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Research Paper

An appraisal of management skills of apple growers and apple productivity at varied elevations in Himachal Pradesh

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ABSTRACT : Apples are an important crop for the Himachal Pradesh state as the India's second largest producer of fresh apples and processed apple products he present study was undertaken in an Indian Himalayan state, Himachal Pradesh, with the major aim of studying the managerial skills of the farmers and the impact of the altitudes on the apple productivities Through questionnaire survey, the farmers responses were recorded at low hills ($\leq$ 2500 m), mid-hills (2500-3000 m) and upper hills ($\geq$3000 m) amsl as a whole. At overall level, in the study area the average value of MSI was 99.58. It was further concluded that there is no major disparity between the productivities of different altitudinal zones except between E_1 zone and other elevation zones. The mean productivity varied merely from 15.54 to 17.38 MT/ha between E_2–E_5 elevations. Statistically they were at par with each other. The computed value of critical difference was 1.94. The study area apple productivity matches with the world apple productivity. However, the productivity in the study area was found far less from the productivities attained by the many developed nations such as France. Italy, Brazil, Chile etc. Therefore, this study may be helpful for the researchers in up taking appropriate processes to fill the gaps in the managerial skills of the farmers and apple orchard productivity.

KEY WORDS : Apple farmers, Managerial skill index, Apple productivity, Altitude

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INTRODUCTION :

Apple cultivation in Himachal Pradesh has become the mainstay of over 1.7 lakh families in the state as the orchards now cover 1,09,533 hectares, around 49 per cent of the total area under fruit cultivation. Today the apple production in Himachal Pradesh is on the verge of declining productivity due to various factors. One of the factors is the managerial skills and another one is the land elevation. Significant financial and economic stress is facing many farm families, and a number of them are attempting to assess their potential to not just survive the current period of low prices and incomes, but to be viable, long-term participants in the agriculture of the future. The successful farm business of the future will require not only the personal and business attitudes and skills that have contributed to that success in the past, but new attitudes and skills as well (Boehlje and Ray, 1999). Beyond expressing praise for the individual's

management skills, what does such a statement mean? If asked to produce evidence to support their statement about any farmer, many would point to the fact that his fields are free of weeds and the field edges are well groomed. Others would point out that he uses the newest technologies, he has the latest machinery, and his machinery is well maintained. Some would cite the timely planting of crops each year and the track record of good yields. These production characteristics are important, but there are several other, less noticed and less talked about business management functions that farm managers of the future must perform in order to achieve success. And they must perform them well. In addition to being good production or plant managers, future farm managers must be skilled general managers (Boehlje *et al.*, 2001). Differences in farm business performance will result from differences in the management of a farm's resources and production processes. Farms are essentially manufacturing operations. Thus, careful organization and management of production will facilitate peak efficiency and in turn, contribute to increased profitability (Boehlje and Ray, 1999). No one system of apple production can ever provide the ideal solution for all circumstances. Each orchard presents its own particular problems where the 'fruit grower's resources in terms of money and managerial skills must be properly integrated (Walker, 1981). Technology improvements coincided with population migration from rural to urban living. These events have led to an increased size of farms and the large agribusiness firms (Gray, 2012). The acreage and the variables that are associated with the human capital, e.g., the level of schooling and the years of experience in agricultural activity, explain the levels of technical efficiency to a significant degree (Juan and Wilman, 2013). Hence, the purpose of this study is to study the managerial skills of the apple farmers in the study area and the impact of land elevation on the apple productivity.

MATERIALS AND METHODS :

Sampling plan :

This block was divided into five altitudinal zones and were designated as E_1, E_2, E_3, E_4 and E_5 for $\leq$1500m, 1500-2000m, 2000-2500m, 2500- 3000m, $\geq$3000m above mean sea level (amsl), respectively. A list of villages falling under each altitudinal zone was prepared along with the area under apple and other crops. There after 2 villages were selected randomly from each altitudinal zone. Thus, in all 10 villages were ultimately selected for the present investigation. Seven households from each village were selected based on equal allocation sampling method. Thus a sample of 70 apple growers from the block was drawn at random.

Managerial skill index :

Managerial skill index was used to measure the management capability of different orchardists. The formula to calculate the managerial skill index (MSI) (Timothy and Krishnamurthy, 1990) is given as under:

$$\text{MSI } Z \frac{M_i}{\overline{M}} x100$$

$$M_i = \frac{1M_1 + 2M_2 + 3M_3}{6}$$

where,

M_1 = Number of years of schooling
M_2 = Years of experience in farming
M_3 = Farm training undergone, if any.

With,

M_1 = 0 If illiterate
1 If upto school/literate
3 If college/college drop out

M_2 = 0 If no experience of farming
1 If there is 1 to 10 years of experience in farming.
3 If there is more than 10 years of experience in farming.

M_3 = 0 If no farm training undergone.
1 If once trained
3 If trained more than once.

Managerial skill index of each orchardist was estimated and grouped.

Comparative analysis of apple productivity:

One way classification method was applied.

$$\text{C D} = \text{"t" table value at error d.f. x} \sqrt{\frac{2 \text{ x MSE}}{r}}$$

$$CV = \frac{SD}{Mean} x100$$

$$\sigma = \sqrt{\frac{\sum_{i=1}^{n} (x_i - \bar{x})^2}{n-1}}$$

where,

r= Number of observations in each category

CV= Co-efficient of variation
CD= Critical difference
SD= σ = Standard deviation

RESULTS AND DATA ANALYSIS :

The results obtained from the present investigation as well as relevant discussion have been summarized under following heads :

Management :

In practice, management is a continuous process through observing and conceiving ideas. It covers all aspects of farm business that have a bearing on the economic efficiency of a farm. Solutions of economic problems faced by farmers are generally facilitated through recording of data related to farm. Management plays an important role in agricultural production in cohesion with other resources. Through the improvement in agriculture technology, farming has gone beyond its framework of just providing the necessities of life to the farm family. Not only the farmer now produces to meet family subsistence needs, but at the same time endeavours to produce maximum marketable surplus. This has made agricultural production market oriented and introduced business content in the farming profession. The management resource itself is very much responsible to achieve the objectives of professionalism. An attempt has been made to measure the managerial ability of the orchardists in the study area through a special index termed as managerial skill index.

Management skill index of study area :

At overall level, the detailed distribution of orchardists and average value of managerial skill index (MSI) is shown in Table 1.

It was observed from the table that maximum number of orchardists (52.86 %) were falling in the MSI range of 100-50 having average MSI of 83.99; followed by 30 per cent orchardist in MSI range of 150-100 with average MSI of 124.65 and 11.43 per cent orchardists in MSI range of 200-150 with average MSI of 169.12 in the study area. Only 5.71 per cent of the farmers were in the range of less than ≤ 50 MSI score having average MSI of 49.02. When pooled, MSI ranged between 49.02 -176.47, with average MSI of 99.58.

Elevation wise management skill index of the study area :

In case of elevation wise orchards, the detailed distribution of orchardists and average value of managerial skill index (MSI) is placed in Table 2. Table depicts that maximum average MSI value of orchardists was in the E_5 elevation (110.64) and minimum being in E_1 elevation (98.04). E_2, E_3 and E_4 elevation farmers had equal average MSI value (103.64) (Fig. 1).

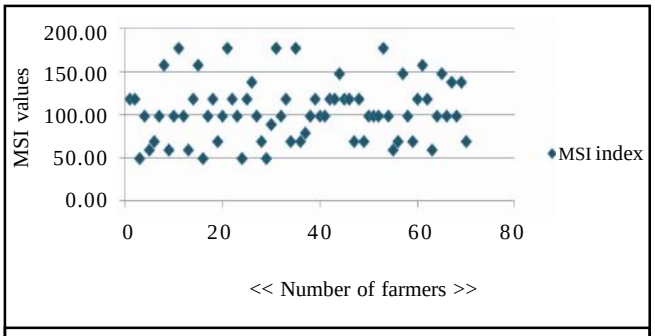

Fig. 1 : Managerial skill index of the farmers (study sample), 2012-13

Elevation wise productivity analysis :

The statistical analysis of the productivity is done with precision. As enumerated in the Table 3, it states that the productivity varied from 9.13 - 24.91 MT/ha in the pooled condition. The mean productivity is worked out to 15.60 MT/ha and the standard deviation in the productivity was noticed to be 3.17. This variance in the range of apple productivity is estimated to be the act of the chokepoints like climatic variations. It is significant

Table 1: Orchardists' distribution and their average value of Managerial Skill index (MSI) in the study area, 2012-13

Range of MSI	Orchardists		Range	Average MSI	SD
	Number	Percentage			
200-150	8	11.43	156.86 - 176.47	169.12	3.59
150-100	21	30	117.65 - 147.06	124.65	11.66
100-50	37	52.86	58.82 - 98.04	83.99	16.27
≤ 50	4	5.71	49.02	49.02	0
Total	70	100	49.02 - 176.47	99.58	34.63

to note that the average yield per hectare has positive relationship with the altitudinal range indicating thereby that altitude play an important and positive role in increasing the productivity of the orchards. This provides ample evidence to the fact that, altitude being a proxy for climatic factors in causing a shift in apple farming towards higher elevation zones, which implies that in future all-out efforts must be directed towards establishment of apple, in higher elevation zone to run the industry on profitable lines.

An argument may be contentious, but well thought out and researched line of reasoning productivity analysis plays a pivotal role in helping plan in a defined manner for future prosperity in the global stratum.

The mean values of productivities in different elevation zones have been presented in Table 4. As shown in the table, the maximum mean productivity of 17.38 MT/ ha was observed in E_5 elevation. This elevation was statistically at par with E_4 (16.87 MT/ ha), E_3 (16.28 MT/ ha) and E_2 (15.54 MT/ ha) elevations, respectively. Whereas the minimum mean productivity of 11.93 MT/ ha was observed in E_1 elevation.

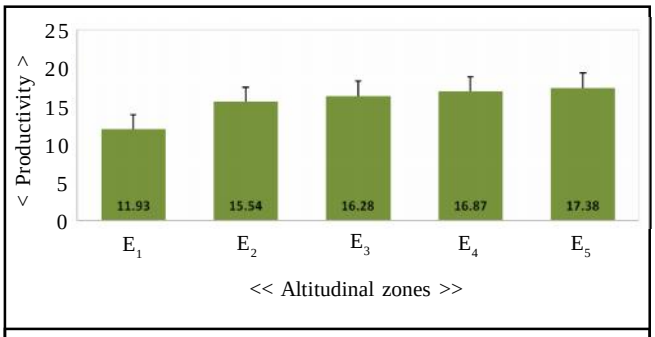

Fig. 2 : Mean productivities of different altitudinal zones

Therefore, it is observed that there is no major disparity among the productivities of different altitudinal

Table 2 : Elevation wise management skill index of study sample, 2011-12

Elevation	Orchardists		Range	Average MSI	SD
	Number	Percentage			
E_1	14	20	49.02 - 156.86	98.04	37.88
E_2	14	20	49.02 - 156.86	103.64	37.63
E_3	14	20	49.02 - 176.47	103.64	36.82
E_4	14	20	49.02 - 176.47	103.64	32.57
E_5	14	20	58.82 - 156.86	110.64	31.81
Pooled	56	100	49.02 - 176.47	103.92	34.63

Table 3 : Elevation wise productivity analysis

Sr. No.	Elevation	Apple productivity (MT/ ha)			SD
		Minimum	Maximum	Mean	
1.	E_1	9.13	15.42	11.93	1.47
2.	E_2	12.25	20.39	15.54	2.1
3.	E_3	14.26	20.19	16.28	1.99
4.	E_4	13.33	24.91	16.87	3.8
5.	E_5	13.6	22.74	17.38	2.85
	Pooled	9.13	24.91	15.6	3.17

Note: SD - Denotes standard deviation

Table 4: Productivity differences in different elevations

Altitudes	Range (MT/ha)	Mean (MT/ha)	C.V. (%)
E_1	9.13 - 15.42	11.93	12.33
E_2	11.99 - 20.39	15.54	13.51
E_3	13.66 - 24.19	16.28	12.22
E_4	12.79 - 24.91	16.87	22.53
E_5	13.03 - 22.74	17.38	16.49
		C.D. = 1.94	

zones except between E_1 and other zones. As the mean productivity value in E_1 zone was noted to be 11.93 MT/ha, the mean productivity varied merely from 15.54 – 17.38 MT/ha among E_2 – E_5 elevations. The critical difference value was computed to 1.94 and there was statistically no difference in the apple productivities of the orchards falling in E_2, E_3, E_4 and E_5 elevation zones, which was less than the CD value (1.94). It is expected that the geographical situation in the E_1 zone is held responsible for the low productivity. The data heaves into an ambiguous situation of thought that there has been an increasing clamor from the climate change on the lower elevations. As a result, there is continuous slide in the productivity in lower elevations.

Conclusion:

Management is a continuous process through observing and conceiving ideas. At overall level, in the study area the average value of MSI was 99.58. Nearly 52.86 per cent of orchardists had MSI of 124.65, 11.43 per cent orchardists MSI worked out to be highest of 169.12. The study revealed that the average yield per hectare has a positive relationship with altitudinal range indicating thereby that altitude play an important and positive role in increasing the productivity of the apple orchards. It was further concluded that there is no major disparity between the productivities of different altitudinal zones except between E_1 zone and other elevation zones. The mean productivity varied merely from 15.54 to 17.38 MT/ha between E_2–E_5 elevations. Statistically they were at par with each other. The computed value of critical difference was 1.94. On the basis of current data, the average productivity of apple in the study area was found two and a half times more to that of average apple productivity of the state as a whole and nearly one and a half times more to that of Indian apple productivity. The study area apple productivity matches with the world apple productivity. However, the productivity in the study area was found far less from the productivities attained by the many developed nations such as France. Italy, Brazil, Chile etc. Therefore, This study may be handy for the researchers in up taking suitable measures in reaching out the farmers to fill the gaps in the managerial skills of the farmers and productivities in comparison with global scenario.

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