

## Production and Marketing Efficiency of Apple Farming- A Study in Shimla and Kullu Districts of Himachal Pradesh

Firdous Ahmad Wani<sup>1</sup> Dr Manoj Songara<sup>2</sup>

<sup>1</sup>PhD in Commerce at Devi Ahilya University, Indore

<sup>2</sup>Professor of Commerce at Govt. K.P College Dewas

### Abstract:

Horticulture is the mainstay of the Indian agricultural economy. Horticultural production contributes to 34 per cent of our agricultural GDP from 15 per cent of total agricultural area; and 11 per cent of total agricultural export earnings during the year 2017-18. The present study makes an attempt to examine the production and marketing efficiency of apple farming. The study was conducted in Shimla and Kullu districts of Himachal Pradesh. The primary data was collected from 200 apple growers of Kullu and Shimla district. The production efficiency of apple was analysed by using stochastic frontier production function. The study revealed that the inputs, viz., density of plants per hectare, fertilizers, organic manure and labour were the four significant variables positively influencing apple yield. Among the five marketing channels prevailing in the study area, channel II (Grower – Retailer – Consumer) was the most efficient channel as indicated by the modified marketing efficiency. The major production constraint faced by apple growers was inadequate irrigation and finance problems while the major marketing constraint faced by them were lack of storage facility and malpractices in market.

**Key Words; Apple, Distribution channels, Horticulture, Marketing, Production**

### Introduction

Horticulture occupies a very significant position in the agricultural sector of Indian economy. The various fruits grow in India are exported to different countries in the world. However, apple production is most prominent one in India. In India apples are grown as a commercial crop in the hilly areas. The apple fruit grows especially in the state of Himachal Pradesh. Apple production is one of the important sources of economy in Himachal Pradesh. Apple cultivation in Himachal Pradesh is fast expanding because apple has a comparative advantage over the other crops that can be grown in hilly regions. (Weinberger, Katinka, & Thmas A, 2007), Horticulture has emerged as the potential accelerator in the growth of economy, country's nutritional security, poverty alleviation and employment generation programs is highly praised. The area under fruits, which was 792 hectares in 1950-51 with the total production of 1200 tonnes increased to 2,24,352 hectares during 2014-15. The total fruit production in 2014-15 was 7.52 lakh tonnes, which during 2015-16 has been reported as 8.19 lakh tonnes. In 2015-16, it was envisaged to bring 3,000 hectares of additional area under fruit plants against which

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3,244.06 hectares of area was brought under plantation and 8.48 lakh fruit plants of different species were distributed (*Economic Survey, 2015-16*).

Horticulture is the prime mover of economic growth in Himachal Pradesh and the state has also craved and a niche as a horticulture state and is also known as “Fruit Bowl Of Nation” (APEDA). Himachal Pradesh has emerged as the Horticulture state of India it has been recognized as the apple state of India for being adjudged as the best producer quality of apples. In the state of Himachal Pradesh, farmers are encouraged to grow the world’s finest and choicest variety of apple. The state department of Horticulture helps them in the economic upliftment of rural population and has also generated employment. The total area under fruits in Himachal Pradesh is about 226799 hectares with a production of 928829 MT of all kinds of fruits. Apple is the major fruit accounting 46 percent of total Area under fruits and 88 percent of the total production (Anonymous, 2006) and (Kaur, 2002). Apple is a predominant fruit crop of Himachal Pradesh and in recent years it has emerged as the leading cash crop amongst fruit crops. Apple is the fourth major fruit crop of the country in terms of production after Mango, Citrus Fruit and banana. Apple is grown mainly in the state of Jammu and Kashmir, Himachal Pradesh, Uttarakhand and Arunachal Pradesh. Himachal Pradesh is the second largest producer of apple in India, After the Jammu and Kashmir. Himachal Pradesh is known for the production of quality apples. The state has agro-climatic and geographical conditions favourable for apple cultivation (Singh, Kalia, & Lal, 2007), (Panwar, 2011). Production of several fruits was comparative advantage than vegetables in Himachal Pradesh. The income from Apple orchards was more compared to other field crops and the productivity of apples in Himachal Pradesh can be doubled if orchard management is improved (Sharda & Raman, 1996).

## Research Methodology

Shimla and Kullu districts were purposively selected for the study because apple is predominantly cultivated in these districts. The studies were conducted in Shimla and Kullu districts in the State of Himachal Pradesh during 2017-18. Jubbal-Kothai block from Shimla district and Naggar Block from Kullu districts were purposively selected, as the apple crop is dominant in these blocks. Two villages, Nagar and Katran of Naggar block from Kullu and two more villages, namely, Khaneti and Kiara of Jubbal-Kothai block from Shimla District were purposively selected for the study. From each village 50 apple farmers were randomly selected as a resulting of total sample size of 200 apple growers (100 from each district).

The data for the study included both primary and secondary. The primary data for the study was obtained from the sample apple growers through personal interview method with the help of a pre-tested schedule. The help of Assistant Horticulture Officers of the Department of Horticulture, Shimla, HAREC (Hill Agricultural Research and Extension Centre, Bajaura) and local traders were availed in contacting the farmers as this instilled confidence in the minds of the farmers to provide reliable data. The analytical tools made use in the study are SPSS and MS Excel for the efficiency of apple crop and modified marketing efficiency analysis.

## Results and Discussion

### Estimated stochastic frontier production function for apple production

Economic efficiency comprises of technical efficiency and allocative efficiency. In order to study the technical efficiency of apple farming, the stochastic frontier production approach was used and the estimation was done by using Maximum Likelihood Estimation (MLE) method. The results of the same are presented in Table1.

Table1. Estimated stochastic frontier production function for apple production

S no.	Variables	Elasticity co-efficient	Standard error	t-value
1	Frontier production function constant	-0.42	0.88	-0.56
2	Density of Plants	0.39*	0.18	3.21
3	Plant protection chemicals	-0.56	0.42	1.21
4	Organic manure	0.46*	0.12	3.12
5	Labour	0.46*	0.85	2.34
6	Fertilizer	0.95	0.56	2.82

*Dependent Variable (yields in qtls/ha) R2 = 0. 61 and Adjusted R2 = 0.83 at 5 % significant level*

The frontier production function analysis was done to find out the resource productivity by taking apple yield in physical units (qtls/ha) as the dependent variable. The independent variables, viz., density of plants, organic manure and labour were in physical terms. It is evident from the table1 that the density of plants per hectare, fertilizers, organic manure and labour were the four significant variables positively influencing apple yield. The elasticity co-efficients (significant at 5 % level) of fertilizer and organic manure were 0.95 and 0.46, respectively while the elasticity co-efficients (significant at 1 % level) of number of plants per hectare and labour were 0.39 and 0.46, respectively. All the variables except plant protection chemicals (-0.56) included in the model were significant.

### Marketing Channels and marketing efficiency of apple marketing

In the present study, an attempt was made to track the marketing channels of apple as long as it was possible and accordingly, The results revealed that there are 5 (Five) marketing channels for apple fruits found in the State of Himachal Pradesh are as follows:

*Channel I-* Grower- Consumer

*Channel II-* Grower- Retailer-Consumer

*Channel III -* Grower- Forwarding Agent- Commission Agent- Retailer-Consumer

*Channel IV -* Grower-Pre-harvest Contractor-Commission Agent- Wholesaler-Retailer-Consumer

*Channel V - Grower- Commission Agent-Wholesaler-Retailer-Consumer*

In the study area, majority (35 %) of the sample apple growers marketed their produce through channel II. This channel was preferred as the growers realized relatively higher produce's share in consumer rupee. However, 25 per cent of them preferred to market their produce through channel IV pre-harvest contractors and 20 per cent through channel III forwarding agents, 15 and 5 were followed Channel I and Channel V. The reasons for preferring pre-harvest contractors were to save time, money as well as labour required for harvest and post-harvest operations.

### **Production and Marketing Constraints of Apple growers**

The farmers were interviewed to elicit the problems faced by them relating to various aspects of production and marketing of apple crop in the study area.

### **Production Constraints faced by the Apple Growers in Shimla and Kullu districts of Himachal Pradesh**

Small scale apple farmers lack regularity in terms of production for the markets due to insufficient access to production resources. With the increase in the production of apple in the both districts of Himachal Pradesh faced many problems in the field of marketing of apple and its production are needed arising between farmers. In this section, an effort has been made to analyse the problems faced by the apple growers in surroundings of marketing and production. The production problems faced by the farmers in the district of Shimla and Kullu were recorded during the sample survey and the same is presented and tabulated below as table wise sample farms of the study area.

Table 2. Constraints in Production of Apple Crop

S.No	Constraints	Shimla	Kullu	Overall Avg. (%)
1	Shortage of Labour	97	98	195 (97.5)
2	Chemical fertilizers	95	97	192 (96)
3	Plant Protection Chemical	97	93	190 (95)
4	Financial Problems	95	99	194 (97)
5	Lack of irrigation facility	100	98	198 (99)

Source: Survey 2017-2018

Note: figures in parentheses indicate percentage to the numbers of apple growers in respective districts and to the total number of sample growers in the case of overall average farmers.  
Total Number of selected farmers were: 200 (100 from each district)

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Shortage of both skilled and unskilled labour for conducting the various operations, application of farmyard manure and fertilizers, training and pruning of trees and plant protection measures were reported by 195 respondents of overall study area of both Shimla and Kullu. The apple farmers also forwarded that their opinion related to the faced problems pertaining to cost and availability of chemical fertilizers. A quick reference of table 1 reveals that inadequate quality of chemical fertilizers and non availability of desired brand in both districts. At overall level in Shimla and Kullu are higher prices of chemical fertilizers, non availability of chemicals at time, not availability of spurious quality and lack of technical labours for spraying chemicals were reported by 95 percent in both districts. For smooth operations and expansion of any industry accessibility to finance on reasonable terms is important and this is well in recognized in economic development. The industry has to procure the apple fruits during the harvesting and processing period that has been stored for a considerable period of time and this necessities large investment in working capital. The commercial banks are unenthusiastic to lend to huge funds for need for production and marketing of apple crops. Lack of credit facility from banks, inappropriate subsidy policies and schemes provided by government, mortgage problem and higher interest rate of banks were main problems faced by the respondents of Shimla and Kullu district. Quality plays an important role in the production and marketing of apple products in particular. Quality products can be produced only if proper quality inspection can be made at different stages such as at the time of procurement of apple fruit, fertilizer yield management, processing and operation and packing stages, irrigation and modern technology. Farmers do not have access the farm infrastructure such as store rooms and cold rooms to keep their products in good conditions after harvesting.

## **Marketing Constraints faced by the Apple Growers in Shimla and Kullu districts of Himachal Pradesh**

Fruit production and marketing has a significant place in India and especially in the State of Himachal Pradesh due to capable climate and natural conditions. However, there are number of crucial problems about the marketing of apple fruit. Marketing of apple is as critical as production of apple. Due to lack of marketing and improved marketing practices contribute to the complicated nature of marketing of apple in the inhabitant. In the absence of any planned marketing programme and without awareness among the farmers about the apple marketing, growers often remain underprivileged prices for their apple fruit. The various marketing problems and constraints faced by the apple growers need to be tackled in order to boost up the growth of area under apple crop. The objective of this study is to reveal the problems of apple fruit production and marketing by using data which was obtained from the Apple Growers survey. This study covers apple fruit, which constitutes 85 % of the total fruit Production and 49 % of the total area in the State of Himachal Pradesh.

Table 3. Constraints in marketing of apple fruit

S. No	Constraints	Shimla	Kullu	Overall Avg. (%)
1	Lack of grading and packing labour	91	85	176 (88)
2	Transport problem	89	98	187 (93.5)
3	Lack of packing material	95	93	188 (94)
4	Lack of communication intelligence	93	98	191 (95.5)
5	Lack of Storage facility	100	100	200 (100)
6	Malpractice in market	100	100	200 (100)
7	Market intervention scheme	89	94	193 (96.5)

Source: Survey 2017-2018

Note: figures in parentheses indicate percentage to the numbers of apple growers in respective districts and to the total number of sample growers in the case of overall average farmers.

Total Number of selected farmers were: 200 (100 from each district)

The packaging of a product is important to protect the product from damage besides information about the product that attracts customers. Its needs is more emphasised in the case of processing apple marketing, since low standard packaging may cause health hazards. It has been found that major problems faced by the farmers in terms of packaging and grading system are shortage of well trained labours, higher wages of labours, unavailability of labours and strict labour union rules. Shortages of well trained labours were reported by 88 percent in the both districts of Shimla and Kullu. Mostly farmers have no means of transport to carry their produce to markets. Transportation problems result in loose of quality and late delivery, which in turn to lower prices and this regards as the greatest problem faced by emerging apple farmers. An analysis of apple grower's problem revealed that major concern is high transportation charges by 93.5 percent of orchardist's perception in the both district of Shimla and Kullu with the ratio of (1.43:1.53) percent respectively. The shortage of packing material and higher prices of packing material were the main problem faced in the both district of Shimla and Kullu. Automation and mechanisation of production activity on one side and global approach to business on other has necessitated storage and inventory management. Storage is necessary for holding the apple fruit in proper condition for a long time and adjusted supply and demand through the creation of time living. Small holder farmers don't have access the storage rooms and cold rooms to keep their apple crop in good condition after post harvest. Lack of these facilities constitutes the barriers to entry into apple markets. Access to storage facilities increase farmers flexibility in selling their apple. Farmers in both regions didn't have enough scientific storage facilities for apple crops.

### Conclusion

India is blessed with various types of soils and varied agro-climatic conditions as a result of which the country has the advantage of growing a variety of horticultural crops in particular and other crops in general. The cultivation of apple is mainly cultivated in northern Himalayan areas, while the apples are the monopoly of

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hilly regions of India like Himachal Pradesh, Jammu and Kashmir, Uttarakhand and Arunachal Pradesh. The top two apple fruit producing Indian states are Jammu and Kashmir and Himachal Pradesh. Apple is pre dominant fruit crops of Himachal Pradesh and J&K. In recent years, apple has emerged as the leading cash crop amongst fruit crops in the country. It constitutes 96 percent of area and 97 percent of production in the top two Indian states, and once known for its best quality of apple in the country, but apple cultivation now has become economical, valuable, job creation and profitable since recent years. It produces more than 10 lack jobs directly or indirectly. A study of production and marketing aspects of apple in detail is one of the greater importance's to Himachal Pradesh. The present study is a modest attempt to analyse the production efficiency and marketing efficiency of apple and the constraints in production and marketing of apple in Shimla and Kullu district of Himachal Pradesh.

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