



## Status of Fruit Farming in Central Valley of Khyber Pakhtunkhwa

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### Abstract

This retrospective study was conducted in four districts of Khyber Pakhtunkhwa namely Charsadda, Nowshera, Mardan and Peshawar during January February, 2013 to examine the status and factors affecting fruit orchards. A total of Sixty four fruit orchards growers were interviewed on the basis of land acquisition. Data indicates that farmer areas for citrus and planted Stone fruit such as peach, plum and apricot were declined in the last 10 years while the area under pear and loquat were increased. The study results also indicate that a number of factors were affecting fruit orchards. These problems were ranked as (1) diseases/insects, followed by (2) high price, (3) water shortage problem, (4) adulteration in inputs, (5) marketing problem and (6) non-availability of credit. It is concluded that various factors are responsible for the decline in production of fruit orchards. It is thus, recommended that agriculture department should regularly disseminate technical-know-how regarding improved fruit orchards management practices through training, field days and workshop and other awareness programmes for fruit orchards growers. The government should also keep check and balance on price and quality of inputs to encourage fruit orchard growers to increase their production.

**Keywords:** Fruits, orchards, problems, decline

### Introduction

Fruits are important sub-sector of the agricultural sector of Pakistan. Fruits are valued as protective food. They are rich source of minerals, vitamins providing more energy per unit weight than cereals. Pakistan has wide range of agro-climatic conditions, which allows the production of a variety of tropical and sub-tropical fruits. On a comparative basis the fruit trees are perennial and involve less management and

labour, as compared to vegetable, which are more intensive and require more labour and inputs (Sharif, 2011). Khyber Pakhtunkhwa (KP) is blessed with wide range of fruits and is the largest producer of delicious fruits. Peach (*Prunus persica*), guava (*Psidium guajava*), plum (*Prunus cerasifera*), pear (*Pyrus calleryana*), apricot (*Prunus Armeniaca*), apple (*Malus domestica*), date (*Phoenix dactylifera*), mango (*Mangifera indica*), pomegranate (*Punica granatum*), grapes (*Vitis vinifera*) and citrus are the commercially grown and important fruits of the province (Khan et al., 2010). Fruit farming has been an important business of Khyber Pakhtunkhwa province

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of Pakistan and the total fruit production during 2009-10 was 374395 tones from 38414 hectares (GOKP, 2010-11). There are growing concerns about the low productivity of horticulture crops in Pakistan as compared to others developing region of the world, especially when compared with our neighbour countries (PHDEB, 2007). Particularly in Khyber Pakhtunkhwa from last half decade (2005-06 to 2010-11) a significant decrease in the area and production was recorded in central valley of Khyber Pakhtunkhwa as show in Table 1: (GOKP, 2010-11).

The central valley of Khyber Pakhtunkhwa consists of Peshawar, Charsadda, Mardan and Nowshera districts which constitute the core of horticultural economy. Production of deciduous fruits in the central valley of KP has a special edge over other fruit growing areas because of its climatic condition (Khan *et al.*, 2010). The province has an ideal environment for growing fruits like apple, citrus, guava, apricot, peach, plum, loquat, persimmon, melon etc., which apart from meeting domestic demands, offer great potential for export. The ecological zoning of the province indicates that every zone has different environment, where different varieties of fruits can be grown. The northern and hilly areas of Malakand region are suitable for high quality apple, peaches, walnut, citrus etc. The plain areas comprising Charsadda, Nowshera, Mardan and Peshawar valley are ideal for Peach, pear, plum and loquat etc., while the Dera Ismail Khan region is suitable for dates and melons (Khan *et al.*, 2010). Fruits Statistics of Khyber Pakhtunkhwa shows that area under some fruits in central valley has shrunk from 2005-06 to 2010-11 (Table 1).

Fruit farmers claim that this has happened mainly because of the government policies revolving around field crops like wheat, cotton etc., with very little attention towards horticultural crops. They viewed about the public sector institutions, responsible for

promotion of horticulture, are unable to develop new cost-effective varieties of fruits. The problem is further compounded by the lack of modern technology (DAWN, 2008). Keeping in view the importance of horticulture crops on the livelihoods of the farmers, a research study was designed with the following objectives, so as to provide appropriate suggestions to overcome the constraints.

### Objectives

To:

1. Observe the trend in area under fruit orchards in the central valley of Khyber Pakhtunkhwa.
2. Highlight bottlenecks in growth of the fruit orchards in central valley of Khyber Pakhtunkhwa .
3. Suggest solutions to the problems observed

### Methodology

This study is based on both primary and secondary data. Primary data were obtained through a well-structured and pre-tested questionnaire, using a comprehensive interview schedule, designed in the light of the pre-set objectives on the basis of personal observations and literature review. While secondary data was collected from various sources including review of published/unpublished research studies, internet etc.

### Sample size

The data collection for this study was made in the month of January/February, 2013. The results would have been more accurate with a bigger sample but keeping in view the prevailing law and order situation in the province, only 64 fruit orchard growers from four districts of Khyber Pakhtunkhwa namely Charsadda, Nowshera, Mardan and Peshawar, were randomly selected (Table 2).

**Table 1: Area and production of major fruits in central valley of KP**

Categories	2005-06				2010-11			
	Charsadda	Nowshera	Mardan	Peshawar	Charsadda	Nowshera	Mardan	Peshawar
Peach							(+)	
-Area (Hec)	63	75	105	81	63	75	381	78
-Production (tons)	679	750	1015	931	679	750	3684	895
-Yields (kg)	10778	10000	9667	11494	10778	10000	9669	11474
Pear							(-)	
-Area (Hec)	134	135	475	299	134	135	270	298
-Production (tons)	1611	1661	5448	3915	1611	1661	3097	3906
-Yields (kg)	12022	12304	11469	13094	12022	12304	11470	13107
Citrus					(-)	(-)	(-)	(+)
-Area (Hec)	122	307	442	69	38	204	235	75
-Production (tons)	1225	3098	4816	690	381	2058	2559	751
-Yields (kg)	10041	10091	10896	10000	10026	10088	10889	10013
Loquat					(-)		(+)	
-Area (Hec)	30	22	36	9	10	20	66	9
-Production (tons)	297	213	700	76	99	194	1302	77
-Yields (kg)	9900	9682	19444	8444	9900	9700	19727	8556
Plum							(-)	
-Area (Hec)	226	250	625	382	225	250	199	380
-Production (tons)	2688	2956	6876	4412	2676	2956	2161	4396
-Yields (kg)	11894	11824	11002	11550	11893	11824	10859	11568
Apricot							(-)	
-Area (Hec)	85	110	94	120	85	108	24	115
-Production (tons)	889	1100	998	1140	889	1080	255	1091
-Yields (kg)	10459	10000	10617	9500	10459	10000	10625	9487
Persimon								
-Area (Hec)	197	110	145	61	197	110	145	63
-Production (tons)	2268	2497	1448	610	2268	2497	1119	600
-Yields (kg)	11513	22700	9986	10000	11513	22700	9991	9524

Source: Fruits Statistics Khyber Pakhtunkhwa 2005-06 to 2010-11

**Table 2: Sample distribution of fruits producers in the target area**

Districts	Frequency	Percent
Charsadda	13	20
Nowshera	25	39
Mardan	9	14
Peshawar	17	27
Total	64	100

Source: Survey results, 2013

The sample respondents were categorized into three land holding groups viz. up to 5 acres were considered as small, 5.01-25 acres as medium and above 25 acres as large. Out of 64 sample respondents, 21 (32.8%) were Small, 24 (37.5%) farmers medium and 19 (29.7%) were large farmers (Table 3).

**Table 3: Distribution of sample size in the target area**

Categories	Number of respondents	Percent
Small (0.1 to 5 ac)	21	32.8
Medium (5.01 to 25 ac)	24	37.5
Large (above 25 ac)	19	29.7
Total	64	100

Source: Survey results, 2013

### Data analysis

Data collected were analyzed using the Statistical Package for the Social Sciences (SPSS). Basic statistics for description of data (frequencies, percentages, cross types, means and standard deviation) were used.

### Percent change estimation

For percent change estimation in fruit orchards' area during last ten years, the following formula was also used by (Shah *et al.*, 2001). Percentage Change = (Present Fruit Orchards Area – Past Fruit Orchards Area)/ Past Fruit Orchards Area\*100

### Limitations of the study

The researchers tried their best to explain the nature and purpose of the study to the respondents, however, the suspicion of the farmers could have affected accuracy of the

information provided. The quantitative data given were only estimates, to the best knowledge of the farmers as most of them did keep records. This has, therefore, led to considerable variations in their responses.

## Results and discussion

### District-wise fruit orchards area

Table 4 reveals that on average the farmers planted peach (*Prunus persica*) on 18.44 acres of land 10 years back which had now decreased to 11.29 acres, reflecting a decline of 6.7 acres in the peach orchards. Inter district comparison shows that the peach orchards decreased in Mardan district from 60.02 acres to 52.88 acres followed by Charsadda from 12.2 acres to 9.32 acres where as in Nowshera and Peshawar districts the area under peach increased slightly. The result showed that overall the area under pear in the study area had slightly increased from 7.75 acres to 8.09 acres. The results shows that the area under pear orchards remained unchanged in Mardan district, while in districts Charsadda and Nowshera the area under pear slightly declined in comparison to area under pear 10 years back. The table also depicts that the overall area under citrus in the study area declined from 50.22 acres to 30.03 acres. Mardan is the major citrus growing area where 10 years back the sample respondents allocated 116.67 acres of land to citrus orchards, which had now decreased to 72.78 acres, the main reasons of the citrus decrease in Mardan district identified by the sample respondents during verbal discussions were lack of irrigation water, while in other three districts like Charsadda, Nowshera and Peshawar, the area under citrus increased. Overall in loquat orchards slight increase was found where the farmers devoted 8.74 acres 10 years back, which at present was 8.85 acres. Inter district comparison shows that the loquat orchards increased from 9.78 acres to 12.03 in district Mardan, while in Charsadda district the loquat area decreased from 8.39 acres to 5.68 in the study area the area under plum declined from 10.12 acres to 6.61 acres. Inter districts comparison reveals that plum orchards decreased in Mardan and

Peshawar districts, while in Nowshera district 0.17 acres were increased and Charsadda district plum area increased from 8.92 acres to 11.32 acres. The area under apricot was decreased from 3.36 acres 10 years back to 1.73 acres at present. Inter district comparison shows that the apricot orchards were decreased in Charsadda district from 6.50 acres to 2 acres followed by Nowshera district. While only in

Peshawar district the area under apricot was increased 1.59 acres. In persimmon orchards it was found the Charsadda sample farmers allocated 8 acres land to persimmon orchards 10 years back and declined to 4.27 acres, whereas in Mardan districts the area increased from 6.70 acres to 10.91 acres. Overall the area of persimmon orchards decreased from 7.66 acres to 5.60 acres in the target area.

**Table 4: District-wise fruit orchards area of sample respondents in target area (Ac)**

Fruits		Districts				Overall
		Charsadda	Nowshera	Mardan	Peshawar	
Peach	Present	9.32	3.23	52.88	2.68	11.29
	10 years back	12.2	0.00	60.02	1.86	18.44
	Percent change in area	-23.60	+	-11.89	+44.09	-38.77
Pear	Present	4.98	0.27	19.77	0.00	8.09
	10 years back	5.64	1.02	19.77	0.00	7.75
	Percent change in area	-11.70	-73.52	0.00	0.00	+4.36
Citrus	Present	20.00	13.9	72.78	2.56	30.03
	10 years back	10.00	3.89	116.67	0.00	50.22
	Percent change in area	+100	+257.32	-37.62	+	-40.20
Loquat	Present	5.68	0.00	12.03	0.00	8.85
	10 years back	8.39	0.00	9.78	0.00	8.74
	Percent change in area	-32.30	0.00	+23.01	0.00	+1.26
Plum	Present	11.32	2.38	27.73	3.43	6.61
	10 years back	8.92	2.21	66.97	4.00	10.12
	Percent change in area	+26.90	+7.69	-58.59	-14.25	-34.71
Apricot	Present	2.00	0.00	0.00	1.59	1.73
	10 years back	6.50	0.23	0.00	0.00	3.36
	Percent change in area	-69.23	-	0.00	+	-48.64
Persimmon	Present	4.27	0.00	10.91	0.00	5.60
	10 years back	8.61	0.00	6.70	0.00	7.66
	Percent change in area	-50.40	0.00	+62.83	0.00	-26.88

Source: Survey results, 2013

**Table 5: Fruit orchards area of sample respondents by farm size in target area (AC)**

Fruits	Small	Medium	Large	Overall
Peach (2012) acres	1.18	3.62	24.31	11.29
Peach (2002) acres	1.09	2.63	32.22	18.44
Percent change in area	+8.33	+37.60	-24.55	-38.77
Pear (2012) acres	0.00	0.27	9.207	8.09
Pear (2002) acres	0.00	1.022	9.67	7.75
Percent change in area	0.00	-72.33	-4.83	+4.36
Citrus (2012) acres	0.277	7.38	50.09	30.03
Citrus (2002) acres	0.00	3.88	81.11	50.22
Percent change in area	+	+90	-38.24	-40.20

Loquat (2012) acres	0.00	5.55	9.32	8.85
Loquat (2002) acres	0.00	0.00	8.73	8.74
Percent change in area	0.00	+	+6.74	+1.26
Plum (2012) acres	1.62	2.80	17.81	6.61
Plum (2002) acres	1.74	2.63	31.36	10.12
Percent change in area	-7.40	+6.49	-43.21	-34.71
Apricot (2012) acres	0.90	0.00	2.13	1.73
Apricot (2002) acre	0.00	0.22	6.5	3.36
Percent change in area	+	-	-67.13	-48.64
Persimmon (2012) acres	2.27	1.72	8	5.6
Persimmon (2002) acres	2.5	0.00	9.36	7.66
Percent change in area	-9.09	+	-14.70	-26.88

Source: Survey results, 2013

**Percent change in fruit orchards area**

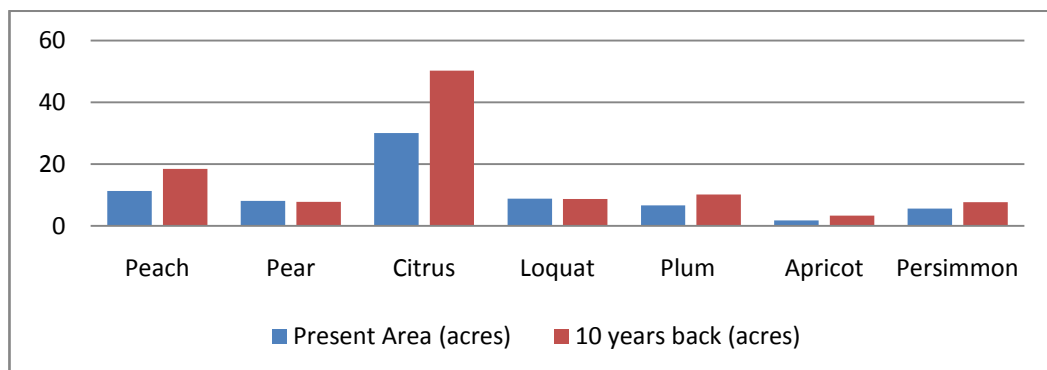
The data regarding the area under different fruits by sample respondents 10 years back and present were presented in Table 6 & Figure 1. Data in Table 6 indicates that the area farmers planted peach orchards 10 years back on 18.44 acres, which declined to 11.29 acres, showed 38.77 percent decrease in area. Similarly citrus area declined from 50.22 acres to 30.03 acres, showing 40.20 percent decrease in area during the last 10 years, loquat area increased from 8.85 acres to 8.74 acres, showed +1.26 percent increase in Loquat

orchards, the area under plum declined from 10.12 acres to 6.61 acres, showed 34.71 percent decrease in Plum orchards, apricot area declined from 3.36 acres to 1.73 acres showed 48.64 percent decrease in apricot orchards the area under persimmon fruits decreased by 26.89 percent and showed 126.88 percent change in persimmon orchards area. While the area under pear fruit increased from 7.75 acres to 8.09 acres, showing 4.36 percent change in area during the last 10 years.

**Table 6: Percent change in fruit orchards area of sample respondents in target area**

Fruits	Area, 2012 (Acres)	Area, 2002 (Acres)	Percent Change in Area
Peach	11.29	18.44	-38.77
Pear	8.09	7.75	+4.36
Citrus	30.03	50.22	-40.20
Loquat	8.85	8.74	+1.26
Plum	6.61	10.12	-34.71
Apricot	1.73	3.36	-48.64
Persimmon	5.6	7.66	-26.88

Source: Survey results, 2013



**Figure 1: Present and past fruit orchards area of sample respondent's in target area**

### Causes for decrease in area under fruit orchards

The sampled farmers pointed out a number of reasons for decreasing area under fruit orchards. Table 7 shows that majority (59.4%) of the sample farmers reported disease and insect pest attacks on fruit orchards as a major problem that decreased

the area under fruit orchards. Other farmers reported different reasons affecting area under fruit orchards including marketing problems (21.9%), low production (37.5%), high cost of inputs (17.2%), energy crises (12.5%), lack of cold storages (7.8%), lack of capital (10.9%), drought causes (6.2%) and environmental changes (12.5%).

**Table 7: Causes for decrease in area under fruit orchards area by farm size in the target**

Categories			Small(n=21)	Medium(n=24)	Large(n=19)	Overall(n=64)
Marketing Problems	Yes	Number	4	5	5	14
		Percent	6.2	7.8	7.8	21.9
	No	Number	16	17	13	46
		Percent	25	26.6	20.3	71.9
	Answer	Number	1	2	1	4
		Percent	1.6	3.1	1.6	6.2
Low production	Yes	Number	7	9	8	24
		Percent	10.9	14.1	12.5	37.5
	No	Number	13	13	10	36
		Percent	20.3	20.3	15.6	56.2
	Answer	Number	1	2	1	4
		Percent	1.6	3.1	1.6	6.2
High inputs cost	Yes	Number	4	2	5	11
		Percent	6.2	3.1	7.8	17.2
	No	Number	16	20	13	49
		Percent	25	31.2	20.3	76.6
	Answer	Number	1	2	1	4
		Percent	1.6	3.1	1.6	6.2
Energy Crises	Yes	Number	3	3	2	8
		Percent	4.7	4.7	3.1	12.5
	No	Number	17	19	16	52
		Percent	26.6	29.7	25	81.2
	Answer	Number	1	2	1	4
		Percent	1.6	3.1	1.6	6.2
Disease Attack	Yes	Number	12	14	12	38
		% age	18.8	21.9	18.8	59.4
	No	Number	8	8	6	22
		Percent	12.5	12.5	9.4	34.4
	Answer	Number	1	2	1	4
		Percent	1.6	3.1	1.6	6.2
Lack of cold Storage	Yes	Number	1	2	2	5
		Percent	1.6	3.1	3.1	7.8
	No	Number	19	20	16	55
		Percent	29.7	31.2	25	85.9
	Answer	Number	1	2	1	4
		Percent	1.6	3.1	1.6	6.2
Lack of capital	Yes	Number	3	1	3	7
		Percent	4.7	1.6	4.7	10.9
	No	Number	17	21	15	53
		Percent	26.6	32.8	23.4	82.8
	Answer	Number	1	2	1	4
		Percent	1.6	3.1	1.6	6.2

Drought	Yes	Number	1	2	1	4	
		Percent	1.6	3.1	1.6	6.2	
	No	Number	19	20	17	56	
		Percent	29.7	31.2	26.6	87.5	
Answer	No	Number	1	2	1	4	
	Percent	1.6	3.1	1.6	6.2		
Climate change	Yes	Number	3	3	2	8	
		Percent	4.7	4.7	3.1	12.5	
	No	Number	17	19	16	52	
		Percent	26.6	29.7	25	81.2	
	Answer	No	Number	1	2	1	4
		Percent	1.6	3.1	1.6	6.2	

Source: Survey results 2013

**Table 8: Causes reported for decrease in area under fruit orchards by districts**

Categories			Charsadda	Nowshera	Mardan	Peshawar	Overall	
Marketing Problems	Yes	Number	6	5	1	2	14	
		Percent	9.4	7.8	1.6	3.1	21.9	
	No	Number	7	20	8	11	46	
		Percent	10.9	31.2	12.5	17.2	71.9	
	Answer	No	Number	0	0	0	4	4
		Percent	0	0	0	6.2	6.2	
Low production	Yes	Number	9	6	3	6	24	
		Percent	14.1	9.4	4.7	9.4	37.5	
	No	Number	4	19	6	7	36	
		Percent	6.2	29.7	9.4	10.9	56.2	
	Answer	No	Number	0	0	0	4	4
		Percent	0	0	0	6.2	6.2	
High inputs cost	Yes	Number	7	3	1	0	11	
		Percent	10.9	4.7	1.6	0	17.2	
	No	Number	6	22	8	13	49	
		Percent	9.4	34.4	12.5	20.3	76.6	
	Answer	No	Number	0	0	0	4	4
		Percent	0	0	0	6.2	6.2	
Energy Crises	Yes	Number	1	5	1	1	8	
		Percent	1.6	7.8	1.6	1.6	12.5	
	No	Number	12	20	8	12	52	
		Percent	18.8	31.2	12.5	18.8	81.2	
	Answer	No	Number	0	0	0	4	4
		Percent	0	0	0	6.2	6.2	
Disease Attack	Yes	Number	11	12	6	9	38	
		Percent	17.2	18.8	9.4	14.1	59.4	
	No	Number	2	13	3	4	22	
		Percent	3.1	20.3	4.7	6.2	34.4	
	Answer	No	Number	0	0	0	4	4
		Percent	0	0	0	6.2	6.2	
Lack of cold Storage	Yes	Number	1	2	1	1	5	
		Percent	1.6	3.1	1.6	1.6	7.8	
	No	Number	12	23	8	12	55	
		Percent	18.8	35.9	12.5	18.8	85.9	
	Answer	No	Number	0	0	0	4	4
		Percent	0	0	0	6.2	6.2	
Lack of capital	Yes	Number	2	3	1	1	7	
		Percent	3.1	4.7	1.6	1.6	10.9	



	No	Number	11	22	8	12	53
		Percent	17.2	34.4	12.5	18.8	82.8
	No	Number	0	0	0	4	4
	Answer	Percent	0	0	0	6.2	6.2
Drought	Yes	Number	0	1	0	3	4
		Percent	0	1.6	0	4.7	6.2
	No	Number	13	24	9	10	56
		Percent	20.3	37.5	14.1	15.6	87.5
Answer	No	Number	0	0	0	4	4
	Percent	0	0	0	6.2	6.2	
Climate change	Yes	Number	4	3	0	1	8
		Percent	6.2	4.7	0	1.6	12.5
	No	Number	9	22	9	12	52
		Percent	14.1	34.4	14.1	18.8	81.2
Answer	No	Number	0	0	0	4	4
	Percent	0	0	0	6.2	6.2	

Source: Survey results, 2013

### Fruit orchards grower’s constraints

The study identified some constraints to fruit farming which are depicted in table 9. The major problems in production, as perceived by the farmers, were ranked and given scores by the sample respondents, included diseases/insects, followed by high input prices, water shortage, adulteration in inputs, marketing problem and non-availability of credit.

**Table 9: Constraints to fruit farming**

Categories	Ranking	Score
Diseases/ Insects	1	44
High Price of Inputs	2	23
Water Problem	3	19
Adulteration in Inputs	4	18
Marketing Problem	5	4
Non Availability of Loan	6	3

Source: Survey results 2013

### Conclusion and recommendations

The findings of the study revealed that apricot orchards area decreased by 48.64 percent followed by citrus area 40.20 percent, peach area 38.77 percent, plum area 34.71 percent and persimmon 26.88 percent during the last 10 years. In case of pear there was an increase of 4.36 percent and loquat witnessed a 1.26 percent increase in the study area during last 10 years. The sample farmers reported that fruit insect pests and diseases, low production of fruits, high cost of inputs, marketing problems

were the major constraints that decreased the fruit orchards in the study area.

### Recommendations

- During survey it was noted that diseases, insects and pests was the main problem on fruit farms resulting in low yield/income which adversely affect the area under fruits in the study area. It is suggested that agricultural research system and agricultural extension department should regularly disseminate technical-know-how regarding improved fruit orchards management practices through training and awareness programmes for fruit orchards growers.
- The government should encourage quality input producers to have their company operated outlets all over the fruit farming zones. This is expected to offer a check on hoarding of inputs by the investors and assessing quality control at the same time.

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mentioned research study as a major author and gave a main idea to extract the valuable information regarding status of fruit farming. He contributed in data collection, data analysis and supervised the work of other authors of this study. Mr. Arshad Farooq, contributed in questionnaire development, data collection, data editing, report writing, methodologies, literature review and analysis section of the paper. Mr. Abdul Hassan helped in data collection, editing and analysis. Dr. Abdul Samad Khan, provide technical support and review the research study. Mr. Muhammad Azam Niazi, contributed in technical report writing. Dr. Umar Farooq provided valuable suggestions regarding the mentioned research study.

It is worth mentioning that this article not submitted and nor published in any national or international journals.

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