

Status of Saffron in Jammu and Kashmir: An Economic Analysis

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Abstract:

In the present study simple multiple regressions was used to understand the contribution of different variables influencing saffron production the results indicated that the regression coefficients of time (0.96) fertilizers (0.23) and area (0.13) contributed significantly to 0.48%. Also auto correlation model was used; indicated (2.246) presence of perfect positive autocorrelation between the variables. Estimated calculation of area was calculate through the compound growth rate resulting 2469.023 ha will be used in 2012 for the cultivation purposes in 2012. Data used has shown a declining trend in the production and productivity from the last decade due to conversion of saffron land for commercial purposes.

Keywords:

Saffron, multiple regressions, autocorrelation, production, productivity.

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Introduction:

Saffron (*crocus sativus*) is a perennial herb which belongs to the Iridaceae family and is the most expensive species in the world for its aroma and colour; it is the world's most favored species and its monopolistic character makes it more and more expensive. The countries like Iran, Spain and India are the major saffron producing nations of the world with Iran contributing to the 88% of the world's saffron production and at the same time India contributes around 7% of the total production with the average productivity of 2.30kg/ha. Production of saffron in India is restricted to the states of Jammu and Kashmir and Himachal Pradesh with the area of around 5707 hectares and annual production. Out of this area 4496 hectares lie exclusively in Jammu and Kashmir with Pulwama accounts 78.91 % of the area under saffron cultivation followed by Budgam 12.27%, Srinagar 7.32% and Doda 1.5%. As per the official sources in the past 10 years there has been a steady decline in saffron production due to shift of agricultural land to the commercial purposes, in 1998 the crop was grown over 4161 heaters which has come down to 3715 heaters in 2009-10 which is

the threat to the saffron industry in J&K, undoubtedly we have achieved new heights in the field of agriculture and horticulture and horticulture still there is an urgent need for taking concentrate steps at the gross root level so that people attached with agriculture get more profits from their profession. The state cannot progress unless the economic condition and standard of living is enhanced as 80% of the people are still dependent on agriculture for the livelihood however state and central government and some research intuitions have taken some important steps to boost the value of Kashmiri saffron with the world bank lurching a project called "value chain on Kashmiri saffron" which aim to boost production and quality using environment friendly techniques, and there is being demonstration of plots in J&K and national saffron mission to promote the saffron production in Jammu and Kashmir, apart from this government has promised 70 Kanals of an would be provided for setting up the saffron research centre to fetch a good amount on the account of exports. Low prices and competition from cheaper imported Iranian saffron have forced many traditional saffron farmers to abandon this crop so government need to step in urgently to project this sector before it is too late.

With the passage of time the saffron of Kashmir is dying that can be guarded from

Methodology:

The present study was conducted on the biases of secondary data which has been taken from the digest of statistics government of Jammu and Kashmir and directorate of economic and statistics government of Jammu and Kashmir to obtain the production and productivity on the biases of area and to calculate or estimation of production on the biases of difference approach of logarithm and to forecast the production of saffron in the upcoming years and also multiple regression model was applied to understand the relationship between various variables and to forecast it in the same way.

Objectives of the study:

- ❖ To analyze the production and productivity of saffron in Jammu and Kashmir.
- ❖ To highlight the constraints and suggesting the alternative solutions in saffron production.

the fact that its decline has decreased from 16MT.

Calculated growth rate for area in year 2012:

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

$$A^*_{2012} = 3682$$

Multiple linear regression model used:

$$Y = f(X_1, X_2, X_3)$$

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + u_1$$

Where A^* is the annual compound growth rate of area for 2012 and α is the constant term, Y = production of saffron, X_1 = is the area under saffron and X_2 = average fertilizers used and X_3 is the time element and u_1 is the stochastic variable.

Data base Analysis:

The assessment of the contribution of different variables was made through a simple linear multiple regression model in which saffron production was the dependent variable and area, fertilizers and time were the independent variables the results indicated that the coefficient of determination (R^2) was 0.482 meaning

thereby that the explanatory variables included in the model explained 48.2 percent variation in the saffron production in which variable X_2 (area) has shown 0.14, variable X_3 (fertilizers) has shown 0.233 and the third variable X_3 (time) has shown 0.96 percent (%) variation which was positive and statically significant which implied that the three variables had exerted significant influence in the overall production of saffron. The estimated coefficient of correlation between the three variables was calculated as 69.4 and the Estimated autocorrelation was calculated as 2.246 which is greater than 1 implying there exists a perfect positive correlation which is closer to '0' ($d=0$) indicating the evidence of positive autocorrelation.

Saffron production world scenario:

Saffron is being produced only in some of the major countries of the world with Iran occupying the maximum area of 43408 hectares with the total production of 174tons and the productivity of 4.00 kg/ha, contributing about 88% of the world's saffron production, India occupies the second (2nd) largest area of 3265 heaters but the production is only 7.50 tons with the average productivity of 2.30kg/ha. Spain however with 600 heaters of land and the 3rd largest producer with the average productivity 8.33 kg/ha which is being highest in the world. Other countries of the world include Azerbaijan, Morocco and Italy contributing to a large extent in the overall production of saffron of the world.

Table No.:1.1 Country Wise Productions, Productivity and Area

Country	Area(ha)	Production (MT)	Yield (kg/ha)
Iran	43,408 (87.7)	174.00 (88.89)	4.00
India	4265(6.59)	7.50 (3.83)	2.29
Greece	1000 (2.02)	4.30 (2.19)	4.30
Azerbaijan	675 (1.36)	3.70 (1.88)	5.48
Spain	600 (1.21)	5.00 (2.54)	2.00
Morocco	500 (1.01)	1.00 (.50)	2.00
Italy	29.4 (.06)	0.24 (0.12)	8.16
Total	49477.4	195.74	3.96

(Source: annual report of directorate of Agricultural Jammu and Kashmir)

The leading saffron producing countries of the world like Iran, Spain and Greece with intensive production technologies are able to achieve higher production and productivity 4-8kg/ha which is much higher than our productivity as a result it has made a great threat to the saffron industry due to increasing of imports every year. The data has revealed that during the year 2006-07 total saffron imported from different countries was 3.3 metric tons to 3.7 in 2010-11. With the prevailing drought conditions and at the same time saffron is a rain fed crop so the soils in the Kashmir are thirsty and unfertile also overloaded with pathogenic fungi and rodents. Thus there is a

Production and productivity of saffron in Jammu and Kashmir:

Our country India has made great strides in the field of social and economic development, we have achieved new heights in the field of agriculture and horticulture as it acts as the backbone and plays an important role in the economy of India. No one can deny the fact that agriculture has contributed to the extreme in the GDP of India since independence. Still there is an urgent need of taking concrete steps to enhance production and productivity in both agriculture and horticulture. Agriculture

need to bring more and more area under cultivation and increase the average productivity by adopting intensive production system, at the same time government has made some progressive steps in enhancing the saffron production of valley launching the projects like “value chain on Kashmiri saffron” with the support of Indian council of agricultural research using environmental friendly techniques and “national saffron mission” through the investment of Rs 3760 million, but still there is lot to do to increase in the production and more importantly productivity so that the people engaged in this can reap rich fruits from it.

itself is a vast field; it is like a tree with endless branches-one among them is a saffron cultivation. The state Jammu and Kashmir tops the list of saffron growing states of India. It can be gauged from the fact that out of 5707 ha of land under it cultivation 4496 ha lies exclusively in Jammu and Kashmir. Even globally Kashmir is considered in of the three prominent areas for cultivation of saffron. The state of Himachal Pradesh is also now emerging as a premium zone of saffron in India.

Unfortunately from the last few years both production and area in Jammu and Kashmir has come down from 5707 ha area in 1996-1997 to 2742 ha in 2003 2004 and the production from 15.95 MT to just 5.15 MT. From 2003-04 with the coming of horticulture technological mission (MM-1

and MM-2) the crop got technological boost and incentives for area expansion and production with the result area since the crop has increased from 3143 to 3785ha and production from 3.86 to 9.46 MT by 2009-10.

Table 1.2: Area Production and Yield in Jammu and Kashmir

Year	Area (ha)	Production (MT)	Productivity (kg/ha)
1996-97	5707	15.59	2.80
1998-99	4116	12.88	3.13
1999-00	3997	73.65	1.89
2000-01	2831	3.59	1.27
2001-02	2713	0.30	0.095
2002-03	2825	6.05	2.28
2003-04	2742	5.15	1.88
2004-05	3143	6.86	2.23
2005-06	3200	7.50	2.34
2006-07	3010	6.50	2.15
2007-08	3280	8.20	2.50
2008-09	3280	7.70	2.34
2009-10	3785	9.46	2.50
2010-11	2479.196	9.50	2.55
2011-12	2469.023	10.00	2.64

Source (directorate of Agri., Jammu and Kashmir)

The data reveals with the passage of time from 1996-97 to 2004-05 area under saffron has shown a declining trend , the main factors responsible for that is the increasing

population, urbanization and land costs which has lowered the production and productivity through poor marketing, lack of motivation and incentives for cultivation

apart from this ageing of traditional growers and lack of labour, outdated cultivation techniques and absence of mechanization, lack of sector innovation and renewal of sick industry and extreme fragmentation and small size holding and the application of manures and fertilizers are some of the common reasons responsible for the declining the production and productivity of saffron in J&K. after 2004-05 government has indicated many technological programs for the development of saffron which include Mini Mission-I for research technology in which 03.00 crores were invested, for production related programs Mini Mission-II was launched with the investment of 40.99 crores and for processing and marketing Rs 52.64 crores were invested to enhance the production and productivity of saffron in Jammu and Kashmir At present the average productivity of saffron in Kashmir 2.3 kg/ha. Almost all saffron in a belt bounded in the west and mountainous Kashmir of east, the leading saffron growing countries like Iran, Spain and Greece use an intensive production technology that is why they are able to achieve higher level of production and productivity.

Suggestions to promote saffron production in Jammu and Kashmir:

With the passage of time saffron production has shown a declining trend as a result production has decreased from 16 metric tons to 6.5 metric tons which suggest a 40% decrease and the productivity of saffron has come down to 2.3 kilograms/ha. No doubt government has launched several important projects like national saffron mission, establishment of SMSC nursery etc. to increase the production of saffron but still there is lot to do so that growers associated with it can reap rich dividends from it. The study has revealed that there is 13% variation in the production of saffron through area so it becomes mandatory to suggest the ways to increase the production of saffron in Jammu and Kashmir.

- Establishment of saffron research centers, sprinkle irrigation facility market intervention schemes at the gross root level so that it will increase the production of saffron at the same time steps should be taken by the state and central government through trade which is flourishing should be given

further boost as the saffron can fetch a good amount of exports.

- It becomes compulsory for setting up the saffron mandies in the Kashmir valley as the government has promised but still it is not yet implemented further Govt. incentives infrastructure and input supply should be brought at the micro level.
- Large scale multiplication of healthy corms, micro corm use of media and low tunnel production, enriching soils with recommended levels of manures and fertilizers at the same time large scale adaptation of scientific intensive technologies, integrated nutrient management and dust pollution controls should be brought under consideration so that it will boost the saffron production and productivity in J&K.
- A large number of small scale industries should be established for the proper hygienic measures while handling the saffron crop at the same time land sealing act should be brought under action so that area under saffron can be sealed up.

Keeping in view, it is necessary for the state as well as central government to boost the

saffron industry in Jammu and Kashmir by enlarging the area and the adaptation of intensive production technologies so that we can fetch good dividends from the crop at the same time implementation of modern scientific technologies should be adopted.

Conclusion:

In pursuit of the findings and observations of the variables mentioned above the paper concludes that with the increase in urbanization total area under saffron is declining continuously so there is the urgent need for increasing area and intensive production techniques that would boost the saffron industry in Kashmir as a result it would generate foreign exchange earnings due to its monopolistic character and quality. All those factors that have become the hindrances in the actual production needs to be examined and should be brought before the ministry of agriculture so that immediate steps would be taken to resolve it. For increasing production and productivity there is the need of the development of irrigation schemes and the application of drip and sprinkler and enriching soils with recommended levels of manures and fertilizers and organic cultivation.

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