The Pharma Innovation

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An investigation into the socio-economic status and problems of cherry growers with reference to Shimla district of Himachal Pradesh

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Abstract

A study has been carried out to find out the problems faced by cherry cultivators and their socio economic conditions in Shimla district of Himachal Pradesh. Primary data from a representative sample of 50 farmers was collected from three purposively selected tehsils namely Nankhari, Kumarsain, and Kotkhai. Results revealed that 90.10 per cent of the family members were literates with a literacy index of 3.32. Average operational land holding size was 1.69 hectares of which 87.71 per cent was under fruit crops. Among different fruit crops, 42.54 per cent were cherry plants on overall category and dominant varieties of cherry were Dero Nero, Stella, Merchant and Van. The share of income from fruit ranged between 75.46 to 76.31 per cent indicating the fact that the study area was dominated by fruit cultivation and 40 per cent of the income from fruits was from the cultivation of cherry. Problem of bird attack, diseases, low shelf life, part payment to the farmers by contractors, change in climatic conditions and shortage of skilled labour were found more pronounced in the study area.

Keywords: Socio economic conditions, literacy index, varieties, income, problems

Introduction

Horticulture sector witnessed voluminous increase in production over the last few years and it is providing employment opportunities across primary, secondary and territory sectors in India. However horticulture in the state of Himachal Pradesh is economic necessity as land for agricultural crops is limited due to hilly terrain however state has wide range of agro climatic conditions due to which a large number of horticultural fruit crops (from temperate to sub tropical), and other crops are successfully grown. Farmers have seized this opportunity and state has came forward as the 'Horticultural State of India' by producing 8,45,422 metric tonnes of total fruits from an area of 2,32,139 in 2019-20 [2, 3]. Apple is the major commercial temperate horticultural crop of the state where as cherry a fleshy stone fruit belonging to genus Prunus of family Rosaceae is emerging as an alternative crop as area under cherry grew significantly at 2.1 per cent growth rate during 2007-17 and accounted for 28 per cent of total area under cherry in India [1, 4]. It is gaining significance in the state due to climate change because it has many advantages compared to competing fruit crops such as less water requirement, short-production duration and high value in the market. Additionally it provides crop diversification among crops which is focused on the economic gains to improve the Socio-economic development, productivity, extended employment and agro-socio-economic upliftment of resource-poor farming communities [5].

The main cherry grown areas in India are the North-Western Indian states of Jammu and Kashmir (J&K), Himachal Pradesh (H.P.) and in Uttarakhand. In Himachal Pradesh it is mainly grown in the higher reaches of Shimla, Kullu, Mandi, Chamba, Kinnaur and Lahaul & Spiti districts, at an altitude of 6,000 to 8,000 feet above mean sea level among which Shimla district is the major pocket under cherry cultivation which covers an area of 352 ha i.e. 78.4 per cent of the total area under cherry in state, with a production of 591 tonnes i.e. 95 per cent of the total production in H.P. [1]. Growers have exploited the niche advantages for fruits in the past in Himachal Pradesh moreover; the innovative orchardists have also been evolving new management practices and strategies in response to emerging needs. Even though, cherry emerged as an alternative crop in the apple growing areas still overall growth of cherry industry in the state over past few years were very low with only 0.20 and 0.08 per cent share in total fruit area and production [1, 4].

This growth has not been found to be dependent on man-made factors only but natural factors which are uncontrollable like hails, rainfall, snowfall, evaporation and humidity etc. have huge impact in bringing significant variations in production of fruits in general. At global level also many areas, though environmentally suited to cherry production, are currently unsuitable to profitable cherry production. The reason for this is the high perishability of the cherry with a useful life of only 2-3 weeks even with the best 'cool chain' storage facilities.

The status of cherry growers and major problems faced by them in cherry cultivation is unknown. Therefore there is a need for studying constraints regarding the cherry cultivation; especially at the local level. There is drought of research work in production, marketing and constraints regarding the cherry cultivation. This paper attempts to highlight the socioeconomic status of cherry growers and major constraints encountered by them while cultivating cherries. The study of cherry growers' status shall help suggest possible improvement in the producing region besides a thorough understanding of existing problems in production and marketing system will help in evolving effective policies, measures and procedures in handling the problems of cherry orchardists.

Materials and Methods
Purposive sampling was adopted to select the study area i.e. Shimla district of Himachal Pradesh because of its maximum contribution with respect to area and production of cherry in the state. Three major cherry growing areas, *viz.*, Kumarsain, Nankhari and Kotkhai tehsils selected purposively based on the secondary information available and simple random sampling was adopted further to select the ultimate sample of 50 cherry growers. For the analysis of data cherry growers were divided into two classes according to the type of cherry orchards, *viz.*, sole cherry orchards and mixed cherry orchards with apple or any other fruits. 56 per cent of selected growers had sole cherry orchards, whereas, 44 per cent in mixed category orchards. The data were collected through using personal interview technique on recall basis with the help of structured pre-tested schedule and both primary and secondary data was used for the study. The primary data on demographic features such as family size, age, education, occupation, economic parameters (land inventory, farm building, livestock, cropping pattern and income), problems faced by the growers on various aspects of production and marketing were collected from the selected households in the study area. Secondary data were also collected from the records of department of horticulture-Shimla, Himachal Pradesh, national horticulture board, block development offices of respective blocks, respective revenue offices and directorates of land records. To meet out the requirements of the study objectives simple tabular analysis was used to analyse the Socio-economic status and resource endowments. To compare, interpret and contrast the results in the study simple statistical tools like averages and percentages were used. Socio economic status was examined by calculating sex ratio, literacy rate index and cropping intensity by using the following formulae:

$$\text{Sex Ratio} = \frac{\text{No. of females in a family}}{\text{No. of males}} \times 1000$$

$$\text{Literacy rate} = \frac{\text{Total no. of literate person}}{\text{Total population}} \times 100$$

$$\text{Literacy Index} = \frac{\sum W_i X_i}{\sum X_i}$$

Where
W_i = Weights (0, 1,2,3,4 and 5) for illiterate, primary, middle, matric, secondary and graduate & above respectively.
X_i = Number of persons in respective category.

$$\text{Dependency ratio w. r. t. total workers} = \frac{\text{No. of dependents in a family}}{\text{Total workers}}$$

$$\text{Cropping intensity} = \frac{\text{Gross cropped area}}{\text{Net sown area}} \times 100$$

Chi-square test
The multiple responses of producers reporting various problems were taken into consideration for analysis and Chi-square test was used to test whether there is any significant difference among sole and mixed orchard of state in the problems faced by them. Chi-square test in m x n contingency table was applied where m and n are the number of problems faced by farmers. The detail of approximate Chi-square test ($\chi2$) is given as under:

$$\sum_{j=1}^{L} \sum_{i=1}^{K} \frac{(O - E)^2}{E} \sim \chi2 \quad (L - 1)(K - 1) \text{d. f.}$$

Where
O   =   Observed value
E   =   Expected value
K   =   number of problems
L   =   number of farm size groups

Results and Discussions
The socio economic characteristics like demographic features, dependency ratio, farm investments, literacy status and cropping pattern were analyzed and the results have been presented in Table 1 as they play an important role in ascertaining the socio-economic prosperity of the family in a particular area.

At overall level, the average family size comprised of about 6.0 persons, out of which 52.55 per cent were males and rest were females. The number of females per thousand of males was worked out to be 844 and 984 for sole and mixed categories respectively and 905 at overall level which was 909 in Himachal Pradesh census 2011. Analysis of family structure revealed the dominance (62%) of joint family system in the study area. Literacy situation of the sampled farms revealed that at overall level the proportion of literacy rate was 90.10 per cent and the literacy rate of males (96.58 per cent) found to be higher as compared to females (83.66 per cent) in overall category.

Literacy index, which shows the quality of education, was found 3.32 at overall level; moreover there was no significant difference in the quality of education among males and

females in the study area. On an average, the percentage of workers in family in overall farms was found to be 74 per cent and overall dependency ratio w.r.t. total workers was 0.35,

indicating that on an average one worker has to support less than one family member.

Table 1: Category wise Farm specific characteristics of sampled households

Particulars	Sole Orchard	Mixed Orchard	Overall
Average family size	06.32	05.68	06.04
Male (%)	54.24	50.04	52.55
Female (%)	45.76	49.60	47.45
Sex ratio	844	984	905
No. of families	28.00	22.00	50.00
Nuclear family (%)	39.29	36.36	38.00
Joint family (%)	60.71	63.64	62.00
Literacy rate (%)	89.16	91.30	90.10
Male literacy rate	96.55	96.61	96.58
Female literacy rate	82.05	85.71	83.66
Male Literacy index	03.57	03.73	03.64
Female Literacy index	02.72	03.34	02.99
Literacy index	03.15	03.54	03.32
No. of workers (%)	76.84	70.40	74.00
No. of dependents (<14 yrs & >65 years) (%)	23.16	29.60	26.00
Dependency ratio	0.30	0.42	0.35
Service sector occupation (%)	11.03	17.24	13.76
Business sector occupation (%)	07.35	04.60	06.14
Agriculture sector occupation (%)	81.62	78.16	80.10
Total land holding (owned) (ha)	1.76	2.04	1.88
Orchard Area (ha)	1.55 (88.07)	1.78 (87.25)	1.65 (87.71)
Gross cropped area (ha)	1.66 (94.32)	1.94 (95.10)	1.79 (95.21)
Net sown area/operational land holding (ha)	1.57 (89.20)	1.83 (89.71)	1.69 (89.89)
Cropping intensity (%)	105.72	106.24	105.95
Adult Cattle Units (ACU)	1.97	0.87	1.48
Total investment on Implements (Rs./farm)	69,101.79	71,118.18	69,989.00
Total investment on buildings (Rs./farm)	11,35,178.57	12,57,272.73	11,88,900.00

Figures in parentheses are percentage

Occupational distribution revealed that about 80.10 per cent farmers had farming as the main occupation and rest had service and business as their main occupation. Average investment on implements was Rs. 69,989.00 per farm at overall category while overall investment on buildings was Rs. 11,88,900 per farm. At overall level; area under orchard comprised 87.71 per cent of the total landholdings and operational land holding were 89 per cent of the total land holdings. Cropping intensity was found to vary between 105.72 to 106.24 per cent revealing the fact that cropping pattern was dominated by the cultivation of fruit crops in the area. The analysis of livestock inventory showed that average number of adult cattle units (ACU) varied from 0.87 to 1.97 between sole and mixed farms with an overall average of 1.48 ACU.

An attempt has been made to study the varietal status and production of cherry plants in the study area to examine the preference of the farmers about the cultivar of cherry. Results are given in the Table 2 and it can be observed that overall on an average 20.27 per cent of the total cherry plants were in the non-bearing stage and 80.73 per cent in bearing stage of which 'Dero Nero II' was the main cultivar (15.12%), followed by an old variety 'Red' on seedling rootstocks (14.34%), 'Merchant' (13.57%), 'Stella' (12.02%) and the some other varieties like 'Black', 'Van', 'Napoleon White', 'Sunburst' were also being grown prominently in study area. In addition to this cultivars such as 'Lambert', 'Regina', 'Lapins', 'Tieton', 'Merton Glory', 'Sam', 'Brooks', 'Bing', 'Early River' and 'Germersdorfer' were also found under cultivation with a proportion of 8.53.

Table 2: Variety wise inventory and production of cherry plants

Particulars	Average Percentage of Cherry Plants (percentage to total cherry trees)		Overall Production (kg/plant)		
Cultivar	Non Bearing Plants	Bearing Plants	EB	MB	LB
Stella	14.06	12.02	15	25	37
Van	9.38	10.47	12	24	48
Black	0.00	10.85	14	33	51
Napolean white	4.69	6.20	09	22	18
Dero-nero II	17.19	15.12	15	25	21
Merchant	14.06	13.57	14	25	24
Red	0.00	14.34	00	33	42
Cencist	7.81	4.26	12	24	33
Sunbrust	9.38	5.04	0.11	0.24	00
Overall Total	20.27	80.73	8.00	22.57	16.45

In case of non bearing plants new cultivars like 'Dero Nero II' (17.19%), 'Stella' (14.06%), 'Merchant' (14.06%), 'Van' (9.38%), 'Sunburst' (9.38%), 'Cencist' (7.81%) and 'Napoleon White' (4.69%) were found in study area showing the preference among the farmers. Overall category 'Dero

nero II', 'Merchant' and 'Stella' were found best with respect to production, whereas 'Red' and 'Black' old cultivars were giving higher production, but these cultivars are no longer preferred by the farmers because of longer gestation period and small size of berry.

Table 3: Average gross income from farm and nonfarm sources (per cent/farm)

Particulars	Sole orchards		Mixed orchard		Overall	
	Number of plants	Gross income	Number of plants	Gross income	Number of plants	Gross income
Cherry	52.81	32.48	29.46	26.86	42.54	30.10
Apple	40.04	39.72	62.98	46.98	50.13	42.79
All fruits	100.00	74.69	100.00	75.21	100.00	74.91
Farm	-	75.40	-	76.30	-	75.80
Non farm	-	24.60	-	23.70	-	24.20
Total	-	100.00	-	100.00	-	100.00

Figures in parentheses are percentage

To examine the relative importance of cherry cultivation in the economy of sampled households source wise break up of farm income on different categories has been summarized in Table 3. It can be seen from the table that in the sole category the proportion of cherry plants was 52.81 per cent compared to 29.46 per cent in mixed farms. Apple was the next important crop with a share of 40.04 to 62.98 per cent in sole and mixed category of farm respectively. Cherry contributed 52.81 per cent of the fruit income on sole farms, whereas, its contribution in mixed farms was 29.46 per cent. The yield exhibited increasing trend upto the age group 5-12 years, thereafter, it stagnated upto 12-22 years and then started declining. Farm income from cultivation of fruits, vegetables and rearing of livestock ranged from 75.40 per cent to 76.30

per cent on sole and mixed farms with an overall average of 75.80 per cent. It can further be inferred that about 24 per cent of the average gross income was contributed by non farm sector in the study area. The share of income from fruit ranged between 74.69 to 75.21 per cent again indicating the fact that the study area is dominated by fruit cultivation.

An attempt has been made to analyze the problems faced by cherry growers in study area and results have been presented in Table 4 for the sampled farms of the study area. Chi square was calculated and values which were found to be higher than tabulated value i.e. 3.84 at 0.05% probability level at 1 degree's of freedom were said to be significant. This indicates that suggestions provided by the farmers differ significantly between categories of various farm groups.

Table 4: Problems faced by the orchardist (Multiple Response in percentage)

Sr. No.	Particulars	Sole orchard	Mixed orchard	Overall	Chi square
A.	**Shortage of labour**				
i.	Shortage of skilled labour & higher wages rates	75.00	27.27	54.00	22.27**
B.	**Plant protection chemicals**				
i.	High prices of chemicals	14.29	18.18	16.00	0.23
C.	**Storage facility**				
ii.	Less shelf life and no storage facility	40.86	90.00	63.60	11.43**
D.	**Transportation**				
iii.	High transport charges	14.29	18.18	16.00	0.23
E.	**Malpractices**				
i.	Deduction of more charges	28.57	68.18	46.00	8.11**
ii.	Part payment & do not take the consent of farmers while selling	75.00	68.18	72.00	0.16
iii.	Not Getting good prices for the crop	75.00	40.91	60.00	5.01**
F.	**Others**				
i.	Lack of healthy plant material & Extension Services	14.29	22.73	18.00	0.96
ii.	Diseases (Gummosis, canker), insects (borer, fruit fly) and birds	82.14	95.00	87.72	0.88
iii.	Climatic condition	35.71	100.00	64.00	15.23**

** Significant at 5 per cent level

Gummosis, borer, low shelf life of cherry fruit, part payment to the farmers by contractors, change in climatic conditions and shortage of skilled labour were found to be the major problems in study area, whereas, problems *viz.*, shortage of skilled labour and higher wages rates, less shelf life and no storage facility, deduction of more charges by middleman, lack of availability of good prices for the crop and climatic conditions were found significant i.e. suggestions provided by the farmers differ significantly between categories of various farm.

Cherry farming completely depends on the climatic conditions which are changing every year causing huge loss hence efforts are needed to motivate and educate the

orchardists by holding short term training programmes besides; critical inputs should be made available to them at proper time of desired quality at affordable prices. Cherry being a perishable product incurs huge post-harvest losses and to minimize these losses, steps are required for quick disposal of the produce using improved techniques of refrigeration, storage, maintenance, packing material and expansion of network of link roads. Non- availability of sufficient market information to cherry growers also affects efficiency of the cherry markets as a consequence of which the growers miss the opportunities to sell their produce at remunerative prices, at right place and right time. Malpractices in buying and selling affect the distributive justice and efficiency of the

system. The practice of *e-marketing* could be used to increase the marketing efficiency in cherry trade. Strict enforcement of market laws through strict vigilance of the markets can help curb these malpractices.

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