



Examining Disparities in Agricultural Development across Regions in Haryana, India: A Index based Analysis

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Abstract

The present paper is an attempt to measure agricultural regional disparities in Haryana over the period of 2001-02 to 2013-14. The inter-districts agricultural disparity has been measured by using deprivation method. The study found that the regional disparities in the agricultural development in the state of Haryana are decreasing over time. It is evidenced by decreasing value of coefficient of variation of the constructed index. Further, developed and moderately developed category values of index indicate that major agricultural development in the state is concentrating in the north-eastern part of Haryana. This proves the converging agricultural development in the state and but in some districts situation of agriculture is a serious issue of concern and requires immediate attention of policy makers.

Keywords: *Infrastructure development, Regional disparities, Deprivation Method, Coefficient of Variation, Haryana.*

1. Introduction:

Ignorance of spatial factors agricultural growth theories had been one of the major limitations in economic literature from the days of 'Adam smith' till recently. The assumption of perfect mobility of factors between regions and the neglect of distance, geographical economies of scale and scope, and locational preferences constituted the foundation of the traditional economies of efficient utilization of resources. In many developing countries, discontent due to unequal development of a region- a result of neglect of locational factor in national economic policies has reached an alarming proportion and becomes the political divisive issue.

The empirical evidences demonstrate that in a growing economy, regional disparities diverge at initial stages of development and subsequently they converge later when the economies reach the stage of maturity (Williamson, 1965; Myrdal, 1957; Alonso, 1968 and Rostow, 1960). This may be true to some extent. But the Indian economy is crossing take-off stage to reach the stage of maturity (Rostow, 1960). More so, regions grow at different rates due to difference in natural endowments and also due to differences in their geo-political, socio-economic and religious importance in the country. The difference in growth rate is also attributed to the difference in public policy (Olson, 1997).

Amongst the Indian states, Haryana is one of the better performing states. Haryana came into being on November 1, 1966, as a result of bifurcation of Punjab. It is located strategically surrounding the national capital Delhi from three sides. Economically, Haryana GDP has been growing at more than 9 percent over the last decade. It is pertinent to mention here that growth of GDP of Haryana has been consistently above the all India growth rate. Development of agriculture has been the major factor behind superior performance of Haryana. It was one of the early adopter of green revolution in the country. Moreover, growth rate in agriculture is less than 2 percent in comparison to above 10 percent growth rate in non-agricultural sectors of the state. This reflects a structural shift in favour of non-agricultural activities in the state.

In view of the discussion it can be said that Haryana is a relatively small and economically better performing state, these factors seems to be the reason that at political level, policy making level or academically, regional disparities in agricultural development have attracted attention. In fact policy document or efforts on the part of policy makers exist that can be seen to address the issue disparities in the state. Regional disparities are expected to increase in future as after the introduction of policy of economic liberalization, governments have withdrawn its authority pertaining to the location of infrastructural and other economic activities. Therefore keeping above discussion in mind the present study is an attempt to measure the intra-state disparities in infrastructure development in Haryana over the period of 2001-02 to 2013-2014.

2. Objectives and Methodology of the Study

The main objective of the study is to measure the incidence of agricultural disparities existing at district level in Haryana. For the purpose, we have computed the agricultural development level attained in certain indicators at district. A vector of 10 indicators encompassing all dimensions of agricultural development is used for working out the inter-district agricultural development index. (List of the indicators is at Appendix-I) Further in the study it is hypothesized that the regional disparities in agricultural development are shrinking over time and secondly, Infrastructural development in the state is concentrated in some extent in the north- eastern part of Haryana.

2.1 Construction of Composite Index

Development is a multidimensional phenomenon. Each of these dimensions is measured in different units. Given the difficulties in analysing development with respect to each of this dimension, researchers generally prefer to aggregate them what one calls composite index, to depict the overall status of region .For reduction of this dimensionality problem many methods have been suggested in the literature. While some are weighted others are weight free. The literature is silent vis-à-vis superiority of any method over others. Keeping the limitation in mind, a weight free index has been constructed.

2.2 Development Index or Deprivation Method

The Development index (DI) is constructed in three steps. The first is to define a measure of deprivation that a region suffers in each of its variables. The notion of deprivation used by the UNDP (United Nation Development Programme) is one of absolute deprivation. In order to get an index of deprivation, the measure of regions is divided by the difference between the maximum and minimum value. Mathematically, T_{ij} is the deprivation indicator for the J_{th} region with respect to the variable is defined as

$$T_{ij} = \frac{\text{Max}_i - X_{ij}}{\text{Max}_i - \text{Mini}_i}$$

The second step is to define an average deprivation index by taking a simple average of all the indicators.

$$T_j = \sum_{i=1}^n T_{ij}/n$$

Finally, the Development index is defined as absence of deprivation.

Mathematically

$$(DI)_j = (1 - \sum T_{ij} / n)$$

2.3 Categorization of Regions/Districts

For the sake of easy comparison among development dynamics across different districts over time the study classified all the districts into three categories namely; developed, moderately developed and underdeveloped. This categorization for both method used in study is made by assuming that the worked out composite index follows a normal distribution with mean (μ) and standard deviation σ . The groups are categorized by using the following cut-off points.

Developed $Z_d \geq \mu + 0.44\sigma$

Moderately Developed $\mu - 0.44\sigma \leq Z_d \leq \mu + 0.44\sigma$

Less Developed $Z_d \leq \mu - 0.44\sigma$

By using above framework districts are classified into developed, moderately developed and less developed both at sectoral and overall level for the method.

2.4 Sources of Data

The nature of study dictates the requirement of the secondary sources of information. Accordingly, all the required data has been obtained from various authentic sources. Some indicators have been manipulated by taking two and more different variables related with parent variable. The main source of data is as follow:

- Statistical Hand Book of Haryana issued by Economic and Statistical Organization, Planning Department, Government of Haryana, From 2001-02 to 2013-14.
- Economic Survey of Haryana issued by Economic and Statistical Organization, Planning Department, Government of Haryana, (various issues).

2.5 Reference Years

The study has attempted to estimate infrastructure development index and its inter-district variations in Haryana during 2001-02 to 2013-14. The study carried out at four points of time i.e., 2001-02, 2005-06, 2009-10, 2013-14. The year 2001-02 is selected to analyse the effect of agricultural development programmes that had been undertaken during the New agriculture Policy. The year 2005-06, 2009-10 and 2013-14 are chosen to analyse the impact of the implementation of various measures taken for reduction of spatial variations during that period.

3. Empirical Findings of the Study

The results pertaining to the agricultural development are depicted in the table 2. The table 2 (DIM) demonstrate that in 2001-02 Panipat stands first in agricultural development followed by Karnal, Kurukshetra, Yamunanagar, Kaithal and Rohtak. All these seven are in the category of developed districts. While five districts namely Fatehabad, Panchkula, Sonipat, Hisar and Rewari are moderately developed and remaining seven districts are in less developed category. In 2005-06, a few upward or downward changes in ranks and status of districts can be observed. Table 2 shows that six districts are less developed, six are moderately developed and seven districts are developed in agricultural development. The results presented in table 2 show that in 2013-14 eight districts are developed, five are moderately developed and six districts are less developed in agricultural development. A look at ranks of districts reveals that districts namely

Panipat, Yamunanagar , Rohtak , Hisar, Rewari, and Sirsa show downward trend in their ranks over the period of study. Relative development of agriculture in Kurukshetra, Kaithal, Karnal Ambala, Mahendergarh and Bhwani remained more or less same as shown by their respective ranks over the period of study. An upward move of ranks of Panchkula, Sonipat and Jind show increasing agricultural development in these districts. However, in the year 2013-14 Panchkula replaced Panipat and became the agricultural most developed district of state.

Through the study period i.e., 2001-02 to 2013-14 it has been observed that the agricultural development in Haryana has shown a tendency of convergence. The regional balanced agricultural development needs better transport and communication connectivity in addition to better infrastructure facilities. Improvement in the transport connectivity facilities in a region substantially improves the geographic attractiveness of other regions by reducing the transport cost between the regions (Xubei, 2004). The issue of connectivity in terms of better highways, Ports and railway was ignored by the planners in Haryana particular and India in general.

The differences in the values of the index among the districts bring out in some extent unequal development in agriculture in Haryana and these inequalities are rising as the value of Coefficient of Variation is increasing during the study period 2009-10 from 21.2 per cent to 24.5 per cent in 2013-14 by DIM (Table 2) but overall inequalities as shown by C.V (31.2 to 24.5) From period 2001-02 to 2013-14 shrinking. Thus the hypothesis i.e. Inter-district disparities in terms of agricultural development are shrinking in Haryana is accepted.

Table 1: Average and coefficient of variation of the Agricultural Infrastructure Development Indicators

Average				
Indicators	2001-02	2005-06	2009-10	2013-14
X ₁	82.98	80.93	87.66	88.89
X ₂	18.24	19.14	21.37	25.15
X ₃	55.46	53.17	57.97	62.73
X ₄	12.84	11.78	11.68	11.57
X ₅	6.40	7.48	9.21	10.06
X ₆	7.39	7.58	8.61	14.31
X ₇	47.42	67.91	81.21	94.02
X ₈	3.68	3.78	3.89	04.10
X ₉	106.50	136.94	177.04	208.08
X ₁₀	52	42.78	35.83	42
Coefficient of Variation				
Indicators	2001-02	2005-06	2009-10	2013-14
X ₁	19.99	28.79	14.61	18.60
X ₂	40.71	44.87	32.33	37.66
X ₃	20.59	29.38	17.06	14.43
X ₄	19.64	20.10	19.77	23.96
X ₅	30.73	42.04	98.72	99.66
X ₆	25.76	30.94	35.68	36.78
X ₇	39.57	38.48	49.94	46.92
X ₈	62.06	70.13	68.41	64.90
X ₉	83.07	80.32	91.79	87.76
X ₁₀	74.93	69.43	29.73	71.48

Table 2: Development Index of Districts of Haryana (Development Index method)

Districts	2001-02			2005-06			2010-11			2013-14		
	IDI	Rank	Status	IDI	Rank	Status	IDI	Rank	Status	IDI	Rank	Status
Panipat	.703	1	D	0.508	6	D	0.457	6	D	0.41	7	D
Karnal	0.588	2	D	0.61	1	D	0.549	2	D	0.476	3	D
Kurukshetra	0.585	3	D	0.588	2	D	0.525	3	D	0.497	2	D
Yamunanagar	0.547	4	D	0.507	7	D	0.459	5	D	0.352	10	MD
Kaithal	0.53	5	D	0.526	3	D	0.49	4	D	0.448	4	D
Ambala	.493	6	D	.453	9	MD	0.451	7	D	0.412	6	D
Rohtak	0.481	7	D	0.467	8	MD	0.345	15	LD	0.324	13	MD
Fatehabad	0.437	8	MD	0.514	4	D	0.41	9	MD	0.382	9	MD
Panchkula	0.387	9	MD	0.434	10	MD	0.587	1	D	0.51	1	D
Sonipat	0.375	10	MD	0.51	5	D	0.375	12	MD	0.401	8	D
Hisar	0.368	11	MD	0.398	12	MD	0.378	11	MD	0.289	15	LD
Rewari	0.36	12	MD	0.411	11	MD	0.383	10	MD	0.289	16	LD
Sirsa	0.355	13	LD	0.392	13	MD	0.321	16	LD	.274	17	LD
Jind	0.341	14	LD	0.32	16	LD	0.348	14	LD	0.346	11	MD
Jhajjar	0.306	16	LD	0.345	15	LD	0.306	17	LD	0.303	14	LD
Mahendgarh	0.258	17	LD	0.23	19	LD	0.29	18	LD	0.197	19	LD
Gurgaon	0.235	18	LD	0.319	17	LD	0.365	13	LD	0.326	12	MD

Bhiwani	0.219	19	LD	0.305	18	LD	0.274	19	LD	0.201	18	LD
c.v	31.2%			23.1%			21.2%			24.5%		

4. Conclusion

The present study was an attempt to measure the incidence of intra-state regional disparities in agricultural development of Haryana over the period of 2001-2013. It can be concluded that regional disparities in the agricultural development in the state of Haryana are decreasing over time. It is evidenced by decreasing value of coefficient of variation of the constructed indices by DIM. Further, developed and moderately developed category values of indices indicate that in some extent agricultural development in the state is concentrating on north eastern and middle part of Haryana. This proves the unbalanced agricultural development (in few area likely southern Haryana) in the state and is issue of concern and need to attention over there.

5. Appendix-I

Agriculture Development Indicators

X_1 = Percentage of net irrigated area to the net sown area.

X_2 = Number of pumpsets per 100 hec of net sown area.

X_3 = District road length per 100 sq. km of area.

X_4 = No. of post offices per lakh of population.

X_5 = No. of tractors per 100 hec. of N. S. A.

X_6 = No. of bank branches per lakh of population.

X_7 = Credit- Deposit ration of schedule commercial banks.

X_8 = Regulated market per lakh hec of net sown area.

X_9 = Warehouse capacities in tones per hec at net sown area.

X_{10} = No. of beds per lakh of population

6. References

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