



ROAD DENSITY AND REGIONAL DEVELOPMENT IN HARYANA- 2011

Dr. Subodh Rani

PGT GSSS Kahni, Rohtak

ABSTRACT

In the present paper, an attempt has been made to analyze the road density and levels of regional development in Haryana in 2011. Two variables (Total road length per 100 km<sup>2</sup> and Total road length per lakh population) are chosen for the measurement of the road density and four broad categories: Demographic, Social, Economic and Ecological have been selected to study the regional development levels. District wise rank orders have been assigned to find out the composite index and to draw a connection between road density and regional development. It is recorded that district Kaithal has the maximum road density by both the indicators. In regional development, Sonipat district has attained the 1<sup>st</sup> rank whereas Palwal is the least developed district. It is suggested that there is an urgent need to construct new roads and expand the existing highways for a balanced regional development in state.

**KEYWORDS :** Road Density, Regional Development, Rank Orders, Composite Index

Introduction

Transportation has been described as the lifeblood of civilization. A road network is usually established in a region with a view to facilitate economic and social interaction. Regional development is a process aiming at human welfare not only in aggregate terms, but also in an equitable manner among areas and groups of people. It attempts to secure the best conditions and possibilities for comprehensive development for all, eliminates inter-regional disparities in the quality of life and makes the best possible use of the natural endowments and human genius of a region. The major objective of present paper is to analyze the regional imbalances in the development and to relate it with the road density in the state.

Study Area- Haryana

Haryana is an important state of North Western India which consists of six divisions, 22 districts and 93 tehsils. In 2011, total population of Haryana state is 2.54 crore. Haryana has two major physiographic regions: the flat alluvial plain covering most of the state and, in the northeast, a strip of the highly dissected shivalik range. The state has 14 national highways, 31 state highways and 37 major district roads in 2011.

Source of Data and Research Methodology

The present study is based on secondary data. District Statistical Offices and various other government offices have been consulted. Total road length per 100 km<sup>2</sup> and Total road length per 100000 population are chosen for the measurement of the road density. Nine variables [Share of urban population, literacy rate, No. of Recognized High/Sr. Sec. Schools Per 100 km<sup>2</sup>, No. of Medical Institutions Per 100 km<sup>2</sup> area, No. of Medical Institutions Per 100000 persons, No. of Rural Development Co-operative Societies per Lakh Population, No. of registered working factories per 100 km<sup>2</sup>, Workers employed in registered working factories per 100 km<sup>2</sup>, Net irrigated area as percentage of Net area sown] have been selected to study the regional development levels. Correlation analysis has been applied to draw a connection between road density and levels of regional development.

Density of roads

(I) Total road length per 100 km<sup>2</sup>

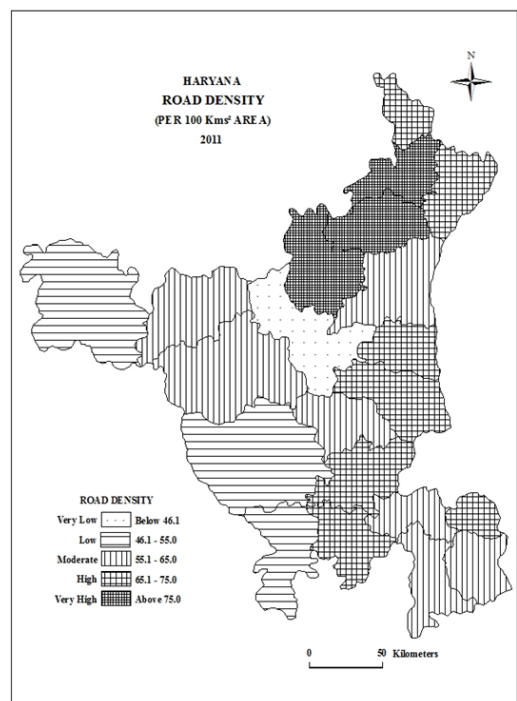
The highest and lowest road density is recorded in Kaithal and Jind respectively [Table 1.1]. Table 1.2 shows the regional variations in road density per 100 km<sup>2</sup> area [Fig. 1.1].

**Table- 1.1: District wise Length and Density of Roads in Haryana, 2011.**

Sr. No.	Districts	Total Length (kms.)	Road Length/ 100 km <sup>2</sup>	Road Length/ Lakh Persons
1	Panchkula	601	66.93	107
2	Ambala	1274	80.94	113

3	Yamuna Nagar	1177	66.57	97
4	Kurukshetra	1178	76.99	122
5	Kaithal	1879	81.1	175
6	Karnal	1603	63.61	106
7	Panipat	898	70.82	74
8	Sonipat	1431	67.44	99
9	Jind	1150	42.56	86
10	Fatehabad	1585	62.45	168
11	Sirsa	2249	52.58	174
12	Hisar	2291	57.52	131
13	Bhiwani	2444	51.15	150
14	Rohtak	1045	59.89	98
15	Jhajjar	1339	73.01	140
16	Mahendergarh	1032	54.34	112
17	Rewari	1049	65.81	117
18	Gurgaon	720	59.02	48
19	Mewat	948	63.45	87
20	Faridabad	533	68.07	29
21	Palwal	832	60.82	80
	State Average	27258	61.65	101

Source: Statistical Abstract of Haryana, 2011



**Table- 1.2: Haryana: Levels of Road density/ 100 km<sup>2</sup> (2011)**

Category	Density	No. of Districts	Name of Districts
Very Low	Below 46.0	1	Jind
Low	46.0 – 55.0	3	Sirsa, Bhiwani, Mahendergarh
Moderate	56.0- 65.0	7	Fatehabad, Hisar, Rohtak, Karnal, Gurgaon, Mewat, Palwal
High	66.0- 75.0	7	Panchkula, Yamunanagar, Panipat, Sonipat, Jhajjar, Rewari, Faridabad
Very High	Above 75	3	Ambala, Kurukshetra, Kaithal

**Source:** Computed by Author.

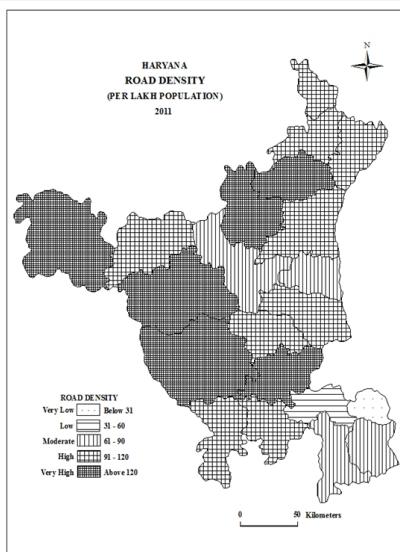
**(II) Total road length per 100000 population**

The highest and lowest road density is recorded in Kaithal and Faridabad districts respectively [Table- 1.1]. Table- 1.3 shows the regional variations in road density per lakh population [Fig. 1.2].

**Table- 1.3, Haryana: Levels of Road density/ Lakh Population (2011)**

Category	Density	No. of Districts	Name of Districts
Very Low	Below 31	1	Faridabad
Low	31 – 60	1	Gurgaon
Moderate	61- 90	4	Panipat, Jind, Mewat, Palwal
High	91- 120	9	Panchkula, Ambala, Y.nagar, Karnal, Sonipat, Fatehabad, Rohtak, Mahendergarh, Rewari
Very High	Above 120	6	Kurukshetra, Kaithal, Sirsa, Hisar, Bhiwani, Jhajjar

**Source:** Computed by Author.



**Selected Indicators of Regional Development**

**Mishra and Tripathi (1991)** studied the levels of road development and socio- economic transformation of Basti district of Uttar Pradesh by using four indicators. **Mahajan (1998)** explained the role of roads in economic development of Himachal Pradesh by evaluating the growth of roads. **Vaidya (1998)** provided statistics on transportation by presenting many articles. Here, nine indicators of regional development have been selected. Table 1.4 shows the average values of these regional development indicators in Haryana.

**Table- 1.4, Average Values of the Indicators of Regional Development in Haryana, 2011.**

Sr. No.	Indicators:	Average
<b>(a) Demographic Indicators</b>		
1.	Share of urban population in percentage	33.63%
2.	Literacy Rate in percentage	75.66%
<b>(b) Social Indicators</b>		

3.	No. of Recognized High/Sr. Sec. Schools Per 100 km <sup>2</sup> area	16
4.	No. of Medical Institutions (Allopathic) Per 100 km <sup>2</sup> area	8
5.	No. of Medical Institutions (Allopathic) Per 100000 persons	13
6.	No. of Rural Development Co-operative Societies Per 100000 persons	147
<b>(c) Economic Indicators</b>		
7.	No. of registered working factories per 100 km <sup>2</sup> area	39
8.	Workers employed in registered working factories per 100 km <sup>2</sup> area	3140
<b>(d) Ecological Indicators</b>		
9.	Net irrigated area as percentage of Net area sown	81%

**Source:** Computed by Author.

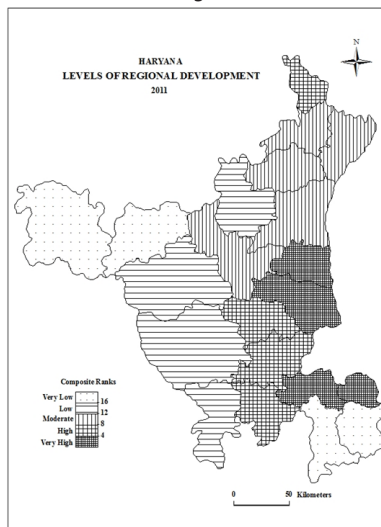
Rank orders have been assigned to district wise scores of indicators to prepare a composite index [Table- 1.5].

**Table- 1.5, Haryana: Districtwise Composite Index of Regional Development Indicators, 2011**

Sr. No.	Districts	A	B	C	D	E	F	G	H	J	Total	Composite Rank
1	Panchkula	3	2	14	3	11	1	9	8	19	70	7
2	Ambala	5	4	9	9	14	15	7	11	12	86	10
3	Yamuna Nagar	7	9	9	9	14	18	3	4	9	82	9
4	Kurukshetra	11	12	12	3	11	12	12	16	1	90	11
5	Kaithal	17	17	18	9	2	6	14	20	6	109	15
6	Karnal	10	14	11	14	14	17	8	9	4	101	12
7	Panipat	4	11	3	3	17	11	4	3	1	57	3
8	Sonipat	9	6	3	2	4	3	5	5	1	38	1
9	Jind	15	16	12	9	4	9	14	12	10	101	12
10	Fatehabad	19	20	19	20	11	10	16	19	5	139	20
11	Sirsa	14	18	20	21	4	5	18	18	11	129	17
12	Hisar	8	15	14	14	4	8	13	13	13	102	14
13	Bhiwani	18	12	14	19	1	7	17	15	18	121	16
14	Rohtak	6	8	8	3	4	13	10	10	14	76	8
15	Jhajjar	12	6	3	3	2	14	6	7	16	69	6
16	Mahendergarh	20	9	14	14	4	16	18	17	20	132	18
17	Rewari	12	5	3	3	4	4	11	6	15	63	5
18	Gurgaon	2	1	2	9	20	2	2	2	17	57	3
19	Mewat	21	21	21	14	17	21	21	21	21	178	21
20	Faridabad	1	3	1	1	20	19	1	1	8	55	2
21	Palwal	16	19	14	19	20	20	14	7	136	19	

**Source:** Computed by Author.

Sonipat, Panipat, Gurgaon and Faridabad are most developed whereas Mewat, Palwal, Sirsa and Fatehabad are the least developed districts [Table 1.6 & Fig. 1.3].



Category	Range	No. of Districts	Name of Districts
Very Low	Above 16	4	Sirsa, Fatehabad, Mewat, Palwal
Low	13 – 16	4	Hisar, Bhiwani, Mahendergarh, Kaithal
Moderate	9- 12	5	Ambala, Yamunanagar, Kurukshetra, Karnal, Jind
High	5 - 8	4	Panchkula, Rohtak, Jhajjar, Rewari
Very High	Below 5	4	Sonipat, Panipat, Gurgaon, Faridabad

**Source:** Computed by Author.

#### Degree of correlation

The value of correlation coefficient (r) varies from -1 to +1. The district level correlations between the road density/ 100 km<sup>2</sup> and road density per Lakh population (X axis) and nine variables of regional development (Y axis) have been identified. Karl Pearson's co-efficient of correlation method has been used i.e.

$$r = \frac{\sum xy}{\sqrt{\sum x^2 \sum y^2}}$$

The district wise correlation between road density and selected variables has been shown in table- 1.7A & 1.7B.

Sr. No.	Variables	r	r <sup>2</sup>	P Value
1.	Urban Pop	0.223	0.050	0.331
2.	Literacy (%)	0.207	0.043	0.369
3.	R Schools/ 100 km <sup>2</sup>	0.223	0.050	0.331
4.	MI/ 100 km <sup>2</sup>	0.426	0.182	0.054
5.	MI/ Lakh Pop	-0.120	0.014	0.605
6.	RD Societies/ Lakh Pop	0.033	0.001	0.886
7.	Factories/100 km <sup>2</sup>	0.131	0.017	0.572
8.	Workers/ 100km <sup>2</sup>	0.042	0.002	0.858
9.	Net irg. area	0.298	0.089	0.189

**Source:** Statistical Abstract of Haryana, 2011. Compiled by Author.

Sr. No.	Variables	r	r <sup>2</sup>	P Value
1.	Urban Pop	-0.645	0.416	0.002
2.	Literacy (%)	-0.298	0.089	0.189
3.	R Schools/ 100 km <sup>2</sup>	-0.692	0.485	0.0004
4.	MI/ 100 km <sup>2</sup>	-0.640	0.410	0.002
5.	MI/ Lakh Pop	0.796	0.634	0.00001
6.	RD Societies/ Lakh Pop	-0.005	0.0005	0.981
7.	Factories/100 km <sup>2</sup>	-0.671	0.451	0.001
8.	Workers/ 100km <sup>2</sup>	-0.676	0.457	0.001
9.	Net irg. area	0.032	0.001	0.889

**Source:** Statistical Abstract of Haryana, 2011. Compiled by Author.

The p-value of correlation between **road density/ 100 km<sup>2</sup>** and all the regional development indicators is found insignificant which means that it doesn't have any impact on the behavior of these indicators. Only the No. of Medical Institutions Per 100 km<sup>2</sup> is having a positive moderate correlation. The p-value of correlation between **road density per lakh population** and No. of Recognized High/Sr. Sec. Schools per 100 km<sup>2</sup> area and No. of Medical Institutions Per Lakh Population is found significant.

#### Conclusion

It is concluded that the eastern sector of Haryana is more developed as compared to western Haryana. Also, eastern sector has a better road density/100 km<sup>2</sup> whereas; western sector has better road density/ lakh population. Although road transport has been emerged as an important element of infrastructure yet it doesn't have a major impact on the distributional patterns of development in Haryana. Finally, it is suggested that there is an urgent need to

construct new roads as well as expand the existing national highways and state highways in the south western part of Haryana. Government should take necessary steps to improve the behavior of regional development in extreme western and southern parts of the state.

#### References

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