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# Analysis of regional disparity in agricultural development of Chhattisgarh

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### Abstract

The present paper analyses district and regional level disparity in agriculture development in Chhattisgarh on a number of various parameters for the year 2001, 2001 1nd 2017-2018. The Regional disparity was assessed to examine whether all the districts are similar with respect to ecology, economy and social equity. The Kruskal-Wallis technique is used to test the null hypothesis that whether a regional disparity exists in Chhattisgarh concerning the level of sustainable agricultural development or not. The value of H (6.39, 9.63 and 7.70) was very significant respectively for the difference in sustainable agricultural development in the years 2001, 2011 and 2017-18. That clearly showed that Chhattisgarh districts have regional inequalities. Due to unequally scattered resource base and different climatic conditions in different areas, the state experiences district development inequalities in terms of ecology, economy and equity, hence a holistic development plan must be incorporated which bridges these gaps and leads to overall development in the state.

**Keywords:** Regional, disparity, agricultural, development, kruskal-wallis technique, chhattisgarh, sustainable

## Introduction

The growth of agriculture is a prerequisite for the overall development of the Indian economy. It contributes significantly to the export earnings and affects the performance of other sectors of the economy through forward and backward linkages. Indian economy at the dawn of the 21st century finds itself at the crossroads. The last few years have seen its transformation from an ailing agricultural economy to a rapidly growing one with the services sector emerging as the power-house for the economy. The economy has experienced an average annual growth rate of approximately 6 to 8 per cent during the last two decades. As is to be expected, improvement in economic growth and per capita income has translated, at least partly, into a reduction in the level of poverty in the country and accelerated improvement in various indicators of human development. However, there is a broad consensus among critics as regards growth not being inclusive and balanced. It is claimed that there exists huge diversity and regional disparity across the economy at the state level. The gap between rich and poor regions that existed even at the time of independence has widened over the years and significantly intensified during the period of reforms. There exists voluminous literature dealing with the issue of regional disparity. Most studies have targeted the state as a unit for measuring disparity and have sought to gauge the impact of development policy on the relative development of the states.

The origin of sustainability in development can be traced to the first UN conference on human development held in 1972 at Stockholm when global consciousness on ecology, environment and poverty emerged. Sustainable development implies development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It is a symbiotic relation between humans and natural systems, and compatibility between ecology, economy and equity. Agriculture is one of the most aggressively managed ecosystems, and it has an impact on the global food system. Therefore, environment-friendly agriculture is a must for the sustainability of humans and society. The sustainable agriculture can be considered as food production that integrates the goals of environmental health, economic efficiency and social equity (Sajjad *et al.,* 2014) [4].

Agriculture is the main occupation in developing countries like India, where the majority of rural poor depend on it for income and livelihood. Therefore, the sustainability of agriculture cannot be defined in isolation to the issue of livelihoods. Livelihood security means secured ownership of, or access to, resources and income-earning activities, including reserves and assets to offset risks, ease shocks and meet contingencies (Acharya, 2006) [1]. According to Chambers and Conway (1992) [2], a livelihood is sustainable when it can cope with and recover

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from the stress and shocks, maintain its capability and assets, and provide sustainable livelihood opportunities for the next generation.

The inter-related dimensions of sustainability are ecology, economics and equity; therefore, to ensure sustainable development ecological security, economic efficiency and social equity are must. Ecological security is essential to preserve and develop the resource base of the economy. Economic efficiency provides guidance to the use of resources (human and capital) under present technological conditions and social equity ensures a broad-based distribution of economic benefits both at present and in the future, in the form of secured livelihoods, especially for socially and economically vulnerable groups.

The regional disparity was assessed to examine whether all the districts are similar concerning ecological, economic and social equity developments. The Kruskal-Wallis technique was used to test the hypothesis that all the districts come from the same population about sustainable agricultural development (Narain et al., 1999) [3]. The regional disparity was assessed to examine whether all the districts were similar with respect to ecology, economy and social equity. The Kruskal-Wallis technique was used to test the null hypothesis that whether a regional disparity exists in Chhattisgarh with regard to the level of sustainable agricultural development or not. The disparity in sustainable agricultural development during 2001, 2011 and 2017-18.

**Data and Methodology**
A number of factors affect the sustainable development of an area, hence relevant and maximum available indicators were used in this study. The regional disparity was calculated for Chhattisgarh. The district-wise data were collected compared for the years 2001, 2001, 2017-2018. The secondary data were collected from various published sources of Government of Chhattisgarh; Directorate of Economics and Statistics, Chhattisgarh, Directorate of Agriculture, Directorate of Animal Husbandry, National Dairy Development Board (NDDB), Statistical Abstracts of Chhattisgarh State, Health Statistics, Directorate of Rural Development, etc.

**Analytical tools**
Regional inequality was evaluated to analyze whether all districts are similar in terms of the development of ecological, economic and social equity. The Kruskal-Wallis technique was used to test the hypothesis that all the districts come from the same population with regard to sustainable agricultural development (Narain et al., 1999) [3]. A non-parametric Kruskal-Wallis test is used to examine whether samples originate from the same distribution. The test statistic is given by:

$$H = \frac{12}{N(N+1)} = \sum_{j=1}^{k} \frac{R_j^2}{n_j} - 3[N+1]$$

Where,

$n_j$ (i = 1, 2,..., k) represent the sample sizes for each of the k groups

$R_j$ = the sum of the ranks for the ith group. The combined sample is ranked.

N = total number of observations across all groups.

This statistic approximates a chi-square distribution of degrees of (k-1) freedom.

If the value of the test statistics is significant, the null hypothesis would be rejected, which means regional variation between districts is present.

**Results and Discussion**
Regional disparity is assessed to examine whether all the districts were similar with respect to ecology, economy and social equity. The Kruskal-Wallis technique was used to test the null hypothesis that whether a regional disparity exists in Chhattisgarh about the level of sustainable agricultural development or not. The results of Table 1 put forth that value of H is highly significant for the disparity in sustainable agricultural development during 2001, 2011 and 2017-18. This showed that regional disparity exists among districts of Chhattisgarh, which indicated rejection of the null hypothesis (H0) accepted of the alternative hypothesis (H1). The state had experienced disparities in development within the districts in terms of ecology, economy and equity due to unevenly distributed resource base and different climatic conditions in various regions, hence a holistic development plan must be incorporated which bridges these gaps and leads to overall development in the state. Narain et al. (1999) [3] used Kruskal-Wallis technique to assess the inter-district variation of development in the southern region and found that there was a significant difference in the level of overall socio-economic development in different states and wide regional disparities existed in the southern region.

**Conclusions**
The value of H (6.39, 9.63 and 7.70) was very significant respectively for the difference in sustainable agricultural development in the years 2001, 2011 and 2017-18. That clearly showed that Chhattisgarh districts have regional inequalities. Due to unequally scattered resource base and different climatic conditions in different areas, the state experiences district development inequalities in terms of ecology, economy and equity. The findings of such studies have been used by government agencies to frame policies to promote balanced regional development. These policies have met with limited success and not only disparity has increased but has started showing its ugliest face. One significant factor causing limited success to efforts of balanced developments has been the neglect of variations within states and exclusive reliance on information relating to disparity at the state level. A series of measures are needed on the part of the government to bridge the yawning gap. We give three suggestions to alleviate the problem First, there is a need for region-specific policies in this state which is huge in size. For the high density eastern regions where excessive dependence of population is causing adoption of backward technology and small size of holding, more that resurrecting agriculture we need to create alternative employment opportunities in rural areas in form of Rural Non Farm Sector. Once, the surplus population shifts in the non-agricultural sector and can generate some surplus there, it would be possible to pool back the surplus in agriculture and higher farm-nonfarm linkages which work in both the direction would pull the agricultural sector up.

**Policy Measures**
The government should focus on the dissemination of micro-irrigation, high-value crops, market institutions and extension,

and information service institutions. Efficient water management through micro-irrigation systems, reducing wide fluctuations in agricultural productivity and prices, checking distress sales and rising cultivation cost, increasing agricultural exports and dissemination of modern technologies and agricultural innovations are some of the important sectors that need immediate attention of the government.

**Table 1:** Regional disparity in sustainable agricultural development using the Kruskal-Wallis Test

| Test statistic | 2001 | 2011 | TE 2017-2018 |
|---|---|---|---|
| H Value | 6.39 | 9.63 | 7.70 |

**\*\***significant at l% level of significance

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