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An Inter-District analysis of Physical Infrastructure in Assam

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Abstract

Infrastructure helps in the development of an economy both directly and indirectly. Infrastructure can be broadly divided into two- physical and social. Both physical and social infrastructures are important for sustainable development of an economy but physical infrastructure plays an important role because it helps in the development of social infrastructure. Regional disparity in infrastructure is one major issue in India and Assam is no exclusion to it. Disparities in infrastructural facilities have been one of the major reasons of imbalance in development in India. Assam is a State in the North-Eastern Region (NER) of India. The infrastructural development of the NER is lagging far behind in comparison to the other regions of the country.Both physical and social infrastructure provision are not up to the mark in the region. It must be noted that infrastructure which is the backbone of any economy is lagging behind in NER of India including Assam which may be one reason that has put North-East as one of the low rung region in the country. Thus, the present study focuses basically on the physical infrastructural facilities among the different districts in Assam considering the year 2016. Assam is the centre State which connects with the other NE States.In order to assess the infrastructural facilities, a total number of 9 indicators were considered for the study. The States are divided into four different categories viz., highly developed, medium level developed, developing and low developed categories on the basis of constructed development index.

Keywords:Physical

Infrastructure;Development index; Infrastructure

Development.

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1. Introduction

One of the basic facilities required for any country/region/state is the provision of infrastructural facilities. Infrastructure is the backbone for the development of any economy. Mainly it is classified under two categories viz. physical and social infrastructural facilities. Transport (roads, railways, waterways and civil aviation), electricity and telecommunications are included under physical infrastructure, while health, education, etc. are included under social infrastructural facilities. Both physical and social infrastructural facilities are important for the development of any economy but physical infrastructure is comparatively more important as it enhances the creation of social infrastructural provisions [1]. One of the major characteristics of development in India has been the wide regional disparity in the levels of development. Regional disparity is a common issue in any developing country and India is no exception to it. Regional

disparities are of various types such as disparity in income, production, expenditure levels, infrastructure development, socio-economic aspects, etc.
Disparity in availability of infrastructural facilities has been one of the major reasons of imbalance development in India. Infrastructure is the foundation for the development of any country/region/State. Infrastructure helps in the development of an economy both directly and indirectly. It's the real capital that contributes to economic development by raising the productive capacity. It affects production, consumption, distribution, etc. Assam which is a State in the North-Eastern Region (NER) is also no exception to the disparities in infrastructural facilities.
Thus, the present study focuses on physical infrastructural facilities in Assam at the district level. For assessing the disparities among the districts of Assam composite indices are computed using principal component analysis. The analysis considers only one year 2016.

2. Literature Review

A number of studies have already been done focusing on the extent and nature of disparities in development of infrastructure in India. Different studies focused on different aspects. Some focused on the extent of disparity in infrastructural development and also focused on whether these disparities were converging or diverging over time. While some others focused on only regional infrastructural development on the basis of some constructed composite indices. While few others also focused on the impact of infrastructure on regional economic growth. Some of these studies are worth mentioning- Dadibhavi (1990) [4], [3], Ghosh and Prabir (1998) [5], Deb and Prabir (2004), Chaudhari and Halder (2009) [9],Patra and Acharya (2011) [8], Khan and Islam (1990) [7], Basavaraj (2007) [2], Ghosh (2004) [6]etc. It must be noted that these studies were made by these researcher on different States of India. Thus, from above it is found that many studies were done at the India level and also many studies were done in different States to assess the disparity in infrastructural development but only a few studies has been done till now to assess disparity in infrastructural development among the States of NER and at district level in Assam. Thus, the present paper focuses on physical infrastructural facilities in Assam at the district level.

3. Objectives

The objectives of the paper are as follows:
i) To assess the status in physical infrastructural facilities based on optimum combinations of developmental indicators among the different districts in Assam.

ii) To examine the imbalances between the levels of development and to classify the States into different development stages over the two time periods.

4. Research Question

Does there exist any disparity among the different districts in the State of Assam in the selected physical infrastructural development facilities indicators for the period 2016-17?

5. Data and Methodology

5.1 Source of data:

The study is based on secondary data collected from different sources. These sources are- Directorate of Economics and Statistics, Government of India, Ministry of Road Transport and Highway, Government of India, Road Transport Yearbook, Central Electricity Authority Ministry of Power, Government of India, Quarterly Statistics on Deposits and Credits of Schedule Commercial Banks, RBI, Various issues, etc.

5.2 Selection of indicators:

The indicators selected for this study are mentioned below-

1. District wise number of villages electrified.
2. Circle-wise number of consumers.

3. Solar home lighting installed by Assam Energy Development Agency under remote village electrification programme.
4. Numbers of solar photovoltaic power plant installed under Jawaharlal Nehru National Solar Mission and Special Area Demonstration Project Programme.
5. Lengths of road per lakh population.
6. Lengths of road per 100 sq. km.
7. Number of motor vehicles registered per lakh population.
8. Number of vehicles on road.
9. Number of post office per lakh population.

5.3 Method for analysis:

First of all the data were normalized using the following formula-
$Z_i = X_i - \bar{X}/X_i$
In this study in order to assess the status of physical infrastructural facilities in Assam we have constructed physical infrastructure index which is computed by this following equation-
Index= $W_1*Z_1+W_2*Z_2+W_3*Z_3+\ldots\ldots\ldots\ldots+W_n*Z_n$
Where, Z_1, Z_2, Z_3 and Z_n are different variables of thephysical infrastructure. W_1, W_2, W_3 and W_n are weights assigned to the different variables.
To calculate the weights following method is used:
$W_i = F_{ik} . V_k$
Where,
W_i = Weights of the i_{th} Variable,
F_{ik} = Factor loading of i_{th}variable and k_{th}Factor, reflecting highest correlation between X_i and Factor k,and
V_k = Variation explained by k_{th} factor.
In order to calculate the Factor loading, Principal Component Analysis method (Factor Analysis) is used.

6. Findings and Discussions

Development which is known to be a multidimensional process cannot be evaluated on the basis of a single indicator, while, taking too many indicators and assessing them individually may not provide the correct result. Therefore, in the present analysis 9 indicators are taken into consideration to assess the status of physical infrastructure among the different districts of Assam. Indicators common to all the states were taken into consideration. Since data were not available therefore only one year is considered for this study i.e. 2016. The table 1 below shows the composite indices of the different districts of Assam.

Table 1: Rank of the different districts in Assam.

Districts	Physical Infrastructure Index	Rank
Kokrajhar	0.30	15
Dhuburi	0.33	13
Goalpara	0.31	14
Barpeta	0.37	10
Morigaon	0.28	17
Nagaon	0.39	9
Sonitpur	0.29	16
Lakhimpur	0.40	8
Dhemaji	0.30	15
Tinsukia	0.35	12
Dibrugarh	0.40	8
Sivasagar	0.42	6
Jorhat	0.43	5
Golaghat	0.37	10
KarbiAnglong	0.31	14
DimaHasso	0.52	2

Cachar	0.31	14
Karimganj	0.29	16
Hailakandi	0.33	13
Bongaigaon	0.41	7
Chirang	0.28	17
Kamrup	0.48	3
Kamrup Metro	0.44	4
Nalbari	0.56	1
Baksha	0.28	17
Darrang	0.36	11
Udalguri	0.26	18

Source: Author's own computations.

The composite indices of development have been worked out for different districts for physical infrastructure. Different districts are ranked on the basis of the computed composite indices. The value of the composite index lies between 0.26 and 0.56. If the composite index value moves toward 1 the better the facilities. From the table 1, it can be seen that Nalbari is found to be in the first position among the districts of Assam with a score of 0.56. On the other hand, Udalguri is found to be in the lowest position with an index score of 0.26 in the year 2016. There is wide disparity in physical infrastructural facilities among the different districts of Assam which is prominent from the composite index value.

6.1 Relative Share of Area and Population under Different Levels of Development:

In order to assess the different levels of development simple ranking of districts on the basis of the composite indices would be sufficient but by using a suitable classification of districts on the basis of mean and standard deviation will give a more meaningful analysis. For relative comparison of the different States with respect to physical infrastructural development it appears quite appropriate to assume that the districts having composite indices less than or equal to (mean-standard deviation) are highly developed and districts having a composite indices greater than (mean + standard deviation) are low developed. In the same way, districts with composite indices in between (mean) and (mean-standard deviation) are middle level developed and the districts with composite indices between (mean) and (mean + standard deviation) are developing. This is shown with the help of the table 2 below-

Table 2: Different categories of districts in Assam

Districts	No. of districts
Highly developed (› 0.44)	5
Middle level developed (0.36-0.44)	6
Developing (0.28-0.36)	14
Low Developed (‹0.28)	2

Source: Computed by the Author.

In table 2, we can see that 5 districts viz. Nalbari, DimaHasao, Kamrup, Jorhat and Kamrup Metro were found to be in the highly developed category. Sivasagar, Lakhimpur, Bongaigaon, Dibrugarh, Barpeta and Tinsukia were found to be in the medium level of development. Fourteen districts viz. Nagaon, Darrang, Golaghat, Dhuburi, Hailakandi,Kokrajhar, Goalpara, Dhemaji, Sonitpur, Cachar, KarbiAnglong, Karimganj, Morigao and Chirang were found to be in the developing category. Two districts viz.Baksha and Udalguri were found to be in the low developed category.

6.2 Relative Share of Area and Population:

In order to know the actual scenario of physical infrastructural facilities among the districts of Assam, the relative share of area covered under each category along with the population shares are shown below in table 3. This will help in assessing the true picture of physical infrastructural facilities in Assam.

Table 3: Relative Share of area and population

Categories	No. of districts	Area (%)	Population (%)
Highly developed	5	16.38	15.54
Middle level developed	6	19.74	23.33
Developing	14	58.16	55.42
Low Developed	2	5.69	5.71

Source: Author's own computations.

From the above table 3, it is found that only 16.38% of the area is covered under the highly developed category which comprises of 15.54% of the population share of the State. The middle level developed category includes about 19.74% of the area and 23.33% of the population share in the state. Developing category comprises of the highest percentage covering 58.16% of the area with 55.42% of the population. While the low developed category includes 5.69% of the area with 5.71% of the population.

7. Conclusion

Thus, from the above analysis it is found that the physical infrastructural facilities are not uniform among the different districts of Assam. Wide disparities exist among the different districts of Assam in physical infrastructure facilities. Nalbari is found to be in the first position in case of infrastructure provision and Udalguri in the last position. The composite index value ranges between 0.26 and 0.56 which depicts wide disparities in Physical infrastructure. Moreover, from the above analysis we also found that only 16.38% were under highly developed category which comprises about 15.54% of the population share of the state. The major portion of the state is still under the developing category covering 58.16% of the area of the state and 55.42% of the population share of the state. Thus, it is clear that the major portion of the state is still under the developing category.

8. Recommendations:

The following suggestions can be provided on the basis of the study-
1. The policy makers must focus on the development of infrastructural facilities because without it no economy can progress.
2. A low developed district may not be low developed in all aspects in certain indicators they may be highly developed or middle level developed.
3. Dimension specific policies must be taken by the government.
Thus, concrete action on the part of both the State as well as Central government is needed.

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