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Research Article

AGRICULTURAL DEVELOPMENT LEVEL DISPARITIES IN INDIAN STATES

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Abstract- The level of agriculture development of different states of India was obtained with help of composite index based on optimum combinations of eight agricultural development indicators. The study utilizes very recent time period for measurement of development for seventeen non-specific states of India. It is found that Uttar Pradesh scores first rank in the agriculture development whereas Goa stands on the last position. Wide disparities have been observed in the level of agricultural development between different states of India.

Keywords- Composite index, Agricultural development, Indian states

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Introduction

India has experienced phenomenal growth in the past decade and occupied the 9th rank in terms of nominal gross domestic product however the poverty figures puts forth the scope for next potential growth trajectory. Amid rising poverty numbers ensuring food security is the most promising area before the policymakers though India has made immense progress towards food security since independence. Over the period of time Indian population has increased thrice however food grain production has quadrupled resulting into increase in food grain per-capita [1]. Before the mid-1960s India relied on imports and food aid to meet domestic requirements. However, two years of severe drought in 1965 and 1966 provoked India to explore the domestic sources instead of constant relying on imports for food security. India adopted significant policy reforms for attaining the status of self sufficiency in food grain. The broader reforms were towards improving crop yields through introducing disease resistant wheat varieties, better farming practices, etc. These policy reforms under the ambit of green revolution were initially concentrated on mainly in the irrigated areas of the states of Punjab, Haryana and Uttar Pradesh [2]. With success of this agriculture policy, India's green revolution technology was extended to rice. The extension was motivated due to poor irrigation infrastructure, which was strengthened substantially with the innovations of tube wells by Indian farmers [3]. With these policy initiatives India's agricultural economy has witnessed remarkable growth but the structural behavior has reversed as the share of agriculture in GDP has fallen from 43 percent in 1970 to 16 percent in 2011 [4]. The story behind structural shift is the pre-dominance of services sector in India in the past couple of decades. Despite of lower pie of the sector in total GDP, the agriculture plays a vital role in India's economy as around three fifths of Indian population depends on agriculture for their principal means of livelihood. As per estimates by the Central Statistics Office (C.S.O), the share of agriculture and allied sectors (including agriculture, livestock, forestry and fishery) was 15.35 percent of Gross Value Added during 2015-16 at 2011-12 prices. India is the largest producer, consumer and exporter of spices and spice product. India's fruit production has grown faster than vegetables, making it the second largest fruit producer in the world. India's horticulture output, comprising fruits, vegetables and spices is estimated to be 283.4 million tons in 2015-16 [5]. Agriculture exports contribute 10 percent of the country's exports and India's food grain production has increased marginally to 252.23 million tons in 2015-16. The above figures clearly highlight the growing role of agriculture sector in Indian economy.

Literature Review

In the existing literature, number of studies tried to measure the regional disparities by the agriculture development indicator. The prominent work by [6-8] studied for estimating the level of development at district level had so for been made for the states of Orissa, Andhra Pradesh, Kerala, Uttar Pradesh, Maharashtra. He found that disparities among different regions were prominent, but the underdeveloped region did not mean all its indicators were underdeveloped. [9] utilized the cross sectional data for measuring the inter-state disparities in rural infrastructure in India and its impact on agricultural development and rural poverty. Composite indices of rural economic and social infrastructure had been prepared for the selected states for 1980-81, 1990-91 and 2000-01 covering 16 indicators of economic infrastructure and 7 indicators of social infrastructure. The technique of Principal Component Analysis (PCA) was used to prepare the composite index of infrastructure development. The analysis revealed that extreme disparities continue to persist with respect to the availability of economic and social indicators in rural areas at the state level. Economic and social infrastructure was found to have a strong positive effect on agricultural productivity and a strong negative effect on rural poverty. [10] examined the intra-state disparities in five states in India; Gujarat, Haryana, Kerala, Orissa and Punjab were used three indicators, consumption, inequality and the incidence of poverty, to examine this issue. These indicators taken together reflected overall well-being of the population as they were the outcome of the interplay of a large set of economic and policy variables. The states chosen for the analysis of intra-state disparities had a relatively homogeneous initial level of poverty in 1973-74,

the coefficient of variation (counting the headcount ratio (HCR) being about 20% in 15 major states). Identified the level of socio-economic development of the districts of Gujarat. The development was measured with the help of 57 indicators in the fields of agriculture, industry, human resources and infrastructure. The data considered for the study pertain to the two period's viz. the pre-reform period i.e. 1991 and post-reform period i.e. 2001, using factor analysis technique. [11] investigated pattern of regional disparities in socio-economic development in India at district level in northern and central region of India on the basis of 43 indicators of agriculture, industrial and infrastructural sector. The study is an effort for evaluating the status of development at state level separately for health sector and educational sector for Indian states. It would be of interest to estimate the status of development at state level, since there has been growing consensus about the need of state level planning in the country. Under these are following objectives.

Objectives

•To measure the relative performance of agriculture development for Indian states.

Materials and Methods

As development is a multi -dimensional process, so its impact cannot be fully captured by any single indicator. A number of indicators when analyzed individually do not provide an integrated picture of reality. Hence, there is a need for building up of a composite index of development based on optimum combinations of various agriculture development indicators. Some states have faced situational factors of development unique to it as well as common and environmental factors. Common indicators to all the states have been included in the analysis for evaluating the level of development. Composite indices of agriculture development have been obtained for different states by using the data on the following agriculture development indicators:-

Agriculture development indicators:

1. Gross state domestic product of agriculture at constant prices (in lakh R.S.)
2. Gross sown area (in thousand hectares)
3. Gross irrigated area (in thousand hectares)
4. Cropping intensity (in percent)
5. Total food grain production (thousand tons)
6. Total area of food grain (thousand hectares)
7. Consumption of fertilizer (kg.per hectares)
8. Percent of net area irrigated to net area sown

A total of eight agriculture development indicators have been taken for the analysis. These indicators may not form an all-inclusive list but these are the major interacting components of agriculture development. These indicators are directly related with the agriculture development in the states of India.

Sample Design

Current study is based on the secondary data derived from the Reserve bank of India, "Hand book statistics on Indian states" and Economic Survey Reports of the state and official websites of the states. The secondary data has been collected for a year 2013-14. The composite index for agriculture development of the different nonspecific states of India has been calculated on the basis of Wroclaw Taxonomic method which has been explained in detail.

Research Method

The composite index of development is constructed applying Wroclaw Taxonomic Method developed by [12] have also used this statistical method for calculating the Composite index which can include any number of indicators. Let $[X_{ij}]$ be the data matrix, i = 1, 2, ..., n (Number of unit) and j = 1, 2, ... k (number of indicators). $[X_{ij}]$ are transformed to $[Z_{ij}]$ as follows:

$$[Z_{ij}] = (\overline{X_{ij}} - X_j) / S_j$$

$\overline{X_j}$= mean of the jth indicator, S_j = standard deviation of the jth indicator and $[Z_{ij}]$ is the matrix of standardized indicators. From $[Z_{ij}]$, identify the best value of each indicator, maximum value or minimum value depending upon the direction of the impact of indicator on the development.

$$P_{ij} = (Z_{ij} - Z_{oj})^2 \text{ and } (C_i) = \left[\sum_{j=1}^{k} Pij/(C.V.)j\right]^{½}$$

Where P_{ij}= pattern of development, Z_{oj}=Best value for indicator, and $(C.V.)_j$ is the coefficient of variation of the jth indicator in X_{ij}.

$$D_i \text{ (Composite Index)} = C_i/C$$

Where C = (Mean Value of C_i + 3* (Standard deviation of C_i)

Results and Discussion

Development level

The composite indices of agriculture development have been worked out for nonspecific state of India in respect of agriculture sector. The states have been ranked on the basis of composite indices. The values of composite indices along with the rank of states are given in [Table-1]. It may be seen from [Table-1] that in case of agriculture development, the state of Uttar Pradesh was ranked first the state of Goa was ranked last. The composite indices varied from 0.220 to 0.779.

Table-1 *Composite index (C.I.) and rank for Nonspecific States of India*

		Agriculture Development	
Sr. No.	States	Index Value	Rank
1	Andhra Pradesh	0.514	7
2	Bihar	0.502	6
3	Chhattisgarh	0.673	13
4	Goa	0.779	17
5	Gujarat	0.579	10
6	Haryana	0.423	5
7	Jharkhand	0.744	16
8	Karnataka	0.587	11
9	Kerala	0.705	15
10	Madhya Pradesh	0.416	4
11	Maharashtra	0.555	9
12	Odisha	0.689	14
13	Punjab	0.350	2
14	Rajasthan	0.523	8
15	Tamil Nadu	0.633	12
16	Uttar Pradesh	0.220	1
17	West Bengal	0.411	3

Source: Authors' Calculation

Conclusion

The study concludes that with respect agriculture development, the state of Uttar Pradesh and Punjab are found to be better developed in comparison to other states. The states of Goa is low developed in agricultural sector because of less cultivated area and less net sown area There is a requirement to have a recent re-approach towards agriculture development. The government has played major role for this purpose. There is necessary need to discontinuation in the conversion of agricultural land for non–agricultural purposes. But state of Goa is basically based on service sector and having highest per capita income as compare to other states of India. Special care should not be taken for the implementing the agriculture development programs in this state.

Conflict of Interest: None declared

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