

# Production and Productivity of Rice in Jammu and Kashmir: An Economic Analysis

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## Abstract:

*The present study was based on the secondary data in which simple linear regression was used to understand the impact of time on the production of rice; the results have indicated that the coefficient of determination ( $R^2$ ) for time was calculated as 34.88%. Also  $t$  test was used to understand whether production of rice depends upon time or not which was statistically significant in which null hypothesis was rejected at 0.05 level of significance and 11 degree of freedom. Apart from this estimated production of rice in the year 2012 was calculated through compound growth rate resulting 261.33(000) qtls will be produced in the year 2012. Data used in the study has shown continuous fluctuation and declining trend in the production and productivity from the last decade due to conversion of paddy land for other commercial purposes which is a threat to the people of Jammu and Kashmir.*

**Keywords:** *production, productivity, Simple linear regression. Rice, growth rate. Land diversion*

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## Introduction:

Rice (*Oryza sativa*) is most extensively cereal crop in the world and is staple food of about 2.9 billion or more. As a matter of fact rice is the life line in majority of the Asian countries and Among them, India is one of the most important producer as well as consumer of rice, with world's largest area devoted to rice cultivation and is the 2<sup>nd</sup> largest producer of rice after China. India shares around 21% of global rice production from about 28% of rice area. The states like Orissa, west Bengal, Punjab, Utter Pradesh etc. are contributing to the extreme, among these states Jammu and Kashmir is also a chief contributor to the overall production of rice in India.

Jammu and Kashmir is basically an agrarian state with 80% of the people engaged in agriculture for their livelihood. The state is divided into two blocks- Jammu with 40% of area and Kashmir with 60% of total area for agriculture purpose. The economy of J&K is largely agrarian with 70% of the population dependent on it and about 49% of the working population I engaged in it. Presently agricultural sector is contributing

14% to the Gross Domestic Product (GDP) at National level and the annual growth rate of GDP of Agricultural and allied sectors during the 11<sup>th</sup> five year plans now placed at 3.3% at national levels against target of 4% but it is higher than achievement of 2.4% in the tenth five year plan. Rice production in J&K is predominantly a mono cropped activity and is grown in both the blocks with the productivity of 41 quintals/hectare being the highest one in the country. Production of Rice has increased from 4327 in 1965 to 5001 (000qtls.) in 2010-11, against the area 212.00 to 261.35 (000ha) respectively. With the passage of time rice production has shown a declining trend as the area under rice is being used for other commercial purposes, the growing demand of apple and its increase in the prizes has shift the man power to the said crop has compel the producers of rice to go for apple production. As a result, 3.5 hectares has been converted for commercial and other purposes which is being revealed by the department of agricultural, despite the fact that there is a sealing act on paddy land by the Govt. for its conversion to some other activities which has caused the food deficiency in J&K and has already touched to 40%. As a matter of fact J&K is not sufficient to fed its own people as a result a large quantity of rice (on

an average 4.97 lakh tones) in a year are drawn from central pool to meet the deficient requirement of the state. At the same time the silver line in this scenario is the shift taking place from traditional practices of cultivation to the use of modern technology and sowing of high yielding varieties of seeds is assuring good production.

### Methodology:

The main objective of this research work is to develop a suitable trend in production and then forecast the yield of rice in both the blocks of J&K by simple regression analysis and also 't' test was employed for the determination of hypothesis. For this purpose we employed secondary data of Jammu and Kashmir which has been published annually from the period 2000-01 to 2012-13, and has been taken from Digest

$$P^*_{2012} = \left\{ \text{Anti log} \left[ \frac{\log n - \log m}{t} \right] \right\}^{-1} \quad P^*_{2012} = 261.335$$

### Objectives of the study:

1. To find out the trend in rice production of Jammu and Kashmir from last 13 years.

of Statistics government of Jammu and Kashmir 2010-11. All annually rice yields were calculated by taking the time series analysis rather than difference approach, but estimated production of year 2012 was calculated by difference approach logarithmic. Apart from this; different publications regarding rice production in Jammu and Kashmir, newspapers from J&K (greater Kashmir, Rising Kashmir) was brought under study which has provided the valuable guidelines and necessary data that has helped me in this research work.

### Estimated rice production data for year 2012:

Due to non-availability of data growth rate technique was used to calculate the estimated production of Rice in for the year 2012 was calculated through compound growth rate.

2. To find out the problems in rice production, and suggesting the solutions to tackle them.
3. Estimation and projection of rice production in Jammu and Kashmir in forth coming years.

## Rice production in India:

India is the world's 2<sup>nd</sup> largest producer of rice after China and has devoted world's largest area in the rice cultivation. The major Rice producing states in the country are West Bengal (17%), Utter Pradesh (12.6%), Andhra Pradesh (11.7%), Punjab (11.5%), Orissa, Madhya Pradesh and Bihar (7.5%).

There is a continuous declining fluctuation in the area as well as production of rice in India as it is being continuously dominated by the small holders and at times there is the problem of responsive inputs and the people are not willing to take risks that has become the threat to the production of Rice in India.

**Table No.1 Rice area, productivity and production in India:**

Year	Area (million hectare)	Productivity (kg/ha)	Production (million tonnes)
1950-51	30.8	668	20.6
2006-07	43.8	2131	93.3
2007-08	43.9	2202	96.7
2008-09	45.5	2178	99.2
2009-10	41.9	2130	89.1
2010-11	37.0	2177	80.4
2011-12	35.8	2237	80.1

**Source: Directorate of Economics and Statistics, Agricultural statistics at a glance 2010. Govt. of India, New Delhi.**

The data revealed that with the passage of the time production and area has shown continuous declining trend with the result cultivation of rice in crises with shrinking of area, stagnant yields, water scarcity and escalating input costs. These costs are continuously increasing and also with the increase in urbanization there is a shortage of labour and area which has itself become a

challenge in front of India. For ensuring inclusive growth agricultural needs to be given priority for any reform agenda in order to make India a self-sufficient to ensure food security for people.

## Rice production in Jammu and Kashmir:

The Jammu and Kashmir economy depends mostly on traditional form of occupation which is unaffected and unaltered by modern day industrial development and changing times, the indigenous traditional occupations of agricultural forms the backbone of the economy of the state and at the same time rice occupies prime position as it is the staple food to the majority of the people of Jammu and Kashmir state from

the ancient times which is being cultivated in 12 districts, out of them four districts came under the high productivity. About 40% rice area is concentrated in high productivity group and is contributing more than 55% of total production in the state. With the passage of time the area under the rice has shown a declining trend only because the conversion of paddy land for non-agricultural practices which has also hit the production of rice and also saturation in the availability of land for cultivation has also impacted the overall production of rice.

**Table 1.1 Production, productivity, area and growth rate of Rice in Jammu and Kashmir.**

Year	Production (000) qtls.	Area(000) ha	Productivity	Growth rate
2000	2915	250.63	11.63069	6.04
2001	4153	244.05	17.017	6.4
2002	4223	249.80	16.90552	6.5
2003	4214	236.20	17.84081	6.5
2004	5048	259.82	19.42884	7.7
2005	4928	250.03	19.70963	9.1
2006	5574	259.01	21.5204	8.6
2007	5546	252.52	21.96262	8.5
2008	5620	263.25	21.34853	8.6
2009	5637	257.63	21.88022	8.6
2010	5011	259.89	19.28123	7.7
2011	4959	261.35	18.97456	7.6
2012	4972	261.33	19.02575	7.6

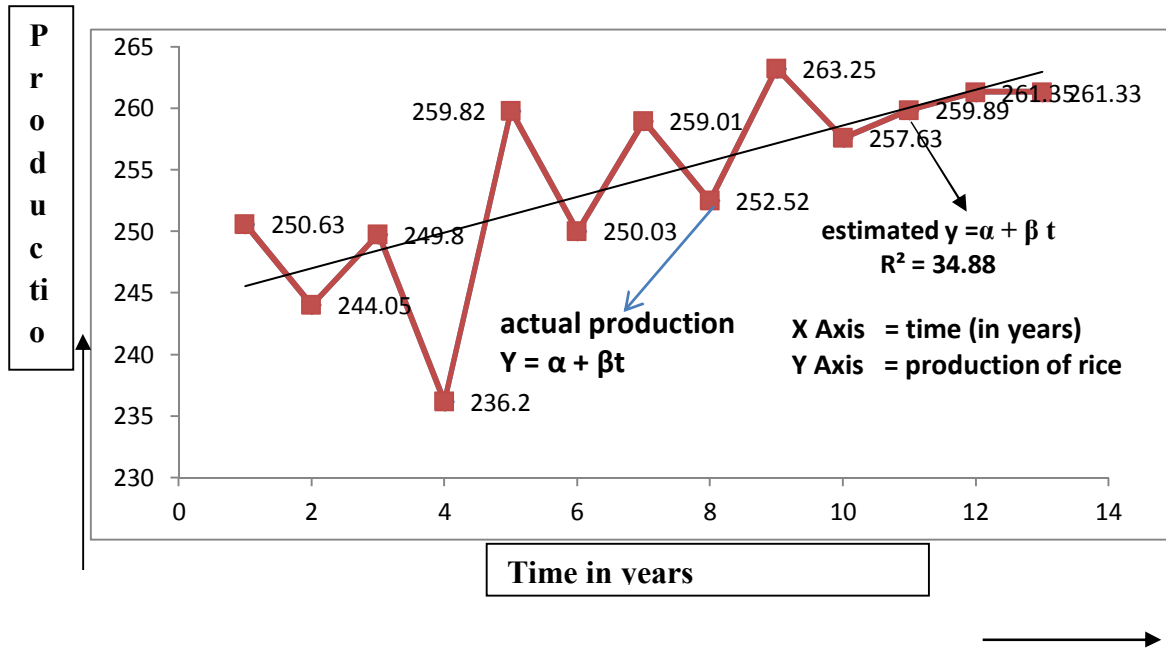
Source: Digest of Statistics government of Jammu and Kashmir, annual publication (2010-11)

The above table reveals that with the passage of time the data has shown continuous fluctuation in the production which has been shown a declining trend. The growth rate was maximum in the year 2005 as 9.1% from then onwards it has also shown fluctuations and has now come down to 7.6 resulting the decline in the production. The area under the crop is also an average declining which was maximum in the year 2008 as 263.252 which shows the interest of the people in the said crop is declining as a result employment opportunities in this crop has brought impact on the people of Jammu and Kashmir. Productivity in the crop has also shown declining a dynamic change which was highest in the year 2007 and 2008 shows the people are not willing to take risks due to the loss in crop.

The main causes responsible for the decline in the overall production of rice in Jammu and Kashmir is small and fragmented land holding which on an average is 0.66 ha and is continuously declining, increasing

pressure of population due to growing urbanization, extreme limits to irrigability of cultivated land and also single cropping season in temperature. Rice production in Jammu and Kashmir is entirely traditional in nature, subsistence farming is still in vogue and farmers are quite ignorant about the scientific methods of cultivation despite the efforts are made but still state is deficient of food grains and have to import from outside. That is why Jammu and Kashmir is not sufficient to feed its own people as a result on an average 4.97 lakh quintals are drawn from the central pool to meet the deficit requirement of the state. The people of Jammu and Kashmir are also facing the problems of inadequate and unorganized marketing infrastructure which have compelled the producers of rice for other commercial crops. Apart from this the yield gap exists as the farmers use suboptimal doses of inputs and hardly follow any recommended technology, improper management of irrigation facilities etc.

Graph no. 1: Calculated trend line in the production of Rice in Jammu and Kashmir.



### Simple linear Regression Model:

Rice production (Y) is the function of time (t)

$$Y = f(t), \quad Y = \hat{\alpha} + \hat{\beta} t \text{ (estimated)}$$

$$\left. \begin{aligned} \sum Y &= n \hat{\alpha} + \hat{\beta} \sum X \\ \sum XY &= \hat{\alpha} \sum X + \hat{\beta} \sum X^2 \end{aligned} \right\} \text{normal equations.}$$

#### Hypothesis:

$H_0$  = Time has no impact on the production of rice

$H_a$  = Time has an impact on the production of rice

The above hypothesis is used while applying 't' test to indicate whether there is any relationship between production and time.

So if  $t^* > t_t$ .....  $H_0$  is Rejected, ( $t^*$  is calculated and  $t_t$  is tabulated)

And if  $t^* < t_t$ .....  $H_0$  is accepted.

## Results and discussion:

While calculating simple linear regression and t test the results have indicated that the coefficient of determination ( $R^2$ ) has revealed 0.3488 (34.88%) of interdependence between dependent variable (Y) production of rice and Independent variable (X) time. Also  $\hat{\alpha} = 4221.61$  and  $\hat{\beta} = 109$  and standard error of  $\hat{\beta} = 41.89$ . The results for t test indicated that  $t^*$  or calculated t was equal to  $= 2.6016$  and  $t_t$  or tabulated t was equal to 2.201 at 0.05 level of significance and 11 degree of freedom ( $d.f = n-k$ ) where  $n = 13$  and  $k = 2$ . So we conclude with the results that  $t^*$  was greater than  $t_t$  which indicates that null hypothesis ( $H_0$ ) was rejected in that case we can concluded that production of rice depends upon time.

## Suggestions:

With the passage of time Jammu and Kashmir is continuously facing the problem of Paddy land diversion from almost 5 to 6 years which has brought direct impact on the production of rice as a there is a mismatch between demand and supply which has upswing the price in the valley that is why we have to import from the central pool to meet the deficit for the requirement. So government has to wake up early before it is too late. Following are some suggestions that if not increase but may be brought the declining trend of rice towards the right path.

- ❖ There is need to ban the conversion of paddy land for other commercial purposes so that at least we can reap the rich dividends from the said crop. The declining trend in the reported area of the state needs to be checked by land surveys.
- ❖ Improved seeds should be distributed among the farmers at the village level and awareness campus should be propagated so that it should brought interest in the minds of people regarding the said crop.
- ❖ There is a need in the supply of inputs at the times like fertilizers, pesticides, fungicides and all other essential nutrients (micro as well as macro martinets) so that it will enrich the soil to increase the production as well productivity of rice in J&K.
- ❖ Establishment of rice research institutes and market intervention schemes at the gross root level and there is need of setting up rice mills that will increase the production.
- ❖ The interdependence of rain for the crop should be replaced with permanent irrigation system so that it will brought interest in the people for the crop, since irrigation is an



important determinant for the growth of rice so low gestation irrigation projects should be funded to expand irrigation faculties and the existing facilities of irrigation should be made functional.

Keeping in view it becomes necessary to the government to thing about the diversion of the paddy land and to adopt sealing act in it. Government has to enlarge the market innovate schemes and all the research centers have to supply the high yielding varieties that are disease resistant so that it will revolutionized farm production and productivity at the universal level. Adaptation of modern technology and sowing of high yielding varieties of those seeds which are assuring good production.

### **Conclusion:**

The study has revealed that there is the land diversion of paddy crop taking place for other commercial purposes which needs to be examined before the ministry of agricultural before it becomes too late as there has been decrease in the net area sown in J&K region from the last decade, still there is a lot of untapped area that can be exploited if the government will brought interest in the minds of people for the crop. The major challenge is sustaining the supply of rice to meet rising demand in the valley and to cope up the problems timely inputs of irrigation, seeds manures and fertilizers to promote increasing productivity and more importantly ensuring food security for the people. Therefore it becomes necessary to intensify the efforts to increase in the area and the adaptation of recommended new technologies which will overall increase the production and productivity of rice in Jammu and Kashmir.

## References:

1. Dwivedi Sudhakar, Dwivedi.C.M, Singh Tarunvir: *An Economic Analysis of Basmati Rice Production in Jammu District of Jammu and Kashmir*; Division of Agricultural Economics and Statistics (SKUAST) Chatha. Journal of Reserch, SKUAST-J (2009).
2. Gupta. B.B, Salgotra.K.R, Bali.S.A, *Status Paper on Rice in Jammu and Kashmir*: Prof. & Head Division of Plant Breeding and Genetics (SKUAST) Jammu: Rice Knowledge Management Portal (RKMP) Directorate of Rice Research (2009).
3. Mathauda S.S, Mavi S.H, Bhangoo S.B, *Impact of projected climate change on rice production in Punjab (India)*: Department of Agronomy Agricultural University, Luudhiana-141004. International Society for Tropical Ecology. (2000).
4. Prasanna Lakshmi.A.P, Kumar Sant, Singh Aruna: *Rice Production in India- Implication of Land Inequity and Market Imperfection*, National Centre for Agricultural Economics and Policy Research, New Delhi: Agricultural Economics Research Review (2009).
5. R.T. Shanmugam, R. Sendhil: Quantification and prioritization of constraints causing yield loss in Rice in India, *Journal of Agrcultura Tropica ET Subtropica* (2006).
6. Singh Devinder, Nain.S.B, Hansra.S.B, *Trends in Non-Basmati Rice Productivity and Factors of Yield Gap in Jammu Region*: School of Agricultural, IGNOU, New Delhi. Journal of community Mobilization and Sustainable Development (2011).
7. Wani. H.M, Baba.H.S, Yousuf Shahid. *Land- use Dynamics in Jammu and Kashmir*: Sher-e-Kashmir University of Agricultural Science and Technology of Kashmir, Agricultural Economics Research Review (2009).
8. [www.google scholar.com](http://www.google.com).
9. [www.google.com](http://www.google.com)