

Research Article



To Study the Effectiveness of Farm Services Center Regarding Provision of Agricultural Inputs to its Member Farmers in Khyber Pakhtunkhwa, Pakistan

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Abstract | The government of Khyber Pakhtunkhwa in the year 1999, started a new strategy of Farm Services Center for the empowerment of farmers that aimed to provide agricultural inputs like seeds, fertilizers, pesticides, machinery along with advisory services in order to increase per acre yield. This study was conducted in Khyber Pakhtunkhwa province in the year 2016. The study was conducted to assess the effectiveness of Farm Services Centers (FSCs) in district Charsadda regarding provision of agricultural services to its member farmers. About 57% respondents were registered with FSC since last 4-6 years period. Also 57% of the respondents mentioned that the extension agent was the source of awareness about FSC. About 43% of the respondents were invited by FSC for general body meeting whereas only 26% participated in the process of election. Maximum respondents were provided farm machinery by FSC i.e. cultivator (51%), rotavator (56%), mold board plough (56%), disk plough (48%), single furrow (47%), drill (61%) and ridge maker (53%). Market was the source of seed for majority of the respondents regarding cauliflower (43%), bitter melon (32%), bottle gourd (13%), potato (34%) and squash (29%). Similarly, majority of the respondents obtained urea (73%), SSP (54%), DAP (60%) and Nitro-Phos (55%) from the FSC whereas 91%, 99% and 96% respondents obtained Micron, Super Silica and Gypsum from the concerned dealers. It is concluded that there was a gap in invitation of farmers for general body meeting and participation in elections by FSC members. FSC administration did not fulfill its obligation regarding provision of vegetable seed to its members resultantly they purchased seeds from the open market. Due to effective services of FSCs, farmers were inclined towards the cultivation of vegetables on larger areas and hence achieved significant yield of these selected vegetables in the study area. It is suggested that steps should be taken so that the participation of farmers in general body meetings and elections of FSC should be enhanced so that the trust of farmers be developed and they would be able to reach the solution of their problems. Timely availability of vegetable seeds along with subsidy should be ensured so that farmers can avail this opportunity.

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Introduction

Like other developing nations, agriculture is the backbone of Pakistani economy. Agriculture not only provides food to consumers and fiber for the domestic

industry, but also provides livelihoods and employment to majority of the country populace. Agriculture is the chief source, either directly or indirectly, of the export earnings of Pakistan (Agriculture in Pakistan and the Doha Development Agenda, 2006).

Agricultural sector contributes about 19.8 percent to the Gross Domestic Product (GDP) of the country and plays an important role in national economy. Approximately 130 million of the country inhabitants are fed by it and contribute about 60 percent to the total export earnings of the country. Moreover almost 43 percent of the total work force in the country is employed in agriculture, and is the major source of livelihood for the rural population of the country and it also provides raw materials and locally produced industrial products to the markets (GOP, 2016).

Agriculture extension is the most logical, scientific and systematic method of disseminating new knowledge and skills to farming community to enable them in successfully adopting and diffusion for making an efficient use of their land and other resources (Ullah, 2014). Agricultural extension is sustained service to broaden the basic education of the farmers primarily to the agricultural sector in rural population. It comprises of effective and organized source of communication among farmers in order to provide solution to their basic problems. The objectives of Agriculture Extension are mainly oriented to better approaching into clear formulation of farmer's desires (Farooq et al., 2010).

Government of Khyber Pakhtunkhwa launched a new approach of Farm Services Center after failure of the past extension approaches like village-AID program, Integrated Rural Development Program, Inputs at Farmer's Doorsteps and Training & Visit System in the year 1999. These previous approaches were under heavy criticism due to expensive, unyielding, top down approach, ineffective communication with farmers, not responsive to farmers' needs and were unable to convene the challenges of changing circumstances (Butt et al., 2005).

Farm Services Centers were built up to raise farmers' accesses to the quality agricultural inputs (like seeds, fertilizers, pesticides and machinery), specialized guidance and advisory services. The focuses were made with a perspective of organizing and empowering small farmers at a platform where full technical support of agriculture was accessible to them. To give one window services to the farmers in genuine matter, the legislative bodies of related segments of the Agriculture Department were kept under one rooftop. Furthermore, facilitation of farmers along with all major production inputs like seeds, fertilizers, pes-

ticides and machinery were made available at their doorsteps (Haq et al., 2009).

Various studies (Haq et al., 2009; Ali 2015) reported that FSC that is based on public private partnership approach has fundamentally and overwhelmingly enhanced the farmer's skills and gave inputs, technologies and abilities for better per acre production. The production of various crops per unit was considerably increased because of the FSC that eventually has a positive impact on national economy. Moreover, the provision of quality agricultural inputs had additionally encouraged the farmers to get more production. Therefore, the study in hand was conducted to assess the effectiveness of farm services center regarding provision of agricultural inputs to its member farmers in district Charsadda which has great potential for vegetable cultivation.

Materials and Methods

Universe of the study

District Charsadda of Khyber Pakhtunkhwa was the universe of the study that was purposively selected as fertile and most suitable for vegetable cultivation as well as to save time and reduces financial expenses. All the vegetable growers registered with FSC were the population of the study.

Sampling design

Farm Services Center Dhakki out of the four FSCs working in district Charsadda was purposively selected for the present study because majority of the farmers were growing vegetable and easily accessible. Based on Sekaran sampling technique (2003), those 234 respondents were selected as a sample that cultivated any one of the five selected vegetable such as cauliflower, bitter gourd, bottle gourd, potato and squash; as it was not possible that farmers can grow all these vegetable.

Tools for data collection

The present study comprised of both primary as well as secondary data. Researcher personally collected primary data by means of structured and open-ended interview schedule in the field whereas secondary data were accumulated from various published and unpublished sources. Interview schedule was pretested on 25 registered farmers of the FSC where many questions were dropped while some were added based on observation and critical analysis with pre testing

on these farmers.

Data analysis

The collected data were fed to and analyzed with the help of statistical software called as Statistical Package for Social Sciences (SPSS V.20). The results were presented in frequencies and percentages. Mean and standard deviation were used for cultivated area under vegetable and vegetable's yield.

Results and Discussion

General characteristics of the respondents

During the survey, respondents were probed about their general characteristics and their responses were presented in Table 1. The results presents that 57% of the respondents were registered with FSC since four to six years ago and followed by 29% of the respondents who were registered three years ago. There are 15% fewer respondents registered with FSC shortly than six years ago. These results conclude that there is decrease in the registration of the farmers with FSCs in the recent years. The distance of the respondents from FSC has a great impact on the frequent visits and meeting with FSC staff. Dissemination of new techniques to farmers as directly related with the FSC office distance. The distance of respondents from FSC office shows that majority (41%) of the sample respondents were living at a distance of up to 3 Km from FSC office, followed by 35% respondents living at 3.1-6 Km away from the FSC office, while only 24% of the total sample respondents were living at a distance of more than 6 Km (Table 1).

There are various sources that play an important role in creating awareness among the farming community about the existence of FSCs. Table 1 showed that maximum (57%) of the respondents were aware about the existence of FSCs through extension agents followed by 23% of the respondents that came to know through fellow farmers. About 20% of the respondents got aware about the FSC due to their personal contact with them. These results conclude that agricultural extension agents were the principal source of awareness among the farmers of the study area. Access to membership is directly related to registration and ultimately to the adoption of FSC recommendations. Table 1 represented the data regarding difficulty in respondents' membership access, which showed that a clear majority of the total sample respondents (84%) faced no difficulty in access to the FSC while

only 16% of the respondents reported that they faced difficulties in access to the FSC membership.

Apart from FSCs, other organizations are also involved in facilitation of the farmers regarding improvement of farmer's skill and awareness about latest technology. Therefore the respondent's views about their membership with other organizations was probed to check solely effect of FSC and presented in Table 1. Majority of the respondents (86%) did not have membership with other organizations which shows the interest of farmers and confidence on FSC. While only 14% of the total sample respondents were registered with other organizations. Farm services center has an obligation to held general body meeting where multiple problems of different farmers are to be discussed and offer solutions to their problems. Therefore data regarding invitation of respondents by FSC to general body meeting was collected during the survey. Table 1 showed that 57% of the total sampled respondents reported that they were not invited whereas 43% of the sample respondents were invited by the FSC to general body meetings.

Participation of farmers in farm services center' general body election is very essential because executive committee selected as a result of these elections who further selects the management committee members which takes important decision regarding FSC activities. Due to the significant role of management committee in the assistance of farmers, they were inquired about their participation in FSC general election and their views are given in Table 1. Maximum number (74%) of the sample respondents did not participated in the FSC general election. Only 26% of the total sample respondents participated in the FSC general election and they were of the view to elect devoted person who take interest in minimizing their problems. These results are in conformity with those of Ullah (2015) who reported that about 68% of the respondents did not participated in general election of the FSC. Results of the respondents' view about their access to brochures/newspapers are presented in Table 1 which shows that only literate farmers of the current study (i.e., 70%) have reported their access to brochures/newspaper, while the illiterate respondents (30%) have reported their no access to brochures/newspapers and they get information through other way.

Sources of machinery

Machinery plays an important role in farming because

it not only reduces the time of operation but also results in obtaining higher yield. According to the by-laws of the FSCs, it is their major responsibility to provide latest machinery to the farmers on reasonable rent. Therefore, the respondents were asked about the sources of machinery that they have utilized during their farming and their views are presented in Table 2. This table showed that more than half of the respondents (51%) have used the cultivator provided by FSC on rent basis whereas 49% of the respondents reported cultivator rented from other sources that includes own (24%), fellow farmers (16%) and others (9%). Both rotavator and mould bold ploughs were utilized

by 56% respondents provided by FSC. Similarly, for disk plough the major source was FSC reported by 48% of the respondents followed by own (20%), fellow farmers (15%) and other sources (10%). Similarly, FSC was the major source also for single furrow reported by 47% respondents, drill (61%) respondents and ridge maker (53%) respondents. However, own was the major source reported for tractor trolley 43% respondents and hand spray machine 92% respondents while also the minor source reported for mould bold plough (9%) respondents, disk plough (11%) respondents, and single furrow (4%) respondents and drill as reported by (7%) respondents.

Table 1: *Distribution of respondents according to general characteristics*

Characteristics	Categories	Frequency	Percentage
Length of registration with FSC (in Years)	Up to 3	67	29
	4-6	133	57
	Above 6	34	15
Distance from FSC (Km)	Up to 3	97	41
	3.1 to 6	81	35
	Above 6	56	24
Source of information about FSC	Fellow farmers	53	23
	Extension agents	134	57
	Self-contact	47	20
Difficulty in access	Yes	196	84
	No	38	16
Membership with other organizations	Also other	32	14
	Only FSC	202	86
Invitation to general body meeting	Invited	100	43
	Not invited	134	57
Participation in general election	Participated	61	26
	Not participated	173	74
Access to brochures	Yes	164	70
	No	70	30

Source: Field survey, 2016.

Table 2: *Distribution of respondents regarding sources of machinery*

Type of machinery	Sources of machinery				Total
	Own	FSC	Fellow Farmers	Others	
Cultivator	56 (24)	120 (51)	37 (16)	21 (9)	234 (100)
Rotavator	46 (20)	130 (56)	35 (15)	23 (10)	234 (100)
Mould bold plough	22 (9)	132 (56)	30 (13)	50 (21)	234 (100)
Disk plough	26 (11)	113 (48)	40 (17)	55 (24)	234 (100)
Single furrow	10 (4)	110 (47)	40 (17)	74 (32)	234 (100)
Drill	16 (7)	142 (61)	24 (10)	52 (22)	234 (100)
Ridge maker	40 (17)	125 (53)	28 (12)	41 (18)	234 (100)
Tractor trolley	101 (43)	22 (9)	79 (34)	32 (14)	234 (100)
hand spray machine	215 (92)	9 (4)	4 (2)	6 (3)	234 (100)

Source: Field Survey, 2016; Note: Values in Parentheses are Percentages.

Table 3: *Distribution of respondents stating sources of vegetables seeds*

Seed sources	Cauliflower	Bitter gourd	Bottle gourd	Potato	Squash
Home seed	3 (1)	13 (6)	39 (17)	15 (6)	2 (1)
Fellow farmers	3 (1)	-	2 (1)	3 (1)	9 (4)
FSC	17 (7)	34 (15)	12 (5)	9 (4)	17 (7)
Agri. research	2 (1)	1 (0)	3 (1)	11 (5)	1 (0)
Market	100 (43)	74 (32)	30 (13)	80 (34)	69 (29)
Not cultivated	109 (47)	112 (48)	148 (63)	116 (50)	136 (58)
Total	234 (100)	234 (100)	234 (100)	234 (100)	234 (100)

Source: Field Survey, 2016; **Note:** Values in Parentheses are Percentages.

Table 4: *Distribution of respondents purchasing fertilizers from different sources*

Types of fertilizers	Sources of fertilizer purchased for vegetables			
	FSC	Input Dealer	Both	Total
Urea	171 (73)	8 (3)	55 (24)	234 (100)
Single super phosphate (SSP)	127 (54)	70 (30)	37 (16)	234 (100)
Micron	2 (1)	212 (91)	20 (8)	234 (100)
Super silica	2 (1)	232 (99)	-	234 (100)
DAP	141 (60)	26 (11)	67 (29)	234 (100)
Nitro-phos	128 (55)	43 (18)	63 (27)	234 (100)
Gypsum	7 (3)	224 (96)	3 (1)	234 (100)

Source: Field Survey, 2016; **Note:** Values in Parentheses are Percentages.

Sources of vegetable seeds

Good quality seed is the pre-requisite input for cultivation of vegetables and plays an important role in the production and obtaining maximum yield. The hybrid and diseased resistant variety seeds are more popular in the market. Keeping in view the promising characteristics of seed due to which farmers purchase hybrid variety seeds from different seed companies. The question in this regard was asked from the respondents. Their views are presented in the Table 3. This table showed that respondents purchased vegetables seeds from different sources like cauliflower from market which was reported by 43% respondents, FSC (7%), Agri. Research (1%), fellow farmers (1%) and home seed (1%) while 47% respondents did not cultivate cauliflower. The seed sources for bitter gourd were market reported by 32% respondents, FSC (15%), home seed (6%), fellow farmers (0%) and Agri. Research was reported by only one respondent, while 48% respondents did not cultivate bitter gourd. The seed sources reported for bottle gourd were home seed by 17% respondents, market (13%), FSC (5%), fellow farmers (1%) and Agri. Research (1%) while (63%) respondents did not cultivate bottle gourd. The sources reported for potato seeds were market by 34% respondents, home seed (6%), Agri. Research

(5%), FSC (4%) and fellow farmers (1%) while 50% respondents did not cultivate potato. Similarly, the sources reported for squash seed were market 29% respondents, FSC (7%), fellow farmers (4%), home seed (1%) and Agri. Research (58%) while 48% respondents did not cultivate squash. These findings are at par with those of Ullah et al. (2016) who indicated that almost 60% of the respondents purchased vegetable seed from market whereas 40% respondents utilized seed from FSC. This might be due to non-availability of vegetable seeds in the Farm Service Centers.

Fertilizers sources

Fertilizer is also an important agriculture input regarding soil fertility and that provide different essential nutrients to the crops. The use of fertilizers with required amount and timely application can boost the vegetable yield significantly. Respondents' views regarding sources of fertilizers for the selected vegetables are presented in Table 4. This table showed that although fertilizers were provided by FSC but the farmers also purchased from other sources. The results shows that vast majority (73%) of the respondents reported the purchase of urea from FSC followed by 24% of the respondents who purchased it from both FSC and input dealer while only 3%

respondents purchased urea from input dealer. SSP was purchased by 54% of the respondents from FSC whereas 30% respondents purchased SSP from input dealer and 16% respondents purchased from both the sources. A clear majority of the respondents (91%) purchased micron from input dealer and only 1% respondent purchased from FSC and about 8% responded that they purchased it from both FSC and fertilizer dealer. Super silica was purchased by overwhelming majority of the respondents i.e. 99% from input dealer while merely 1% respondents purchased it from FSC. The result further showed that FSC as a source of DAP, Nitro-phos and gypsum was reported by 60%, 55% and 3% of the respondents respectively. Also respondents purchased fertilizers from input dealer were in the ratio of; gypsum (96%), Nitro-Phos (18%), and DAP (11%) while the percentage of respondents purchasing fertilizers from both sources was as; DAP (29%), Nitro-Phos (27%) and gypsum (1%). These results are less than those of Ullah (2015) who reported that 60% of the respondents purchased urea, 100% respondents purchased Super Micron and Super Silica and 57% purchased DAP from the Farm Service Center. This might be due to the availability of the fertilizers in greater quantity and also farmers' easy access to these inputs in district Charsadda.

Area under cultivation of vegetables

The farmers cultivate various vegetable according to house hold consumption and market demand. The respondents were asked about the area cultivated under the selected vegetable and their views are presented in Table 5. It showed that potato was the major vegetable grown by the sample respondents with the mean area under cultivation of 2.234 acres, followed by bitter gourd (2.204 acres), squash (1.824 acres), cauliflower (1.822 acres) and bottle gourd (1.611 acres). The own interest of farmers, experience and availability of storage facility are the prominent reasons and factors that affect the cultivation of area under any specific vegetable. These findings show that in the study area farmers were more inclined towards the cultivation of vegetables to get higher income from vegetables as compared to other agronomic crops.

Vegetable yield

Table 6 represented the yields of the selected vegetables which shows that mean yield of cauliflower was 7912.90 Kg per acre with a standard deviation of about 13388 Kg per acre. The data further showed that mean yield of bitter gourd was 24456.45 Kg/

acre, bottle gourd was 29118.67 Kg/acre, potato was 20233.66 Kg/acre and squash was 25083 Kg/acre.

Table 5: *Area under vegetables cultivation*

Vegetable sown area (in acres)	Mean	Std. deviation
Cauliflower	1.822	3.3279
Bitter gourd	2.204	3.3697
Bottle gourd	1.611	3.7237
Potato	2.234	3.8011
Squash	1.824	3.6751

Source: Field survey 2016.

Table 6: *Average production of vegetables of the sampled respondents*

Yield of vegetables (Kg/acre)	Mean	Std. deviation
Cauliflower	7912.90	13387.605
Bitter gourd	24456.45	9036.118
Bottle gourd	29118.67	28566.341
Potato	20233.66	28651.769
Squash	25083.87	8138.600

Conclusions and Recommendations

Majority of the respondent faced difficulty in access to obtain the Farm Service Center membership in the study area having experience of FSC more than 4 years. Extension Agents were the prominent source of awareness about the existence of FSC. Big gap was observed in invitation of farmers to general body meeting and elections by FSC which was the only organization that was carrying out activities in the study area for the improvement of farmers' socio economic conditions. FSC played significant role regarding provision of machinery to its member farmers for their higher production. FSC did not fulfill its obligation regarding provision of vegetable seed to its members resultantly they purchased seeds from the open market. Mostly used fertilizers were provided to majority of the respondents on subsidized rates. Due to services of FSCs, farmers ignored the distance and were diverted towards the cultivation of vegetables on large areas and hence achieved significant yield of the vegetables in the study area.

Recommendations

On the basis of conclusions of this study, the following recommendations were made:

- Steps should be taken for the participation of

farmers in general body meetings and elections of FSC so that the trust of farmers should be developed and they also get positive results in obtaining the solution to their problems.

- Timely availability of vegetable seeds on subsidized rates should be ensured so that farmers can obtain seeds from the FSC in time.
- Efforts should be made to provide the agricultural inputs like seeds, fertilizers, pesticides, machinery and equipments on the subsidized rates so that farmers can be benefitted.
- The administration of FSC should motivate the non-registered farmers through mass media so that they can register themselves with FSC to get more production for their higher income.
- There is a need of promoting organic farming among the vegetable growers of the study area and also to introduce modern technology to get better results.
- Vegetable can produce higher yield in tunnel farming technology therefore tunnel technology must be provided to the vegetable growers in order to boost their vegetable production.

Author's Contribution

MZK provided the main theme and supervised the study. SSA collected the data and wrote the manuscript. AN performed data analysis and fine tuned data interpretation.

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