

Potential of Contract Farming to Promote Productivity of High-Value Agriculture Crops of Jammu & Kashmir: Evidence from Saffron Cultivation

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Abstract

Saffron is one of the most important high-value crops of Jammu and Kashmir, yet its cultivation has experienced a continuous decline in area, production, and productivity over the past two decades. This paper examines the potential of contract farming as a mechanism to revive saffron cultivation and promote high-value agriculture in the Union Territory. The study is descriptive and based on secondary data collected from research articles, government reports, and official publications. It analyses historical and recent trends in saffron cultivation and identifies key constraints, including weak market linkages, technological limitations, inadequate institutional support, adulteration, and the dominance of intermediaries. The review suggests that contract farming can address these challenges by providing assured markets, quality inputs, technical assistance, credit, and price stability. Strengthening farmer–agribusiness linkages through an enabling policy framework can enhance productivity, improve farmers' incomes, and contribute to the sustainable development of the saffron sector in Jammu and Kashmir.

Keywords: Contract farming, high–value crops, Saffron

INTRODUCTION:

With a global transition in consumption demand patterns, an inclination towards high-value agricultural products as compared to conventional crops has been observed in the last few decades. High-value crops refer to the crops that provide higher per-hectare yields than conventional crops and generate more revenue comparatively. There is a drastic shift from conventional crops to high-value horticultural, dairy, poultry, and other related products (Kumar and Gupta, 2015). As a result of the crop diversification followed by liberalization and globalization small farmers find it difficult to meet the market demand due to lack of market access, technological and financial constraints, risks associated with marketing, etc. There is a lack of proper backward and forward linkages between the growers and suppliers. As a result, farmers do not get desired profits, leading to discouragement for further production. Such linkages can be provided under contract farming by providing better returns to the farmers, marketing and financial support (Sharma et al., 2018).

Contract farming can be defined as a verbal or written agreement between the farmers and the contracting firm for a fixed period. The contracting firm provides the grower with certain resources including credit,

inputs, technical assistance, and other services whereas the grower supplies to the firm a pre-decided quantity of the produce of certain quality. Jammu and Kashmir have a huge potential for growing high-value crops such as apples, walnuts, almonds, saffron, lavender etc. But a lack of proper marketing facilities, a lack of credit supply, and related factors hinder the productivity of these crops. Saffron (*Crocus sativus*), popularly known as “red gold,” is among the most expensive spices in the world and is cultivated notably in the Kashmir region, where it has been granted a Geographical Indication (GI) tag. The word *saffron* is derived from the Arabic term “*Zafaran*,” which refers to the colour yellow. It is known as “*Kum Kum*” in Sanskrit, “*Kesar*” in Hindi, and “*Koung*” in the Kashmiri language. Saffron is widely used in food preparations and holds importance in religious rituals especially related to Hinduism. Saffron is also used for medicinal purpose and curation of certain infections (Menia et al., 2018). Kashmir has the privilege of producing this high-value spice of supreme quality. Despite its exceptional quality and international reputation, saffron cultivation in Jammu and Kashmir has experienced a persistent decline over the last two decades, reflected in reductions in the cultivated area, overall production, and yield levels. The sustainability of saffron agriculture has been negatively impacted by a number of factors, including climate unpredictability, poor irrigation infrastructure, technological limitations, urbanization, land-use change, market inefficiencies, adulteration, and the dominance of intermediaries. The long-term sustainability of this traditional crop is seriously threatened by these difficulties, which have decreased farmers' profits and deterred many producers from carrying on with saffron farming.

The production constraints of saffron cultivation in Kashmir have been the subject of numerous studies, and several others have examined the role of contract farming in enhancing productivity and farmers' welfare across various agricultural commodities. However, the relevance of contract farming for the revival of saffron cultivation in Jammu and Kashmir has received less attention. Previous research has mostly addressed these problems separately. In order to assess its potential as a policy tool for boosting productivity, fortifying market connections, and encouraging the sustainable growth of the saffron industry in the Union Territory, this paper attempts to close this gap by combining data on saffron cultivation trends with insights from the contract farming literature.

Objectives of the Study:

Study aims to analyse the past and present trends in saffron cultivation in the Kashmir valley and to suggest policy measures for the sustainable development of saffron cultivation in the region.

Methodology:

The study is purely descriptive in nature, making use of secondary data. Relevant information was collected and reviewed from academic journals, working papers, government websites, official reports, and other published sources. The study reviewed high-value agriculture, with particular emphasis on the role of contract farming in enhancing agricultural productivity, while also analysing historical trends and the current status of saffron cultivation in the Kashmir Valley.

Literature Review

Saffron is King of all spices and best quality saffron in the world is grown in Kashmir. Pampore region which is also known as Saffron bowl of Kashmir is the largest producer of saffron in the UT along with Budgam, Srinagar, and Kishtwar districts. But in the past years decline in the saffron production has been observed followed by increased adulteration, entrepreneurial constraints, unawareness among the farmers

and lack of global competence (Shafi and Mir, 2022). As Iran is the largest producer of Saffron in the world, several studies about contract farming in saffron suggest that contract farming is cost-efficient as it reduces the cost on research and information by making new raw material easily available. The quality and price of the crop are decided beforehand. To fetch good profits, proper marketing of processed food including fruits, vegetables and other high-value crops is required and contracting companies provide with good marketing facilities which is otherwise difficult for the farmer. Contracting firms contribute to the production of high-quality agricultural products by facilitating farmers' access to modern technologies and essential inputs. Such arrangements can particularly benefit small-scale farmers by improving their productivity and contributing significantly to higher farm incomes (Sedighi, 2015). A study by Haq and Tariq (2020), on saffron cultivation in Kashmir acknowledged that there exists technical lag among the farmers and if they are trained to use technology efficiently, the output can potentially be increased by 40 percent without incurring any supplementary cost. But in spite of all the possibilities, it is again a challenge to increase productivity which keeps hovering around 2 kg per hectare, which is far away from the top producers including Iran and Spain which is around fourfold varying from 4-6 kg per hectares. The study suggests introduction of contract farming and thus increasing the linkages between the farmer cooperatives and agribusiness firms.

Challenges of saffron production in Kashmir:

Saffron growers often receive inadequate returns for their produce, while limited marketing infrastructure and the involvement of multiple intermediaries and *dalals* further reduce farmers' earnings. These challenges have contributed to growing dissatisfaction among cultivators and have encouraged some farmers to shift towards alternative crops, such as walnuts, apples, and apricots. Studies claim that 70.86 percent of the produce is sold to dalals, 16 percent to sub-firms whereas remaining 13 percent through other agencies. The farmers cannot afford preservation cost that compels them to sell the produce at very nominal price to the brokers during harvest season (Mukhter et al., 2020). Other challenges include adulteration of Saffron with Iranian saffron which is available in abundance and comparatively cheaper, mixing plastic or wax to the product, paper cuttings with sugar coating, dried meat fibres, and slick fats-dyed stigma of corn or maize. The weight of saffron is increased by traders using oils and glycerin, later, the same quality of saffron is sold to the numerous tourists who arrive (Husaini et al., 2010). Conversion of saffron fields to residential buildings is other major issue contributing to declining area under saffron cultivation. Compared to the highest producers of crops, who use latest technology for saffron cultivation, Kashmiri saffron producers are still producing using indigenous technology and they lack access to information and technology (Mukhter et al., 2020). Saffron production and yield are restricted globally due to a number of problems, such as a lack of access to high-quality plant materials, poor management of agricultural inputs, and a loss of technical expertise and innovative technology (Hosseini, 2020).

Contract farming provides security related to price and market access. Contracts that specify the price and quantity of the product to be grown reduces the uncertainty among farmers. Contract farming facilitates farmers' access to market information, modern technologies, agricultural inputs, and financial support. By providing these resources, it can enhance farm productivity and product quality while encouraging the cultivation of high-value crops that may otherwise be difficult for small and resource-constrained farmers to produce (Meemken and Bellemare, 2020). Tripathi et al., (2005) under potato Contract Farming in Haryana found that the cost of cultivation, yield and income were higher under contract farming. Approximately 92% of the reviewed studies report a positive association between contract farming and

agricultural productivity (Bellemare and Bloem, 2018). Contract farmers were 21 percent more production efficient than independent growers identified in a study of rice farming in Ghana (Bidzakin et al., 2020). Contract farming has the potential to increase productivity and income because increased access to better inputs will lead to increase in productivity and further increase in income (Parrirenyatwa and Mago, 2014). Yield in potato farms in Haryana increased to 255.78 quintals per hectare under contract farming which was 8.84 percent higher than non-contract farmers (Tripathi et al., 2005).

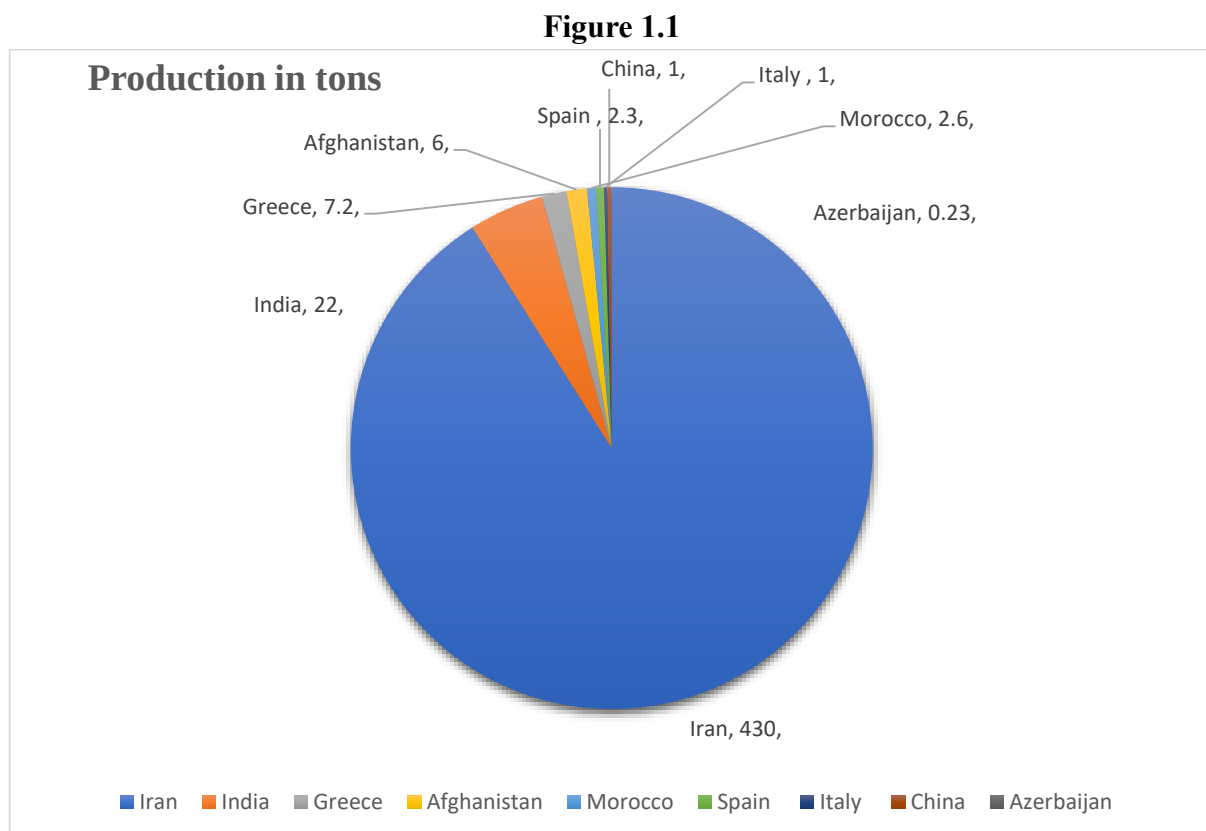
FINDINGS:

Horticultural crops play a major role in the economy of Jammu & Kashmir and the highly-priced spice also known as 'red gold' is grown in Kashmir. A study by Qadri (2020), reveals that near about 10,000 families from 226 villages are directly or indirectly involved in saffron production in Kashmir. Pampore in Pulwama has the highest area contributing to 74.6 percent of saffron cultivation followed by Budgam, 16.13 percent and Srinagar, 6.68 percent (Taufique et al., 2017).

India was the second largest grower of saffron in the world followed by Iran in the year 2019 and in terms of percentage share proportion is merely around 5 percent.

Production in tons

Figure 1.1, shows the overall production of Saffron in tons. We can clearly identify from the figure that Iran being the lead producer with 430 metric tons of overall saffron production is the largest contributor to the world market. India stands the second position with only 22 metric tons of Saffron production followed by Greece and Afghanistan.



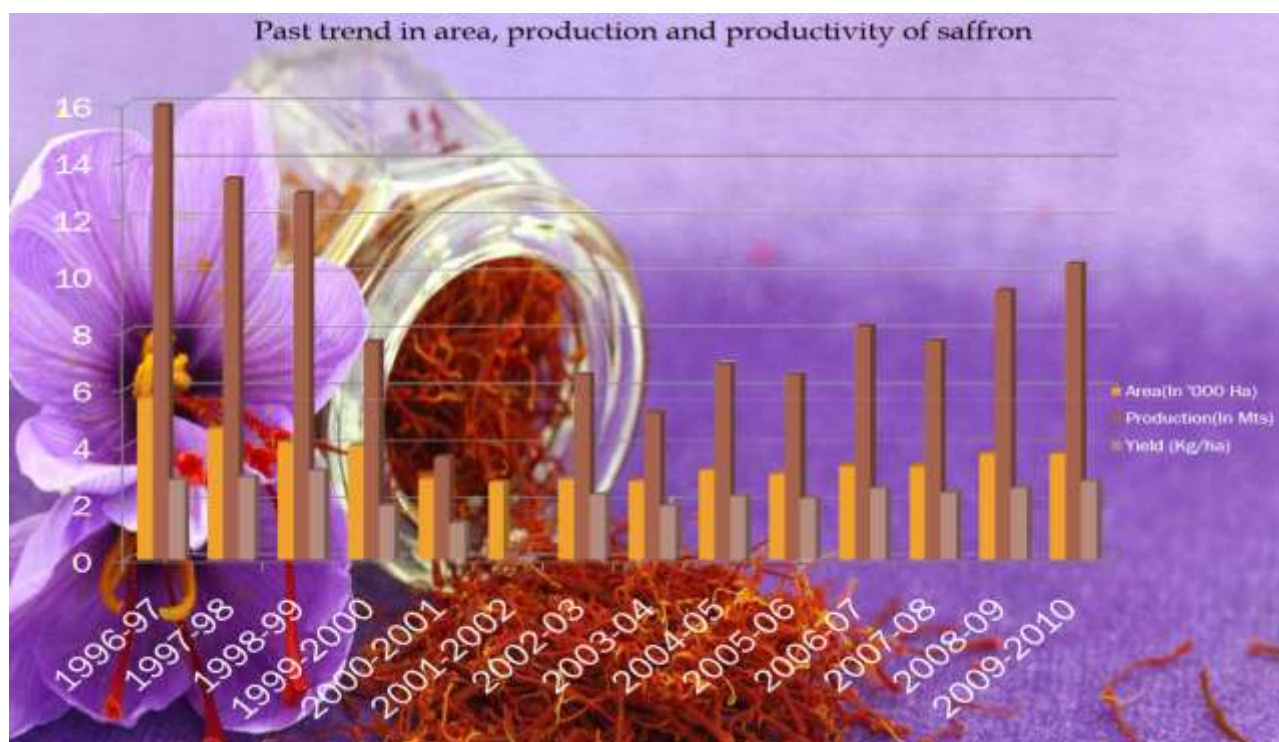
Past trend in area, production and productivity of saffron:

Saffron production has observed a decline in production over a period of time. Year 1997 was the period of prosperous production of saffron in the valley after which the growth trend started declining. Total area under cultivation and productivity both declined in past two decades. Area declined from 5707 hectares to 3715 hectares in 2010 and production declined from 15.95 metric tons to 10.40 metric tons.

Table 1.1: Trends in Saffron Cultivation, Production and Productivity in Jammu and Kashmir, 1996–97 to 2009–10

Year	Area (Ha)	Production (Metric Tons)	Yield (kg/ha)
1996–97	5707	15.95	2.80
1997–98	4618	13.39	2.90
1998–99	4116	12.88	3.13
1999–2000	3997	7.65	1.89
2000–01	2831	3.59	1.27
2001–02	2713	0.30	0.095
2002–03	2825	6.50	2.28
2003–04	2742	5.15	1.88
2004–05	3143	6.86	2.23
2005–06	3010	6.50	2.15
2006–07	3280	8.20	2.50
2007–08	3280	7.70	2.34
2008–09	3715	9.462	2.50
2009–10	3715	10.40	2.75

The data presented in the table illustrate the changes in the area under saffron cultivation, production, and productivity in Jammu and Kashmir during the period 1996–97 to 2009–10. The area under saffron cultivation declined from 5,707 hectares in 1996–97 to 3,715 hectares in 2009–10, representing a reduction of nearly 35 percent. Overall, the table reveals that saffron cultivation in Jammu and Kashmir experienced a long-term contraction in cultivated area, while production and productivity remained highly unstable. The sharp decline in production and yield during the early 2000s, followed by partial recovery, suggests considerable variability in saffron performance during the period under consideration. The persistent reduction in cultivated area, despite improvements in production and productivity in the later years, highlights the need to examine the underlying economic, climatic, technological, and marketing factors influencing saffron cultivation in the region.



Source: Directorate of Agriculture, Kashmir

Present trend in area, production and productivity of saffron:

NSM(National Saffron Mission) was initiated by Government to boost saffron production but revival witnessed is still at a very minimal rate observing the area rejuvenated under NSM is 2462 and total area under cultivation is approximately around 3791 hectares which is far away from the year 1997. But because of the NSM's efforts, the saffron industry saw a steady revival in each of these areas until the year 2013. Saffron cultivation increased by nearly 20% to 3230 hectares, while output increased by more than 50% to 84 quintals, resulting in a 2.60 kg increase in yield per acre. However, it appears that this impetus was lost after that. Despite the fact that there were 3591 more hectares under this crop in 2016, production fell to 51.33 quintals, and the yield dropped to just 1.42 kg per hectare.

Relevantly, the Kashmir Valley generates more than 70% of the saffron produced in the Pulwama district. According to these government statistics, Pulwama's yield was predicted to be 1.25 kg per hectare in 2016 and the same was found in a field study by Imtiaz ul Haq and Tariq, 2020.

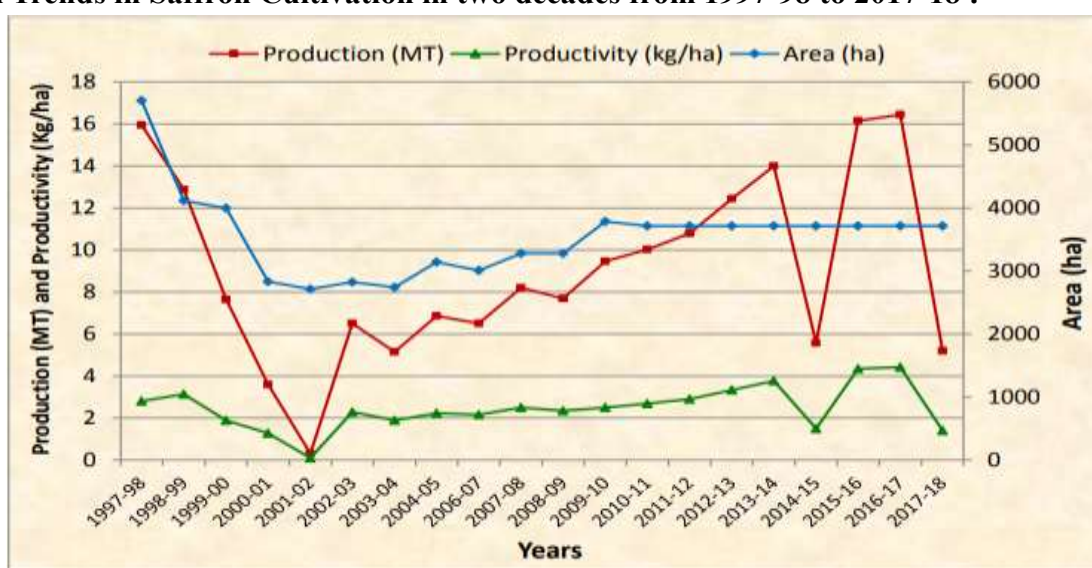
Year	Rejuvenated under NSM	Cumulative Total	Average yield/ha	Normal	Average yield/ha
2010-11	-	-	-	3715	2.7
2011-12	331	331	4.5	3384	2.75
2012-13	943	1274	4.5	2441	2.75
2013-14	528	1802	4.5	1913	2.812
2014-15	157	1959	1.5	1756	1.5s
2015-16	176	2135	5.5	1580	2.8
2016-17	79.81	2214.81	5.49	1497	2.85
2017-18	172.90	2387.71	1.64	1323.75	0.973

2018-19	74.29	2462.00			
Total	2462			Total -3791	

Source: Directorate of Agriculture, Kashmir

The table indicates that the **National Saffron Mission (NSM)** contributed to the rejuvenation of saffron cultivation, with the cumulative rejuvenated area reaching **2,462 hectares by 2018–19**. However, saffron productivity fluctuated considerably during the period, rising to **2.85 kg/ha in 2016–17** before declining to **0.973 kg/ha in 2017–18**. Thus, despite progress in area rejuvenation, sustained improvements in productivity remain a challenge.

Growth Trends in Saffron Cultivation in two decades from 1997-98 to 2017-18 :



Source: Directorate of Agriculture Kashmir (J&K)

There is a series of problems contributing to the decline in saffron production. Several studies reveal many factors including lack of incentives for farmers, inefficient technology, exploitation of farmers on the hands of intermediators and dalals, lack of market access, increased adulteration, shifting to other cash crops including apple, walnuts etc, construction on saffron fields (Mukhter et al., 2020; Husaini et al., 2010; Hosseini 2020). On the other hand Contract farming increases the market access, removes the constraint of information and technology , increases profits and provides credit and inputs to the farmers (Tripathi et al., 2005; Shafi and Mir,2022; Sedighi,2015).

Conclusion and Policy Recommendations:

As J&K possesses the privilege to produce high-quality saffron in the world, but the reduction in productivity over the years has become a serious challenge to recover. Awareness among the saffron growers and encouragement should be promoted among farmers. The existing loopholes can be resolved with better policies in the hands of the Government by promoting practices like Contract farming. This idea is also supported by many research studies . Contract farming is cost-efficient as it reduces the cost of research and information by making new raw materials easily available (Sedighi,2015). Contract farming can provide market access to the farmers and increase their profits by increasing the linkages between the farmer cooperatives and agribusiness firms (Haq and Tariq, 2020). Keeping in view the

importance of integrating farmers including fruits and vegetable growers to agro-industries with the objective to mitigate market and price uncertainties, reducing post-harvest losses and creating rural employment, the Department of Agriculture formulated and released a Model Act called “The State/ UT Agricultural Produce and Livestock Contract Farming & Services (Promotion & Facilitation) Act, 2018”. The Model Act not only provides the facilitative eco-system for contract produce output but also for services all along the agri-food value chain starting from pre-harvest, harvest and post-harvest including marketing. Tamil Nadu and Odisha have legislated “The Tamil Nadu Agricultural Produce and Livestock Contract Farming and Services (Promotion and Facilitation) Act, 2019”, The Odisha Agricultural Produce and Livestock Contract Farming and Services (Promotion and Facilitation) Act, 2020 respectively whereas Punjab has already enacted a separate contract farming Act (Department of Agriculture, Annual Report 2020-21). Such Act should also be enacted in state so that farmers should get access to market through these agribusiness firms. But sometimes the question comes into consideration is that the standards of Contract companies are very high which farmers fails to meet. Such kind of issues should also be taken into consideration by Government by making is useful both for contracting companies and especially the farmers.

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