

Research Article



Role of Farm Services Center regarding Empowerment of Vegetables Growers in District Charsadda

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Abstract | This study was conducted in Charsadda district in the year 2016 to investigate the role of Farm Services Center (FSC) regarding empowerment of vegetable growers. Primary data were collected from 234 vegetable growers through well-structured interview schedule. Whereas secondary data were amassed from various published and unpublished sources. Results of the present study revealed that majority (85%) respondents had joint families system. Almost (60%) respondents had landholdings up to five acres and majority (77%) respondents were involved on full time basis in agriculture whereas 80% of the respondents reported agriculture as their major source of income. FSC was the major source of agricultural information followed by agriculture extension department. More than half of the respondents (i.e. 60%) reported that FSC arranged trainings for them regarding their capacity building. Fertilizer application was the major skill stated by overwhelming majority of (95%) respondents followed by improved agricultural technology (94%) and sowing methods (93%) learned through FSC. Mass contact method was rarely used in the study area as only 10% of the respondents ranked it very high and 28% respondents reported it very low on likert scale. It can be concluded that FSC had developed the linkages of the respondents with agriculture research and water management department in the study area. Top learned skills from this approach were fertilizer application, improved agricultural technology and sowing methods. It is suggested that there is a need that FSC has to establish the linkages of the farmers with the entire line department associated with the farming. FSC should take steps to build the capacity of the farmers regarding the latest improved practices of vegetable cultivation to achieve more production.

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Introduction

The agricultural sector contributes about 19.8 % to the Gross Domestic Product (GDP) and plays an important role in Pakistan's economy. Approximately, 130 million of the country inhabitants are fed by it and contribute about 60% to the total export earnings of the country. Moreover almost 43 percent of the total work force in the country is em-

ployed by agriculture, and is the major source of living for more than 60% of the rural population of Pakistan (GoP, 2016). A large variety of vegetables are cultivated in Pakistan. More than 36 species are grown and consumed as winter and summer vegetables. National statistics of vegetables production indicated that during Kharif (2006) vegetable production stood at 1.2 million tonnes that dropped to one million tonnes in 2010. Similarly in 2006, production of *rabi* vegeta-

bles was 2.2 million tonnes that came down to two million tonnes in 2010. During these four years population grew and the vegetables demand increased. In Khyber Pakhtunkhwa during 2015, *Kharif* vegetables were grown on an area of 222497 hectares and their production was 943183 tonnes while *rabi* vegetables were grown on 163081 hectares and yielded production of 2146173 tonnes (FVCSP, 2015).

Agricultural extension is a source that can help to improve food security and lessen poverty. Agricultural extension is sustained service to broaden the basic education of the farmers primarily to the agricultural sector's employed rural population. It comprises of systematic and organized source of communication with farmers and among farmers in order to provide them help regarding solution of their basic problems (Farooq et al., 2010). Agricultural extension services help the farmers to adopt modern farming techniques. In this regard, the extension agents disseminate the new technologies developed by the researchers among the farming community. Agricultural extension also facilitates the farmers regarding management of their field, decision making and organizational skills. In boosting farmers' per acre yield, extension services ensure that the farmers should adapt judicious use of chemical fertilizers, soil preparation, protection measures along with improved varieties (Ahmad et al., 2007).

A variety of extension approaches like village-AID program, Integrated Rural Development Program (IRDP), Inputs at Farmer's Doorsteps Approach and Training & Visit System have tried from time to time for effective distribution of agricultural technology in public sector, but were under heavy criticism like expensive to a great extent, too unyielding, top down oriented, ineffective in communicating with the farmers, not responsive to farmers' needs and were unable to convene the challenges of changing circumstances (Butt et al., 2005).

Government of Khyber Pakhtunkhwa, keeping in view these shortcomings in 1999, for the first time set up a new podium of Farm Services Center (FSC). In 2005 the Farm Services Centers were renamed as Model Farm Services Center (MFSC) and built up at district level. To raise farmers' accesses to the quality agricultural inputs (like seeds, fertilizers, pesticides and machinery) specialized guidance and experience sharing, the FSCs were then settled at sub

district levels as sub branches of MFSC. The focuses were considered with a perspective of organizing and empowering small farmers at a platform where full technical support of sub-sector of agriculture was accessible to them. To give one window services to the farmers in genuine sense, the legislative bodies of related segments of the agriculture department were kept under one rooftop. Furthermore, facilitation of farmers with all major production inputs like seeds, fertilizers, pesticides and machinery were also available there (Haq et al., 2009).

The fundamental idea of the FSC program was to provide a stage to the farmers in order to empower them to determine their issues of common interest particularly in farming collectively through creating linkages with Government Line Agencies (GLA). The basic rationale was skill enhancement and to arrange input in advance to be saved from any scarcity and black marketing. It was a volunteer public private partnership program (Dad et al., 2007). Therefore, the present study was thus initiated to find out the role of Farm Services Center regarding empowerment of vegetable growers in Charsadda district.

Limitation of the study

This study was limited to only Farm Services Center Dhakki of district Charsadda due to distance, finance, availability and shortage of time. The study focused principally on the performance of FSC regarding empowerment of vegetable growers in the study area. Since limited financial resources affected the study, large coverage and wide scope was not possible.

Materials and Methods

Universe of the study

Charsadda district of Khyber Pakhtunkhwa was the universe of the current study. This district was purposively selected for the present study to save time and reduces financial expenses because the researcher was a permanent resident of this district. The total area of Charsadda district is about 996 square kilometers (98646 ha) and lies between 34° 03' and 34° 38' North latitudes and 71° 28' and 71° 53' East longitudes. Its total cultivated area is 85091 ha (61%); out of which 72983 ha (86%) areas has the supply of water, and about 12108 ha (14%) is un-irrigated (SMEDA, 2015). Climatic conditions of district Charsadda favor the cultivation of wide range of vegetables and therefore, *Kharif* vegetables are cultivated on an area

of 2494 hectares that yields a production of 20816 tonnes. *Rabi* vegetables are cultivated under an area of 968 hectares that produces 8553 tonnes of production (Crop Statistics, 2013). All the vegetable growers registered with FSC were the population of the study.

Sampling design

Farm Services Center Dhakki in Charsadda district was purposively selected for the present study. It is because that majority of the farmers were growing vegetables in this area and also researcher has an easy access to the farmers of this area. For the present study, 234 respondents were selected based on Sekaran sampling technique (2003). In the study area, majority of the vegetable growers were cultivating cauliflower, bitter gourd, bottle gourd, potato and squash. Therefore, these vegetable growers were selected purposively as a sample for this study. Since it was not possible that a vegetable grower can cultivate all these vegetables, hence those 234 vegetable growers were selected as a sample who cultivated anyone of these five selected vegetables.

Tools for data collection

The present study was comprised of both primary as well as secondary data. The secondary data were accumulated from various published and unpublished sources. Principle researcher personally collected primary data with the help of a well-structured and pre-tested interview schedules from the vegetable growers in their fields. Interview schedule was pre-tested on 25 registered farmers of the FSC.

Data analysis

The collected primary data were fed to and analyzed with the help of statistical software known as Statistical Package for Social Sciences (SPSS V.20). The results were presented in frequencies and percentages.

Results and Discussion

Demographic information of the respondents

Demographic information of the respondents such as family system, size of landholding, involvement in farming and major source of income are presented in Table 1. Family system is a unit in which each of the members plays an ominous and distinctive responsibility. Family system plays a major role in allocation of authority in the family and farming activities. More labor is likely available for the activities of farming in the joint family as compared to nuclear family (Amin et al., 2010). Data regarding family sys-

tem of the sampled respondents in Table 1 showed that a clear majority of the total sampled respondents (85%) have joint family system whereas 15% respondents have nuclear family system. These results regarding family status are in contrast with those of Amin et al. (2010) who reported that 40% of the respondents belong to joint family whereas the rest of the respondents belonged to nuclear family. Landholding is a significant factor that drastically changes the behavior of an individual particularly in farming for modern technology. As the size of landholding increases, the individual will be more inclined towards the adoption of technologies and vice versa (Belay et al., 2012). Results regarding the landholding of the respondents showed that clear majority of the total sample respondents i.e., 60% were small farmers with land holding up to 5 acres, followed by 31% of the respondents from the second category with landholding of 5-10 acres (Table 1). Only 9% of the respondents were reported in the third category of above 10 acres of land landholding. These results are quite less than those of Pervaiz et al. (2013) who reported that 91% of the total respondents had landholding of less than five acres. Table 1 showed that clear majority of 77% of the total sample respondents were fully involved in the farming and they concentrate whole time on it while 23% of the respondents were part time farmers. It means that these farmers are also involved in some other jobs. These results are in contrast with those of Ullah (2015) who reported that about 53% of the respondents were involved full time in agriculture

Table 1: Demographic Characteristics of the Respondents.

Characteristic	Categories	Frequency	%age
Family System	Nuclear	36	15
	Joint	198	85
	Total	234	100
Size of Landholding (Acres)	Up to 5	142	60
	5 to 10	72	31
	Above 10	20	9
	Total	234	100
Involvement in Farming	Full time	181	77
	Part time	53	23
	Total	234	100
Major Source of Income	Agriculture	187	80
	Business	28	12
	Govt. Jobs	19	8
	Total	234	100

Source: Field Survey, 2016.

Table 2: Distribution of respondents on the basis of First-Hand Information Source.

Degree of importance						
Sources of Information	Very Low	Low	Medium	High	Very High	Total
FSC	2 (1)	6 (3)	24 (10)	41(18)	161(69)	234(100)
Agri. Extension	3 (1)	3 (1)	28 (12)	61 (26)	139 (59)	234(100)
Fellow Famers	25 (11)	16 (7)	62 (26)	45 (19)	86 (37)	234(100)
Agri. Research	27 (12)	16 (7)	101 (43)	34 (15)	56 (24)	234(100)
Mobile/Phone	84 (36)	39 (17)	73 (31)	17 (7)	21 (9)	234(100)
Field Day	11 (5)	53 (23)	71 (30)	28 (12)	71 (30)	234(100)
TV	98 (42)	45 (19)	49 (21)	28 (12)	14 (6)	234(100)
Farmers meeting	8 (3)	22 (9)	86 (37)	57 (24)	61 (26)	234(100)
Radio	74 (32)	72 (31)	60 (26)	17 (7)	11 (5)	234(100)
Input Dealer	52 (22)	13 (6)	46 (20)	65 (28)	58 (25)	234(100)

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

Table 3: Distribution of respondents on the basis of Human Resource Development/Training arranged by FSC.

Training Arranged By FSC		
Yes	141	60
No	93	40
Total	234	100

Source: Field Survey, 2016

while 47% were practicing farming as part time. Results showed that vast majority of the respondents (80%) reported agriculture as their major source of income which shows that they fulfill their household requirement from agriculture only. Business was the second major source of income as reported by 12% of the total respondents whereas the remaining 8% of the respondents reported that they are government servants and the remuneration of his job is their major source of income (Table 1).

Sources of agricultural information

Data regarding sources of agricultural information of the respondents are presented in Table 2 which showed that maximum of the respondents (69%) reported FSC very high on five point likert scale whereas only 1% respondents reported it very low as source of agricultural information. Agriculture extension and fellow farmers were reported by 59% and 37% of the respondents respectively as very useful information source regarding farming. The respondents reported agriculture research as a source of information on a likert scale as very high (24%), high (15%), medium (43%), low (7%), and very low (12%). Field day, farmers meeting and input dealer were also an important sources of agricultural information in the study area

as reported very high by 30%, 26% and 25% of the respondents respectively. However, it is worth mentioning that TV and Radio were the worse sources used for agricultural information in the study area as reported by only 6% and 5% of the respondents respectively very high on a likert scale. These results are in contrast with Ullah et al. (2016) who reported that about 3% and 10% of the respondents pointed that they got information regarding farming from agriculture extension department as high and very high on likert scale respectively.

Trainings arranged by FSC

FSCs arranged various training programs to provide latest knowledge and skills about modern technologies to the farmers. The farmers can learn a lot of skills about new technology and agricultural practices during the trainings. In this regard a question was asked from respondents and their responses are presented in Table 3. Table 3 showed that the majority of the sampled respondents (60%) reported that trainings were arranged by FSC while 40% of the sampled respondents reported that no trainings were arranged by the FSC. These results are in contrast with those of Ullah (2015) who found that 64% of the respondents reported that MFSC did not arranged trainings.

Improvement in skills through learning from FSC

The operation of new technology need skillful person which is one of the major objectives of FSC so that new technology can be used effectively. In this way the farmer will get maximum benefit from the available technologies. In order to know whether FSC had provided skills to the respondents regarding farming, they were asked during the survey and their responses

Table 5: Distribution of respondents on the basis of linkages with line agencies.

FSC linkages with;	Very Low	Low	Medium	High	Very High	Total
Water management	13 (6)	3 (1)	61 (26)	53 (23)	104 (44)	234 (100)
Agriculture Research Department	8 (3)	11 (5)	64 (27)	45 (19)	106 (45)	234 (100)
Agriculture Engineering	43 (18)	19 (8)	83 (35)	49 (21)	40 (17)	234 (100)
Seed companies	13 (6)	16 (7)	69 (29)	8 (5 (36))	51 (22)	234 (100)
Pesticides companies	15 (6)	22 (9)	65 (28)	71 (30)	61 (26)	234 (100)
Farm Machinery Industry	17 (7)	18 (8)	111 (47)	44 (19)	44 (19)	234 (100)
Credit providing Agency	53 (23)	59 (25)	66 (28)	22 (9)	34 (15)	234 (100)

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

Table 4: Distribution of respondents regarding learning skills from FSC.

Skills	Yes	No	Total
Improved agricultural technology	220 (94)	14 (6)	234 (100)
fertilizer application	223 (95)	11 (5)	234 (100)
sowing methods	217 (93)	17 (7)	234 (100)
Seed Bed preparation	171 (73)	63 (27)	234 (100)
Protection method	174 (74)	60 (26)	234 (100)
Chemical Application	132 (56)	102 (44)	234 (100)
Post-harvest Technique	112 (48)	122 (52)	234 (100)
Seed storage	142 (61)	92 (39)	234 (100)
Harvesting	201 (86)	33 (14)	234 (100)
Packing	118 (50)	116 (50)	234 (100)
Grading	140 (60)	94 (40)	234 (100)
Marketing	99 (42)	135 (58)	234 (100)

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

are presented in Table 4 which shows that majority of the respondents (95%) reported fertilizer application as the top most skill learned from FSC, followed by improved agricultural technology reported by 94% respondents. Sowing method was the third top ranked skill reported by 93% of the respondents while skill regarding harvesting was reported by 86% of the respondents. The results also showed that FSC performed its role effectively in providing skills to the farmer regarding seed bed preparation, protection methods, seed storage, grading, chemical application and packing reported by 73%, 74%, 61%, 60%, 56% and 50% of the respondents respectively. However, the performance of FSC was not up to the mark in providing skills to the farmers regarding post-harvest techniques and marketing as reported by 48% and 42% of the sampled respondents respectively. It might be concluded from these results that skills re-

lated to field crops were on priority basis to FSC that they tried to provide to the farmers in the study area because most farmers were showing interest as cultivating these crops. Ullah (2015) also found similar results which showed that FSC is playing effectively their role in providing skills to the farmers regarding improved farming.

Respondents' linkages with other line agencies

Data regarding establishment of linkages of the respondents with the other line departments are presented in Table 5 which showed that 44% of the respondents reported very high on likert scale that FSC established their linkages with Water Management Department. Less than half of the respondents (45%) reported very high response regarding development of linkages with Agriculture Research while 27% respondents reported medium response. The results further showed that FSC almost failed to establish linkages of the respondents with the agriculture engineering, seed companies, pesticide companies, farm machinery industry and credit providing agency reported by 17%, 22%, 26%, 19% and 15% respectively. Haq et al. (2009) reported that facilitations provided in the shape of linkages with government departments were ranked 3rd in the strengths of the FSCs with mean 3.71 and standard deviation of 1.25.

Capability of working staff in FSC

Respondents were further probed to investigate about the capabilities of staff working in FSC and their responses are given in Table 6. The results shows that 71% of the respondents reported very high capability of the FSC staff in agronomic practices and less than half of the respondents (41%) reported very high capabilities in soil management practices on likert scale. The capabilities of FSC staff in horticultural practices were also satisfactory as reported by 52% of the respondents

Table 6: *Distribution of respondents stating capabilities of working staff in FSC.*

Staff capabilities	Very Low	Low	Medium	High	Very High
Agronomic Practices	-	5 (2)	8 (3)	56 (24)	165 (71)
Soil Management	3 (1)	15 (6)	58 (25)	63 (27)	95 (41)
Horticultural Practices	4 (2)	6 (3)	34 (15)	69 (29)	121 (52)
Integrated Crop management	5 (2)	12 (5)	83 (35)	72 (31)	62 (26)
Water Management Practices	4 (2)	7 (3)	69 (29)	91 (39)	63 (27)
Food Preservation technique	23 (10)	48 (21)	59 (25)	60 (26)	44 (19)
Sowing New Varieties	2 (1)	16 (7)	24 (10)	101 (43)	91 (39)
Delivery Messages	2 (1)	7 (3)	57 (24)	91 (39)	77 (33)

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

Table 7: *Distribution of respondents stating regarding Farmer's Empowerment.*

Farmer's Empowerment Regarding;	Very Low	Low	Medium	High	Very High
Farm Management	6 (3)	2 (1)	19 (8)	65(28)	142(61)
Marketing of Produce	31 (13)	40(17)	30 (13)	30(13)	103(44)
Selection of Varieties	3 (1)	14 (6)	20 (9)	65(28)	132(56)
Water Management Practices	3 (1)	9 (4)	53 (23)	67(29)	102(44)
ICM	9 (4)	2 (1)	72 (31)	78(33)	73 (31)
Food Preservation techniques	30 (13)	65(28)	44 (19)	26(11)	69 (29)
Fertilizer Selection	8 (3)	4 (2)	36 (15)	86(37)	100(43)
Time of Sowing	-	5 (2)	14 (6)	81(35)	134(57)
Organic farming	29 (12)	45(19)	52 (22)	25(11)	83 (35)

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

and their capabilities in Integrated Crop Management (ICM), water management practices, food preservation techniques, sowing new varieties and delivery of messages were reported very high by 26%, 27%, 19%, 39% and 33% of the respondents respectively. Ullah et al. (2016) concluded that capacity building of Management Committee and MFSC staff should be enhanced in planning, record management, seed procurement and other related fields of agriculture and livestock.

Farmers' empowerment: Empowerment of farmers is the provision of ability and capacity to use modern knowledge to boost their social and economical situation keeping in view the preservation and conservation of environment. Farmers are educated in all the best practices of sustainable production in quantity and quality to raise their livelihood by satisfying the needs of the buyers along with no damage to environment.

Table 7 represents the data regarding farmers' empowerment through FSC which shows that 61% of the respondents reported very high empowerment

on likert scale in farm management whereas 44% of the respondents reported very high empowerment in marketing of produce. Regarding selection of varieties, 56% of the respondents reported very high while 28% respondents reported high empowerment on likert scale. About 44%, 31% and 29% of the respondents ranked very high empowerment on five point likert scale regarding water management practices, integrated crop management and food preservation techniques respectively. Empowerment in fertilizers selection, time of sowing and organic farming was reported very high by 43%, 57% and 35% of the respondents respectively. Similarly Ullah et al. (2016) reported that food preservation techniques, marketing of produce and organic farming were the major issues in which the member farmers of the FSC were not empowered and ranked 7th, 8th and 9th with mean value of 2.78, 2.28 and 1.76 respectively.

Methods for dissemination of information: Dissemination of information are increasingly popular due to drastic improvement in all phases of life including agriculture as large gap between transmitted information and received as per need of the end users.

Table 8: *Distribution of respondents on the basis of methods used for disseminating of information.*

Contact Method	Degree					Total
	Very Low	Low	Medium	High	Very High	
Individual	15 (6)	16 (7)	12 (5)	60 (26)	131 (56)	234 (100)
Group	12 (5)	15 (6)	85 (36)	60 (26)	62 (27)	234 (100)
Mass	65 (28)	64 (27)	53 (23)	29 (12)	23 (10)	234 (100)

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

Provision of accurate and timely agricultural information to farmers guide to application of Information and Communication Technology (ICT) in agriculture as technology developed within laboratories and research fields will be useless if not reached to the end users.

One of the prime responsibilities of the Farm Services Center is to aware/ inform the farmers about appropriate technology. To increase famers' interest, the change agents disseminate new agricultural practices. The agricultural extension officers motivate and persuade farmers through practical application of agricultural practices. The extension agent used various methods, suitable according to situation and nature of technology. The data in this regard is presented in **Table 8**. In this table data was categorized as individual, group and mass contact method for communication of information and motivation of famers to adopt new technology. The respondents were asked about the method used in disseminating of information to them. The data shows the statement of 234 respondents about dissemination of information through individual contact as very low (6%, low (7%), medium (5%), high (26%) and very high (56%). The data also shows that 27% of the respondents reported group contact method very low on likert scale while 36% of the respondents reported it medium. Mass contact method was rarely used in the study area as only 10% of the respondents ranked it very high and 28% respondents reported very low on likert scale. **Khatam et al. (2013)** concluded that extension agent can easily diffused agricultural technology through the utilization of individual contact methods such as farm visits, demonstrations, home visits and office call.

Conclusions and Recommendations

Majority of the respondents were small farmers having landholding up to five acres and have joint family system and agriculture was their main source of income. FSC arranged Human Resource Trainings frequently and agriculture extension were the prominent

source of information for the agricultural operations. Top learned skills were fertilizer application, improved agricultural technology and sowing methods and developed the linkages with agriculture research and water management department in the study area. Information about sowing of new varieties, water management practices and delivery of new messages were the top most capabilities of the FSC staff by empowering them in fertilizer selection; sowing time and integrated crop management techniques. Individual contact method was the most frequently used teaching methods for dissemination of information.

On the basis of conclusions of this study, the following recommendations were made in the study area.

- FSC should take steps to build the capacity of the farmers regarding the latest improved practices of vegetable cultivation, pesticide application, post harvest losses and seedbed preparation of the vegetables.
- There is a need that FSC has to establish the linkages of the farmers with seed companies, pesticide companies and credit providing agencies so that the farmers can be encouraged for higher production.
- FSC should make efforts to utilize group and mass contact methods for the diffusion of the latest improved agricultural technology among the farming technology for increasing production.
- FSC should provide regular trainings to its member farmers to empower them in food preservation techniques, organic farming and marketing of the produce.
- Tunnel technology could be provided to the vegetable growers on reasonable prices and also skills should be provided for vegetable cultivation.

Authors Contribution

Shah Saud Ahmad collected and analyzed data and also wrote the manuscript. Muhammad Zafarullah Khan provided technical input and guidance at every step of the manuscript publication.

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