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A study on constraints faced by apple growers in production and marketing of apple in Uttarakhand

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ABSTRACT: Horticulture sector is a major segment under the growing agriculture sector. India is the second-largest producer of fruits and vegetables in the World. Uttarakhand produces 57,753.49 metric tonnes of apples per year from both the regions of the State. Majority of apple growers are categorized under medium to low socio-economic status because of the constraints faced by them. Past researches showed that Apple growers were facing major problem of marketing inefficiency. The extension worker and farmers ratio are also less and there is a huge information gap. As a result, there is a need to assess the constraints faced by apple growers in Uttarakhand. The present study was conducted in the Uttarkashi district of Uttarakhand. Four villages were selected randomly from one block as it had a maximum number of apple growers. A total sample of 120 respondents (30 from each village) was selected by PPS sampling method. The data collection was done by using a pre-tested structured interview schedule. Besides knowledge test was also developed for determining the knowledge of apple farmers in the study area. The findings of the present study indicated that majority of the respondents (72.5%) belonged to middle age group, had education upto intermediate level (32.5%), had medium family size (92.5%), were in medium annual income (67%), had medium size of apple orchard (65%), had ten to thirteen year of experience in apple farming (44.16%), had medium information seeking behaviour (59.16%), had medium risk orientation (69.17%), owned mobile with internet (100%), have medium mass media exposure (65.84%). Climate change, lack of reasonably priced and efficient transport, poor transportation infrastructure, high cost of packaging material, knowledge deficit about grading facilities and low-quality extension services were identified as significant constraints.

Key words: Apple Growers, apple production, constraints, marketing of apples

India's economy is primarily based on agriculture, which is also vital to the growth of the country. A little more than half of India's inhabitants lived in villages, where agriculture is the main source of food, fuel, and revenue for other requirements. The Indian horticulture industry makes a very substantial contribution to the Indian economy by making up more than 30 per cent of the Gross Value Added in Agriculture. Fruit growing is one of the important and age-old practices in India since the past (Shaheen *et al.*, 2004). The cultivation of fruit crops play an important role in the overall status of agriculture productivity of the Nation. Apple is known as the king of temperate fruit and symbol of health. (Sharma *et al.*, 2010). It is mainly cultivated in Jammu & Kashmir, Himachal, Uttarakhand, Arunachal Pradesh, Nagaland, Kerala, Tamil Nadu, etc. Apple production and area in India is 2,316 thousand metric tonnes and 308 thousand hectares respectively. The two important states namely J&K

and Himachal Pradesh accounts for 92 per cent of the total production and about 85 per cent of the total area under apple cultivation in India. Apple is known in India as a most significant commercial fruit crop. (Wani *et al.*, 2021). Uttarakhand is mostly a hilly State resembling similar conditions to Jammu & Kashmir and Himachal Pradesh, having poor infrastructure and road network. Many disadvantaged and small apple growers lack sufficient access to knowledge about new technology and initiatives pertaining to the industry. Major problems faced by apple growers in the Garhwal region were seasonal changes like natural calamities, unseasonal rains, storms, hailstorms, etc. However, apple contributes more than half of the area under fruit cultivation as well as production in Uttarakhand but due to substantial changes in climate, the area as well as production of apple is declining in Uttarakhand. In Uttarakhand, there are many rural areas with dispersed inhabitants, and it

is expensive to personally convey information. The ratio of extension agents to farmers is 1:1156, which is quite low and demonstrates a wide gap. The current study's objectives are to look at the socio-economic, communication, and psychological traits of apple growers in the Garhwal region, to examine the constraints faced by apple growers in the production and marketing experience in Uttarakhand and to suggest strategy for the development of apple growers.

MATERIALS AND METHODS

Uttarkashi district of Uttarakhand was selected for the purpose of study in the year 2020-21. Four villages namely *Harsil*, *Jhala*, *Sukhi* and *Dharali* were selected randomly from the *Bhatwari* block which was selected purposively. A total sample of 120 respondents were selected by using PPS sampling method. Structured interview schedule was divided into two parts viz., general information, and constraints faced by Apple growers.

Constraint Analysis: Friedman test analysis was used to study the constraints faced by apple growers. The prime advantage of this technique over simple frequency distribution is that the constraints are arranged based on their severity from the point of view of respondents. Constraints were divided into seven main sub heads viz., Production, Marketing, Labour, Road and Transport, Packing, Grading, Information Reach. The responses to these constraints were recorded on a three-point continuum of 'most severe, severe and not severe' with the respective weightage of 3, 2 and 1. Nonparametric test i.e., Friedman two-way ANOVA by ranks test, as described by (Tripathi, 2014) was also used to identify the most severe constraints among the seven major constraints faced by apple growers by using the following formula:

$$F_r = \frac{12}{nk(k+1)} \left(\sum_{j=1}^k R_j^2 \right) - 3n(k+1)$$

RESULTS AND DISCUSSION

(i). **Profile characteristics of Apple growers:** The

findings of the present study (figure-1) regarding the socio-economic, communication and psychological parameters indicated that majority of the apple growers (72.5%) belonged to middle age group (36-57 years), had education up to intermediate level (32.5%), had medium family type (92.5%), were in medium annual income (67.5%) had medium size (<1.45 acre) of apple orchard (65%), had ten to thirteen years of experience in apple farming (44.16%), had medium information seeking behaviour (59.16%), had medium risk orientation (69.17%), owned mobile with internet (100%), have medium mass media exposure (65.84%). The information needs of respondents founded that all respondents (100%) needed information regarding plant protection measures.

It was also found that apple growers were quite matured age-wise and were engaged in farming. They had an intermediate level of education, lived in a medium family type having 3 to 4 Members (Kaur, 2011) and took apple cultivation in this region as a full-time enterprise. It was also revealed that although apple growers in Uttarakhand combine traditional farming with apple cultivation, their income is only moderate, which may have encouraged the respondents to use apple cultivation as an additional source of income in addition to crop-based farming. Further, it is evident from fig.1 that most of the respondents (65.00%) had a medium sized apple orchard of about 1.45 acre which might be due to undulated hilly regions and fragmented land holdings. So, most of the apple growers had 1.45 acre or small landholding size. Smallholding size may be one of the factors that have also contributed for similar findings as reported by Chauhan (2011). Interestingly, the apple growers were found to be growing apple for about 10-13 years, they may have started farming at an early age as a family tradition.

Information asymmetry at farm level is often seen as a critical factor in farm productivity. Timely access to latest/advanced information about agriculture technology is therefore crucial and plays a critical role in technology adoption (Sunetha and Ansari, 2014). Information seeking behaviour of respondents

Table 1: Distribution of respondents according to socio-economic characteristics (n=120)

S. No.	Categories	Frequency	Per centage
1.	<i>Age</i>		
a.	Young age (upto 36 years)	14	11.66
b.	Middle age (36 to 57 years)	87	72.5
c.	Old age (more than 57 years)	19	15.83
2.	<i>Education</i>		
a.	Primary school	13	10.83
b.	Middle school	24	20.0
c.	High school	30	25.0
d.	Intermediate	39	32.5
e.	Graduate and above	14	11.66
f.	Primary school	13	10.83
g.	Middle school	24	20.0
3.	<i>Family type</i>		
a.	Small	9	7.5
b.	Medium	111	92.5
4.	<i>Annual Income</i>		
a.	Low (< ₹1, 08,650)	31	25.83
b.	Medium (₹1,08,650 to ₹1,51,300)	81	67.5
c.	High (> ₹1,51,300)	8	6.66
5.	<i>Size of apple orchard</i>		
a.	Small farmers (<0.70 acres)	19	15.84
b.	Medium farmers (0.70 to 1.45 acres)	78	65.00
c.	Large farmers (>1.45acres)	23	19.16
6.	<i>Farming Experience</i>		
a.	Less than 10 years	4	3.33
b.	10 - 13 years	53	44.16
c.	13 - 19 years	37	43.3
d.	19 - 22 years	15	21.6
e.	More than 22 years	17	14.16
7.	<i>Information seeking behaviour</i>		
a.	Low	27	22.50
b.	Medium	71	59.16
c.	High	22	18.34
d.	<i>Risk orientation</i>		
e.	Low	15	12.50
f.	Medium	83	69.17
g.	High	22	18.33
8.	<i>Mass Media Exposure</i>		
a.	Low	19	15.83
b.	Medium	79	65.84
c.	High	22	18.33

was studied to find out how actively the farmers were seeking information. Figure 1 depicts that majority of the respondents (59.16%) had medium level of information seeking behaviour followed by 22.50 per cent who had low level of information seeking behaviour and 18.34 per cent displaying high level of information seeking behaviour. The findings of the present study are supported by

Raghuwanshi(2015). Thus, it can be concluded that most of the respondents had a medium level of information seeking behaviour which indicate, emerging trends towards using different information sources by the respondents of rural areas for bridging the information gap. Current study also highlighted that maximum numbers of respondents are curious to seek information about developments in agriculture from different sources. Psychologically speaking, the growers who had viewed apple farming as a business opportunity with a medium level of risk orientation towards the enterprise. Rathwa (2013) too reported the similar findings and the possible cause could be that most of the apple growers had a medium level of information source utilization.

From the results presented in the fig.1, it can be inferred that all the respondents (100%) owned smartphones with internet followed by 96.6 per cent of respondents who owned television, 46.67 per cent read/ subscribed to daily newspaper, 19.16 per cent of respondents had read/ subscribed farm magazine, and surprisingly none of the respondents reported to have Radio and have used Kisan Call Centre seeking information about apple cultivation. Additionally, 65.84 per cent apple growers had a medium level of mass media exposure followed by 18.33 per cent with high and 15.83 per cent with low level mass media exposure. The findings of the present study are in line with the study of Sharma (2008).

(ii) Constraints faced by apple growers: Findings regarding constraints are given in Table 2 which reveals that most severe production constraint perceived by apple growers was climate change followed by lack of credit availability from institutional sources and lack of knowledge about package of practices. The fourth major constraint reported by apple growers was lack of timely availability of good quality inputs followed by high incidence of diseases, insects, and pests. Majority of apple growers also reported that lack of reasonably priced and efficient transport facility was the most severe constraint under marketing category followed by lack of marketing facilities at village level and delayed payment by marketing agencies. The fourth constraint reported by apple growers was high prices

Table 2: Distribution of respondents according to constraints faced by apple growers (n=120)

Constraints	Most Severe	Severe	Least Severe	Mean Score (X)	Overall Rank
1. Production Constraints (Friedman Mean Rank Value Score= 3.86)					
a. Climate change	77 (64.17)	22 (18.34)	21 (17.50)	2.97	I
b. Lack of timely availability of good quality inputs	56 (46.67)	29 (24.17)	35 (29.17)	2.53	IV
c. High incidence of diseases, insects pests	45 (37.50)	47 (39.17)	28 (23.34)	1.62	V
d. Inadequate irrigation facilities	35 (29.17)	69 (57.50)	16 (13.34)	1.32	VI
f. Lack of credit availability from institutional sources	67 (55.84)	25 (20.84)	28 (23.34)	2.81	II
h. Lack of Knowledge about package of practices	62 (51.67)	21(17.50)	37 (30.84)	2.56	III
2. Marketing Constraints (Friedman Mean Rank Value Score= 3.92)					
i Lack of marketing facilities at village level	81(67.50)	29 (24.17)	10 (8.34)	2.72	II
ii Delayed payment by marketing agencies	76 (63.34)	23 (19.17)	21 (17.50)	2.13	III
iii Lack of reasonably priced and efficient transport	81 (67.50)	28 (23.34)	11(9.17)	2.93	I
iv Demand/supply mismatch and low price of farm produce	56 (46.67)	31(25.84)	33 (27.50)	1.14	V
v High prices of plant protection chemicals	71 (59.17)	30 (25)	19 (15.84)	1.94	IV
3. Labour constraint (Friedman Mean Rank Value Score= 3.42)					
i Shortage of labour	51 (42.50)	40 (33.34)	29 (24.17)	2.01	III
ii Higher wage rate	63 (52.50)	32 (26.67)	25 (20.84)	2.51	II
iii Unavailability of technically sound labour	71(59.17)	29 (24.17)	20 (16.67)	2.76	I
4. Proper road and transport facilities Constraint (Friedman Mean Rank Value Score= 3.57)					
i Poor transportation infrastructure	83 (69.17)	20 (16.67)	17 (14.17)	2.45	I
ii Non-availability of transport in time	59 (49.17)	31(25.84)	30 (25)	1.53	IV
iv Documentation for the loan is difficult	62 (51.67)	34 (28.34)	24 (20)	2.11	III
v High-interest rate for the loan	78 (65)	26 (21.67)	16 (13.34)	2.21	II
5. Packaging constraint (Friedman Mean Rank Value Score= 3.18)					
i Shortage of wooden boxes and cardboard in time	49 (40.84)	39 (32.50)	32 (26.67)	2.30	II
ii High cost of Packing material	69 (57.50)	49 (40.84)	2 (1.67)	2.49	I
6. Proper grading and standardisation constraint (Friedman Mean Rank Value Score= 3.18)					
i. Knowledge deficit about grading facilities	87 (72.50)	21 (17.50)	12 (10)	3.87	I
7. Information Reach constraint (Friedman Mean Rank Value Score= 3.69)					
i Poor communication facilities	80 (66.67)	40 (33.34)	20 (16.67)	1.09	II
ii Low quality extension services	87 (72.50)	17 (14.17)	16 (13.34)	2.81	I

of plant protection chemicals followed by demand/supply mismatch and low price of farm produce.

Further, majority of apple growers reported that unavailability of technically sound labour was the major constraint under skilled labour area. The second rank constraint perceived by the respondents was higher wage rate followed by shortage of labour. Under transportation head, poor transportation infrastructure was perceived by majority of respondents as first constraint followed by high-interest rate for the loan and documentation for the loan is difficult. Majority of apple growers also reported that high cost of packing material was found to be the most severe constraint under packaging followed by shortage of wooden boxes and cardboard in time. Majority of apple growers reported that low quality extension services followed by poor communication facilities were major

information reach constraints.

The asymptotic significance obtained from the Friedman test was 0.000 ($p < 0.01$) and Chi-square value was 76.77 with 3 degrees of freedom. Significance value showed, Monte Carlo Significance at 99 per cent Confidence Interval. Hence, it can be interpreted that there was significant difference between seven different sub-dimensions of constraints faced by the apple growers.

Table 2 further revealed that the marketing constraints had the highest mean rankings derived from using the Friedman test, making them the most severe of the seven broad restraints. Production constraints were the second-worst constraint. Third most severe constraint was lack of information constraints followed by lack of proper road fatalities constraints, suggesting that it was the weakest overall constraint.

CONCLUSION

Apple is one of the most important fruit crops of Uttarakhand and the state government is committed to increase the area under apple cultivation besides improving production and productivity. Even visiting tourists relish at the prospect of seeing apple orchards. The present findings have highlighted the major constraints reported by Apple growers under production, infrastructure and marketing categories. Besides, the extension system should generate mass awareness about latest package of practices to be adopted by the apple growers so that its productivity and production efficiency could be enhanced. The state government as well as central government must take into consideration these different constraints while formulating new policies and programmes for the promotion of apple cultivation in Uttarakhand.

Additionally, the apple growers have reported a trust deficit regarding the necessary knowledge and skills of the grassroots extension workers. Hence, the efforts should be undertaken by the concerned agencies/ institutions to periodically review the situation and provide necessary training to extension workers and other change agents in order to upscale their competencies and enhance their acceptability and respect among the farming community.

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