90	10.49
G22	31.23	28.41
G23	2.50	5.04
G25	43.22	263.85
G26	54.82	68.06
G27	.86	.72
G28	.33	.71
G29	.69	1.57
G30	.76	.70
G33	4.11	6.00

Table V.21

Haryana : Distributionof Metalled Surfaced Road, 1981

Length of Mettaled Road (kms)	Number of Districts	Name of the Districts
500 and above	1	Gurgaon
400-500	6	Ambala, Kurukshetra, Karnal, Mahendergarh, Sonepat, Faridabad.
300-400	4	Jind,Rohtak, Bhiwani,Hissar
200-300	1	Sirsa

Table V.22

Haryana : Percentage of Villages Connected by Pucca Road, 1981

Percentage of villages	Number of Districts	Name of the Districts
95-100	3	Jind, Bhiwani, Sonepat
90-95	6	Kurukshetra, Karnal,Rohtak, Gurgaon, Mahendergarh,Hissar.
85-90	2	Faridabad, Sirsa
80-85	1	Ambala

There is not much difference in case of availability of postal facilities in Rajasthan and Haryana. Rohtak, Bhiwani, Hissar and Sonepat district have higher percentage of villages with postal facilities in comparison to other districts. Ambala, Gurgaon, Faridabad districts have

very low percentage of villages having postal facilities

(i.e. between 15-25 per cent). It is given in Table V.23.

Table V.23

Haryana : Percentage of Villages having Postal Facilities, 1981

Percentage of villages	Number of Districts	Name of the Districts
45 and above	4	Rohtak,Bhiwani, Hissar, Sonepat
35-45	3	Karnal, Jind, Sirsa
25-35	2	Kurukshetra, Mahendergarh
15-25	3	Ambala,Gurgaon,Faridabad.

In respect of medical facilities also Haryana is in much better position than Rajasthan. In Haryana, 58 per cent villges have the medical facilities in comparison to 17 per cent in Rajasthan. About 70 per cent villages of Rohtak, Mahendergarh, Hissar have the medical facilities. On the other hand, 40-50 per cent villages in Kurukshetra, Karnal, Gurgaon and Bhiwani districts are served by medical facilities (Table V.24). In case of number of hospitals, and dispensaries per 1000 sq.kms district Faridabad, and Ambala have higher number of hospitals and dispensaries. District Kurukshetra, Jind, Sirsa, have less number of hospitals and dispensaries, other districts have the average number of hospitals and dispensaries (Table V.25).

High growth in number of hospitals and dispensaries has
been experienced by Faridabad, Hissar, and Bhiwani district.
Negative growth have been observed in Karnal district.
It may be attributed to the methodological problem in
dividing the districts in order to make comparison of
districts in 1971-81. Other districts also marked by
low growth.(Table V.26).

Table V.24

Haryana : Percentageof villages having Medical Facilities,
1981

Percentage of villages	Number of Districts	Name of the Districts
70 and above	3	Rohtak, Mahendergarh,Hissar
60-70	2	Sonepat, Sirsa
50-60	3	Ambala, Jind,Faridabad
40-50	4	Kurukshetra, Karnal,Gurgaon Bhiwani

Table V.25

Haryana : Distribution of Hospitals and Dispansaries
per 1000 Kms, 1981

Humber of Hospital Dispensaries	No. of Districts	Name of the Districts
12.5 and above	2	Faridabad, Ambala
10 - 12.5	4	Rohtak,Gurgaon,Mahendergarh, Sonepat
7.5 - 10.0	3	Karnal, Bhiwani,Hissar
5.0 - 7.5	3	Kurukshetra, Jind,Sirsa

Table V.26

Haryana : Growth on the Number of Hospitals and Dispensaries, 1971-81

Growth (per cent)	No. of Districts	Name of the Districts
50 and above	3	Faridabad, Hissar, Bhiwani.
25 - 50	3	Jind, Mahendergarh,Ambala
0-25	5	Sonepat,Sirsa, Kurukshetra, Rohtak, Gurgaon
-25 - 0	1	Karnal

In terms of village having education facilities, more than 90 per cent villages of Haryana have education facilities whereas in Rajasthan about 68 per cent village have education facilities Jind, Rohtak, Bhiwani, Hissar and Sirsa district are characterised by about 95 per cent of their villages having education facilities. Ambala, and Gurgaon district comparatively have less percentage of villages with education facilities (Table V.27).

Table V.27

Haryana : Percentage of Villages having Education Facilities, 1981

Percentage of villages	Number of Districts	Name of the Districts
95 and above	5	Jind, Rohtak,Bhiwani, Hissar, Sirsa
90-95	3	Karnal,Mahendergarh,Sonepat
85-90	2	Kurukshetra, Faridabad
Less than 85	2	Ambala, Gurgaon

Number of primary schools per hundred population is comparatively high in Mahendergarh and Gurgaon district. District Rohtak, Hissar, Sonepat have less number of primary schools (Table V..28). Growth in number of the primary schools has been shown in Table V..29. High growth has been observed in Kurukshetra district and Sonepat, Faridabad, Bhiwani, Rohtak, have experianced negative growth. This may be attributed to methodological difficulties.

Table V.28

Haryana : Distribution of Primary Schools per Hundred Population, 1981

Number of Primary schools	Number of Districts	Name of the Districts
.50 and above	2	Mahendergarh, Gurgaon
.50 - .40	2	Kurukshetta, Sirsa
.40 - .30	4	Faridabad, Karnal, Bhiwani, Jind
.30 - .20	3	Rohtak, Hissar, Sonepat

Table V. 29

Haryana : Growth in the Number of Primary Schools, 1971-81

Growth (per cent)	Number of Districts	Name of the Districts
40 and above	1	Kurukshetra
20-40	5	Gurgaon, Mahendergarh, Karnal, Sirsa, Ambala
0-20	2	Jind, Hissar
-20 - 0	4	Sonepat, Faridabad, Bhiwani, Rohtak

Number of colleges per lakh population is high in
Rohtak, Ambala and Bhiwani districts. Sirsa district has
less number of colleges per lakh population. High number
of colleges in Rohtak may be attributed to the presence of
university, medical colleges and other educational institu-
tions. According to literacy rate Ambala, Rohtak, and
Sonepat district have high percentage of literacy i.e.
above 40 per cent. Jind, Sirsa and Hissar district are
characterized by low percentage of literacy (Table V.31).
Growth in literacy rate observed very high in the districts
of Faridabad, Hissar, Karnal and Mahendergarh and low in
Jind, Bhiwani, Gurgaon and Sirsa. High growth in Faridabad,
and Hissar may be attributed to the industrial development
which these districts have experienced during 1971-81.
(Table V.32).

Table V.30

Haryana : Distribution of Colleges per Lakh Population,1981

Number of Colleges	Number of Districts	Name of the Districts
1.25 and above	3	Rohtak, Ambala, Bhiwani
1.00 - 1.25	5	Kurukshetra,Jind,Mahendergarh, Hissar, Sonepat
.75 - 1.00	3	Karnal, Gurgaon, Faridabad
.50 - .75	1	Sirsa

Table V.31

Haryana ı Distribution of Districts According to Literacy
Rate, 1981

Literacy Rate	No. of Districts	Name of the Districts
40 and above	3	Ambala, Rohtak, Sonepat
35-40	4	Karnal, Gurgaon, Mahendergarh, Faridabad
30-35	2	Kurukshetra, Bhiwani
25-30	3	Jind, Hissar, Sirsa

Table V.32

Haryana ı Growth in Literacy Rate, 1971-81

Growth (percent)	Number of Districts	Name of the Districts
100 and above	2	Faridabad, Hissar
80- 100	2	Karnal, Mahendergarh
60- 80	4	Ambala, Kurukshetra, Rohtak, and Sonepat
40-60	4	Jind, Bhiwani, Gurgaon, Sirsa

In respect of bank deposits per capita Ambala and Faridabad district rank first and second in 1981 and Bhiwani and Jind are at the eleventh and twelveth position respectively.
Bank deposit per capita in Ambala and Faridabad is above Rs. 800/-, and district Bhiwani, Jind, have below Rs. 400/- per capita bank deposit (Table V. 33). High growth in bank deposit per capita has been observed in Faridabad, Karnal

and Hissar district, wereas low growth has been recorded
by Bhiwani, Rohtak, Kurukshetra, Sirsa, Ambala, Jind,
and sonepat. It has been obse rved that bank deposit
per capita is low in the districts where industrial
development is low (Table V.34).

Table V.33

Haryana : Distribution of Bank Deposit per Capita (Rs.)
1981.

Bank deposit (Rs.)	Number of Districts	Name of the Districts
800 and above	2	Ambala, Faridabad
600 - 800	3	Karnal,Rohtak, Gurgaon
400-600	5	Kurushetra, Mahendergarh Hissar, Sonepat, Jind.
200-400	2	Bhiwani, Jind

Table V. 34

Haryana : Growth in Bank Deposits per capita, 1971-81

Growth percent	Number of Districts	Name of the Districts
1000 and above	1	Faridabad
800-1000	2	Karnal, Hissar
600- 800	2	Mahendergarh,Gurgaon.
400-600	7	Bhiwani, Rohtak, Kurukshetra, Sirsa, Ambala, Jind,Sonepat

5.2.2 Patterns of Development of Socio-Economic Infrastructure - Selected indicators of socio-economic infrastructure have been composed into index of socio-economic infrastructure development. Districts have been classified into high, medium, low and very low category of development for the year 1970-71 and 1980-81.(Table V..35 and V..36 shows the correlation among different indicators to measure the levels of socio-economic infrastructure development. As it may be evident from Table V.36 that transport, education, medical facilities and financial institutions have positive relationship to each other. The indicators representing availability of infrastructure in villages are not correlated to those of medical facilities, education and banking facilities. The relationship among the variable which was strong during 1971 have become weak or even negative in some cases.

Table V..37 shows the relationship of each indicator to the index of socio-economic infrastructure development. During 1970-71 first factor explain 50 per cent of total varianee. Indicators G17, , G20, G21, G24, G25, and G33 are highly correlated with development index. During 1980-81 first factor explains 43.3 per cent of total variance in which G16, G20, G21, G24, G25 and G33 are contributing more. Analysis of this table reveals that indicators representing infrastructure available in villages are not contributing in explaining the variance. It may be possible

Table V.35

Haryana : Correlation Matrix, 1970-71

Indica-tors	G16	G17	G18	G19	G20	G21	G22	G23	G24	G25	G26	G27	G28	G29	G30	G33
G16	1.0															
G17	.39	1.0														
G18	-.33	-.90	1.0													
G19	.00	-.79	.41	1.0												
G20	.56	.60	-.47	-.23	1.0											
G21	.23	.50	-.35	-.29	.89	1.0										
G22	.10	-.51	.75	.84	-.08	-.12	1.0									
G23	.44	.57	-.39	-.28	.46	.39	-.28	1.0								
G24	.23	.50	-.39	-.36	.82	.96	-.28	.50	1.0							
G25	.20	.52	-.42	-.38	.85	.95	-.30	.50	.96	1.0						
G26	-.19	-.81	.82	.82	-.67	-.74	.70	-.49	-.79	-.82	1.0					
G27	.37	.04	.19	.34	.69	.73	.33	.45	.71	.65	-.18	1.0				
G28	.63	.45	-.32	-.05	.92	.75	.07	.23	.63	.68	-.48	.61	1.0			
G29	.16	-.06	.10	.44	.16	-.14	.65	-.07	-.32	-.21	.37	.10	.27	1.0		
G30	.12	.79	-.86	-.80	.36	.25	-.56	.23	.24	.29	-.67	-.27	.22	.04	1.0	
G33	.66	.56	.-43	-.33	.51	.47	-.44	.79	.58	.53	-.56	.42	.41	-.40	.16	1.0

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Table V.36

Haryana : Correlation Matrix, 1980-81

Indicators	G16	G17	G18	G19	G20	G21	G22	G23	G24	G25	G26	G27	G28	G29	G30	G33
G16	1.0															
G17	-.42	1.0														
G18	-.32	.02	1.0													
G19	-.77	.67	.52	1.0												
G20	.65	-.43	.22	-.30	1.0											
G21	.59	-.64	.10	-.34	.89	1.0										
G22	-.71	.19	.36	.65	-.38	-.23	1.0									
G23	-.02	-.17	.12	-.11	.21	.05	.18	1.0								
G24	.48	-.53	-.47	-.52	.51	.59	-.08	.38	1.0							
G25	.61	-.81	-.11	-.59	.72	.84	-.32	.28	.73	1.0						
G26	-.73	.77	.38	.79	-.48	-.64	.40	-.14	-.69	-.81	1.0					
G27	.11	.19	.13	.28	.35	.29	-.07	-.09	.0	.04	-.04	1.0				
G28	.28	.26	.20	.17	.63	.35	-.19	.21	.19	.08	.0	.72	1.0			
G29	-.34	.55	.51	.51	-.25	-.40	.50	.15	-.52	-.63	.52	-.03	.15	1.0		
G30	.65	-.49	-.33	-.82	116	.21	-.41	-.03	.30	.27	-.60	-.22	-.10	-.08	1.0	
G33	.44	-.45	.06	-.45	.60	.44	-.46	.63	.38	.68	-.34	-.06	.21	-.35	.03	1.0

that these variable may contribute in explaining the

remaining variance. Absolute value of the different districts

Table V. 37

Haryana : Factor Matrix		1970-71 F1	1980-81 F1
Indicators			
G16	Length of metalled surfaced road per 1000 sq. kms	.46	.82*
G17	Percentage of villages connected by Pucca Road	.83*	-.77*
G18	Percentage of having medical Facilities	-.76*	-.32
G19	Percentage of villages having postal facilities	-.65	-.82*
G20	Percentage of literates	.84*	.71*
G21	Percentage of female literates	.82*	.77*
G22	Number of post-offices per lakh population	-.53	-.57
G23	Hospitalsaand dispensaries per lakh population	.64	.21
G24	Number of bank offices per lakh population	.86	.74
G25	Bank deposits per capita	.86*	.91*
G26	Percentage of villages having educational facilities	-.93*	-.89*
G27	Number of colleges per lack population	.43	.03
G28	Number of higher secondary schools per ten thousand population	.67	.15
G29	Number of middle schools per ten thousand population	-.23	-.63
G30	Number of Primary schools per 100 population	.59	.55
G33	Number of hospitals and dispensaries per thousands sq. kms	.72*	.64
Total variance explained		50%	43.3%

*Significant at 1 percent level.

Fig.V.3   187

HARYANA
LEVELS OF DEVELOPMENT OF
SOCIO-ECONOMIC INFRASTRUCTURE
(1970-71)

HIGH

MEDIUM

LOW

VERY LOW

kms 20 0   20 40 kms

in composite index is given in Appendix II. Classification
of districts into high, medium and low and very low cate-
gory of socio-economic infrastructure development is
given in Table V.38.

<u>Table V.38</u>

Haryana : Classification of Districts According to Index
of Socio-Economic Infrastructural Development,

Value of composite index	1970-71	1980-81
High (.54 and above)	Ambala,Faridabad, Gurgaon	Ambala, Faridabad, Gurganon
Medium (.21 - .54)	Karnal	Karnal
Low (-1.08 - .21)	Kurukshetra, Mahendergarh, Rohtak,Sonepat, Bhiwani,Hissar, Sirsa	Kurukshetra,Mahender-garh, Rohtak,Sonepat, Bhiwani, Sirsa
Very low (-.108 and below)	Jind	Jind & Hissar

Inter-temporal analysis of the the above table reveals
that there is no change in the number of districts falling
under high and medium category of the development. Ambala,
Faridabad and Gurgaon have remained at the top three positions
1980-81 also. District Karnal remain at the fourth position
and in medium category of socio-economic infrastructural
development. Other districts falling very low category
also remained at their respective position in 1980-81 as
they were during 1970-71.except district Hissar which made
downward movement from low category in 1970-71 to very low
category in 1980-81. Since the composite index is closely

Fig.V.4 189

HARYANA
LEVELS OF DEVELOPMENT OF
SOCIO-ECONOMIC INFRASTRUCTURE
(1980-81)

HIGH

MEDIUM

LOW

VERY LOW

kms 20 0 20 40 kms

correlated with the length of surface road, medical facili -

ties, higher education and bank deposit per capita which

are largely found in urban areas so one may say that

districts which are highly urbanised are developed in socio-

economic infrastructure.

A general improvement in the levels of socio-economic

infrastructure development is descernible from the Table V.39.

Mean value of each indicators have increased during 1971-81

except the number of middle schols and primary schools. This

may be attributed to the fast growth of population. A notable

Table V.39

Haryana: Mean Values of Different Indicators of Socio-
Economic Infrastructure Development.

Indicators	1970-71	1980-81
G16	218.94	410.79
G17	16.76	92.25
G18	26.45	58.20
G19	27.14	36.15
G20	26.69	35.77
G21	14.60	21.72
G22	16.72	19.51
G23	3.21	3.39
G24	2.79	7.52
G25	105.10	605.01
G26	64.67	90.64
G27	.83	1.09
G28	.95	1.13
G29	.78	.68
G30	.44	.38
G33	8.08	10.55

increase has been observed in the most of the indicators.

During 1970-71 only 16.76 villages had the facilities of

pucca roads which have increased upto 92.25 percent in

1980-81. Length of surfaced road per 1000 sq. kms increased

from 218.94 kilometer to 410.79 kilometer in 1980-81. Bank deposit per capita have increased from Rs. 105.10 to Rs. 605.01 in 1980-81. A remarkable improvement have been seen in other indicators also. But wheatever improvement has taken place remained only those districts which were already developed in socio-economic infrastructure.

5.3 Summary of Findings :

Levels of socio-economic infrastructure development has been observed comparatively very high in Haryana and low in Rajasthan. Length of metalled road, village connected by pucca roads and village having medical facilities are much more in Haryana. Average values of other indicators such as literacy rate, number of colleges, bank deposits and number of hospitals and dispensariess are considerably high in Haryana. Since the development of socio-economic infrastructure is explained by above mentioned indicators so one may say that levels of socio-economic infrastructure development is high in Haryana and low in Rajasthan.

Inter-regional variations in the levels of socio-economic infrastructure is more pronounced in Rajasthan than in Haryana. But this sector exhibits less inter-district variations in comparison to that of agriculture and industrial sector. It has been observed that there was not a significant change in the position of districts in the states regarding levels of socio-economic infrastructure development during 1971-81.

Educational facilities are more widely spread than medical facilities in both states. Only 16.64 percent of villages in Rajasthan have medical facilities whereas 68.06 per cent of villages have the education facilities. In case of Haryana the percentage of villages having medical and education facilities is 58.20 per cent and 90.64 per cent respectively. This may be attributed to the better position of Haryana in agricultural, industrial development. It has been also noted in the analysis that the district which were classified as industrially developed are also found to be developed in socio-economic infra-structure because of a high correlation between these two sectors.

..*.*.*.*

Chapter VI

DISPARITIES IN THE LEVEL OF SOCIO-ECONOMIC DEVELOPMENT -
AN ATTEMPT TOWARDS EXPLAINATION

6. Levels of Socio-economic Development in Rajasthan and
Haryana - 1971-81

The main objective of this chapter are to examine the
pattern of development and changes therein occured during
1971 to 1981. An attempt has also been made to analyse the
sectoral disparities in the levels of development of agri-
culture, industry and socio-economic infrastructure, and, also
to understand as to how they influence the spatial patterns of
disparities. It is very difficult to analyse the patterns of
development and it's relationship with the key sectors of
economy by considering each indicator separately. In the
preceeding chapters composite indices of agriculture, industry
and socio-economic infrastructure have been constructed. But
these individual indices are not enough to show the levels of
socio-economic development of different districts. It may be
possible that districts developed in one sector may not be
developed in the other. Therefore, an attempt has been made
here to construct a composite index of development by treating
composite indices of agriculture, industry and socio-economic
infrastructure as indicators.

Table VI.1 shows the correlation matrics of these composite
indices. As it may be evident from the Table VI.1 that there is
a very high correlation between industrial development and

Table VI.1

Rajasthan : Correlation Matrix, 1971-81

Composite Indices	FAGRI	1970-71 FINDSI	FSEI
FAGRI	1.0		
FINDSI	.09	1.0	
FSEI	.05	.74	1.0
		1980-81	
FAGRI	1.0		
FINDSI	.22	1.0	
FSEI	.23	.83	1.0

Haryana : Correlation Matrix, 1971-81

Composite Indices	FAGRI	1970-71 FINDSI	FSEI
FAGRI	1.0		
FINDSI	-.11	1.0	
FSEI	.11	.92	1.0
		1980-81	
FAGRI	1.0		
FINDSI	.00	1.0	
FSEI	.24	.73	1.0

Note: FAGRI, composite indiex of agricultural development;
FINDSI, composite index of industrial development;
FSEI, composite index of developmentof socio-economic infrastructure.

socio-economic infrastructure. During 1970-71 agriculture has no relationship with industry and socio-economic infrastructure in Rajasthan but it has been positive relation in 1980-81 although it is not significant. In Haryana agriculture was negatively correlated with industry which has become almost zero in 1980-81. It has been observed that the relationship of agriculture to industry and socio-economic infrastructure has been more strong (positive) in 1980-81. As new technology comes into the agriculture, agriculture has to depend on industries for implements, pesticides, fertilizer etc.

Table VI.2 depicts the relationship of agriculture, industry and socio-economic infrastructure to that with socio-economic development. This may also be called factor loading of different sectors in constructing an index of socio-economic development. As it is evident from the factor matrix that industry and socio-economic infrastructure are explaining the variance in first factor. However, agriculture was poorly correlated with the development index in 1970-71, its relation become more strong in 1980-81. Agriculture is contributing more in explaining variance in Rajasthan than in the case of Haryana. During 1970-71 first factor explains 58.6 per cent of variance which are largely explained by industry and socio-economic infrastructure. During 1980-81 first factor explain 64.1 per cent of total variance. It is due to the increase in explainatory

power of agriculture sector. It is observed here that
agriculture is also helping in raising the standard of
living or socio-economic development. in Haryana the

Table VI.2

Rajasthan : Factor Matrix

Composite indices	1970-71 F1	1980-81 F1
FAGRI	.17	.45
FINDSI	.93*	.93*
FSEI	.92*	.93*
Variance explained =	58.6%	64.9%

Haryana: Factor Matrix

Composite Indices	1970-71 F1	1980-81 F1
FAGRI	.00	.29
FINDSI	.98*	.89*
FSEI	.98*	.94*
Total variance explained	64.1%	59.2%

*significant at 1 per cent level.

FAGRI= composite index of agricultural development;
FINDSI= composite index of Development of Industry
FSEI= composite index of development of socio-economic
       infrastructure.

first factor explains 64.10 per cent of variance in which
industry and socio-economic infrastructure are contribut-
ing more. During 1980-81 first factor explains only 59.2
percent and this time also industry and socio-economic .
infrastructure play mostimportant role. Explaining power

Fig.VI.1

RAJASTHAN

LEVELS OF DEVELOPMENT

(1970-71)

HIGH

MEDIUM

LOW

VERY LOW

kms50 0   50 100 150 kms

of agriculture sector has gone up and came down of
industry and socio-economic infrastructure.

Districts are classified into high, medium, low and
very low category of socio-economic development according
to their position in the composite index. Absolute value
of different districts for 1970-71 and 1980-81 years in
given in Appendix I. Classification of districts accord-
ing to into high, medium, low and very low category of
socio-economic development in Rajasthan has been given
in Table VI.3.

Table VI.3

Rajasthan : Classification of Districts According to
Index of socio-Economic Development

Value of composite index	1970-71	1980-81
High (.87 and above)	Ajmer, Jaipur,Kota, Bikaner, Jodhpur	Jaipur,Ajmer, Kota
Medium (.30 ⌄.87)	Jhunjhunu, Pali Ganganagar	Ganganagar, Bikaner, Jhunjhunu, Alwar, Jodhpur,Udaipur.
Low (-.63-+.30)	Sika r,Sirohi, Udaipur,Alwar, Bharatpur,Bhilwara, Churu,Bundi, Swai-madhopur, Nagaur Tonk, Jhalawar, Chittorgarh.	Sirohi, Bharatpur,Pali, Sikar, Bundi, Bhilwara, Swaimadhopur, Tonk, Chittorgarh, Churu
Very low (-.63 and below)	Dungarpur, Banswara, Jalor, Barmer, Jaiselmer	Nagaur,Jhalawar,Dungar-pur, Banswara, Jalor, Jaiselmer, Barmer

Fig.VI.2

RAJASTHAN
LEVELS OF DEVELOPMENT
(1980-81)

HIGH

MEDIUM

LOW

VERY LOW

kms 50 0 50 100 150 kms

Inter-temporal analysis of the Table VI.3 reveals
that there are five districts which characterised as high
developed during 1970-71 which decrease to 3 districts
during 1980-81. Jodhpur and Bikaner district come down
from high to medium category of development. It may be
attributed to fast growth experienced by Jaipur, Kota,
and Ajmer, during 1971-81. A rise in the composite value
of these district resulted in the downward movement of
Jodhpur and Bikaner district the medium category of
development. Udaipur district moved upward from low
category to medium category of development. Nagaur
district moved downward from low category to very low
category. There is no inter-category change in other
districts positions. However, some changes have seen in
their ranking position. The table clearly shows that the
districts which developed in socio-economic infrastructure
facilities are characterised as developed.

In case of the Haryana inter-temporal analysis of
Table VI.4 reveals that Ambala and Gurgaon were high and
medium developed dustricts during 1970-71 but during
1980-81 Faridabad ranked first followed by Ambala
district. Gurgaon district moved downward from medium
to low category of development. There is no district
falling in medium category of development. Only two

Fig.VI.3   201

HARYANA
LEVELS OF DEVELOPMENT
(1970-71)

HIGH

MEDIUM

LOW

VERY LOW

kms 20   0   20 40 kms

strict Faridabad and Ambala are developed and rest are
aracterised as low and very low developed. Development
Faridabad district may be attributed to the well-
veloped infrastructure facilities, close proximit to
lhi, the national capital, to economies of scale and
traction of entrepreneur etc. Downward movement by
rgaon district may be due to the problems with the
thods of district formation. Since Gurgaon has larger

Table VI.4

ryana : Classification of Districts according to
Composite index of Overall Development

lues of mposite dex	1970-71	1980-81
High .41 and above)	Ambala	Faridabad, Ambala
Medium 98 - 1.41)	Gurgaon	--
Low .47-.98)	Faridabad, Mehendergarh, Rohtak, Karnal, Kurukshetra, Sonepat	Karnal, Gurgaon, Kurukshetra, Sonepat and Rohtak
Very Low .47 and below)	Hissar, Sirsa, Bhiwani, Jind.	Mehendergarh, Bhiwani, Sirsa, Hissar, Jind.

ea than Faridabad so during 1970-71 a large part of the
lue of different indicators went to Gurgaon on the basis
area. Secondly, it also may be possible that the posi-
on of different district came down in composite index
e to factor growth experienced by Faridabad, Bhiwani,
nd, Sirsa, Hissar, remained most backward districts in

Fig. VI. 4 203

HARYANA
LEVELS OF DEVELOPMENT
(1980-81)

HIGH

MEDIUM

LOW

VERY LOW

kms 20 0 20 40 kms

6.1 Disparities in the Levels of Agricultural Development in Rajasthan and Haryana, 1971-81

Disparities in the levels of agricultural development have been analysed with help of co-efficient of variation of the indicators because by compositing these indicators , index of agricultural development show been constructed. The variation in the indicators also gives the overall picture of disparity in a region. Table VI.5 and VI.6 shows the co-efficient of variation of different indicators of agriculturall development. During 1970-71 there were large variations in most of the indicators. The indicators which were characterised large variation are number of tractors (130.55 per cent), consumption of fertilizers (128.19%), number of electrict pumpsets 109.60, percentage of irrigated area 83.96 and area under commercial crops. Since these indicators are part of new farming technology and affect agriculture significantly, it is natural that disparities was more pronounced. On the other hand, there are less disparities in the indicators of agricultural development in Haryana. The reason for this may be cited the spread of new farm technology in Haryana more rapidily than Rajasthan.

Inter-district variation have decreased in Rajasthan with respect to most of the indicators but disparities

increased in respect of productivity per hectare. This may be attributed to the changing cropping pattern with the use of modern farming technology. In Rajasthan, agriculture in mainly dependent on rainfall or one may say the agriculture is rainfed in Rajasthan. In Haryana it is evident from the Table VI.6 that variation in cropping intensity and commercialisation of agriculture have increased during 1971-81, resulting variations in productivity per hectare. Disparities in the number of electric pumpsets also increased during 1971-81. Despite decrease in the irrigation intensity and area irrigated, one may say that disparities in agricultural development have increased in Haryana during 1971-81. This is probably due to the new farm technology which is largely beneficial large farmers. Small farmers may not use H.Y.V's, fertilizers, pesticides and other inputs related to new farm technology due to credit constant The districts where modern inputs of agriculture being used are comparatively developed. Though disparities in the irrigation facilities have decreased, the variations in productivity per hectare have increased during 1971-81.

It would be interesting to know to what extent developed districts differ from less developed districts in Rajasthan and Haryana. First let us have a look on inter-district variation in Rajasthan. Percentage of

Table VI.5

Rajasthan : Co-efficient of Variation (Agriculture)

Indicators	1970-71 (%)	1980-81 (%)
G1 Percentage of Gross Irrigated Area to Gross Cropped Area	83.96	68.80
G2 Irrigation intensity	16.23°	20.64
G3 Cropping intensity	10.33	9.41
G4 Percentage of area under commercial Crops to Gross Cropped Area	68.87	68.44
G5 Number of Electric pumpsets per 1000 hectare of Net Sown Area	109.60	92.04
G6 Consumption of fertilizer per 100 hectare of Gross Cropped Area	128.19	109.15
G7 Productivity per hectare(Rs.)	47.20	56.29
G8 Number of Tractors per 100 hectare of Net Sown Area	130.55	98.57

Table VI.6

Haryana : Co-efficient of Variation (Agriculture)

Indicators	1970-71	1980-81
G1 Percentage of Gross Irrigated Area to Gross Cropped Area	43.18	32.42
G2 Irrigation intensity	18.69	14.63
G3 Cropping intensity	5.22	7.53
G4 Percentage of area under commercial Crops to Gross Cropped Area	46.61	69.22
G5 Number of Electric pumpsets per 1000 hectare of Net Sown Area	59.24	72.08
G6 Consumption of fertilizer per 100 hectare of Gross Cropped Area	107.91	77.58
G7 Productivity per hectare (in Rs.)	20.13	42.67
G8 Number of Tractors per 100 hectare of Net Sown Area	50.62	44.47

as much high as 52.46 per cent in Bundi district followed
by Ganganagar (50.17 per cent) whereas less developed
districts Jaiselmer and Churu have only .04 and .08 per
cent irrigated area. Cropping intensity is high in Udaipur,
Chittorgrah, Alwar 104.79, 133.88 and 136.88 respectively
whereas it is low in Jaiselmer, Barmer and Jodhpur.
(100 per cent, 101.61 per cent and 101.69 per cent respect-
ively. District Pali, Bhilwara have 24.76 per cent and
19.27 per cent area under commercial crops to gross cropped
area whereas it is very low in Churu, Jaiselmer and Barmer
i.e. 0.26 per cent; 0.37 per cent and 1.37 per cent respectively.
Number of pumpsets are high in Chittorgarh, Jaipur (59.37 and
57.15) and negligible in Jaiselmer, Churu, Barmer and Jhalwar .
Consumption of fertilizers per 1000 hectare of gross cropped
area is high in Bundi, Chittorgarh and Ganganagar district
and less in Jaiselmer, Barmer, Churu etc. Productivity
per hectare is high in Bharatpur (Rs. 920), Alwar (Rs. 850)
and Bundi (Rs. 790). It is very low in Jaiselmer, Barmer
and Jodhpur (Rs. 40, 90 and 130 respectively. Among all
the modern inputs of agriculture, irrigation is the most
important input which affect the use of other inputs.
Without irrigation allother inputs are not much effective.

In case of Haryana disparities in agriculture are
less than Rajasthan. In Haryana district disparities
increased during 1970-71 to 1980-81. This may be attributed

to the increase in variation of cropping intensity, area
under commercial crops,productivity and number of electric
pumpsets. However, there was decrease in variations in
case of area irrigated, irrigation intensity, consumption
of fertilizers and number of tractors. Since former four
indicators are more effective in increasing the producti-
vity per hectare, so the variations in productivity per
hectare have increase from 28.13 per cent in 1970-71 to
42.67 per cent in 1980-81. The difference between the
score of developed and less developed districts also
increased from 2.80 in 1970-71 to 3.14 in 1980-81.

Now, let us see to what extent developed district
of Haryana differ to less developed districts. In terms
of percentage area irrigated to gross cropped area is
as much as 87.65 per cent in Karnal followed by Kuruk-
shetra (85.79 per cent) whereas it is very low in Mahender-
garh (28.75 per cent) followed by Bhiwani (35.68 per cent).
Irrigation intensity in high in Kurukshetra (191.25 per cent)
and very low in Bhiwani (139.55 per cent).. Area under
commercial crops is high in Hissar district and low in
Karnal. In other indicators also Karnal and Kurukshetra
have higher values and Bhiwani, Sirsa and Mahendergarh have
the low values.

6.2 Disparities in the Levels of Industrial Development
in Rajasthan and Haryana, 1971-81

Disparities in the levels of industrial development

were more pronounced in Rajasthan than in Haryana in
1970-71. Coefficient of variation of all indicators
was high in Rajasthan and it continued in 1980-81 also.
Rajasthan is marked by large variations in registered
factories and employment in registered factories. Dis-
parities are less in case of other indicators. It
may be possible that coefficient of variation is less
for other indicators because of employment in unorganised
sector and territiary sector. Moreover, during 1971-81
new district such as Alwar, Ganganagar made significant
improvement in Industrial development. In Rajasthan,
despite the decrease in the coefficient of variation for
indicator G11(percentage of industrial workers to total
worker); G12 (percentage of workers in non-agricultural
activities); G13 (percentage of urban population) and
G14 (percentage of worker in non-household industries),
disparities in industrual development increased marginally
due to increase in disparities in registered factories and
employment in registered factories.(Table VI.7).

On the other hand, disparities in industrial develop-
ment are of lower magnitude in Haryana. However, it is
evident that disparities have increased in 1980-81.
Coefficient of variation of registered factories increased
from 64.7 per cent in 1971 and 105.72 per cent in 1981.
Co-efficient of variation has increased considerably in

other indicators also. Variations in percentage of workers in non-household industries decreased from 13.83 per cent to 9.28 per cent during 1971-91 (Table VI.8). Since the selected indicators of industrial development have high positive correlation among them, so the increase in the variation of one indicator leads to the increase in the variation of other indicators also. Only three districts namely Jaipur, Ajmer and Kota are industrially

Table VI.7

Rajasthan : Coefficient of Variation (industry)

Indicators	1970-71 (%)	1980-81 (%)
G9 Percentage of registered factories to total registered factories in the state	105.59	127.80
G10 Percentage of employment in registered factories to total employment in regi- stered factories in the state	122.84	174.61
G11 Percent of industrial workers to total main workers.	35.37	34.30
G12 Percentage of workers in Non-agri- cultural activities to total main workers	35.27	32.16
G13 Percentage of urban population to total population	55.67	53.35
G14 Percentage of Non-Households workers to total industrial workers	26.16	15.08

developed district whereas a large number of district still fall in low and very low category of industrial development. Let us see to what extent developed district differ from less developed district in Rajasthan during 1980-81. In terms of registered factorires and employment in registered factories,

Table VI.8

Haryana ı Cofficient of Variations (industry)

Indicators	1970-71	1980-81
G9 Percentage of registered factories to total registered factories in the state	64.09	105.72
G10 Percentage of employment in regd. factorires in total employment in registered factories in the state	87.51	153.89
G11 Percentage of industrial workers to total main workers	36.96	50.64
G12 Percentage of workers in Non-Agricultural activities to total main workers	23.55	26.80
G13 Percentage of urban population to total population	27.40	38.21
G14 Percentage of Non-Households workers to total workers	13.83	9.28

three developed district account 48.65 per cent and 62.06

per cent of state total registered factories and employment

in the registered factories. On the other hand, less developed

district which are nine in number account only less than 4

per cent of total registered factories in the state.-

. One may conclude on the basis of our study

that there are as mahy as 20 districts which are industrially

backward.

In Haryana also there is concentration of industrial

units and employment in these units in Ambala and Faridabad .

districts. Faridabad and Ambala district account for 50 per

cent of registered factories and 64 per cent of employment

in registered factories of the state. These two districts accounts for high percentage of population engaged in industries, high percentage of population living in urban areas etc. On the other hand, districts like Mahendergarh, Bhiwani, Sirsa, Jind and Kurukshetra have large per cent of population engaged in agriculture, low percentage of urban population etc. thereby these are industrially backward. Concentration of industrial activities around Ambala and Delhi and regions responsible such type of poncentration have been discussed in detail in Chapter IV.

6.3 Disparities in the Levels of Development of Socio-Economic Infrastructure - 1971-81.

The success of any programme of development depends on the availability of adequate economic and social infrastructure. It has been observed in the present study that the development of socio-economic infrastructure has high positive relationship with the development of industrial and overall development but it has weak positive relationship with agricultural development. The role of infrastructural facilities appears to be · crucial and its non-availability and inadequacy is said to be responsible for backwardness in agriculture and industrial development.

Disparities in the levels of development socio-economic infrastructure are less than agricultural and industrial development. This may be attributed to the

Table VI.9

Rajasthan : Coefficient of Variation (socio-economic infrastructure)

...icators	1970-71 (%)	1980-81 (%)
Length of metalled surfaced road per 1000 sq. kms	53.80	36.35
Percentage of villages connected by pucca road	34.74	22.94
Percentage of villages having medical facilities	43.79	34.72
Percentage of villages having postal facilities	46.57	39.37
Percentage of literates	26.17	24.40
Percentage of female literates	45.15	41.88
Number of post-offices per lac population	52.77	26.04
Hospitals and dispensaries per lakh population	29.20	27.29
Number of bank offices per lakh population	32.55	34.51
Bank deposits per capita	104.98	68.30
Percentage of villages having educational facilities	37.86	21.65
Number of colleges per lac population	72.02	61.59
Number of Higher secondary schools per ten thousands population	38.79	21.35
Number of middle schools per ten thousands population	25.66	13.86
Number of primary schools per hundred population	16.22	21.82
Number of hospitals and dispensaries per thousands sq. kms.	49.38	47.52

Table VI.10

Haryana : Coefficient of Variation (socio-economic infrastructure)

Indicators	1970-71 (%)	1980-81 (%)
G16 Length of metalled surfaced road per 1000 sq. kms.	16.86	17.08
G17 Percentage of villages connected by pucca road	16.06	4.32
G18 Percentage of villages having medical facilities	37.41	22.49
G19 Percentage of villages having postal facilities	40.85	40.89
G20 Percentage of literates	16.52	15.77
G21 Percentage of female literacy	32.11	27.07
G22 Number of post-offices per lakh population	13.90	27.02
G23 Hospitals and dispensaries per lakh population	16.45	26.82
G24 Number of bank offices per lakh population	30.61	22.29
G25 Bank deposits per capita	50.63	43.63
G26 Percentage of villages having educational facilities	13.95	9.61
G27 Number of colleges per lakh population	33.46	26.76
G28 Number of Higher Secondary Schools per ten thousands population	13.25	17.30
G29 Number of middle schools per ten thousands population	14.29	25.00
G30 Number of primary schools per hundred population	26.80	32.39
G33 Number of hospitals and dispensaries per thousands sq. kms.	37.09	44.06

nature of these infrastructure particularly social services.
People of an area demand atleast these basic infrastructure
such as education, medical, postal and transport etc.
Government's of states also are more conscious about
providing minimum basic infrastructure to all the parts of
the state. Disparities in socio-economic infrastructure
are less in Haryana than Rajasthan. Haryana has the
distinction in providing fresh drinking water and electri-
city to all it's villages and above 90 per cent villages
are connected by pucca roads and have education facilities
whereas the availability of these services is very much
less in Rajasthan. The reason may be cited as the rugged
and desertic type topography in Rajasthan alongwith it's
backwardness. Infrastructure facilities need heavy invest-
ment. Disparities have decreased during 1971-81 in both
states. Table VI.9 and VI.10 show the coefficient of
variation of different indicators. The indicators which
have been taken in relation to population have shown
increase in the co-cfficient of variation particularly in
Haryana. The probable reason may be population growth.
The growth in the value of indicator did not same at the
same pace as it was in case of population. In Rajasthan,
also some of indicators have shown increase in variations.

6.4 Some Tentative Generalisations

It would be helpful to analyse the relationship of
different sectors of economy to that of overall development
i.e. socio-economic development, in making some tentative
generalisations. Table VI.11 and VI.12 shows the relation-
ship of different sectors to socio-economic development.
As it is evident from the table that there is positive
relationship between industry and agriculture in Rajasthan
but it is not significant. In Haryana, there was negative
correlation between agriculture and industry which con-
tinued to be negative in 1980-81 also. One may say that
upto a certain level the relationship between agriculture
and industry remains negative but thereafter it approaches
toward positive. It may be attributed to the dependence
of agriculture for modern inputslike fertilizers, pesticides,
machinery etc.

It is also true that there exist a positive relation-
ship between agriculture and socio-economic infrastructure.
From our study, it may be pointed out that an early stages
of agricultural development infrastructure plays no role
in the development of agriculture. Because agriculture is
dendendent on other factors such as rainfall, soil and
other physical factors. At the later stage of of agricult-
ural development infrastructure facilities becomes more
important.

Table VI.11

Rajasthan : Correlation Among the Indices of Development

Composite Indices	FAGRI	1970-71 FINDSI	FSEI	CINDXI
FAGRI	1.00			
FINDSI	.09	1.00		
FSEI	.05	.74*	1.00	
CINDXI	.17	.03*	.92*	1.00
		1980-81		
FAGRI	1.00			
FINDSI	.22	1.00		
FSEI	.23	.83*	1.00	
CINDXI	.45	.93*	.93*	1.00

Table VI.12

Haryana : Correlation Among the Indices of Development

Composite Indices	FAGRI	1970-71 FINDSI	FSEI	CINDXI
FAGRI	1.00			
FINDSI	-.11	1.00		
FSEI	.11	.92*	1.00	
CINDXI	.00	.98*	.98*	1.00
		1980-81		
FAGRI	1.00			
FINDSI	.00	1.00		
FSEI	.24	.73*	1.00	
CINDXI	.29	.29*	.94*	1.00

*Significant at 1 per cent level.

Note: FAGRI, Composite index of agricultural development;
FINDSI, composite index of industrial development;
ESEI , composite index of development of socio-economic infrastructure.
CINDXI, compotie index of socio-economic development.

Table VI. 13

Correlation of Selected Indicators with the Socio-Economic Development Index, 1981.

Indicators	Rajasthan	Haryana
1. Literacy rate	$.90^{**}$	$.65^{*}$
2. Percentage of urban population to total population	$.76^{**}$	$.88^{**}$
3. Bank deposite per capita	$.80^{**}$	$.92^{**}$
4. Agricultural productivity per hectare	$.41$	$.18$
5. Number of hospitals & dispensaries per thousand sq. kms	$.57^{*}$	$.78^{*}$

I- tailed significant - *- .01; **- .001.

There exist a high positive correlation between industry and socio-economic infrastructure. Industrial development requires infrastructure facilities without which it is not possible to develop industries. Industrial development need skilled labour, investment, transport and communication facilities. Industry and socio-economic infrastructure are highly correlated with the socio-economic development. Industrial sector raises the income level and infrastructure facilities help in improving the standard of living.

It has also been proved true that the literacy is positively related to socio-economic development. If there is high literacy than people would like to go for industrial services or tertiary sector which is more renumbrative than agriculture. Productivity per worker in agriculture is very low and it may be the only reason responsible for backwardness of agricultural labourer and small farmers. Urbanisation is also positively correlated with socio-economid development. It is not difficult to cite the reason for this. Industries and socio-economic infrastructure are generally found to be concentrated in urban area.

Bank deposit per capita is positively correlated with socio-economic development. Bank deposit is the source of fund needed to develop socio-economic infrastructure and industry. It also shows the marginal propensity to

save of the people of any region. Agricultural productivity is positively correlated with overall development but it is not significant. Number of hospitals and dispensaries is also correlated significantly with overall development. Health facilities help in improving the health of people of an area and if people of an area are healthy then they will be more productive then others which are mot healthy.

To conclude it is clear from the above generalisations that all the three sectors of economy are contributing in raising the levels of socio-economic development, but industry and infrastructure are more conducive in raising the standard of living of the people in a region. Individual indicators of socio-economic infrastructure also help in the development of an area.

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Chapter VII

CONCLUSIONS

The main objective of the present study was to measure the levels of socio-economic development in the sample states of Rajasthan and Haryana at two points of time, viz., 1971 and 1981, and to examine the spatial and temporal disparities in the levels of socio-economic development. The study was carried out in two stages. Firstly, an attempt was made to analyse the sectoral disparities and levels of ..development in agriculture, industry and socio-economic infrastructure. And secondly, an attempt was also made to interperate the changes in the levels of development which may have taken place during 1971-81.

The need of present study, stems from the fact that the identification of backward districts and disparities in the socio-economic development help in formulating and suggesting some policies for the development of backward areas. It may also help in identifying the factors which are more conducive in raising the levels of socio-economic development. This is not absolutely true that developed states are characterised by the same level of development everywhere in the state and backward states are totally backward. Within developed states there are some pockets of backward areas and some developed pockets

in less developed states. For this purpose two states were selected which are characterised as developed and less developed.

In order to assess the levels of socio-economic development thirty indicators of development were choosen representing agriculture, industry and socio-economic infrastructure. First principal component analysis technique, which is a branch of well-known 'Factor Analysis Technique', is used in present study to construct composite index of development for it's advantages over other methods i.e. ranking and equal weights method. This technique takes care of multi-collinearity also. Simple coefficient of variation was used to examine the extent of intra-state and inter-state disparities in sectors of economy and in socio-economic development. The following points emerge from the study :-

i) Inter-district disparities have got reduced in Rajasthan and increased in Haryana during 1971-81. Increase in disparities in Haryana may be because of the impact of new farm technology. Impact of Green Revolution has been observed only in those areas which have assured irrigated facilities. Since there exist variation in the irrigation facilities in the state, the emergence of disparities in agricultural

development is quite natural. In Rajasthan, agriculture is dependent mainly on rainfall and pattern of rainfall distribution remained more or less same as it was in past. Decrease in the disparities in agricultural development may be attributed to the development of irrigation facilities in those areas where irrigation was almost nil in 1970-71.

ii) Barring a few district, there are a large number of districts which are industrially backward in both states. In Rajasthan, only five districts i.e. Jaipur, Ajmer, Kota, Bikaner and Jodhpur were categorized as industrially developed. In Haryana also only three districts which may classified as industrially developed are Faridabad, Ambala and Karnal. Inter-district variations increased during 1971-81 in both states but extent of disparities has been seen higher in Rajasthan than Haryana. Whatever the developmentwhich have taken place during 1971-81, went to the districts which were already developed. The probable reason which one may find for this type of pattern is the nature of industries to concentrate in urban areas where the availability of infrastructure is easy. Untill or unless infrastructure facilities are provided in a suitable package entrepreneurs will not migrate to backward areas for setting up industries.

iii) Inter-district disparities in socio-economic infra-
structure had been found to be lower in comparison
to agriculture and industry. It may be attributed
to the government's efforts to provide minimum basic
infrastructure facilities like education, medical,
postal to all the parts of the state. Disparities
in socio-economic infrastructure have got reduced in
both states during 1971-81.

iv) Since the levels of socio-economic development depends
upon development of agriculture, industry and socio-
economic infrastructure, one may say that whether
disparities in the socio-economic development have
decreased or increased during 1971-81. Both states h
experienced increase in disparities in agricultural
and industrial development and these are the sectors
which provide employment thereby raising the income
level. Disparities in these two sectors led to the
disparities in socio-economic development in the both
states.

v) District which had been observed developed in socio-
economic infrastructure were also found to be develope
in industries. It may be because of high inter-depen-
dence of these two sectors of economy. The backwardne

of most of the district in Rajasthan with resp: t to
industries was due to absence of infrastructur:
facilities.

vi) District which were developed in agriculture w e not
found to be developed in industry and socio-ec omic
infrastructure. Agricultural practices are be g done
by traditional methods in most of the areas so t has
nothing to do with industry. Infrastructure f ilities,
however, positively related with agriculture, it
relationship was not significant. Agriculture evelops
in rural areas/infrastructure facilities compa tively
          where
low than urban areas. Moreover, educated peop do not
like to stay in agriculture because of it's hig. instability,
dependence of Monsoon etc. They migrate to urban areas
in order to seek jobs in tertiary or secondary sector.
During 1980-81 relationship between socio-economic infra-
structure and agriculture had been observed strong than
1970-71.

vii) It had been noted in 1980-81 that the irrigation, degree
of urbanisation, length of surfaced road, literacy rate,
hospital and dispensaries were significantly correlated
with the levels of socio-economic development.

Disparities in the levels of socio-economic development
are more or less due to disparities in industrial development

. and socio-economic infrastructure. Agricultural

development also may enhance the standard of living

at the stage of it's fullest expansion. One should

take care for the development of all the sectors of

an economy to avoid the sectoral imbalances and

disparities in the levels of socio-economic development.

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Rajasthan : Districtwise Values of Composite Indices, 1970-71 and 1980-81

	Districts	Values of Composite Indices of Development of							
		1970-71				1980-81			
		Agri-culture	Indus-try	Socio-Economic Infra-structure	Socio-Economic	Agri-culture	Indus-try	Socio-Economic Infra-structure	Socio-Economic
		1	2	3	4	5	6	7	8
1.	Ganga-nagar	1.066	.431	.049	.363	1.327	.646	.381	.799
2.	Bikaner	-1.392	1.097	1.242	1.094	-1.454	.988	1.181	.704
3.	Churu	-1.805	-.165	.134	-.200	-1.793	-.281	-.141	-.617
4.	Jhunjhunu	-.481	-.228	1.726	.740	-..535	-.009	1.327	.508
5.	Alwar	1.240	-..568	.309	-.017	1.273	-.213	.636	.497
6.	Bharatpur	1.298	-.309	-.045	-.060	1.070	-.122	.027	.202
7.	Swaimadho-pur	.440	-.171	-.608	0.366	.495	-.468	-.463	-.332
8.	Jaipur	.776	2.493	1.386	2.131	.992	2.992	1.891	2.570
9.	Sikar	-.722	-.210	.720	.194	-.388	-.123	.319	.004
0.	Ajmer,	-.079	2.282	2.250	2.387	-.602	1.819	2.355	1.996
2.	Tonk	-.364	-.338	-.573	-.518	-.456	-.230	-.645	-.525
3.	Jodhpur	-1.027	1.122	1.005	1.020	-1.084	.946	.529	.456
3.	Nagaur	-1.134	-.447	-.271	-.495	-.851	-.535	-.607	-.745
4.	Jaiselmer	-1.394	-.747	-2.258	-1.728	-1.503	-.667	-1.596	-1.433
5.	Pali	.021	.519	.169	.366	.392	.358	-.129	.200
5.	Barmer	-1.402	-1.100	-1.637	-1.588	-1.650	-1.109	-1.821	-1.787
7.	Jalor	-1.134	-1.150	-.933	-1.217	-.266	-1.296	-1.378	-1.344
3.	Sirohi	.119	-.179	.346	.099	.570	-.118	.432	.282
)	Bhilwara	1.193	-.073	-.329	-.901	1.038	-.263	-.297	-.028

Appendix I (contd.)

		1	2	3	4	5	6	7	8
20.	Udaipur	1.071	.048	-.114	.074	.759	.092	.184	.308
21.	Chittor-garh	1.474	-.691	-.693	-.582	1.313	-.572	-.781	-.345
22.	Dungar-pur	.057	-1.185	-.363	-.813	-.408	-1.204	-.425	-.875
23.	Banswara	.565	-1.337	-.954	-1.145	-.159	-1.118	-.671	-.894
24.	Bundi	.868	-.110	-.476	-.221	1.375	-.158	-.501	.001
25.	Kota	.583	1.612	.404	1.126	.410	1.525	.855	1.236
26.	Jhalawar	.162	-.592	-.475	-.548	-.438	1.876	-.662	-.838

APPRNDIX II

Districtwise Values of Composite Indices, 1970-71 and 1980-81.

	Values of Composite Indices of Development of						
	1970-71				1980-81		
re	Indus-try	Socio-Economic Infra-structure	Socio-Economic	Agri-culure	Industry	Socio-Economic Infra-structure	Scio-Economic
2	3	4	5	6	7	8	
	2.276	2.205	2.285	.124	1.331	2.063	1.786
	-.364	.106	-.132	2.020	- .625	.054	.045
	-.419	.221	-.102	1.701	.215	.231	.510
	-1.186	-1.383	-1.311	.181	-1.034	-1.184	-1.120
	- .155	.069	- .044	1.077	-. 168	- .151	-. 342
	1.253	.741	1.013	.305	- .275	.944	.412
	- .115	.099	.006	-.699	- .658	-.089	- .493
	- .857	-.874	-.882	-1.125	- .475	-.722	-. 807
	-. 494	-.994	-.759	- .435	-. 299	-1.249	-. 885
	- .375	.033	-.174	.124	-. 054	- .300	-. 166
	1.018	.840	.948	- .300	2.567	1.228	1. 896
2	-. 578	-1-065	-.838	-.819	- .523	- .824	- .835

District-Wise Values of Selected Indicators of Agricultural Development, 1981

State/ District	Percentage of Irrigated Area to GCA	Percentage of Area under Commercial Crops to GCA	No. of Pumpsets per 1000 hectare NSA	Consumption of fertili- zers per 100 hectare GCA	No. of Tract- ors per 100 hectare of NSA
	1	2	3	4	5
RAJASTHAN:					
1. Ganganagar	50.17	17.27	1.29	23.28	8.56
2. Bikaner	3.86	3.59	.01	1. 51	.56
3. Churu	.08	.26	.05	.01	.41
4. Jhunjhunu	13.55	1.31	15.91	1.96	.93
5. Alwar	34.35	7.58	30.61	9.68	8.31
6. Bhartpur	26.27	15.53	14.10	8.65	8.32
7. Swaimadhopur	23.26	11.79	19.78	13.46	1.51
8. Jaipur	15.84	6.34	57.15	8.91	4.96
9. Sikar	21.27	2.86	33.15	2.62	1.70
10. Ajmer	32.00	11.99	18.97	4.56	1.66
11. Tonk	21.43	6.87	8.58	3.49	.89
12. Jodhpur	5.19	6.68	3.57	1.11	3.45
13. Nagaur	5.92	8.92	5.91	2.90	2.44
14. Jaiselmer	.04	.37	.07	0.0	1.13
15. Pali	31.67	24.96	19.46	7.43	4.77
16. Barmer	2.56	1.37	1.06	.18	.64
17. Jalor	25.88	13.32	13.84	1.57	2.44
18. Sirohi	39.25	16.58	36.80	8.23	2.32
19. Bhilwara	49.26	19.27	33.35	12.39	1.98
20. Udaipur	35.11	8.26	35.96	8.03	1.00
21. Chittorgarh	29.39	12.59	59.37	23.91	1.45
22. Dungarpur	11.78	2.52	11.29	3.76	.11

Appendix III(contd.)

		1	2	3	4	5
23.	Banswara	9.21	9.63	10.82	7.23	.14
24.	Bundi	52.46	9.19	10.20	34.67	3.16
25.	Kota	29.68	9.06	8.19	21.83	1.81
26.	Jhalwar	12.00	8.97	17.03	0.0	.35

HARYANA:

1.	Ambala	44.41	13.38	79.05	79.08	9.84
2.	Kurukshetra	85.79	6.09	131.17	93.20	25.32
3.	Karnal	87.65	5.32	152.59	103.48	25.47
4.	Jind	68.99	10.65	30.53	31.58	14.57
5.	Rohtak	52.27	9.09	31.93	19.44	12.10
6.	Gurgaon	41.18	7.10	149.41	15.64	13.38
7.	Mahendergarh	35.68	6.68	102.51	13.67	7.0
8.	Bhiwani	28.75	12.32	17.62	4.14	5.99
9.	Hissar	72.43	29.90	21.02	26.46	8.78
10.	Sonepat	69.58	9.35	53.93	44.06	19.83
11.	Faridabad	55.33	6.19	73.72	29.27	15.98
12.	Sirsa	64.63	27.63	16.21	45.40	17.52

Note: GCA – Gross Cropped Area;
       NSA – Net Sown Area.

District-Wise Value of Selected Indicators of Industrial Development, 1981

State/District	Percentage of Registered Factories to total regd. Factories in state	Percentage of Employment in Registered Factories to employment in regd. factories	Percentage of Industrial worker to total main workers	Percentage of Non-Agricultural workers to total main workers	Percentage of Urban Population	Percentage of Non-household workers to totall Industrial workers
	1	2	3	4	5	6

RAJASTHAN:

State/District	1	2	3	4	5	6
1. Ganganagar	10.98	7.06	7.75	26.17	20.61	74.05
2. Bikaner	3.61	2.56	9.69	40.70	39.48	68.20
3. Churu	1.08	.30	5.67	22.23	29.22	60.20
4. Jhunjhunu	.23	1.60	9.17	29.70	20.04	60.14
5. Alwar	2.44	2.32	7.99	26.07	11.08	62.54
6. Bharatpur	3.19	3.01	6.94	23.62	17.07	65.79
7. Swaimadhopur	1.27	1.41	7.00	22.86	13.42	58.50
8. Jaipur	21.15	32.96	15.83	44.41	36.56	68.26
9. Sikar	.38	.13	9.59	32.03	20.25	52.07
10. Ajmer	9.94	9.87	13.37	38.89	42.80	74.02
11. Tonk	.80	.43	9.83	23.34	18.36	57.22
12. Jodhpur	9.29	4.58	9.14	13.21	34.77	68.63
13. Nagaur	3.05	.92	7.60	19.23	14.56	53.31
14. Jaiselmer	.09	.03	5.68	24.93	13.55	34.71
15. Pali	8.16	4.55	11.66	27.81	18.42	54.20
16. Barmer	.56	.52	4.41	14.33	8.78	49.25
17. Jalor	.14	.10	5.93	16.33	8.06	37.29
18. Sirohi	.47	.23	9.65	32.67	17.90	33.29
19. Bhilwara	4.46	5.58	6.98	13.32	14.08	61.66
20. Udaipur	7.46	6.62	7.26	25.26	15.07	64.57

Appendix IV (contd.)

		1	2	3	4	5	6
21.	Chittor-garh	2.02	1.88	5.98	19.27	13.18	58.40
22.	Dungarpur	.09	.04	4.66	15.83	6.46	49.13
23.	Banswara	.75	.73	4.34	17.40	6.22	50.68
24.	Bundi	1.31	2.32	7.83	22.41	17.01	67.02
25.	Kota	6.66	12.17	13.22	38.74	31.93	73.65
26.	Jalawara	.42	.08	6.37	16.57	11.66	53.03

HARYANA :

		1	2	3	4	5	6
1.	Ambala	23.76	17.18	19.68	53.99	32.90	81.87
2.	Kurukshetra	3.86	.92	7.95	29.92	16.46	72.78
3.	Karnal	13.17	6.19	12.94	40.02	26.18	74.79
4.	Jind	2.25	1.09	6.70	24.54	13.80	64.67
5.	Rohtak	5.11	4.74	11.61	48.36	19.83	73.79
6.	Gurgaon	4.21	3.53	10.97	39.85	19.93	71.79
7.	Mahendergarh	1.79	1.29	11.37	38.96	13.87	65.68
8.	Bhiwani	1.85	4.13	9.36	28.83	16.02	78.40
9.	Hissar	7.31	5.21	9.45	30.07	19.29	76.42
10.	Sonepat	6.08	7.19	13.97	39.80	17.96	75.59
11.	Faridabad	27.95	46.58	29.68	57.26	40.82	91.24
12.	Sirsa	2.66	1.92	7.76	28.70	20.44	74.88

APPENDIX V

District-Wise Value of Selected Indicators of Development of Socio-Economic Infrastructure, 1981

State/District	G16	G17	G18	G19	G20	G25	G26	G27	G30	G33
RAJASTHAN:										
1. Ganganagar	97.43	26.61	9.61	13.10	26.03	332.22	33.71	.84	.59	3.88
2. Bikaner	48.93	21.37	19.79	33.98	28.20	631.05	72.15	1.65	.65	2.72
3. Churu	64.47	19.65	21.99	45.73	21.86	249.10	85.38	.76	.60	3.68
4. Jhunjhunu	117.75	25.11	34.11	51.96	28.61	290.03	90.86	1.32	.59	10.29
5. Alwar	184.25	22.57	16.65	21.88	26.53	262.31	69.66	.68	.70	10.62
6. Bharatpur	173.95	22.08	14.15	28.19	26.05	194.84	72.78	.48	.74	5.68
7. Swaimadopur	97.27	22.29	14.67	32.59	22.23	132.95	68.38	.39	.69	5.70
8. Jaipur	143.02	21.43	18.40	25.28	31.40	703.24	60.16	1.40	.53	11.73
9. Sikar	111.74	21.53	26.32	51.91	25.43	148.27	87.33	.94	.60	8.15
10. Ajmer	162.95	25.89	19.72	39.76	35.30	508.83	73.56	1.87	.62	9.90
11. Tonk	83.40	10.91	15.14	22.32	20.56	107.58	49.16	.64	.68	5.42
12. Jodhpur	104.86	18.40	8.44	30.09	26.64	519.85	53.90	.84	.52	3.28
13. Nagaur	60.56	30.21	19.57	44.54	19.38	164.67	83.97	.49	.60	3.89
14. Jaiselmer	31.04	16.03	19.65	38.59	15.80	155.50	81.93	.82	1.23	.55
15. Pali	104.30	16.87	20.42	39.75	21.87	162.97	83.25	.47	.56	5.97
16. Barmer	65.88	24.85	16.65	50.06	12.29	71.59	70.69	.18	.70	1.69
17. Jalor	61.56	19.77	17.77	36.88	13.70	75.63	88.04	.22	.60	3.85
18. Sirohi	139.02	27.71	21.25	30.72	20.07	560.47	77.60	.37	1.00	6.23
19. Bhilwara	109.80	16.01	16.93	25.79	19.79	164.69	61.18	.53	.71	7.08
20. Udaipur	124.20	19.83	12.42	22.26	22.01	294.02	36.27	1.10	.73	6.08
21. Chittorgarh	98.75	15.59	9.05	17.49	21.94	178.58	47.34	.32	.75	3.13
22. Dungarpur	169.50	28.73	15.38	27.28	18.52	154.65	72.24	.44	.86	7.43
23. Banswara	127.85	21.66	10.31	11.63	16.85	142.00	60.00	.34	.85	9.53
24. Bundi	115.68	16.69	12.55	22.07	20.14	146.51	64.69	.34	.80	6.13

Appendix V (contd.)

State/District	G16	G17	G18	G19	G20	G25	G26	G27	G30	G33
25. Kota	97.94	15.97	11.05	20.31	32.53	400.31	55.44	.90	.67	6.83
26. Jalawar	111.75	15.35	11.17	16.41	22.11	109.17	50.07	.38	.79	6.59
HARYANA:										
1. Ambala	497.91	83.90	54.96	17.24	44.62	1188.89	68.86	1.35	.54	14.66
2. Kurukshetra	462.83	92.21	43.03	28.28	32.40	491.76	88.52	1.24	.48	5.61
3. Karnal	419.78	92.45	49.66	35.74	36.77	785.59	93.29	.91	.37	9.41
4. Jind	323.65	96.31	50.85	44.60	26.18	259.79	96.59	1.107	.30	6.96
5. Rohtak	384.97	92.47	78.31	54.79	42.55	660.90	96.12	1.71	.23	10.67
6. Gurgaon	502.21	90.94	40.86	15.75	35.25	715.31	79.35	.94	.53	10.31
7. Mahender-garh	473.42	93.24	74.48	27.59	38.61	424.74	93.93	1.04	.60	10.63
8. Bhiwani	359.87	93.88	55.99	45.75	33.07	348.17	97.64	1.30	.36	8.63
9. Hissar	332.86	74.22	75.30	55.58	29.97	484.46	96.03	1.07	.24	9.82
10. Sonepat	428.83	16.38	63.75	50.15	40.85	435.27	94.86	1.05	.24	11.79
11. Faridabad	447.44	87.76	55.06	16.71	39.19	923.41	86.35	.80	.38	22.79
11. Sirsa	297.71	88.96	66.25	41.64	21.87	441.97	96.21	.57	.41	5.38

Note: **G16-** Length of metalled road per 1000 sq. kms; G17; Percentage of villages connected by pucca road; **G18** - Percentage of villages having medical facilities;(G19, Percentage of village having postal facilities; G20 Literacy rate; G25, Bank deposit per capita; **G26-** Percentage of villages have educational facilities; G27, Number of colleges per 100000 Population; G30, Number of primary schools per 100 population; G33, Number of hospitals and dispensaries per 1000 sq. kms.