

Research Article



Farmer's Empowerment by Farm Services Centers: A Pedagogic Approach for Sustainable Development

Muhammad Zafarullah Khan^{1*}, Rehmat Ullah¹, Asif Nawaz¹ and Ejaz Ashraf²

¹Department of Agricultural Extension Education and Communication, The University of Agriculture Peshawar, Khyber Pakhtunkhwa, Pakistan; ²Department of Agricultural Extension and Rural Development, University College of Agriculture, University of Sargodha, Sargodha, Pakistan.

Abstract | The present study was carried out in Khyber Pakhtunkhwa province during 2014 in order to investigate about the performance of Farm Services Centers in the empowerment of farmers towards the sustainable development. Five districts of Khyber Pakhtunkhwa such as Mansehra, Dir Lower, Swat, Dera Ismail Khan and Swabi were the sampled districts and 80 farmers registered with Farm Services were randomly selected from each district. Thus, sample size was making a total of 400 respondents. Primary data were collected with the help of pre-tested interview schedule through personal interview method. The results of this research study revealed that affinity toward Farm Services Centers were bulk of the educated, middle aged and small landholding farmers. Maximum of the respondents had above 20 years of farming experience. A rapid increase in the registration of farmers with Farm Services Centers was found in the last five years. Chi-square results indicated highly significant association ($P \leq 0.05$) between the duration of registration with Farm Services centers, fertilizers and farm machinery provided to the respondents. Farm Services Center's performed their commitment very well with respect to empowerment of farmers in different agrarian practices like decision making, farm management, varietal selection, management of weed, and selection of fertilizer. Private agricultural companies were also playing their role in technological breakthroughs. It is therefore, suggested that these agricultural companies must be allowed for demonstration to train farmers on their innovations under Farm Services Center's.

Received | January 31, 2017; **Accepted** | February 13, 2018; **Published** | March 15, 2018

***Correspondence** | Muhammad Zafarullah Khan, Department of Agricultural Extension Education and Communication, The University of Agriculture Peshawar, Khyber Pakhtunkhwa, Pakistan; **Email:** drzafar@aup.edu.pk

Citation | Khan, M.Z., R. Ullah, A. Nawaz and E. Ashraf. 2017. Farmer's empowerment by farm services centers: A pedagogic approach for sustainable development. *Sarhad Journal of Agriculture*, 34(2): 225-232.

DOI | <http://dx.doi.org/10.17582/journal.sja/2018/34.2.225.232>

Keywords | Decision making, Farm services center, Fertilizer, Seed companies and Weed management

Introduction

Agriculture has been, and is, a highly regulated activity in Pakistan. While farmers are increasingly subject to food safety and environmental regulations, the objective for sustainable development in agriculture is of much concern with market price stability and farmer's income support and provision of domestic subsidies. To accumulate terrific agriculture, growth section must be envisioned with the modern capacity building production strategies, increasing

competitiveness and providing friendly environment for local trade (Gabre-Madhin and Johnston, 2002). The above factors will convict more investors in this sector and will sharply meet the domestic demand of better quality food and surplus for export (Javid et al., 2010). There is a terrible need of the latest agricultural technology to achieve food security. The latest techniques of agriculture should replace the orthodox methods of farming. In order to achieve the above mentioned goals, many extension strategies have been tested so far but none of them were effectual in in-

creasing agricultural productivity. The Khyber Pakhtunkhwa government thus started a Farm Services Centers (FSC) approach in 2001 in 23 districts of the entire province to make the farmers capable in various aspects of farming in their own milieu and financial assets with an equal share from the government (Dad, 2004).

The government of Khyber Pakhtunkhwa established these FSCs with the fundamental intention for the provision of agricultural inputs of good quality, improved transfer of technology and well-organized system of marketing. Moreover, it also aimed to provide assistance to the farmers in order to solve their own conflicts and consequently for the improvement of farmers with the help of agricultural officer. For the empowerment of the farmers, they were granted an equal share to the amount they have collected in order to offer more autonomy in their roles and responsibilities in terms of executing and managing the activities under FSCs themselves. The FSCs were established based on the idea that usually farmers had lack of resources. Therefore, the government initiated this strategy of FSC to bring them collectively where they will be made capable to efficiently utilize their resources. Farmers can get membership with FSC by payment of Rs. 100 as enrolment fee and Rs. 500 as membership fee. The government provides a matching grant equal to the farmers share (Dad et al., 2007).

Objectives of FSCs

- To amplify access of farmers towards good quality farm inputs probably at their doorstep on minimum possible rates.
- To develop the skills of farming community regarding planning, needs assessment and management of their farms.
- To establish the linkages of the farmers with markets, line agencies and services providers.
- To made the farmers capable to accomplish seed production system and administer the distribution of inputs effectively.

The FSCs provide the services to the farming community such as secure rights and interests of farmers, upgrade farmers' knowledge and skills, awareness regarding advances in farming, boost crop yield, provision of certified seeds, build up economy of rural areas, pesticides, fertilizers and services regarding animal husbandry. The FSCs also provide latest farm machinery such as tractor, sheller, thresher, rotavator,

lazer leveler etc and also provide expertise about the latest technology. Moreover the FSCs facilitate the registered farmers to take benefits from the laboratories maintained and developed by government on the lowest possible rates.

Shah et al. (2016) argued that beneficiary farmers of FSC had higher productivity in terms of crops, live-stock and milk. Timely availability of improved seeds, fertilizers and pesticides along with latest machinery had significantly increased farmers' income. Ullah et al. (2015) reported that one year of increase in duration of MFSC membership increased sugarcane yield up to 12.84 kg/ha and 45 kg/ha in wheat. Khan et al. (2017) revealed that farmers registered with FSCs were more inclined towards cultivation of vegetables on larger land and also achieved higher yield due to their effective services. Keeping in view the significance of FSC approach, the study in hand was carried out to assess the execution of FSC in strengthening of farmers towards the sustainable development.

Materials and Methods

Universe of study

The Khyber Pakhtunkhwa province is located between 31 to 37° North and 70 to 74° East. The geographic area of Khyber Pakhtunkhwa is 10.17 million ha that constitute 12.8% of the total geographic area of Pakistan (Khattak, 2008). Five districts of Khyber Pakhtunkhwa such as Dera Ismail Khan, Swat, Dir Lower, Mansehra and Swabi were selected for the present study after comprehensive discussion with experts.

Research design

This study utilized Descriptive Survey Research Design. The fundamental idea of the current study was to scrutinize the farmers' empowerment by FSCs, therefore descriptive research design (Khooharo, 2008) was chosen.

Sample size and sample selection

About 80 registered farmers with FSCs from each of the five chosen sampled districts were randomly selected constituting an overall sample of 400 for this study. The agriculture extension department of each sampled district was consulted to obtain the entire list of registered farmers with FSCs in the respective districts. Random numbers were generated with the help of statistical software (SPSS) for the selection of sample respondents.

Data collection tool (Interview schedule)

A well-structured interview schedule containing both open and close-ended questions was prepared for the primary data collection. Before the actual primary data collection, an interview schedule was pre-tested on 5 farmers of each selected districts and the required changes were incorporated. The coefficient of Cronbach alpha (Cronbach, 1951) was calculated in order to check the reliability of the research instrument with the help of SPSS and the calculated Cronbach alpha was 0.82.

Analysis of data

The collected primary data was tabulated and analyzed with the help of SPSS and was presented in simple percentages. Furthermore, Chi-square test was performed to check association among various variables.

Table 1: Demographic characteristic of the respondents.

Variables	Categories	Count	Percentage
Age (In years)	<= 30	75	18.8
	31 - 50	176	44
	51 - 70	137	34.2
	71+	12	3
	Total	400	100
Education (In Years)	<= 5	128	32
	6 - 12	143	35.8
	13+	129	32.2
	Total	400	100
Total Landholdings (in acres)	>5	167	42
	5-50	178	44.5
	51 - 100	30	7.5
	100+	25	6
Total	400	100	
Farming Experience (in years)	<= 20	220	55
	21 - 40	151	37.8
	41+	29	7.2
	Total	400	100
Major source of Income	Agriculture	302	75.5
	Business	46	11.5
	Govt. Job	41	10.2
	Other	11	2.8
	Total	400	100.0
Duration of Registration With FSC	<= 5	220	55
	6 - 10	121	30.2
	10+	59	14.8
	Total	400	100

Results and Discussion

Respondent's profile

For any sustainable approach, the demographic characteristics of the farmers such as education, age, farming background and landholding are considered as very necessary parts in their response and mindfulness towards improved agricultural innovations. Research studies (Saddi et al., 2008; Jensen et al., 2009) reported that demographic factors had impact upon other factors related to diverse aspects which seems somewhat rational. Table 1 shows the data regarding respondents' age and results show that maximum of the respondents (44%) had their age in 31-50 years while (34.2%) of the respondents fall in 51-70 years of age category. Almost 19% of the respondents had less than 31 years of age while a small portion of respondents 3% had recorded age above 70 years. The current results predict that in the study areas, mostly the middle aged respondents had affinity towards FSCs. According to Singh and Singh (2000), education is a prospective foundation that can assist the farmers regarding their knowledge about utilization of agricultural technologies. The results in Table 1 further revealed that almost 36% of the respondents had six to 12 years of schooling followed by the respondents 32.2% that had formal schooling of above 13 years while almost same number of respondents 32.2% had less than six years schooling. The current results are in contrast with those of Cheema (2004) who found that almost 58% of the respondents had five years of schooling. The results in Table 1 showed that less than half 44.5% of the respondents had landholdings of 5 to 50 acres followed by respondents who had a landholding of less than 5 acres (42%). The respondents with 51-100 acres of land were 7.5% and above 100 acres of landholding were 6%. The current results accomplished that petite landholding seems to be a major attribute of the farmers. Results in Table 1 revealed that greater than half of the respondents 55% had upto 20 years of farming experience followed by 38% of the respondents that had experience of 21 to 40 years in farming whereas 7% of the respondents had above 40 years of farming experience. Data in Table 1 showed that agriculture was the top most source of livelihood of almost 76% of the respondents and about 11% of the respondents had business as their source of income. Merely 10% of the respondents argued that government job is the source of their income while a minute number of respondents 3% get their livelihood from other sources. These results

Table 2: Sources of agricultural information.

Sources of Information	Very Low	Low	Medium	High	Very High
Extent of Information availed from FSC	22.5	4	5.8	9.8	58
Extent of information availed from Agriculture Extension	29	6	7.8	10.2	47
Extent of information you avail from Fellow Farmers	22.2	3.2	14.5	14.8	45.2
Extent of information you avail from Agriculture Research	63.5	6.5	9	4	17
Extent of information you avail from TV	90.5	2	2.8	2.2	2.5
Extent of information you avail from Farmers Meetings	59.2	2.2	7.5	8.8	22.2
Extent of information you avail from Radio	91.5	3.2	2.2	1.2	1.8
Extent of information you avail from Input Dealers	30.5	1	10.2	14.8	43.5

Table 3: Distribution of respondents regarding information dissemination method used In FSCs.

Contact Method	Scale	Count	%age
Individual Contact Method	Very Low	50	12.5
	Low	19	4.8
	Medium	50	12.5
	High	110	27.5
	Very High	171	42.8
Group Contact Method	Very Low	121	30.2
	Low	17	4.2
	Medium	32	8
	High	97	24.2
	Very High	133	33.2
Mass Contact Method	Very Low	306	76.5
	Low	14	3.5
	Medium	12	3
	High	65	16.2
	Very High	3	0.8

are in line with those of Verma et al. (2013) viewed that agriculture was the major source of 53.3% of the respondents. The results further showed that maximum 55% of the respondents were registered with FSC 5 years ago while about 30% of the respondents had registered with FSC from 6 to 10 years. Almost 15% of the respondents reported that they had registered with FSC more than 10 years ago (Table 1). Awareness is the initial phase in the adoption process and for this drive agricultural extension is one of the methods accessible to help farmers for their capacity building. It is an extraordinary service as it offers access to small farmers and rural poorer living a long way from the urban areas along with transfer of technology. The outcomes demonstrated the finest communication fidelity and of change agents that they not just aware the farmers about the presence of FSC additionally incite to get enroll with FSCs for better help and learning

of scientific practices regarding modern agriculture.

Extent of information availed from various sources

FSC is an agriculture extension approach that is not only responsible for information dissemination but also to bring about desirable change in farmers' behaviour. The respondents were asked about the information sources available for them in the study area, and their responses were presented in Table 2. The results revealed that information availed from FSC were reported by 58%, 9.8% and 5.8% of the respondents as very high, high and medium respectively on five point likert scale. This means that about 74% of the respondents contacted with FSC members for information regarding farming activities. Agriculture extension as an information source was rated by 7.8%, 10.2% and 47% of the respondents on five point likert scale as medium, high and very high respectively. Fellow farmer was also the important source of information because of easily available and less cost of travelling as 14.8% of the respondents rated high and 45.2% rated very high on likert scale. Input dealers were also playing their role effectively in dissemination of information as indicated by 14.8% and 43.5% of the respondents as high and very high respectively. Agriculture research was not a good source of information as only 17% of the respondents rated very high on likert scale. However TV, Farmers meeting and radio were the most least ranked sources of information by the respondents. The results concluded that FSC, agriculture extension, fellow farmers and inputs dealers were the most prominent sources of information for the respondents in the study area.

Methods used for dissemination of information

The respondents were probed during the survey to investigate about the method that FSCs used for the dissemination of information among them and their views are drawn in Table 3. The results revealed that

almost 70% of the respondents rated individual contact method as high and very high that FSCs used for information dissemination. The results further revealed that group contact method and mass contact method was rated as high and very high by 57% and 17% of the respondents, respectively. During the field survey, it was observed that mostly the respondents visits the FSCs for the required information regarding agriculture that why the respondents rated individual contact method the most used method for dissemination of information. However the FSCs also arranged various types of trainings for the farmers in order to solve their problems but these are not regularly arranged. Mass contact method was very rarely used by FSCs to disseminate information among the farming community.

Table 4: Provision of inputs by FSCs.

Inputs provided	Scale	Count	%age
Provision of Seed as inputs	Very Low	37	9.2
	Low	19	4.8
	Medium	50	12.5
	High	32	8
	Very High	262	65.5
Provision of Fertilizer as inputs	Very Low	41	10.2
	Low	19	4.8
	Medium	44	11
	High	47	11.8
	Very High	249	62.2
Provision of Pesticide as inputs	Very Low	164	41
	Low	37	9.2
	Medium	24	6
	High	11	2.8
	Very High	164	41
Provision of Farm Machinery as inputs	Very Low	131	32.8
	Low	16	4
	Medium	108	27
	High	31	7.8
	Very High	114	28.5

Provision of inputs by FSCs

The FSCs provides seeds, fertilizers, pesticides and machinery to the registered farmers as shown in [Table 4](#). The results revealed that majority of the farmers 65.5% ranked provision of seeds as very high on likert scale whereas 62.2% of the respondents reported provision of fertilizers as very high. Provision of pesticides was reported very high by 41% of the respondents on likert scale. Farm machinery was reported by

28.5% of the respondents very high on likert scale while almost 33% of the respondents reported very low. It is clear from the results that FSCs did not provide the farm machinery satisfactorily therefore the government along with other inputs must pay special emphasis on provision of farm machinery to the farming community. During the survey it was found that farmers had adopted steadiness in fertilizer application, good quality seeds, latest machinery and application of pesticides to acquire potential yield. Moreover less amount of inputs and also due to less number of machinery with FSCs and their provision for short duration were the major issues observed during the data collection. It can be associated with the fact that due to the availability of machinery for less time, it is difficult for the farmers to cover all the field operations because of greater landholdings. Accordingly the greater part of the farmers got less opportunity to book the machinery for their field operations and for an excessive amount of time. In order to address the above mentioned issues, the FSCs ought to bring more stakeholders on board to minimize the financial burden on FSCs. [Mesic et al. \(2007\)](#) reported that the yield increases when inputs were made easily available.

Association among duration of registration and provision of inputs by FSCs

Chi-square test was applied to check the association between inputs provided by FSCs and duration of registration and the results were shown in [Table 5](#). [Table 5](#) revealed highly significant association ($P \leq 0.01$) among the farm machinery provided by FSCs and duration of registration with FSC. The results showed that with increase in duration of registration, the provision of machinery got decreased which showed an inverse association. It was found during the field survey that respondents that had registered with FSCs for more years are utilizing the machinery available on rent instead of FSCs' machinery that is why an inverse association exists. In contrast, the newly registered farmers with FSCs were more enthusiastic towards the utilization of FSC's machinery. Significant association ($P \leq 0.01$) was observed among the duration of registration and fertilizers provided by FSCs ([Table 5](#)). It might be due to the fact that the newly registered farmers had received the fertilizers more the old member of the FSCs. The results further showed that there was non-significant association among duration of registration and both seeds and pesticides provision by FSCs which concluded that

Table 5: Association among registration duration and inputs provision by FSCs.

Inputs	Scale	Since how many years you are registered						p-value
		<= 5		6 – 10		10+		
		Count	%	Count	%	Count	%	
Seed	Very Low	23	62.2	7	18.9	7	18.9	0.093
	Low	13	68.4	3	15.8	3	15.8	
	Medium	33	66	15	30	2	4	
	High	16	50	8	25	8	25.	
	Very High	135	51.5	88	33.6	39	14.9	
Fertilizer	Very Low	32	78	6	14.6	3	7.3	0.043
	Low	14	73.7	3	15.8	2	10.5	
	Medium	26	59.1	14	31.8	4	9.1	
	High	23	48.9	15	31.9	9	19.1	
	Very High	125	50.2	83	33.3	41	16.5	
Pesticide	Very Low	100	61	36	22	28	17.1	0.064
	Low	23	62.2	10	27	4	10.8	
	Medium	13	54.2	6	25	5	20.8	
	High	4	36.4	5	45.5	2	18.2	
	Very High	80	48.8	64	39	20	12.2	
Farm Machinery	Very Low	84	64.1	26	19.8	21	16	0.000
	Low	11	68.8	4	25	1	6.2	
	Medium	32	29.6	59	54.6	17	15.7	
	High	19	61.3	5	16.1	7	22.6	
	Very High	74	64.9	27	23.7	13	11.4	

Table 6: Linkages of farmers developed by FSCs with inputs agencies.

Input Agencies	Scale	Count	%age
Seed Companies	Very Low	317	79.2
	Low	14	3.5
	Medium	16	4
	High	8	2
	Very High	45	11.2
Pesticide Companies	Very Low	321	80.2
	Low	12	3
	Medium	14	3.5
	High	9	2.2
	Very High	44	11
Farm Machinery Industry	Very Low	345	86.2
	Low	6	1.5
	Medium	16	4
	High	7	1.8
	Very High	26	6.5

seeds and pesticides were provided to the farmers irrespective of their registration duration with FSCs.

Linkages developed with inputs agencies by FSCs

Since creation of farmers’ linkages with the input agencies is one of the fundamental aims of FSCs, therefore respondents were asked about their linkages made by FSCs with input agencies and their responses were presented in Table 6. Almost 80% of the respondents reported that FSC did not build their linkages with seed companies whereas 11.2% of the respondents rated very high their linkages with seed companies build through FSCs. Majority of the respondents 80.2% had reported that FSCs did not developed their linkages with pesticides companies whereas 11% of the respondents rated very high their linkages with pesticide companies established through FSCs. A clear majority of the respondents 87.2% reported that FSCs did not create their linkages with farm machinery industry. The present results conclude that FSCs did not fulfill its obligation regarding development of farmers’ linkages with the input agencies.

Empowerment by FSCs

Empowerment can be defined as to fortify the farmers’ capabilities in decision making about the effective

Table 7: Empowerment of farmers by FSCs.

Empowerment	Very Low	Low	Medium	High	Very High	P-Value
Farm Management	30.5	2	3.5	4	60	0.315
Decision Making	35	1.8	2.2	4.8	56.2	0.137
Marketing of Produce	39.2	2.8	6.5	1.8	49.8	0.105
Selection of Better Varieties	30.2	5.2	3.5	4.2	56.8	0.192
Weed Management	30.2	2.8	4.8	5.5	56.8	0.230
Water Management Practices	34.5	4.8	5	3	52.8	0.209
IPM	35.5	4.2	6	2.5	51.8	0.144
IDM	36.2	3.2	6.8	2.2	51.5	0.139
Food Preservation Techniques	40.2	19	2.5	3.5	34.8	0.000
Extension Methods	34	2.8	4.5	20	38.8	0.02
Fertilizer Selection	31	2.5	4	5.8	56.8	0.243
Time of Sowing	30.8	5.5	2.2	4	57.5	0.072
Organic Farming	37	3.5	2	8.2	49.2	0.05
Need Based Technology	32.5	1.5	9.2	4.5	52.2	0.332

management and utilization of their resources. The respondents were probed during the field survey and their responses are shown in Table 7. The results revealed that FSCs empowered maximum number 60% of the respondents regarding management of their farms whereas more than half of the respondents 56.2% were very highly empowered regarding decision making by FSCs in the study areas. The results further revealed that almost half of the respondents were empowered regarding marketing of their produce while each 56.8% of the respondents were very highly empowered in both selection of varieties and weed management on five point likert scale. The empowerment regarding water management, integrated pest management and integrated disease management were also satisfactory as reported by 53%, 52% and 51.5%. Very high empowerment regarding techniques of food preservation was reported by almost 35% of the respondents whereas 38.8% of the respondents were empowered very high in extension methods. Likewise empowerment in selection of fertilizer, sowing time, organic farming and need based technology by FSCs was also good as viewed by 56.8%, 57.5%, 49.2% and 52.2% of the respondents. These results discovered suitable domino effect regarding farmers' empowerment in a variety of practices. Chi-square test was applied further to check the association between empowerment of farmers by FSCs and duration of registration and the results are shown in Table 7. The results showed a highly significant ($P \leq 0.01$) association among the duration of registration and empowerment in food preservation technique of the respondents. The result further shows

that there were significant associations ($P \leq 0.05$) between duration of registration and both extension methods and organic farming with significance level of 0.02 and 0.05 respectively. However, there were non-significant association among registration duration and empowerment in all other practices. This showed that irrespective of duration of registration, respondents were being empowered by FSCs in a variety of agricultural practices.

Conclusions

The current study concluded that bulk of the educated and middle aged farmers had inclination towards FSCs. Mainstream of the respondents had landholding of less than 5 acres and agriculture was their major source of income. About half of the respondents had above 20 years of farming experience. The farmers' registration with FSC had been increased in the recent years. The FSCs succeeded in their obligation regarding provisions of fertilizers, pesticides and improved seeds to the registered farmers. FSCs almost failed to create the linkages of farmers with the other line departments. FSCs performed their commitment up to greater extent in farmers' empowerment in selection of fertilizers, management of weeds, improved varieties selection, decision making and farm management. It is suggested that government might take initiatives for provision of funds on account of regular trainings arrangement, particular crop machinery and subsidized inputs. The private companies have to be permitted for demonstration to educate the farmers under FSC on their innovations.

Acknowledgement

This paper was supported by the project of higher education commission on impact of farm services center approach on empowerment of farming community in Khyber Pakhtunkhawa-Pakistan, Project No.2873.

Author's Contribution

Muhammad Zafarullah Khan designed and supervised this research study. Rehmat Ullah and Asif Nawaz collected the data, wrote the manuscript and incorporate the suggestions of the reviewers. Ejaz Ashraf helped in data analysis. All authors finally approved the manuscript.

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