Original Research Article

Assessment of existing, desired competencies and skills of apple growers in low and high altitude areas of district Shopian in Jammu & Kashmir:

Abstract: The present study was conducted in low and high altitude areas comprising of villages viz-Keegam, Tikora and Tengwani (low altitude areas) and Imam Sahab, Hillow and Nagbal (high altitude areas) of district Shopian of Jammu and Kashmir with sample size of 120 apple growers. The district Shopian was purposively selected, because of the potentiality for the development of horticulture, mainly because 90 per cent area of the district was under apple plantation. It has been observed that most of the apple growers were not able to perform different tasks (not skilled) regarding apple cultivation and as such they were of the opinion that they need special training sessions in order to be enough competent to perform different tasks in apple cultivation, some apple growers were eager to get trainings on priority basis. It had also been observed that the skills and competencies of the fruit growers regarding expert guidance planning, layout planning, weed management, pest and disease management, intercultural operations, soil testing etc. were low and as such fruit growers need trainings mostly in soil and water testing, pest and disease management, physiological disorder management among others.

Keywords: Altitude, apple growers, skills, competencies.

Introduction

Agricultural sector is considered as an effective factor in economic development of countries. Achieving food security and agricultural development is possible only by cultivated and use of new technologies in farm land (Rasouliazar and Fealy, 2011). Agriculture is the back bone of the Indian economy and plays a vital role in the overall development of the nation. About 70% of India's population, that is 830 million people, reside in rural villages, and agriculture is their primary source of food, fodder and fuel, as well as income to satisfy other needs. India has achieved self-sufficiency in food grain production and now the major concern is to achieve higher growth rate. The focus has now shifted from agriculture to horticulture sector, which besides imparting nutritional security, offers a great potential for efficient input use, higher returns per unit area, crop diversification, foreign exchange earnings and greater employment generation through post-harvest processing in agro industries. Fruit cultivation in India is one such potential

commercial and business sectors for exporting merchandise and shipping from which much of the international revenue is expected. Millions of farmers rely on land, which is too small and too poor to sustain the living of their families, but still they have to make ends meet on that land. Indian agriculture is facing serious challenges because of its ever-increasing population, limited land and water availability, and degradation of natural resources. It is desirable to increase agricultural productivity in a sustainable manner. The excessive use of agro-chemicals over past decades has deteriorated soil health leading to declines of crop yields and produce quality (Yadav *et al*, 2013). Apple is commercially the most important temperate fruit and occupies the fourth (4^{th}) position in the world in terms of production after banana, orange and grapes. China, USA and Turkey are the top three countries in the world as for as apple production is concerned, followed by Italy, India and Poland. According to USDA (United States Department of Agriculture) China is the topmost producer of apple, producing 43 million tonnes in the year 2015-16, followed by United States, which produced 41 million tonnes of apples in the same year. The third apple producing country in the world is Turkey. It produced 2.5 million tonnes of apples in the year 2015-16. Turkey produces one of the finest apples in the world. The apples produced were exported throughout the world (Anonymous, 2016).

Apple is one of the most widely cultivated tree fruits. The apple is the fourth widely produced fruit in the world after banana, orange and grapes. India is ranked as the sixth largest world's apple producing country and second largest country in area (Deodhar *et al,* 2006). Nearly all of the Indian apples are grown in three mountainous states of north India – Himachal Pradesh, Jammu and Kashmir and Uttaranchal, where they are typically grown at an altitude of 4000 to 11,000 feet. J & K and Himachal Pradesh have almost equal area under apple plantation, but J&K has the highest average yield and accounts for 67 per cent of total apple production and 50 per cent of its exports in the country, hence a substantial foreign exchange earner for economic growth. India annually exports apple worth Rs. 400 million (Nearly US$ 10 million) out of which Rs. 200 million in apples comes from J&K's North region i.e. Kashmir (Reshi *et al*, 2010). As far as apple production is considered, it accounts for 51 % of total area of 2.72 lac hectares under all temperate fruits grown in this state. The annual apple production in the state is 13.73 lakh Metric tonnes (Anonymous, 2009). So being the most important fruit crop in the region, farmers need timely trainings to get fully acquainted to different practices in apple cultivation, absence of which may result faulty practices and thereby reduction in production and productivity.

Training of the farmers is essential to induce motivation, create confidence and inculcate efficiency in an individual. Training of the farmers is also inevitable for imparting new knowledge and updating the skills of farmers. Training of farmers had assumed further importance and urgency in the context of the high yielding varieties and improved practices in agriculture and allied fields. In order to make any training meaningful and effective, it is imperative on the part of the training organizers to identify the training needs of the farmers based on which suitable training modules can be developed so that the appropriate training is given to the right people, in the right form, at the right time so that higher degree of productivity and profitability can be achieved (Prajapati and Patel, 2013). Therefore, training of the farmers is 'an intensive learning activity, assisted by competent trainers to understand and practice the skills required in a deficit situation in the knowledge, skills and attitude level of the practicing farmers as well as the availability of appropriate applicable information, the utilization of which will correct the problems (Okwu and Ejembi 2005).

Training of farmers plays an important role in the advancement of human performance in a given situation. Training provides a systematic improvement of knowledge and skills which in turn helps the farmers to function effectively and efficiently on their farms. Training is a process of acquisition of new skills, attitude and knowledge in the context of improving ones productivity. Effective training requires a clear picture of how the farmers will need to use information after training in place of local practices what they have adopted before in their situation. Training to the farmers consists largely of well-organized opportunities for participants to acquire necessary understanding and skill. Farmer training is directed towards improving their job efficiency in farming. The kind of education we call as training is not for knowing more but behaving differently. In KVKs, trainings are conducted at various levels for which the programmes are designed based on the farmer's problems and their needs and interests (Sajeev and Singha, 2010). Training of the farmer is a process of acquisition of new skills, attitude and knowledge in the context of preparing for entry into a vocation or improving ones productivity. Effective training programme requires a clear picture of how the farmers will need to use information after training in place of local practices what they have adopted before in their situation (Sajeev, *et al.* 2012).

Research methodology:

A multistage sampling procedure was adopted for the selection of districts, tehsils, villages and sample respondents. Kashmir valley consists of 10 districts namely Anantnag,

Kulgam, Pulwama, Shopian, Srinagar, Bandipora, Baramulla, Budgam, Ganderbal and Kupwara. Among these, district Shopian was selected purposively. District Shopian was purposively selected because of the potentiality for the development of horticulture, mainly because 90 per cent area of the district was under apple plantation and prevailing agro climatic situations were very good for cultivation of horticultural crops especially fruit crops and apple in particular. The study was conducted in two types of altitudes viz. low altitude, and high altitudes in the form of strata which were purposively selected, because of maximum area under apple cultivation. Each strata consisted of three villages which were randomly selected. A list of apple growers from each village was prepared in consultation with village sarpanches/revenue authorities. The prepared list was stratified properly, taking care that it includes small, marginal and large farmers. Accordingly a sample size of twenty farmers from each village was selected randomly, thus making a sample size of sixty respondents from each strata. A sample size of 120 respondents from two strata's was included in the study.

Result and discussion:

1. "Planning skills" of low altitude farmers.

Table 1 presents the data regarding planning skills of apple growers of low altitude areas. It reveals that 15 per cent of the apple growers had taken guidance from experts before establishment of their orchard while as 85 per cent of apple growers had not taken any guidance from experts, 78.44 per cent of apple growers were of the opinion that they needed guidance, while 21.66 of apple growers did not need any guidance from experts, 78.34 per cent of apple growers preferred to acquire guidance from experts on priority basis, while 21.66 per cent of apple growers did not prefer any guidance. In case of site selection 41.66 per cent of apple growers had selected site prior to the establishment of their orchards, while 58.44 per cent of apple growers had established their orchards without any site selection, 78.44 per cent of them needed training for site selection of an orchard while 21.66 of the apple growers refused to undergo training for selection of site, among these 51.66 per cent of apple growers preferred to undergo training programmes for such skill on priority basis while rest 21.66 per cent had not preferred. In case of selection of varieties, 55 per cent of apple growers had selected recommended varieties, while 45 per cent of apple growers had not selected the recommended varieties for their orchards, 73.44 per cent of apple growers needed training, while 26.66 per cent of apple growers refused to undergo training for this skill, 61.66 per cent of apple growers needed training

in selecting varieties on priority basis while 38.34 per cent of apple growers did not need. In case of layout planning, 61.66 per cent of apple growers had planned the layout of an orchard, while 38.44 per cent of apple growers had not done anything regarding layout of an orchard, 86.66 per cent of apple growers needed training, while 13.44 per cent of apple growers did not need any training for layout planning of apple orchard, 71.66 per cent of apple growers preferred training for this skill on priority basis, while 28.34 per cent of apple growers had not preferred. In case of soil testing, 26.66 per cent of apple growers had done soil testing prior to the establishment of their orchards, while 73.44 per cent of apple growers had not done soil testing prior to the establishment of their orchards, 90 per cent of apple growers needed training, while 10 per cent of apple growers did not need any training for soil testing, 85 per cent of apple growers needed training on priority basis for such skill, while 15 per cent had not preferred. In case of pollinizer ratio, 43.44 per cent of apple growers had maintained the pollinizer ratio in their orchards, while 56.66 per cent of apple growers had not maintained pollinizer ratio in their orchards, 93.44 per cent of apple growers need training in this skill, while 6.66 per cent of apple growers refused to undergo in any training programme for maintaining the pollinizer ratio in apple orchards, 81.66 per cent of apple growers preferred to undergo training for such skill on priority basis, while 18.34 per cent did not preferred.

2. "Management skills" of low altitude farmers.

Table 2 presents the data regarding management skills of apple growers of low altitude areas. It reveals that 38.34 per cent of the apple growers had managed the nutrients for the better health of plants in their orchards while as 61.66 per cent of apple growers had not managed nutrients properly, 75 per cent of apple growers were of the opinion that they needed training for the nutrients management in their orchards, while 25 of apple growers did not need any training programme for such skill, 71.66 per cent of apple growers preferred to acquire training on nutrient management on priority basis while 28.44 per cent of apple growers had not preferred any training programme. In case of management of pests and diseases 28.44 per cent of apple growers had managed the pests and diseases occurring in their orchards, while 71.66 per cent of apple growers had not managed pests and diseases in their orchards, 90 per cent of them needed trainings for this skill while 10 of the apple growers refused to undergo training for management of pests and diseases, among these apple growers 78.34 per cent preferred to undergo training programmes for such skill on priority basis while rest 21.66 per cent did not prefer. In case of management of irrigation, 55 per cent of apple growers had managed this skill in

their orchards, while 45 per cent of apple growers had not maintained the irrigation facilities in their orchards, 81.66 per cent of apple growers needed training, while 18.44 per cent of apple growers refused to undergo training for this skill, 53.34 per cent of apple growers needed training for irrigation on priority basis while 46.66 per cent of apple growers did not need any training for such skill. In case of management of weeds, 61.66 per cent of apple growers had managed the weeds in their orchards, while 38.44 per cent of apple growers had not managed weeds in their orchards, 91.66 per cent of apple growers needed training, while 08.44 per cent of apple growers did not need any training for weed management, 70 per cent of apple growers preferred training for this skill on priority basis, while 30 per cent of apple growers had not preferred. In case of management of stress, 28.44 per cent of apple growers had managed different types of stresses in their orchards, while 71.66 per cent of apple growers had not managed, 85 per cent of apple growers needed training, while 15 per cent of apple growers did not need any training for stress management, 71.66 per cent of apple growers needed training on priority basis for such skill, while 28.34 per cent of apple growers had not preferred. In case of management of physiological disorders, 38.44 per cent of apple growers had protected their orchards against various physiological disorders, while 61.66 per cent of apple growers had not managed these physiological disorders in their orchards, 88.34 per cent of apple growers needed training for better management of physiological disorders in their orchards, while 11.66 per cent of apple growers refused to undergo in any training programme for managing different physiological disorders,78.33 per cent of apple growers prefer to undergo training for such skill on priority basis, while 21.66 per cent did not preferred training for such skill.

3. "Practical skills" of low altitude farmers.

Table 3 presents the data regarding practical skills of apple growers of low altitude areas. It reveals that 61.66 per cent of the apple growers had planted wind breaks on the borders of their orchards while as 38.44 per cent of apple growers had not planted wind breaks around their orchards, 60 per cent of apple growers were of the opinion that they needed training for such skill, while 40 per cent of apple growers did not need any training programme, 21.66 per cent of apple growers preferred training on priority basis for planting of wind breaks while 78.34 per cent of apple growers had not preferred any training programme on priority basis for such skill. In case of control of rodents 61.66 per cent of apple growers had controlled different rodents in their orchards, while 38.44 per cent of apple growers had not controlled these rodents. 68.33 per cent of apple growers

needed training for rodent control, while 31.66 per cent of them did not need any training for this skill. Among these apple growers 45 per cent preferred training programmes for such skill on priority basis while 55 per cent did not prefer. In case of intercultural operations, 30 per cent of apple growers were having this skill, while 70 per cent of apple growers were not performing recommended intercultural operations in their orchards, 76.66 per cent of apple growers needed training on this skill, while 23.34 per cent of apple growers refused to undergo in any training programme, 55 per cent of apple growers needed training on priority basis while 45 per cent of apple growers did not need training programme on priority basis for intercultural operations. In case of handling of spray equipment's, 23.33 per cent of apple growers were handling these spray equipment's properly, while 76.66 per cent of apple growers were not

handling these equipment's, 86.66 per cent of apple growers needed training for handling of spray equipment's, while 13.34 per cent of apple growers did not need any training for such skill, 68.33 per cent of apple growers preferred training for this skill on priority basis, while 31.66 per cent of apple growers had not preferred. In case of proper weighing of chemicals for spray, 18.34 per cent of apple growers were properly weighing the chemicals for spray, while 81.66 per cent of apple growers had not properly weighed chemicals for spraying, 83.34 per cent of apple growers needed training, while 16.66 per cent of apple growers did not need any training for this skill, 61.66 per cent of apple growers needed training on priority basis for weighing of spray chemicals, while 38.34 per cent of apple growers had not preferred any training for such skill. In case of grading and packaging of fruits, 35 per cent of apple growers were grading and packaging the fruits in a better way, while 65 per cent of apple growers had not graded or packaged apple fruits, 85 per cent of apple growers needed training in this skill, while 15 per cent of apple growers refused to undergo in any training programme for grading and packaging of apple fruits, 81.66 per cent of apple growers prefer to undergo training for such skill on priority basis , while 18.34per cent of apple growers did not preferred training for such skill on priority basis.

i. "Planning skills" of high altitude farmers.

Table 4 presents the data regarding planning skills of apple growers of high altitude areas. It reveals that 1.66 per cent of the apple growers had taken guidance from experts before establishment of their orchard while 98.34 per cent of apple growers had not taken any guidance from experts, 95 per cent of apple growers were of the opinion that they needed guidance, while 05 of apple growers did not need any guidance, 91.66 per cent of apple growers preferred to acquire guidance from experts on priority basis and 8.34 per

cent of apple growers did not prefer any guidance on priority basis. In case of site selection 26.66 per cent of apple growers had selected site properly prior to establishment of their orchards, while 73.34 per cent of apple growers had established their orchards without site selection, 86.66 per cent of them needed trainings for selection of site of an orchard while 13.34 per cent of the apple growers refused to undergo training for selection of site, among these 81.66 per cent of apple growers preferred to undergo training programmes for such skills on priority basis while rest 18.34 per cent showed no preference for site selection. In case of selection of varieties, 35 per cent of apple growers had selected recommended varieties for their orchards, while 65 per cent of apple growers had not selected the recommended varieties for their orchards, 93.34 per cent of apple growers needed training, while 6.66 per cent of apple growers refused to undergo training for this skill, 86.66 per cent of apple growers needed training in selecting varieties on priority basis while 13.34 per cent of apple growers did not need. In case of layout planning, 48.34 per cent of apple growers had planned the layout of an orchard in line with the recommendations, while 51.66 per cent of apple growers did not know anything about layout planning, 95 per cent of apple growers needed training, while 05 per cent of apple growers did not need any training for layout planning of apple orchard, 90 per cent of apple growers preferred training for this skill on priority basis, while 10 per cent of apple growers did not prefer it. In case of soil testing, 53.34 per cent of apple growers had done soil testing prior to the establishment of their orchards, while 46.66 per cent of apple growers had not done soil testing for an orchard, 96.66 per cent of apple growers needed training, while 3.34 per cent of apple growers did not need any training for soil testing, 91.66 per cent of apple growers needed training on priority basis for such skill, while 8.34 per cent had not preferred. In case of pollinizer ratio,23.34 per cent of apple growers had maintained the recommended pollinizer ratio in their orchards, while 76.66 per cent of apple growers had not maintained the pollinizer ratio in their orchards, 88.34 per cent of apple growers need training in this skill, while 11.66 per cent of apple growers refused to undergo training for maintaining the pollinizer ratio in apple orchards,80 per cent of apple growers prefer to undergo training on priority basis for such skill, while 20 per cent did not prefer training for such skill.

ii. **"Management skills" of high altitude farmers.**

Table 5 presents the data regarding management skills of apple growers of high altitude areas. It reveals that 33.34 per cent of the apple growers had managed the nutrients for the better health of plants in their orchards while as 66.66 per cent of apple growers had not managed the nutrients properly, 80 per cent of apple growers were of the opinion

that they needed training for the maintenance of nutrients in their orchards, while 20 of apple growers did not need any training programme for such skill, 71.66 per cent of apple growers preferred to acquire training on nutrient management on priority basis while 28.34 per cent of apple growers had not preferred. In case of management of pests and diseases 30 per cent of apple growers had managed pests and diseases occurring in their orchards, while 70 per cent of apple growers preferred to undergo training for management of pests and diseases, 90 per cent of them had not managed pests and diseases, 93.34 per cent of the apple growers needed training for management of pests and diseases, while 6.66 per cent of the apple growers refused to undergo training for the management of pests and diseases, 86.66 per cent of apple growers preferred training for such skill on priority basis while rest 13.34 per cent did not prefer. In case of management of irrigation,48.34 per cent of apple growers had managed this skill in their orchards, while 51.66 per cent of apple growers had not maintained the irrigation facilities for their orchards, 88.44 per cent of apple growers needed training, while 11.66 per cent of apple growers refused to undergo training for this skill, 80 per cent of apple growers needed training on management of irrigation in their orchards on priority basis while 20 per cent of apple growers did not need any training for such skill. In case of management of weeds 31.66 per cent of apple growers know about the management of weeds in their orchards, while 68.34 per cent of apple growers had not managed weeds in their orchards, 80 per cent of apple growers needed training, while 20 per cent of apple growers did not need any training for weed management, 68.34 per cent of apple growers preferred training for this skill on priority basis, while 31.66 per cent of apple growers had not preferred. In case of management of stress, 23.34 per cent of apple growers had managed different types of stresses in their orchards, while 76.66 per cent of apple growers had not managed, 85 per cent of apple growers needed training, while 15 per cent of apple growers did not need any training for stress management, 78.34 per cent of apple growers needed training on priority basis for such skill, while 21.66 per cent of apple growers had not preferred. In case of management of physiological disorders, 26.66 per cent of apple growers had protected their orchards against various physiological disorders, while 73.34 per cent of apple growers had not managed these physiological disorders in their orchards, 90 per cent of apple growers need training in this skill, while 10 per cent of apple growers refused to undergo in any training programme for managing different physiological disorders in apple orchards,88.34 per cent of apple growers prefer to undergo training for such skill on priority basis, while 11.66 per cent did not preferred training for such skill

iii. **"Practical skills" of high altitude farmers.**

Table 6 presents the data regarding practical skills of apple growers of high altitude areas. It reveals that 23.34 per cent of the apple growers had planted wind breaks on the borders of their orchards while as 76.66 per cent of apple growers had not planted wind breaks around their orchards, 71.66 per cent of apple growers were of the opinion that they needed training for such skill, while 28.34 per cent of apple growers did not need any training programme, 56.66 per cent of apple growers preferred to acquire training on priority basis for planting of wind breaks while 43.33 per cent of apple growers had not preferred any training programme on priority basis for such skill. In case of control of rodents 78.34 per cent of apple growers had controlled different rodents in their orchards, while 21.66 per cent of apple growers had not controlled these rodents. 56.66 per cent of apple growers preferred to undergo training for rodent control, while 43.34 per cent of them did not need any training for this skill. Among these apple growers 51.66 per cent preferred training programmes for such skill on priority basis while 48.34 per cent did not preferred. In case of intercultural operations, 40 per cent of apple growers were having this skill, while 60 per cent of apple growers were not performing this skill in their orchards, 88.34 per cent of apple growers needed training on intercultural operations, while 11.66 per cent of apple growers refused to undergo training for this skill, 91.66 per cent of apple growers needed training on priority basis while 18.34 per cent of apple growers did not need. In case of handling of spray equipment's, 51.66 per cent of apple growers were handling these spray equipment's properly, while 48.34 per cent of apple growers were not handling these equipment's properly, 95 per cent of apple growers needed training for handling of spray equipment's, while 05 per cent of apple growers did not need any training for such skill, 88.34 per cent of apple growers preferred training for this skill on priority basis, while 11.66 per cent of apple growers had not preferred. In case of proper weighing of chemicals for spray, 31.66 per cent of apple growers were properly weighing the chemicals for spray, while 68.34 per cent of apple growers had not properly weighed the chemicals for spraying, 98.34 per cent of apple growers needed training, while 1.66 per cent of apple growers did not need any training for this skill, 93.34 per cent of apple growers needed training on priority basis for weighing of spray chemicals, while 6.66 per cent of apple growers had not preferred any training for such skill. In case of grading and packaging of fruits, 11.66 per cent of apple growers were grading and packaging the fruits in a better way, while 88.34 per cent of apple growers had not graded or packaged apple fruits properly, 95 per cent of apple growers needed training in this

skill, while 05 per cent of apple growers refused to undergo in any training programme for grading and packaging of apple of fruits, 90 per cent of apple growers prefer to undergo training for such skill on priority basis , while 10 per cent of apple growers did not preferred training for such skill.

Table - 1: Planning skills of low altitude farmers.

Planning Skills	Task Performed		Training need		Acquiring this skill on priority	
Task Statement	Frequency		Frequency		Frequency	
	Performed	Not performed	Need training	Not need	Acquire	Do not acquire
Expert guidance for planning	09 (15)	51 (85)	53 (88.44)	07 (11.66)	47 (78.34)	13 (21.66)
Site selection	25 (41.66)	35 (58.44)	47 (78.44)	13 (21.66)	31 (51.66)	29 (48.34)
Selection of varieties	33 (55)	27 (45)	44 (73.44)	16 (26.66)	37 (61.66)	23 (38.34)
Layout planning	37 (61.66)	23 (38.44)	52 (86.66)	08 (13.44)	43 (71.66)	17 (28.34)
Soil testing	16 (26.66)	44 (73.44)	54 (90)	06 (10)	51 (85)	09 (15)
Pollination	26 (43.34)	34 (56.66)	56 (93.44)	04 (6.66)	49 (81.66)	11 (18.34)

Figures within parenthesis indicate respective percentage.

Table - 2: Management skills of low altitude farmers.

Management Skills	Task Performed		Training need		Acquiring this skill on priority	
Task Statement	Frequency		Frequency		Frequency	
	Performed	Not performed	Need training	Not need	Acquire	Do not acquire
Nutritional management	23 (38.34)	37 (61.66)	45 (75)	15 (25)	43 (71.66)	17 (28.44)
Pests and diseases management	17 (28.44)	43 (71.66)	54 (90)	06 (10)	47 (78.44)	13 (21.66)
Irrigation management	33 (55)	27 (45)	49 (81.66)	11 (18.44)	32 (53.34)	28 (46.66)
Weed management	37 (61.66)	23 (38.44)	55 (91.66)	05 (08.44)	42 (70)	18 (30)
Stress management	17 (28.44)	43 (71.66)	51 (85)	09 (15)	43 (71.66)	17 (28.34)
Physiological disorder management	23 (38.44)	37 (61.66)	53 (88.34)	07 (11.66)	47 (78.34)	13 (21.66)

Figures within parenthesis indicate respective percentage.

Table -3: **Practical skills of low altitude farmers.**

Practical Skills	Task Performed		Training need		Acquiring this skill on priority	
Task Statement	Frequency		Frequency		Frequency	
	Performed	Not performed	Need training	Not need	Acquire	Do not acquire
Wind breaks	37 (61.66)	23 (38.44)	36 (60)	24 (40)	13 (21.66)	47 (78.34)
Rodent control	37 (61.66)	23 (38.44)	41 (68.33)	19 (31.66)	17 (45)	33 (55)
Intercultural operations	18 (30)	42 (70)	46 (76.66)	14 (23.34)	33 (55)	27 (45)
Handling of spray equipment's	14 (23.33)	46 (76.66)	52 (86.66)	08 (13.34)	42 (70)	18 (30)
Appropriate weighing of chemicals	11 (18.34)	49 (81.66)	51 (85)	09 (15)	37 (61.66)	23 (38.33)
Grading and packaging of fruits.	21 (35)	39 (65)	51 (85)	09 (15)	49 (81.66)	11 (18.34)

Figures within parenthesis indicate respective percentage.

Table - 4: Planning skills of high altitude farmers.

Planning Skills	Task Performed		Training need		Acquiring this skill on priority	
Task Statement	Frequency		Frequency		Frequency	
	Performed	Not performed	Need training	Not need	Acquire	Do not acquire
Expert guidance planning	01 (1.66)	59 (98.33)	57 (95)	03 (05)	55 (91.66)	05 (8.34)
Site selection	16 (26.66)	44 (73.33)	52 (86.66)	08 (13.33)	49 (81.66)	11 (18.34)
Selection of varieties	21 (35)	39 (65)	56 (93.34)	04 (6.66)	52 (86.66)	08 (13.33)
Layout planning	29 (48.44)	31 (51.66)	57 (95)	03 (05)	54 (90)	06 (10)
Soil testing	32 (53.33)	28 (46.66)	58 (96.66)	02 (3.33)	55 (91.66)	05 (8.34)
Pollination	14 (23.33)	46 (76.66)	53 (88.33)	7 (11.66)	48 (80)	12 (20)

Figures within parenthesis indicate respective percentage.

Table - 5: Management skills of high altitude farmers.

Management Skills	Task Performed		Training need		Acquiring this skill on priority	
Task Statement	Frequency		Frequency		Frequency	
	Performed	Not performed	Need training	Not need	Acquire	Do not acquire
Nutritional management	20 (33.44)	40 (66.66)	48 (80)	12 (20)	43 (71.66)	17 (28.34)
Pests and diseases	18	42	56	04	52	08

management	(30)	(70)	(93.44)	(06.66)	(86.66)	(13.34)
Irrigation management	29 (48.33)	31 (51.66)	53 (88.44)	07 (11.66)	48 (80)	12 (20)
Weed management	19 (31.66)	41 (68.33)	48 (80)	12 (20)	41 (68.34)	19 (31.66)
Stress management	14 (23.44)	46 (76.66)	51 (85)	09 (15)	47 (78.34)	13 (21.66)
Physiological disorder management	16 (26.66)	44 (73.44)	54 (90)	06 (10)	53 (88.44)	07 (11.66)

Figures within parenthesis indicate respective percentage.

Table - 6: Practical skills of high altitude farmers.

Practical Skills	Task Performed		Training need		Acquiring this skill on priority	
Task Statement	Frequency		Frequency		Frequency	
	Performed	Not performed	Need training	Not need	Acquire	Do not acquire
Wind breaks	14 (23.33)	46 (76.66)	43 (71.66)	17 (28.33)	34 (56.66)	26 (43.33)
Rodent control	47 (78.33)	13 (21.66)	34 (56.66)	26 (43.33)	31 (51.66)	29 (48.33)
Intercultural operations	24 (40)	36 (60)	53 (88.34)	07 (11.66)	49 (91.66)	11 (18.34)
Handling of spray equipment's	31 (51.66)	29 (48.33)	57 (95)	03 (05)	53 (88.34)	07 (11.66)
Proper weighing of chemicals for spray	19 (31.66)	41 (68.44)	59 (98.34)	01 (1.66)	56 (93.34)	04 (6.66)
Grading and packaging of fruits.	07 (11.66)	53 (88.44)	57 (95)	03 (05)	54 (90)	06 (10)

Figures within parenthesis indicate respective percentage.

Conclusion:

From the study it is evident that majority of the farmers had not planned prior to the establishment of their orchards. It was seen that in the all two altitudes majority of apple growers had not taken any guidance from the experts regarding different operations necessary for the apple cultivation viz site selection, selection of varieties, soil testing, maintaining pollinizer ratio, nutritional management, pest and disease management, irrigation and weed management, stress and physiological disorder management, handling of spray equipment's, intercultural operations and grading and packaging etc. So in order to achieve stability in apple production, the resources should be fully exploited by encouraging farmers by providing them with the necessary support services, with necessary arrangement of credit and subsidies as and when required. Individual member of the family should not be the target for imparting the training rather, more number of family members should be the target group. The need based cost effective training programmes

and strategies need to be tailored in an effective manner so that human resource be put to effective use for achieving sustainable production of apple.

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