ISSN:0971-1260
Vol-21-Issue-04-October-December-2019

Growth and Instability in Agricultural Productivity in South-West Haryana: A Regional Analysis

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Abstract: *Haryana is a developed state and growth of agriculture is one pillar of such a development. To measure the agricultural development increase in area, yield, production etc. are its dimension. Agricultural productivity is the measurement of production in monitory terms, which shows the real picture of development. However, such a development is not static and that's why it is important to measure its instability. The study region shows high instability in comparison to rest of Haryana. The same picture emerges when trends and patterns of agricultural productivity are anylised. South-Western Haryana shows less growth and development than that of rest of Haryana in terms of agricultural productivity.*

Key Words: Agricultural Growth, Productivity, Coefficient of Variation, Instability

Introduction: Agriculture is the back bone of any society. Haryana lies in the very fertile plain formed by Himalayan rivers. More than 70% population of state engaged directly or indirectly in agricultural activities. The state has scaled a remarkable height in its agricultural sector, which has made it self-sufficient in the production of food grains. With the help of modern technology package agricultural sector in Haryana has grown up with high pace. But due to the difference in topography and irrigation facilities South-Western region lacks behind the rest of state. The saucer shape of Haryana makes difficult to provide adequate irrigation to its southwestern region and as a result agricultural production falls behind the northern and western regions of state. Topographical features like soil, permeability etc. also restrict agricultural growth of the region.

Instability in agriculture sector measure different dimensions like variation in the area, yield, production and productivity etc. however modern technology use of HYV seeds has reduced the variability in the different dimensions. Dimensions like area, yield, production and productivity have equal value but in the study instability in productivity has been measured because productivity directly affect the economic conditions of a farmer, district, region, state and even nation. There are many studies on instability conducted during the period of time. Agricultural production has become instable after the infusion of modern technology package

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(Mehra 1981; Hazell 1982; Dev 1987; and Ray et al 1988). Here it has been shown, the range of instability in production among different crops in South-West Haryana. In other word, this study intends to measure the extent of instability in the productivity (measured of major crops) in the study area. State wise study shows that instability in the production has increased in the states like Maharashtra, Orissa, Rajasthan, Tamil Nadu, Gujrat and Madhya Pradesh (Ramesh Chand and SS Raju 2008). However, on the other hand some states like (Punjab, Haryana, Assam, H.P, M.P, Rajasthan and U.P) shows decline in instability with the use of modern technology (Mahendradev 1987). Jodha and Purohit (1971) studied 11 north western district of Rajasthan and found high variability in production and yield. Nadkarni and Deshpande (1983) explore the instability in the production of Karnataka State using major crops and found that agricultural technology has increased the instability. Chand and Raju (2008) revealed that infusion of green revolution package has increased the variation in the production of major crops in states like Maharashtra, TN, Odissa, MP, Rajasthan and Gujarat.

Elamin and Mahir (2011) studied over the Sudan and found that crops like sorghum, wheat and cotton shows a continuous increase in the instability over the two periods i.e. before adoption of liberalization policy (1992/93 to 2007/08). Ramphul (2012) revealed the annual compound growth rate of cereals production in the country for the period 1966-67 to 2010-11. The study shows that annual compound growth rate of cereals was 2 percent during the study period. However, it was only 1 percent for the pulses. Among the cereals wheat and rice shows a growth rate of 3.7% and 2.4% which is highest among all major crops. Sihmar (2014) analysed the instability of major crops in Haryana for three periods i.e. 1980-81 to 1989-90, 1990-91 to 1999-2000 and 2000-01 to 2006-07. Crop wise report shows that wheat is most stable crops in term of production in the study region. The study finds that there is a very positive impact of green revolution and new economic reforms on the total food grain production in Haryana.

The present study explores the instability in productivity of South-Western Haryana and rest of Haryana along with region the study attempts to measure the variation in instability of productivity at district level in the study area as well.

Scope of the Proposed Study: As described in the preceding section instability has various dimensions. The proposed shall explore growth and instability of productivity of major crops in South-Western region of the state. It would explore various aspects of instability and

ISSN:0971-1260
Vol-21-Issue-04-October-December-2019

compare it in South-Western Haryana and rest of state as well as district level variation in South-Western Haryana.

Research Questions

1. What is the trend and pattern of growth in agricultural productivity in Southwestern Haryana viz-a-viz rest of Haryana?
2. What is the level of instability in agricultural productivity in Southwestern Haryana viz – a – viz rest of Haryana?

Objectives of Study: The proposed study shall explore the course growth and instability in South-Western Haryana with following specific objectives.

1. To study the growth of productivity in the study region.
2. To examine the instability in the productivity of major crops at regional level viz-a-viz at district level in the study area.

Profile of Study Area:

Haryana is a landlocked state which lies in the northern part of country. It was formed on November 1, 1966. It covers an area of 44212 sq. km.

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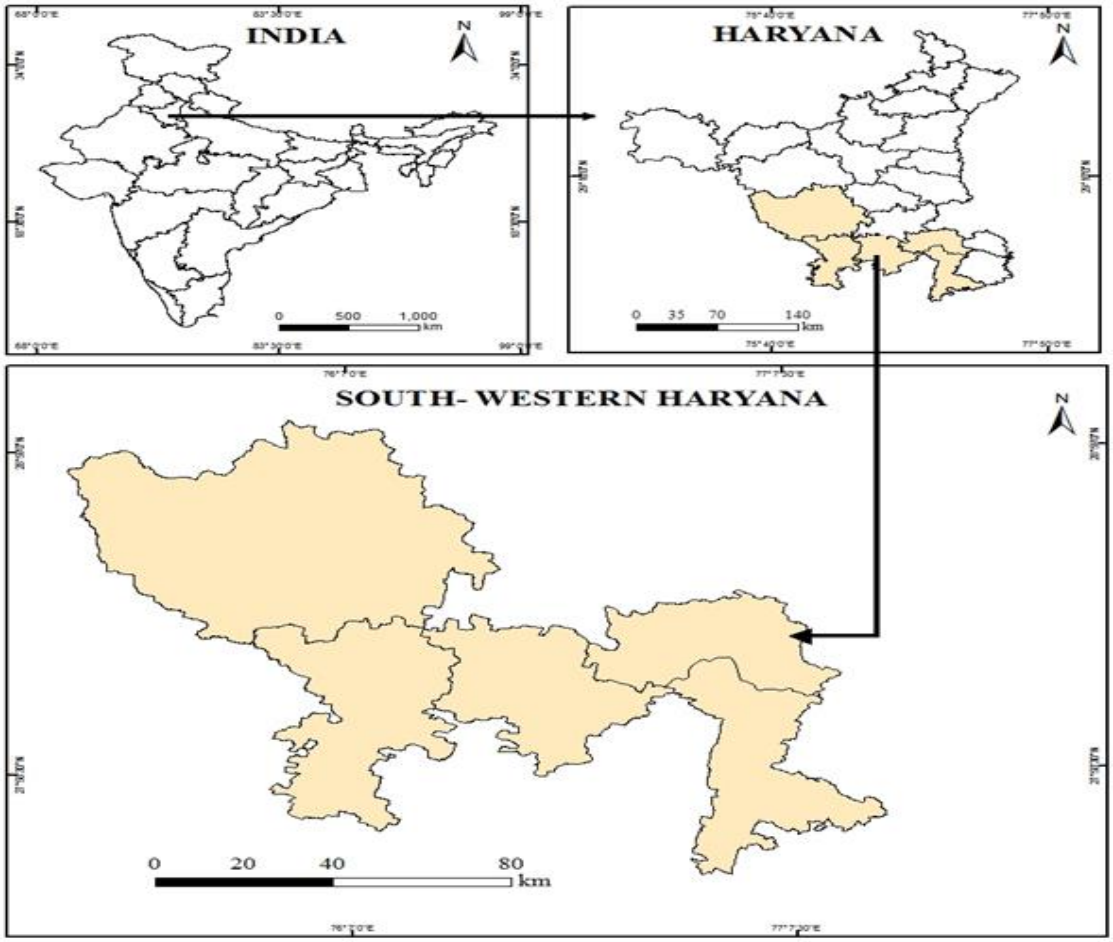

The study covers the south-western part of the state having five districts i.e. Gurgaon (Gurugram), Mewat (Nuh), Rewari, Mahendragargh, and Bhiwani. The study area covers 11036 square km, which is 24.96 percent of the total 44212 square km area of the state. It spread from 27°39´N to 29° 4´ N latitude and 75° 28´ E to 77° 20´ E latitude. The rainfall range lies from 200 to 600 mm. Sahibi, Indori, Kasonti, and Dohan are the seasonal rivers which flow in the study area. The mean annual temperature varies from 23.5° to 25.0° C. The plant species are *Kair* (Capparis Deciduas), *Hins* (Capparis Sepiarria), *Jal* (Salvadora Oleoides), *Jharberi* (Zizyphus Nummularia), *Ber* (Ficus Indica), *Jand* (Prosopis Cineraria) and species of *Kikar* (Acacia).

Period of Study: The present study covers a period of two and half decades (1990-91 to 2014-15) which coincides with post liberalization period.

Data Base and Methodology: The present study is based on the secondary sources of data which has been taken from various issues of statistical abstract of Haryana. To analyse and

ISSN:0971-1260
Vol-21-Issue-04-October-December-2019

interpret the data various statistical tools and techniques has been used. Bhalla and Tyagi method, 1989 has been used to determine agricultural productivity under this method, eight major crops have been selected. These crops are wheat, bajra, rice, cotton (both *desi* and *american*), sugarcane, rape seeds and mustard, barley and gram. To measure agricultural instability different methods can be used, such as the coefficient of variation (CV), dispersion, Cuddy Della Valle Index (CDI), etc. The present study applies coefficient of variation (CV) for measuring the instability. To calculate instability index coefficient of variation has been used in the present study.

Mathematically:

$$II_x = \sigma/\text{Average} \times 100$$

Here

II_x --- Instability index σ ----- Standard Deviation

Analysis and interpretation of data:

Measurement of growth in agricultural productivity:

A significant increase in the growth of agricultural productivity has been seen after the infusion of green revolutionary tools and techniques in the study region. The market reforms, agricultural promotion schemes of government of India like Agricultural Marketing and Farmer Friendly Reforms Index (AMFFRI) adopted during liberalization period also plays an important role in agricultural growth. District-wise trends in the growth of agricultural productivity (Fig. 1) shows that 77% growth alone can be depicted with respect to time in Bhiwani district while other districts fall behind this correlation. Intercept value and value of beta is also highest for Bhiwani district which shows that the growth in agricultural productivity is highest in Bhiwani district when we compare it at district level within the study area. Such a

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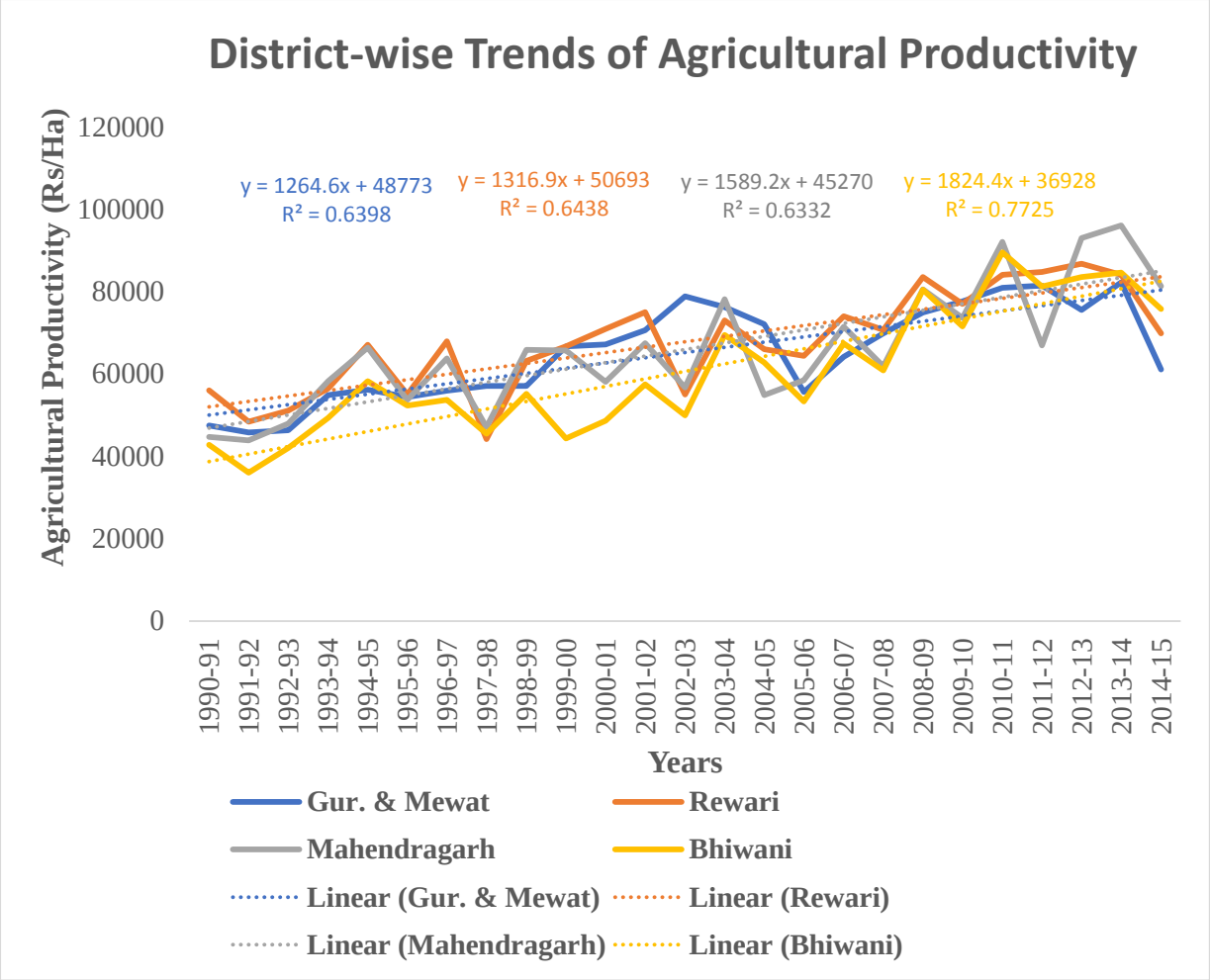

Development is due to the more infusion of modern technology package and growth in the irrigation facilities in Bhiwani district.

Region wise trends in the growth of agricultural productivity (Fig. 2) shows that the study region (SW Haryana) lacks behind in term of agricultural productivity when compare to rest of Haryana. The regression line of both regions depicts that change in agricultural productivity with respect of time is explained by 89% in rest of Haryana while it is 79% for the South-Western Haryana. Intercept value and beta coefficient

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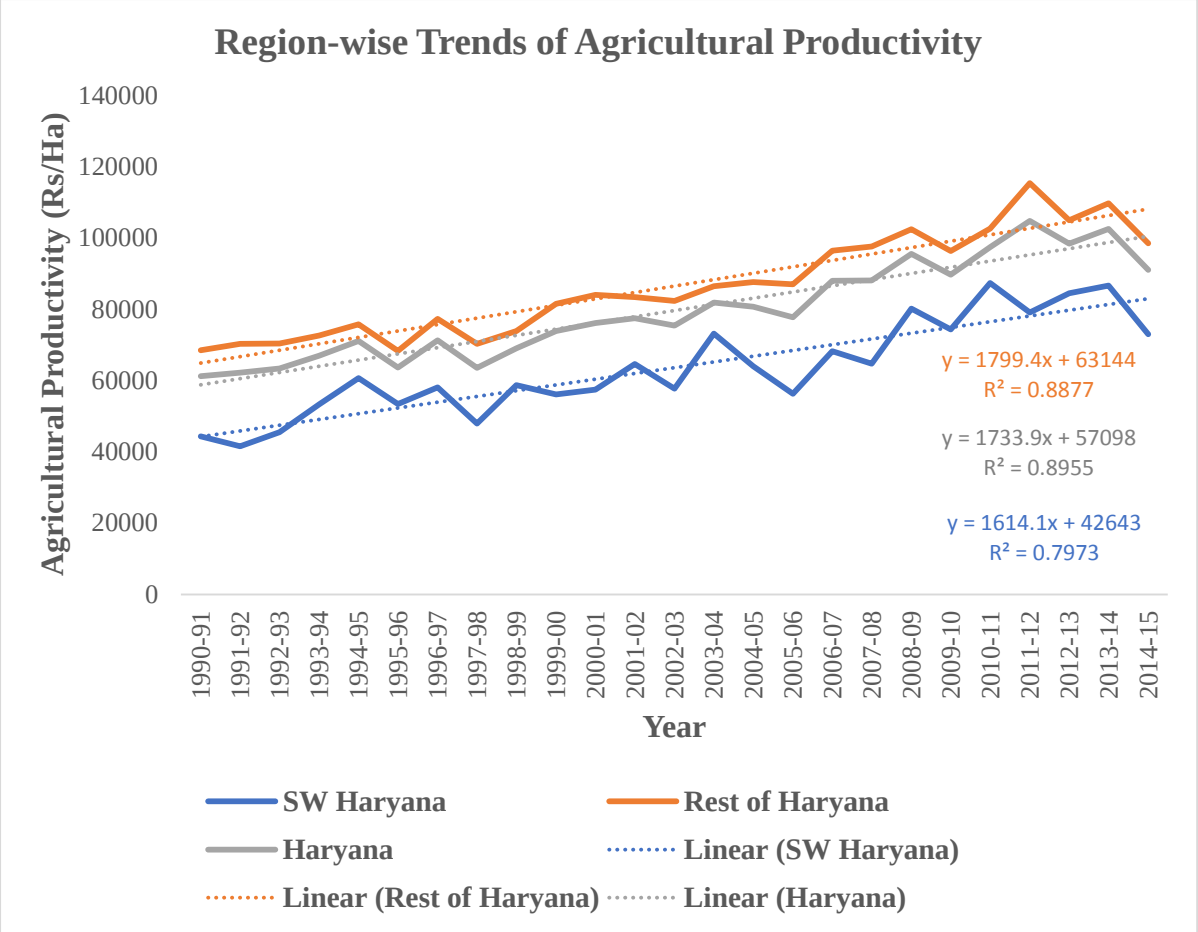

also shows that growth in agricultural productivity is higher in rest of Haryana than South-Western Haryana.

Measurement of instability in agricultural productivity:

Instability index at district level depicts that Bhiwani district shows maximum instability in the

Table-1 District-wise Instability Index of Major Crops

District	Value of Coefficient of Variation
Gurugram & Mewat	17.84
Rewari	17.84
Mahendergarh	22.29
Bhiwani	25.19

ISSN:0971-1260
Vol-21-Issue-04-October-December-2019

agricultural productivity (Table 1). However, both Gurugram & Mewat and Rewari shows less instability of agricultural productivity.

Table-2 Region-wise Instability Index of Major Crops

Region	Value of Coefficient of Variation
SW Haryana	20.90
Rest of Haryana	16.24
Haryana	16.93

Region wise instability of agricultural productivity (Table-2) shows that South-Western Haryana has high degree of instability than rest of Haryana. The probable reason behind this may be the low level of irrigation facilities and less fertile land, use of traditional practices etc.

Conclusion:

It can be concluded from the above interpretation and analysis that agricultural productivity of all districts in the study area is increasing with respect to time but with different rate. When we compare the study region with rest of Haryana, we find that in 1990-91 the agricultural productivity of Southwestern Haryana and Rest of Haryana was Rs. 44305 and 68483 per hectare which goes up to the value of 73025 and 98478 rupees per hectare in 2014-15. In terms of growth in percentage Southwestern Haryana is showing 64.82% growth in agricultural productivity from 1990-91 to 2014-15 and rest of Haryana is showing 43.79% growth rate for the same time period. It is clear from the above facts that both the regions are growing but Southwestern Haryana depicts high growth rate than rest of Haryana. Instability index of major crops in the study area shows that value of coefficient of variation fluctuate from medium to high. Instability is found more in study region when compared to rest of Haryana. Within the study region district Bhiwani shows highest instability and Rewari and Gurugram & Mewat both shows least coefficient of variation.

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