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# Model farm service centers' contribution in enhancing peach production: evidence from remote areas of Northern Pakistan

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## Abstract

To improve the overall agricultural production, it is dire need to improve the farming practices as well as the transfer of modern technologies to the farming community at their doorstep. The intended research study was conducted to know about the contribution of Model Farm Services Centers (MFSCs) in promoting peach production in District Swat where three villages i.e. Deed Panari, Baidara and Sher Palam of tehsil Matta was purposively selected for the study area as famous for maximum production of peach. A well interview schedule was prepared to collect primary data from 80 sampled respondents of the selected three villages. Results showed that majority 52.5% respondents belonged to age group of 50 years, 67.5% were illiterate, 70.0% were living in joint family system, and most of the registered farmers with MFSCs were owner 72.5%. A significant association was observed between farming experience and MFSCs registration with total peach production and more experienced farmers having long tenure of MFSCs registration got higher peach production and vice versa. Paired t-test results revealed that peach yield and income were increased after registration with MFSCs with a highly significant difference (p<0.01). It was highlighted that MFSCs registration improved peach production increased the farm income. Peach growers pointed out various field problems out of which costly inputs and market problems were more common. It is recommended that government should subsidize agricultural inputs along with facilitation of nearby Market to the farmers in the study area. Moreover, government should arrange frequent visit of extension agents in order to enhance peach production in the study area.

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## Introduction

Agriculture sector plays an important role in the economic development of the country. Agriculture accounts 19.8 percent of the Gross Domestic Product (GDP) in 2017-18 and provides 42.3 percent of labor force while more than 67 percent of the country population is living in the rural areas and the main income source of rural population is directly or indirectly depends on agriculture. During the year 2017 the overall performance of agriculture sector recorded a decline of 0.9 percent compared to the growth of 2.9 percent during last year due to negative growth in all related agriculture sub-sectors. With a population growth rate of 1.95 percent there will be net addition of 3.7 million people in Pakistan (GoP, 2017-18).In Pakistan, the atmosphere of Khyber Pakhtunkhwa Swat favors Peach cultivation. It is frequently grown in the hilly regions of north western Himalayas. The peach seasons usually starts in May and lasts till the first week of September.It is delicious in taste and attractive in flavor and aroma. There is a wide range of varieties of peaches, which makes its availability possible for long duration. Peach is regarded as one of the most admired fruit grown in Swat, Peshawar, Para Chinar, Chitral, Hazara, Quetta, Pashin, Ziarat, Mastung, Skurdu, Hunza and Murree hills. (GoP. 2017-2018). Cling and free stone are two important varieties of peach grown worldwide. Government of Khyber Pakhtunkhwa for the first time introduced a new platform of Farm Services Centers.Farm Services Center (FSCs) is an effective platform created for sustainable agriculture in 1999 by Government of Khyber Pakhtunkhwa, Pakistan. Later on, in 2005 the Farm Services Centers were renamed as Model Farm Services Center (MFSCs) and established at district level. The FSCs were then established at sub district levels as sub branches of MFSCs to increase farmer's access to the quality agro-inputs, technical advice and experience sharing. These centers were conceived with a view of organizing and empowering small farmers at a platform where full technical support of sub-sector of agriculture was available to them. The representative of allied sectors of the Agriculture Department was kept under one roof and to provide one window services to the farmers in delivery. Furthermore facilitation of farmers with all major production inputs, seed, fertilizers, pesticides and machinery (Haq *et al.,* 2009). The main theme and aim of this initiative is to belt a smooth plat farm to the rural masses strengthen them to solve their own problem specifically in agriculture through strong coordination between government and line agencies (GALs). The main focus is to improve their knowledge and to enhance their skills to overcome on any shortage of black marketing (Ullah *et al.,* 2015). MFSCs is a farmer oriented program which was started by the government Khyber Pakhtunkhwa in the year 2001 in 22 District in order to make the farmer more capable in diversified aspects of farming in their own socio-economic condition with more share from the Government (Daad, 2004). Different extension services are provided by MFSCs to the peach growers in the study area. Out of which provision of improved variety of seed, fertilizers, proper irrigation procedures, farmer's counseling, latest farming technologies, pesticides and various techniques to reduce pest attack, weed control measures and marketing facilities to the farmers in the study area (APEC, 2004). Peach is the major fruit in terms of area and production in Swat valley but there are many factors which limits the productivity of peach such as yield, input costs, availability of marketing facilities, high post-harvest losses (20-30%) and no attention of the Government to the peach growers (Bakhsh *et al.*, 2006). Therefore, the main objectives of the study were to examine the role of MFSC in the production of peach and to assess performance of MFSC in the dissemination of improved technology among the peach growers in the district swat.

## Materials and methods

### Study area

District Swat was selected study site as peach growers are developed on larger scale and they grow peach as their earning fruit. The lavish green and mountainous Swat Valley in the Malakand Division lies between $34^{\circ,}$ $40^{\circ}$ to $35^{\circ}$ N latitude and $72^{\circ}$ to $740^{\circ}\text{-}3^{\circ}$ E longitude and having population of 2,309,675

according to the census 2017 and its literacy rate is 28.75 %.

*Sampling design*

Multistage sampling technique was used where District Swat was selected in stage first. In stage II Tehsil Matta was selected out of the three tehsils. In the final stage a total of 80 peach growers with the Farm Service Center were selected out of the total 120 registered peach growers from a list obtained from MFSC for data collection.

*Interview Schedule*

A well-structured interview schedule was designed keeping in view the importance and objectives of the study and pre-tested before data collection and changes were made accordingly. An organized and simple way of interviewing was used. The local language was preferred and questions were made simple in order to avoid confusion and accumulate appropriate information from the respondents regarding objectives of the study.

*Collection of data*

Primary data were collected from the respondents and questions were asked regarding farming skills, knowledge, inputs and technologies of peach. Questions were asked in local language whereas interview schedule was prepared in English.

*Statistical analysis*

The collected data were analyzed and the results were shown in percent and frequency distributions. For the statistical analysis, various appropriate tests of statistics were applied and for this purpose Statistical Package for Social Sciences (SPSS) V.20 was used.

*Chi-Square Test*

To check the association among various variables, Chi-Square test was used at 5% significance level. Mathematical expression of Chi-square test is as follow:

$$\chi^2 = \sum_{i=1}^{r} \sum_{j=1}^{c} \frac{(O_{ij} - e_{ij})^2}{e_{ij}} \quad \dots\dots\dots\dots\dots\dots (1.1)$$

*Paired-Sample T-Test*

To check the difference between variables, paired sample t-test was applied at 5% level of probability. Formula for paired sample t-test is presented here:

$$t = \frac{\bar{d}}{Sd\sqrt{n}} \quad \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (1.2)$$

Where:

d = difference between two sample observations (before and after the membership)

n = number of pairs

Sd = standard deviation

**Results and discussion**

*Age of the respondents*

Age is one of the important factor playing major role in the dissemination and adoption of latest technology regarding improved methods of cultivation, improved variety and efficient use of fertilizer. Beside this, it also plays a vital role in the diffusion of innovation among the farming community (Agwu *et al.*, 2008).

In this study, minimum age was recorded 20 years and maximum was recorded 50 years to obtain the exact value and percentage of minimum and maximum, the age was categorized into four groups. The results were obtained from the respondents that were registered members of MFSCs of the selected villages namely Deed Panari, Baidara and Sher Palam as presented in Table 1. Our results are showing agreement with the findings of Pilley (2013) who revealed that maximum respondents were having the age 40 years.

*Literacy status of the respondents*

Education of a person is a key factor responsible for desirable changes in the behavior of an individual. Education also plays an important role in the dissemination of new technology, improved farming method and adaptation of new technique. Hassan (1991) observed that majority of the respondents were illiterate as a result they showed very minute interest to new innovation to get the desired results. The age of the respondents were categorized in six groups and the data were presented in Table 1 where the literacy

status of the respondents majority of the respondents (67.5%) were found illiterate and minimum (32.5%) of them were found literate Equal proportions of the illiterate respondents (23.8%) were found in village Baidara and SherPalam and only (20.0%) illiterate were found in village Deed Panari. The more literate respondents (12.5%) were found in village Biadara while percentage equal proportions (10.0%) of respondents were found in Deed Panari and SherPlam.

**Table 1.** Demographic characteristics of the respondents.

| Village | Age (in years) | | | | Total |
|---|---|---|---|---|---|
| | 20-30 | 31-40 | 41-50 | Above 50 | |
| Deed Panari | 2 (2.5) | 2 (2.5) | 7 (8.8) | 13 (16.3) | 24 |
| Baidara | 2 (2.5) | 5 (6.3) | 8 (10.0) | 14 (17.5) | 29 |
| SherPalam | 3 (3.8) | 1 (1.3) | 8 (10.0) | 15 (18.8) | 27 |
| Total | 7 (8.8) | 8 (10.0) | 23 (28.8) | 42 (52.5) | 80 |

| Village | Literacy status | | Education Level | | | | Total |
|---|---|---|---|---|---|---|---|
| | Literate | Illiterate | Primary | Middle | Matric | Higher | |
| Deed Panari | 8 (10.0) | 16 (20.0) | 1 (1.3) | 1 (1.3) | 4 (5.0) | 2 (2.5) | 24 |
| Baidara | 10 (12.5) | 19 (23.8) | 0 (0.0) | 0 (0.0) | 7 (8.5) | 3 (3.8) | 29 |
| SherPalam | 8 (10.0) | 19 (23.8) | (0.00) | 2 (2.5) | 2 (2.5) | 4 (5.0) | 27 |
| Total | 26 (32.5) | 54 (67.5) | 1 (1.3) | 3 (3.8) | 13 (16.0) | 9 (11.3) | 80 |

| Village | Family status | | Total |
|---|---|---|---|
| | Nuclear | Joint | |
| Deed Panari | 10 (12.5) | 14 (17.5) | 24 |
| Baidara | 7 (8.8) | 22 (27.5) | 29 |
| SherPalam | 7 (8.8) | 20 (25.0) | 27 |
| Total | 24 (30.0) | 56 (70.0) | 80 |

| Village | Tenancy status of peach growers | | | Total |
|---|---|---|---|---|
| | Owner | Tenant | Owner –cum tenant | |
| Deed Panari | 17 (21.3) | 4 (5.0) | 3 (3.8) | 24 |
| Baidara | 21 (26.3) | 5 (6.0) | 3 (3.7) | 29 |
| SherPalam | 20 (25.0) | 5 (6.3) | 2 (2.5) | 27 |
| Total | 58 (72.5) | 14 (17.3) | 8 (10.0) | 80 |

This table also explains the educational level of literate respondents. As evident in Table 1 which shows that (15.0%) respondents was matriculate followed by (11.3%) who were having intermediate level of education. While (3.8%) respondents were having middle level of education and only (3.8%) respondents were in primary level of education. Our findings and results are at par as stated by Perviaz *et al.*, (2003) in her research in District Malakand that overwhelming majority (90%) of the farmer respondents were found illiterate without education, showing that maximum involvement is found by illiterate farming community showing compatibility with this noble profession.

*Family status of the respondents*
Respondents of joint family system have more land as compared to nuclear system. This joint family system has more chance to utilizing agriculture land and obtains more production of agriculture and requires less labour force. All agricultural activities are carried combinedly by Joint family system as compared to

nuclear family system. Nuclear family systems have a small land for agriculture activity and less man power/labour. Likewise the purchasing power of the joint family system will be high instead of nuclear family system and all farming inputs will be easily accessible to farmer as stated by Sudhakar (2009).

The distribution of respondents based on nuclear and joint family system is presented in Table 1 which shows the family status of the respondents among these villages majority 70 percent were in joint family system and only 30 percent who were in nuclear family system.

**Table 2.** Association between literacy and source of income.

| Variable | Major source of income | | | Total |
|---|---|---|---|---|
| | Agriculture | Business | Govt. Servant | |
| Illiterate | 31 (38.8) | 23 (28.8) | 0 (0.0) | 54 |
| Literate | 9 (11.2) | 11 (13.7) | 6 (7.5) | 26 |
| Total | 40 (50.0) | 34 (42.5) | 6 (7.5) | 80 |
| | Chi-square value = 14.285 | P-value= (0.001) | | |

Association of tenancy status and production of peach.

In village Deed Panari 17.5% were in joint family system against 12.5% were in nuclear family system in the same village. Similarly in village Baidara 27.5% respondents were in joint family system and 8.8% were in nuclear family system. Our results are in conformity with Khurshid *et al.* (2014) they were conducting study on the role of extension workers on onion cultivation in District Swat, who concluded that

maximum respondents 41% were getting maximum return from onion crop like joint family having members of 7-10 like joint family system followed by 37% which belonged to the group of 4-6. These findings are also against with those of Amin *et al.* (2010) who pointed out that 40% of the farming community belongs to joint family.

**Table 3.** Association of tenancy status of the respondents and production of peach.

| Variable | Total production in (Tons) | | | | Total |
|---|---|---|---|---|---|
| | Up to 3 | 3.1-5 | 5.1-7 | Above 7 | |
| Owner | 26 (32.5) | 22 (27.4) | 7 (8.8) | 3 (3.8) | 58 |
| Tenants | 8 (10.0) | 3 (3.8) | 2 (2.5) | 1 (1.3) | 14 |
| Owner-cum tenant | 3 (3.8) | 3 (3.8) | 0 (0.0) | 2 (2.3) | 8 |
| Total | 37 (46.3) | 28 (35.0) | 9 (11.3) | 6 (7.4) | 80 |
| | Chi-square | value | =6.148 | P-value=( 0.047) | |

*Tenancy status of the respondents*

Tenancy system of the respondents is presented in Table 1 where majority of the registered farmers in this table were owner (72.5%) followed by tenants (17.5%) and owner-cum tenants (10.0%).

Among the three villages the maximum percentage of owners (26.3%) was observed in village Baidara and minimum percentage of owners (21.3%) were in village Deed Panari. This table also depicts that more

percentage of tenants (6.3%) was noticed in village Sher Palam followed by (6.0%) in village Baidara. The owner-cum tenant percentage (3.8%) was recorded in Deed Panari while minimum (2.5%) owner-cum tenants were found in village Sher Palam. Research findings and results are in contrast revealed by Pervaiz *et al.,* (2013) as well as Khan and Akram, (2012) who concluded during their studies that only 48% and 47% of the farming communities were owner cultivator in their study area respectively,

which may be due to the more interest of the said area as the mentioned fruit is of economic importance and cash return.

*Association between literacy and source of income*
Chi square test was used to assess the association between literacy status and source of income (Table

2). The result outcomes revealed that there was a highly significant association (p< 0.01), which mean that illiterate farmers were found having agriculture as their major source of income, while literate respondents had other sources of income other than agriculture in the study area.

**Table 4.** Association of farming experience with production of peach.

| Farming experience of the respondents | Total production in (Tons) | | | | Total |
|---|---|---|---|---|---|
| | Up to 3 | 3.1-5 | 5.1-7 | Above 7 | |
| 1-10 Years | 12 (15.3) | 15 (18.8) | 6 (7.5) | 1 (1.3) | 34 |
| 11-20 Years | 15 (18.2) | 21 (26.3) | 3 (3.7) | 4 (5.0) | 43 |
| Above 20 Years | 1 (1.3) | 1 (1.3) | 0 (0.0) | 1 (1.3) | 3 |
| Total | 28 (34.8) | 37 (46.4) | 9 (11.2) | 6 (7.6) | 80 |
| Chi-square value= 6.277   P-value= (0.0393) | | | | | |

Table 3 represents the association between tenural system and total production of the peach. The results showed a significant relationship with Chi-square value = 6.148 with P-value= 0.047 with 5% of significance level. It is therefore, concluded that

tenancy of the respondents is significantly associated with the total production of the peach by concluding that owner cultivators had more peach production as compared to tenants and owner cum tenant in the research area.

**Table 5.** Association between respondent's registration with MFSCs and peach production.

| Registration with MFSCs | Total production in (Tons) | | | | Total |
|---|---|---|---|---|---|
| | Up to 3 | 3.1-5 | 5.1-7 | Above 7 | |
| Up to 1 Year | 12 (15.0) | 8 (10.0) | 1 (1.3) | 0 (0.0) | 21 |
| 4-6 Years | 22 (27.5) | 16 (20.0) | 6 (7.4) | 4 (5.0) | 48 |
| 6-8 Years | 3 (3.8) | 4 (5.0) | 2 (2.5) | 2 (2.5) | 11 |
| Total | 37 (46.3) | 28 (35.0) | 9 (11.2) | 6 (7.5) | 80 |
| | Chi-square value= 6.114   P-value= (0.0411) | | | | |

*Association of farming experience with production of peach*
Table 4 shows the association between farming experience and total peach production. The study results showed a significant relationship with Chi-square value =6.277with P-value= 0.0393 with 5% of significance level. It is therefore, established that farming experience of the respondents is significantly associated with the total production of the peach by revealing  that 11-20 years farming experience had more peach production as compared to 1-10 and above 20 years in the study area.

*Association between respondent's registration duration with MFSCs and peach production*
Table 5 shows the association between registration duration with MFSCs and total peach production. The study results showed a significant relationship with Chi-square value =6.114 with P-value= 0.0411 with 5% of significance level. It is therefore, established that registered farmer is significantly associated with the total production of the peach by showing that registered farmers obtained more peach production as compared to those farmers who have less duration of registration with MFSCs in the study area.

**Table 6.** Comparison of yield before and after registration with MFSCs.

| Variable | Yield (Ton) before registration | | Yield (Ton) after registration | | Mean difference (Kg) | t-value | p-value |
|----------|------|------|------|------|------|------|------|
| | Mean | SD | Mean | SD | | | |
| Yield | 3.2563 | 55685 | 3.6363 | 34723 | 0.3800 | -5.390 | 0.000 |

*Paired t-test comparison of yield*

Paired sample t-test was used to investigate yield comparison of peach before and after registration and the analyzed results were depicted in Table 6. The mean value 3.2563 was recorded before registration of farmer with MFSCs and mean value 3.6363 was recorded after registration with MFSCs. The result show mean difference 0.3800 after the registration.

There is a highly significant (p<0.01) difference between before-after yield, which is clear from the obtained mean difference value that is 0.3800. The mean value difference shows that MFSCs facilitate and provide necessary resources to peach grower in study area. Ullah *et al.* (2015) also obtained the same results that MFSCs provide resources and facilitate the farmer community.

**Table 7.** Comparison of income before and after registration with MFSCs.

| Variable | Income (Rs.) before registration | | Income (Rs) after registration | | Mean difference Rs. | t-value | p-value |
|----------|------|------|------|------|------|------|------|
| | Mean | SD | Mean | SD | | | |
| Income | 123125 | 24960 | 165062 | 26606 | 41937 | -10.966 | 0.000 |

*Paired t-test comparison of income*

Income of the respondents was analyzed using t-test statistics and the study outcomes were presented in Table 7.

The mean value 123125 was recorded before registration of farmer with MFSCs and mean value 165062 was recorded after registration with MFSCs. The results showed mean difference of 41937 after the registration. There is a highly significant (p<0.01) difference between before-after income, which is clear from the obtained mean difference value that is 41937. It means that study respondents got Rs. 41937 more income after registering themselves with MFSC, our result are in conformity with Ullah *et al.* (2015) who stated that MFSCs provide necessary resources and facilitate the farmer community.

**Conclusion**

According to study maximum peach growers were owners, illiterate and above 50 years of age, involved in full time agriculture and were in the initial stage of farming. Source of income was agriculture and maximum were producing peach by getting satisfactory production from peach orchards as maximum peach growers were registered with Model Farm Services Centers (MFSCs)  from 4-6 years who got information

about MFSCs from fellow farmers. The MFSCs are not only playing the role of increasing the peach production and yield/acre but also providing agricultural inputs like fertilizer, pesticides, farm machinery, resistant varieties and certified seeds along with timely information, technical knowledge as well as advanced farming practices to peach growers in the study area. Moreover, MFSCs also plays an important role in solving the problem of farming community. Peach growers pointed out various problems during their field operations it is therefore; recommended that MFSC should provide agricultural inputs like pesticides, farm machinery, resistant verities, certified seeds, insect traps and fertilizers on subsidized rate to farming community.

Agricultural Extension Agents should make frequent and regular visits to peach growers for identification of their problem. The government is requested to provide easily accessible market facilities to peach growers to save their fruits from rottening. Moreover, government should provide interest free loans to the needy and efficient peach growers.

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