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PHENOTYPIC PLASTICITY AND TOLERANCE TO SALINITY IN BARLEY EFFECT OF FARM SERVICES CENTER APPROACH ON YIELD OF SELECTED VEGETABLES IN DISTRICT CHARSADE

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Abstract

This study was conducted in the year 2016 to evaluate the effectiveness of Farm Services Center (FSC) regarding selected vegetables yield improvement in District Charsadda. For this purpose, a total of 234 respondents were selected based on Sekaran sampling technique. To probe the sampled respondents, a well-structured and planned interview schedule was prepared. Results of the present study revealed that maximum of the sampled respondents (32%) were from middle (31-40 years) age category. About 71% of the respondents were literate. It was found that 46 % of respondents cultivated their own lands. Results regarding provision of fertilizer by FSC showed that 23% of respondents reported it very high on likert scale whereas only 4% of the respondents reported it very low. It was concluded that the yield of Cauliflower, Bitter gourd, Bottle gourd, Potato and Squash has increased after the registration with FSC with a difference of 498, 2932, 2644, 1657 and 2765 kg acre⁻¹, respectively. The P-value showed significant increase in income of all the vegetables after registration with FSC at 5 % level of significance. Majority of the member farmers trusted on the recommendations of FSC and therefore, they frequently contacted them for the solution of their problems. Hence it is recommended that FSC may provide the agricultural inputs on the lowest possible price to get maximum income from their vegetable production along with the further encouragement of farmers community to be registered with FSC to be benefitted from their services.

Keywords: Charsadda, Farm Services Center, Farmer's contact, Farm machinery and vegetable yield improvement.

INTRODUCTION

Pakistan is prosperous and rich in natural resource, and has a rich base of natural resources that are present in a variety of climatic and environmental zones and therefore, is able to produce a great variety of agricultural goods. In making the economic growth of Pakistan, the significant role has always been played by agriculture sector. In the virtue of the economy of any nation, the significance of agriculture can be observed in three different habits: first, it makes available food stuff to consumers and inhabitants of the country; second, it makes a good contribution to foreign exchange earnings, and third, it plays the role as an industrial commodities market (Raza and Siddiqui, 2014). More particularly, the agricultural sector contributes about 19.8 percent to the Gross Domestic Product (GDP) of the country 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% of the total work force in the country is employed by agriculture, and is the major source of living for the rural population of Pakistan (GOP, 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 in their basic problems. The objectives of Agriculture Extension are mainly oriented to better approaching

into clear formulation of farmer's wishes, farming practices and problems identification and finding their solutions (Farooq *et al.*, 2010).

A variety of extension approaches like Village-AID program, Integrated Rural Development Program (IRDP), Inputs at Farmer's door steps approach and Training & Visit T & V) 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).

The farming community faced a fundamental problem of lack of quality inputs therefore, the government of Khyber Pakhtunkhwa started Farm Services Center approach with the objective to provide timely and low cost seeds, fertilizers, pesticides and farm machinery to the resource poor farmers at their door steps. Also the FSCs were established to provide the farmer with the skills through regular training to cope with the present day needs. The present study was thus initiated to find out the effect of selected vegetables' yield in district Charsadda with respect to the services and inputs provided by the Farm Services Center.

MATERIALS AND METHODS

Universe of the study

District Charsadda of Khyber Pakhtunkhwa was the universe of the current study. This district was purposively selected for the present study because it is more suitable for the vegetable cultivation due to its favorable climatic conditions. The total area of district Charsadda 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). All the vegetable growers registered with FSC were the population of the study.

Sampling design

There were four FSCs working in district Charsadda for the provision of extension services to the farmers. Farm Services Center Dhakki was purposively selected for the present study because majority of the farmers are growing vegetables 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. According to Sekaran (2003) when population is 600 the sample of 234 is appropriate. Those 234 respondents were selected as a sample for the present study who cultivated any one of the five selected vegetables such as cauliflower, bitter gourd, bottle gourd, potato and squash; as it was not possible that farmers can grow all these five vegetables at a time.

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. Researcher personally collected primary data by means of a well-structured and pre-tested interview schedules in the field. Both open and close ended questions were included in the interview schedule regarding the objectives of the study. Interview schedule was pretested on 25 registered farmers of the Farm Services Centers.

Data analysis

The collected data were fed to and analyzed with the help of statistical software Statistical Package for Social Sciences (SPSS V.20). The results were presented in frequencies and percentages. Moreover, to envisage the yield of the vegetables before and after the membership with FSC, a paired t-test was applied. Jehan *et al.* (2014) also used paired t-test to analyze difference in productivity.

RESULTS AND DISCUSSIONS

Demographic Characteristics of the Respondents

Demographic characteristics of the respondents are presented in Table 1. Age is an important socio-economic characteristic that has a greater impact on the behavior of the individuals. Usually it is observed that as the age of the individual advances, the ability of making wise decision is also improved due to mental maturity. The age factor also determines the response of a person during various activities in his life. Rational

discussion making process is also dependant on age. According to demographic studies, physiological reports and other research findings, it is found that age and creativity is positively correlated with adoptability. In other words, younger is a person rapid will be his adoptability and responsiveness to any activity, particularly, in communication and understanding (Jensen, 1982; Basant, 1988; Tsur *et al.*, 1990). The results indicated that the respondents is divided into four different age groups i.e., up to 30, 31-40, 41-50 and above 50 years of age. Maximum of the respondents (32%) belong to the age group of 31-40 years who were young and Rogers (1983) reported that young, educated and trained farmers are generally taking initiative and pioneer in adoption. These were followed by 28% of the respondents which were in the age group of 41-50 years. The respondents that reported their age up to 30 years were 28% while only 15% of the sample respondents belong to the age group of above 50 years. Table 1 further showed that 29% sampled respondents come under the category of illiterate, while maximum 71% were educated in which 23% of the respondents were educated up to middle level along with 23% of the respondents reported an intermediate education while 13% of the respondents were educated up to Matric and 12% of the sampled respondents got primary education. From this above discussion it could be concluded that maximum the level of education higher will be the

adoption rate and vice versa. Moreover, the trend of involvement of educated farmers is encouraging in farming activities as Laila *et al.* (2017) reported that 73% of the respondents were educated.

In Pakistan agricultural land is unevenly distributed, as 88 % of land is owned by 12% of the people who are mostly landlords and as a whole 88% of the total farming population comes under small landholders (MINFAL, 2010-11). Maximum of the sample respondents (46%) were owner cultivators having their own sufficient lands followed by tenants (36%) that have no own land and cultivate the land of other peoples by taking half of the production (Table 1). About 11% of the respondents reported that they cultivate the land of others on some fixed price of land per cropping season. Only 7% of the respondents were those owner-cum-tenants having their own land but due to availability of more land, resources and technologies they also cultivate the land of other people. About 47% of the total sampled respondents had farming experience of more than 20 years, followed by 40% of the respondents having farming experience of 11-20 years (Table 1). A remarkable number of respondents (13%) have farming experience up to 10 years. It might be concluded that experienced farmers were more inclined towards registration with the farm services centers.

Table 1. Distribution of respondents regarding their Demographic Characteristics

Demographic Factors	Categories	Frequency	Percentage
Age (Years)	Up to 30	58	25

	31-40	76	32
	41-50	66	28
	Above 50	34	15
	Total	234	100
Literacy Status	Illiterate	69	29
	Primary	27	12
	Middle	54	23
	Matric	30	13
	Intermediate	54	23
	Total	234	100
Tenancy status	Owners	107	46
	Tenants	85	36
	Owner-cum-tenants	17	7
	Lessee	25	11
	Total	234	100
Farming Experience (Years)	Up to 10	3	13
	11-20	94	40
	Above 20	109	47
	Total	234	100

Source: Field Survey, 2016.

Respondents' Contacts with FSC

The respondents' contact with the FSC is very important because in this way they can convey their problems to them for the purpose to find a proper solution for their problems. This also shows the farmers confidence on extension recommendation and the mutual discussion between these two important components. The data regarding respondents' contacts with FSC is categorized into four different groups and are presented in Table 2 which showed that maximum of the respondents (41%) contacted FSC once in a month followed

by 33% of the respondents who contacted twice a month. The results further showed that 13% and 12% of the respondents contacted the FSC thrice and more than thrice in a month respectively for taking advice regarding farming. These results are in contrast with those of Nawaz *et al.* (2016) who reported that about 64% respondents did not contact extension department to report their problems. It indicates the effective performance of FSC in the study area and also a good sign of trust of the farmers on their farming problem solutions provided by FSC staff.

Table 2. Distribution of respondents regarding Contacts with Extension Agent

Number of Contacts (Per month)	Frequency	Percent
Once	95	41

Twice	78	33
Thrice	27	12
More than Thrice	34	14
Total	234	100

Source: Field Survey, 2016.

Provision and supply of inputs by FSC

The registered farmers have different views about seed, fertilizers and farm machinery. Though these inputs supplied by FSC to registered farmers but the satisfaction of registered famers are not the same on different degree of effectiveness; the views of registered farmers are presented in Table 3. Table 3 showed that 24% of the respondents ranked provision of seeds by FSC very low, 11% respondents ranked it low, 31% (medium), 16% (high) and 18% of the respondents ranked it very high on likert scale. Data regarding provision of fertilizer indicated by 23% respondents was very high on

likert scale, whereas only 4% of the respondents reported it very low. Provision of pesticides by FSC was poorly rated by the respondents as 39% reported very low while only 3% respondents rated it very high. The results further showed that 11% of the respondents reported provision of farm machinery very high while 40% respondents ranked it high on likert scale. Khan *et al.* (2017) also revealed that most of the farmers were empowered by FSCs regarding provision of seeds of various crops/vegetables in the study area. FSCs were also the major source for the provision of seed as reported by 59.48 % of the sampled respondents.

Table 3. Distribution of respondents on the basis of Provision of inputs by FSC

Provision of inputs;	Very Low	Low	Medium	High	Very High	Total
Seeds	57 (24)	25 (11)	72 (31)	38 (16)	42 (18)	234 (100)
Fertilizer	9 (4)	23 (10)	95 (41)	53 (23)	54 (23)	234 (100)
Pesticides	91 (39)	46 (20)	63 (27)	31 (13)	3 (1)	234 (100)
Farm Machinery	9 (4)	10 (4)	96 (41)	94 (40)	25 (11)	234 (100)

Source: Field Survey 2016.

Note: Values in Parentheses are Percentages

Vegetables yield improvement after registration with FSC

Table 4 showed the statistical comparison of the yield of vegetables before and after the registration with FSC.

Paired sample t-test was applied to check either registration with FSC has improved the yield of vegetables of the sampled respondents or not. The mean yield of vegetables (Cauliflower, Bitter gourd,

bottle gourd, Potato and Squash) before the registration with FSC was (2893, 25259, 23129, 6072 and 24632 kg acre⁻¹, respectively) and after the registration with FSC were 3391, 28190, 25773, 7729 and 27127 kg acre⁻¹, respectively. The yield of Cauliflower, Bitter gourd, Bottle gourd, Potato and Squash has increased after the registration with FSC with a difference of 498, 2932, 2644, 1657 and 2765 kg acre⁻¹, respectively. The P-value showed that

yield of the vegetables is improved after the registration with FSC at 5% level of significance. The present findings are in line with Ullah *et al.* (2015) who found that FSC registration duration had highly significant contribution in sugarcane and wheat yield. The results showed that with unit increase in duration of MFSC had increased sugarcane yield up to 0.13 maunds acre⁻¹ (12.84 kg ha⁻¹) and 0.46 maunds acre⁻¹ (45 kg ha⁻¹) in wheat.

Table 4. Yield (kg acre⁻¹) of selected vegetables before and after registration with FSC

Vegetables	Before registration		After registration		Mean difference	t-Value	P-Value
	Mean	SD	Mean	SD			
Cauliflower	2893	947	3391	1108	498	30.71	.000
Bitter Gourd	25258	3241	2820	3603	2932	47.34	.000
Bottle Gourd	23129	4786	2578	5258	2644	28.08	.000
Potato	6072	2160	7729	3184	1657	7.76	.000
Squash	24362	2632	27127	2915	2765	36.40	.000

Income from vegetables before and after registration with FSC

The data regarding the mean income of sampled respondents before and after registration with FSC are given in Table 5. Paired sample t-test was applied for the statistical comparison of income of the sampled respondents from the vegetables before and after the registration with FSC. The mean income of the respondents from the vegetables Cauliflower, Bitter gourd,

Bottle gourd, Potato and Squash before the registration with FSC was Rs. 79480, 297597, 172681, 177304 and 162065, respectively and after the registration were Rs. 124704, 426661, 248391, 276382 and 233098, respectively with mean differences of Rs. 45224, 129065, 75710, 99078 and 71033, respectively. The P-value showed significant increase in the income of all the vegetables (as P < 0.05) after registration with FSC.

Table 5. Average income of the sampled respondents from the selected vegetables before and after registration with FSC

Vegetables	Before Registration		After Registration		Mean Difference	t-Value	P-Value
	Mean	SD	Mean	SD			
Cauliflower	79480	135804	124704	205031	45224	7.14	.000
Bitter Gourd	297597	253092	426661	324164	129065	15.81	.000
Bottle Gourd	172681	166384	248391	228635	75710	8.56	.000
Potato	177304	173052	276382	246619	99078	11.75	.000
Squash	162065	145866	233098	183277	71033	14.96	.000

CONCLUSION

From the present study, the following conclusions were made:

Majority of the respondents were literate having rich experience in farming. Most of the respondents were owner cultivator and are of young age. Majority of the member farmers trusted on the recommendations of the FSC and therefore, frequently contacted them for the solution of their farming problems.

Farm Service Centers played their role effectively regarding provision of seeds and fertilizers to the registered members while do not fulfilled their obligations regarding supply of pesticides and farm machinery to the registered farmers. It was also concluded that the services provided by FSC has significantly increased the vegetables yield and income of the respondents.

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