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Trend and growth rate of price of potato in Uttar Pradesh

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Abstract

The present study discusses the trends and patterns in agricultural growth at the national and sub-national levels in India. Data on important variables like area, production, productivity and price of potato crop were compiled for the period 2000-2001 to 2014-15 from published sources (Sankhyakiya Patrika - updes.up.nic.in). The analysis of data simple and compound growth rate of area, production, yield and price. The study period has been divided in three decades as well as 5 years, 10 years and 15 years respectively.

Keywords: Price of potato, agricultural growth, Indian economy

Introduction

Agriculture is backbone of Indian economy but the growth of agriculture and allied sectors is still a critical factor in the overall performance of the Indian economy. As per the year 2010-16, advance estimates released by the Central Statistics Office (CSO) on 07.02.2016, the agriculture and allied sector accounted for 14.2 per cent of the Gross Domestic Product (GDP), at constant year 2004-05 prices.

Uttar Pradesh is Situated between 23° 52' and 31° 28' N latitude and 77° 3' 84° 39' E longitudes. This is the fifth largest State in the country in terms of area and first in terms of population. The State is bounded by Nepal on the north-east, Uttarakhand on the north, Himachal Pradesh on the northwest, Haryana on the west, Rajasthan on the south-west, Madhya Pradesh on the south and southwest and Bihar on the east. It spreads over a large area, and the plains of the State are quite different from the high mountains in the north. Thus the State is blessed with rich climatic condition and is ideal for bio-diversity particularly in crop production including horticultural crops. The sector which includes fruits, vegetables, floriculture, plantation crops, spices & medicinal and aromatic plants, has gained importance in term of enhancing income per unit area, providing nutritional security, source of raw materials for many food processing industries, earning considerable amount of foreign exchange leading to socio-economic improvement of the people of the State.

Potato is the most important vegetable of the country contributing about 21 percent and 25.5 percent in area and production respectively, of the world. India produced potato about 46 million tonnes during 2014-15 directorate of economics and statistics govt. of India 2016

Uttar Pradesh is the leading state of the country in potato production Uttar Pradesh has produced 13.14 million tons of potato in 6.04 hectare area during 2014-15 with productivity of 225.2 kg/ha during 2014-2015 Its share in the country production is 25.09 percent while area contribution is 29.20 percent. its production is higher than national average of 222.10 q/ha. Next to up is west Bengal followed by Bihar state.

Materials and statistical methodology

Materials

Time series data on monthly price potato in different districts of Uttar Pradesh (up) since year 2000 to 2014 were obtained from the website of Directorate of Economic of statistics (Sankhikey bulletin of statistics). the monthly price of potato was further aggregated for different agro-climate zones of UP and also for overall UP. The monthly price data were further aggregated over year for zones and UP. Time series data on the following items since 2000-2001 to 2014-2015 were also obtained from aforesaid organization.

Area under potato (in hectare), Production of potato (in tons/hectare), productivity (yield) of potato (in tons), No. of mandies in U.P., No. of cold-storage in U.P. and Energy consumption. Population census data of Uttar Pradesh at census year 1981, 1991, 2001, and 2011 were also obtained.

Population data for the year 2014-15 was projected using the growth rate of population between 2001 and 2011.

Statistical methodology

Different statistical methods used for data analysis to fulfill the objectives of the study are described as follows:

3.2.2. Trends of prices of potato in Uttar Pradesh

Time period data on price, production, area and yield of potato price 2000-01 to 2014-15 will be used to study the trends of the above items. Firstly, the three years moving averages of these items computed. The line diagram of moving averages of prices of potato vs its production area and yield will be sketched over time to study the trends and also the relationship between production, area and yield.

Growth rate

The simple annual average growth rate of area production, yield and price of potato will be computed by filling the following simple regression equation applying least square technique

$$Y = a + bt + ut$$

Where $y = \text{area/production/yield/price/of potato}$
 a and $b = \text{parameters of the regression equation}$

$T = \text{time index (t=1,2, \dots, n)}$

$U_t = \text{Error term assumed to follow normal distribution with mean zero and variable } \sigma \text{ let the fitted function is given by}$

$$Y_t = a + bt$$

Simple growth rate will be computed as follows:

$$r = \frac{b}{y} \times 100$$

Where b is estimated value of b and $\bar{y} = \text{mean of } y$

The compound growth function is given by in next line $yt = a(1+r)^t = ab^t e^{ut}$

Where $b = 1+r$

Taking log both side we get

$$\text{Log } yt = \text{log } a + t \text{log } b + ut$$

$$\text{Or } yt^* = a^* + b^*t + ut$$

Where $yt^* = \text{log } yt$, $a^* = \text{log } a$, $b^* = \text{log } b$

The linear regression equation given in (3.2.6.5) will be filled with data by least square techniques, Let b^{**} is estimated value of b^* . The annual average compound growth rate is given by $r = [\text{antilog } (b^{**}) - 1] \times 100$

Results and Discussion

The line diagram of production vs price of potato in presented in fig 4.1.2.2. The production of potato has witnessed linear trend till 2009-10. It remained almost stagnant up to 2011-12 but afterward it has declined consider with some increase during 2014-2015. It shows that fall in production resulted to increase in price of potato shine 2009-10. It is introduce that is supply of a commodity in reduced in the market the consumer has to more price of it.

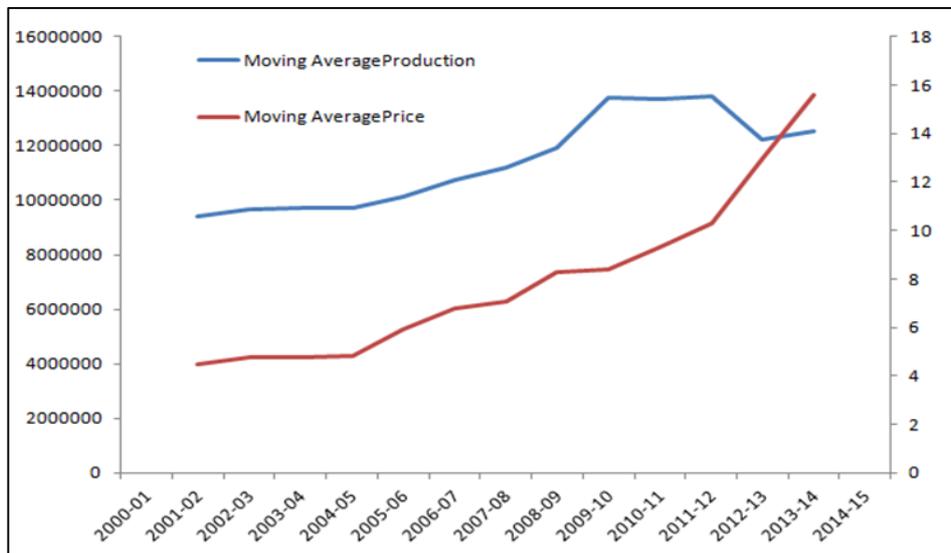


Fig 1: Moving average production price

Table 1: Annual average of Simple growth rate of Area, production, yield and price

	I 5 Years	II 10 Years	III 15 Years
Area	0.768	2.640	2.004
Production	-6.416	3.663	2.987
Yield	-7.218	0.931	0.983
Price	19.189	9.139	9.651

Table 2: Annual average of compound growth rate of Area, production, yield and price

	I 5 Years	II 10 Years	III 15 Years
Area	0.771	2.656	2.061
Production	5.515	3.704	3.070
Yield	-6.238	1.021	0.987
Price	22.310	9.419	9.511

The annual growth rates of area, Production and productivity and price of potato for different periods and for the entire periods have been computed and are presented in Table 1 and 2. Simple and compound growth function have provided consistent estimates of growth rates. The area has registered positive and increasing simple growth rate of two decades and first was registered negative growth rate annually during the every periods and entire periods. A positive annual growth rates and maximum growth rates of 19.189 per cent for price of potato has been obtained during 2009-10 to 2014-15. The compound growth rate of potato was registered positive and increasing order. The highest compound growth rate 22.31 during 2009-10 to 2014-15.

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