



A Review on Trend in Area, Production and Productivity of Wheat Crop in different Districts of Northern Hills of Chhattisgarh State

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ABSTRACT

The present study has been undertaken to study the trends, prediction model of area, production and productivity of wheat crop in Northern Hills of Chhattisgarh in India. Time series data for wheat were collected for the period from 1979-80 to 2012-13 from various governmental publications and web sites. The linear, quadratic and exponential function are fitted in order to analyse the trend in area, production and productivity of above crop. Besides these, compound growth rate, coefficient of variation (CV), instability index of area, production and productivity of this crop have also been estimated and discussed. The result of the study revealed that the growing of wheat is not risky as the CV of area, production and productivity are less than 8.4 per cent. The growth rate for area, production and productivity for wheat crop are positive and instability indices are very low which also indicates less risk in growing this crop in future too. The production and productivity of the wheat crop have increased during the period under review due to the combine effects of area and productivity.

Key Words: Area, production, productivity, compound growth rate, instability indices etc.

Received 10.07.2017

Revised 21.07.2017

Accepted 29.08. 2017

INTRODUCTION

Agriculture occupies a very important and distinguished position in the economy of India. Food security and land required for food production largely depend on yield of major cereal crops. The cereals sector occupies a very important place in the Indian economy. As Per the 2010 FAO world agriculture statistics, India is the world's second largest producer of wheat and rice, the world's major food staples. We have achieved remarkable production since independence i.e., 39.25 Million Tons (1950 -51) to 213.32 Million Tons (2007 - 08) (Planning Commission, GOI).

Wheat is an essential commodity for human civilization and is planted annually in an area of around 220 million hectares across the world. India harvested a record 95.85 million tonnes of wheat during the crop year 2013-14 with a productivity level of 3146kg/ha. This is indeed an important and reassuring milestone.

Geographical area of Chhattisgarh state is 137.90 lakh ha which is 4.15% of the country and net sown area of 46.77 lakh ha which is 35% of its geographical area. The Northern hills of Chhattisgarh region comprises of Sarguja, Jashpur, Koriya, Balrampur and Surajpur. Rice is the staple diet - quite logical in the area proudly called the 'rice bowl of India' by locals. The total geographical area of Northern Hills zone is 28.47 lakh ha which is 21 percent of total area of the State while the net sown area is 8.35 lakh ha.

REVIEW OF LITERATURE

Hazell (1985) studied that recent growth in world cereal production has been accompanied by a more than proportional increase in the standard deviation of production. This study applies variance decomposition procedures to data on crop production by major geographical regions of the world to analyse the sources of this increased instability. It is found that the increase in aggregate production variability is predominantly due to increased yield variability and to a simultaneous loss in offsetting patterns of variation in yields between crops and regions. These changes are probably associated with the sharp increase in the variability of world cereal and oil prices.

Arya and Rawat (1990) studied the growth rates of different crops in Haryana using exponential model. A consistent and positive growth recorded in case of rice, wheat and potato, the high growth rates were attributed to the introduction of new improved seeds associated with assured irrigation, fertilizer use and cultural practices. They further concluded that in most of the district as well as at the state level the production of pulses, coarse grains and sugarcane had decrease over the study period.

Sananse *et al.*, (1990) Trends in area, production and yields of rice in Thane, Raigad and Ratnagiri districts of Konkan region, Maharashtra, India are examined. The study shows that area, production and yields have increased significantly over the period 1960/61-1984/85. The rate of growth of per ha yield was higher than that of area.

Singh *et al.*, (1991-94) estimated the predictive models for the rice crop of Chhattisgarh and its constituent districts. Models had been fitted for area production and productivity of the crop separately for above region, including Madhya Pradesh (M.P.) for comparison. Based on these models predictions of area, productivity, and production of rice had been made year wise between 1990-91 to 1999-2000. The productivity of rice in Chhattisgarh was expected to 1159 kg/ha by the turn of this century, if its present growth trend was maintained. The partial compound growth rates of the area, production and productivity of the crop had also been estimated. Periodic effects of five year as well as annual effects were found to be working in most of the districts/regions. Based the estimated production function of area and productivity it was found that the major influencing factor on the production of rice was its productivity. This influence of productivity was around 60% for the whole of Chhattisgarh (35% that of area). For the districts of Chhattisgarh Plains and those of Hills (or Plateau regions) the productivity influences were around 70% and 50% respectively.

Jain *et al.* (1994) reported growth and instability analysis of oilseed production in five districts of Bundelkhand zone of Madhya Pradesh state, India, over a period of 10 years (1980/81-1989/90). An analysis was conducted with data on area, yield and production of soybeans, sesame and groundnuts. Increased production of soybeans and groundnuts could be attributed more to the area effect. For sesame, the yield effect was more evident than the area effect.

Prasher and Bahl (1998) measured the variation in crop production of the different districts viz. Kangra, Mandi, Shimla and Chamba representing various agro-climatic zones of Himachal Pradesh. Time series data from 1980-81 to 1989-90 were employed and the data pertaining to area, production and yield of major crops were obtained from crop reports. The compound growth rates of area, production and yield of major crops for the period under study were evaluated. It was noted that the area under maize had increased significantly in the state; however, the productivity level was not significant. Barley and pulses showed a negative growth rate in area, which implies that farmers are shifting acreage towards high value cash crops like fruits and off-season vegetables.

Singh and Srivastava (2003) attempted an empirical analysis of the growth rate and instabilities in sugarcane production in different regions in Uttar Pradesh, India. The study used time series data on area, production and productivity of sugarcane for western, eastern and central (including Bundelkhand) regions as well as for the state with reference to the period (1980-81 to 1998-99) and is based on the data available from secondary sources. Instability in area, production and productivity was measured through coefficient of variation analysis using detrended data. The production instability was also decomposed to examine the magnitude of various components of regional sugarcane production variability. Though significant and positive growth in the production of sugarcane had emerged as a common feature in all the three regions of the state, its magnitude has not uniform across the regions.

Hasan *et al.*, (2008) The study measured the change and instability in area, production, and yield of two major cereal crops wheat and maize in Bangladesh based on secondary data during 1980/81-2003/04 using different statistical techniques. Area and production of wheat increased satisfactorily. But yield was not increased to meet the demand of the country. In the case of maize, significant increment happened in yield during the study period. Area and production of maize also increased to fulfill the increasing demand of population. Presently production of maize increased more rapidly than its area.

Shankar *et al.*, (2010) examined the compound growth rate and instability status of crops of Chhattisgarh during Kharif and Rabi season. Zone wise time-series data for a period from 1974-75 to 2004-05 on area, production and productivity of each of the individual major crops were utilized for the study. The study revealed that the rice and sesamum were the crop in which high growth rate accompanied by high instability in all the three agro climatic zones of Chhattisgarh. In last 33 year during kharif season none crop exhibited high growth rate with decreasing instability in Chhattisgarh plain but for Northern hilly region and Baster plateau showed continuous high growth rate. In Rabi season Gram was the crop depicted continuous fluctuation i.e. increasing instability with high compound growth rate. While lathyrus was the crop exhibited decreasing instability accompanied by high growth rate in case of zone I while in case of Northern hilly region and Baster plateau growth rate were below 2%.

Acharya *et al.*, (2012) conclude that growth rates showed a significant positive growth in area under pulses, vegetables and spices and fruits and nuts while cereals showed significant negative growth. The area under jowar, bajra, ragi and minor millets are experiencing a substantial annual decrement. The area under rice has recorded a mild annual increment. The growth in area under oilseeds and commercial crops was negative and insignificant. Similarly the production of cereals, pulses, vegetables and fruits showed a significant positive growth. The production of oilseeds and commercial crops registered insignificant positive growth. The productivity of different crops recorded significant growth in the case of cereals, pulses and fruits. Productivity of oilseeds recorded moderately positive growth. The productivity of commercial crops registered insignificant positive growth and for vegetables the growth in productivity was insignificant and negative.

Dhar (2013) expressed that the decade-wise annual average growth rate of area, production and yield of major food grain crops in Central Brahmaputra Valley and Assam has been calculated for five periods, 1971-80, 1981-90, 1991-2000, 2001-10 and 1971-2010. The growth rate of production of total food grains during all the sub periods till 2000 was higher for Central Brahmaputra Valley than the state as a whole and the difference became more prominent during 1991-2000. It was only during 2001-10, Assam attained higher growth rate of production of total food grains.

Sharma (2013) studied the linear, quadratic and exponential functions are fitted in order to analysis the trend in area, production and productivity of food grains. Quadratic functional form has been fitted for estimating trend due to its higher R² value as compared to the other two forms. Besides these, compound growth rate, coefficient of variation (CV) and instability index are also computed. Similarly, the effects of area, productivity and their interactions towards increasing production are also worked out in the present study. The increase in production occurs due to increase in area as well as interactions of area and productivity of food grain crops in the periods under review.

REFERENCES

1. Acharya, S.P., Basavaraja, H., Kunnal, L.B., Mahajanashetti, S.B. and Bhat, A.R.S. 2012. Growth in area, production and productivity of major crops in Karnataka. *Karnataka J. of Agril. Sci.*, 25(4): 431-436.
2. Anonymous, 1979-1998. Agricultural Statistics, Directorate of Agriculture, Government of Madhya Pradesh, Bhopal.
3. Anonymous, 2012-13. Table of Agriculture Statistics. Commissioner, Land Records and Settlement, Raipur, Chhattisgarh.
4. Arya, S. L. and Rawat, R. K. P., 1990. Agricultural growth in Haryana- A district wise analysis. *Agric. Sit. India*, 45(2):121-125.
5. Dhar, S. 2013. "Trend and Performance of Major Food grain Production." *The Echo*, 1 (4): 103-111.
6. FAO, 1982. The Estimation of Crop Areas and Yields in Agricultural Statistics. Economic and Social Development, Rome, Italy, Paper No. 22.
7. Hasan, M. N., Monayem Miah, M. A., Islam, M. S., Alam, Q. M. And Hossain, M. I. 2008. Change and Instability in Area and Production of Wheat and Maize in Bangladesh. *Bangladesh J. Agril. Res.* 33(3) : 409-417.
8. Hazell, P. B. R. 1985. "Sources of Increased Variability in World Cereal Production since the 1960s." *Journal of Agricultural Economics*, 36 (2): 145-159.
9. Jain, R. K., Ghuraiya, R. S. and Pathak, K. N. 1994. Growth of oilseed production in Bundelkhand zone of Madhya Pradesh: progress and prospects. *Crop Res. Hisar*. 8(2): 225-232.
10. Prasher, R. S. and Bahl, S. K., 1998. Growth and instability in Himachal Pradesh agriculture: a decomposition analysis, *Bihar J. Agric. Marketing*. 6(1): 43-49.
11. Sananse, S. L.; Borude, S. G.; Patil, H. N. 1990. A study on variability and trends in area, production and productivity of rice in Konkan region of Maharashtra, *Journal of Maharashtra Agricultural Universities*, 15(1): 86-89.
12. Shanker, G., Shrivastava, A. and Saxena, R. R. 2010. "Growth and Instability: An Inter-Zonal Analysis of Kharif and Rabi Crops in Chhattisgarh." *Research J. Engineering and Tech.*, 1 (1): 18-23.
13. Sharma, A. S. 2013. "Trends of Area, Production and Productivity of Food Grain in the Northeastern States of India." *Economic Affairs*: 58 (1): 57-68.
14. Sharma, A. and Kalita, D. C. 2004. Trends of area, production and productivity of food grain crops in north eastern states. *Nagaland University Res. J.*, 2: 31-37.
15. Singh, A.K. and Baghel, S.S. 1991-94. Predictive models for the Area, Yield and Production of Rice in Chhattisgarh and its constituent's district along with the influence of Area and Yield on the Production- A different approach. *Farm Sci. J.*, : 6-9.
16. Singh, A. and Srivastava, R. S. L., 2003. Growth and instability in sugarcane production in Uttar Pradesh: a regional study. *Indian J. Agric. Econ.* 58(2): 279-282.

CITATION OF THIS ARTICLE

Pradeep Kumar Ganjeer, Dushiyant Kaushik And M. L. Lakhera. A Review on Trend in Area, Production and Productivity of Wheat Crop in different Districts of Northern Hills of Chhattisgarh State. *Bull. Env. Pharmacol. Life Sci.*, Vol 6 Special issue 1, 2017: 302-304