

POTENTIAL AND TRENDS OF PULSES PRODUCTION IN FAISALABAD

Ramsha Rashid^{*1}, Rabia², Iqra Zafar Khan³, Muhammad Waqas Khan⁴,
Durshana Khan⁵, Sohaib Shaukat⁶

^{*1}M.Sc. hons (Agri. Extension), Institute/Dep.: Institute of Agricultural Extension Education and Rural Development (IAEERD), University of Agriculture, Faisalabad; ²Degree: PhD (Agri. Extension), Institute/Dep.: Institute of Agricultural Extension Education and Rural Development (IAEERD), University of Agriculture, Faisalabad; ³Degree MSc Hons Agriculture Agronomy, Department Agronomy, University/ institute UAF; ⁴Ph.D Agri. Extension, Institute of Agri. Ext. Edu. & R.D, University of Agriculture Faisalabad; ⁵MSc Agri hons, Soil Science, Sindh Agriculture University Tandojam; ⁶MSc. hons (Agri. Extension), Institute/Dep.: Institute of Agriculture extension education and rural development (IAEERD), University of Agriculture, Faisalabad

^{*1}ramsharashid3211@gmail.com; ²rabia.ejaaz@hotmail.com; ³zafarkhaniqra07@gmail.com;
⁴waqasrana3485@gmail.com; ⁵durshanakhan@gmail.com; ⁶sohaib.sj81@gmail.com

Corresponding Author: *

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ABSTRACT

Major source of vegetable protein are pulses. Demand of pulses is increasing day by day due to increase in population. Year 2016 was declared as the “Year of Pulses” by the United Nations to increase the awareness about the importance of pulses. Consumption of pulses have been increased steadily and import of pulses have been increased in recent years. As compared to other crops prices of pulses are very high. Although, pulses are in demand and currently Pakistan importing pulses to fulfill the demand. Specific end goal is to find out the reasons, why farmers are not considering the importance of pulses cultivation. Study was conducted in tehsil Faisalabad (Sadar). From Faisalabad (Sadar) 4 villages were selected conveniently by keeping in view time and resources. In selected villages there were 712 farmers. Sample size had been calculated by using online website (www.surveysystem.com) keeping confidence level 95% and confidence interval 8 which is 124. Proportionate random sampling was used for the selection of respondents. Sample was drawn by using www.randomizer.org. The data were collected through interview schedule. Statistical Package for Social Sciences (SPSS) was used for data analysis. Farmers said pulses are beneficial crop with mean value 2.24. According to respondents’ pulses are beneficial for soil its mean value was 3.85. Respondents have good knowledge about post-harvest handling of pulses crops with mean value 2.87. At mean value 4.03 respondents get information from fellow farmers. Many respondents get agricultural information from pesticide agents their mean value was 3.80. Middleman monopoly is a hindering factor in pulses cultivation its mean value was 4.32. Due to less agricultural land holding respondents do not grow pulses they just grow major crops such as wheat, rice, maize and vegetables to earn more profit. Findings of the study suggested more extension education campaigns should be launched, provision of machinery on subsidy, availability of inputs at subsidized rates on equality basis, provision of certified seed on equality basis from agriculture department, extension staff should be trained in latest production technology of pulses. Respondents pointed out a desire for the government to set adequate pulses prices so that they may grow pulses.

Keywords: Pulses, Perception, Demand, Trends of Pulses, Pulses Production

INTRODUCTION

Agriculture is the most important sector of the economy in developing countries like Pakistan and it is single largest source of economic growth and development. Punjab has the highest agricultural production in Pakistan, contributing about 69 % of the country's cultivated area. During the 2018-19 period, Pakistan imported 976.6 thousand tons of pulses for a cost of Rs. 68.2 billion (AMIS, 2019).

Pulses haven't gotten the attention they deserve for multitude of reasons. Pulses are considered a leftover crop in South Asia and are grown in less productive soils in rainfed climates with minimal effort for pest and nutrient management. Heavy weed infestation and insects damage approximately 30% of standing crops before harvesting, which are the major biotic restrictions. Many diseases have also been reported as reducing yield (Darai *et al.*, 2021).

Chickpea and mung-bean are the most extensively produced pulses crops in Pakistan. Pakistan spends a significant amount of money on pulses' import to reduce gap between requirement and supply in the market. Pulses are grown all around the world, about five percent of the cultivated area is just used for pulses cultivation in Pakistan. The main winter food legume is chickpea, whereas the main summer food legume is mung. Mung bean takes up 18 percent of total pulses area and contributes 16 percent of total pulses production. Cultivation and contribution of black gram in the total pulses' crops are about five percent. lentil grown on 12.6 thousand hectares, yielding 6.4 thousand tons in 2019 a significant decrease from 1997. Lentil production and area were 69.4 thousand hectares and 34.9 thousand tons, respectively, in 1997. The lack of quality seed of improved varieties, inadequate weed management, lack of mechanized harvesting and farmers' transfer to more productive and profitable crops like wheat are the main causes of decreased productivity (PARC,2023).

Carbohydrates offered by pulses are released slowly compared to cereals, they have a great value for maintaining appropriate blood sugar levels and for recovering energy over a lengthy period of time following meals. Pulses are one of the most environment friendly crops because they need only 359 liters of water per kg of pulses, compared to 1,802 liters for soybeans and 3,071 liters for groundnuts. Pulses also have activity of fixing nitrogen in the soil, they provide a major contribution to soil quality (Kumar, 2020).

Pulses such as lentil, peas, beans, chickpea and dry soybean are an excellent dietary choice for smart and responsible global citizens due to their numerous good effects on both human and environmental health. Pulses are also reasonably priced and shelf-stable (Didinger, 2020).

Despite the enormous yield potential, yield of pulses in Pakistan is quite low when compared to potential and yields in many other countries. Due to low production and slow growth rates between the demands for local production and consumption, Pakistan imports huge amounts of pulses to fill the emerging gap. Weed infestation, disease insect pest attack and a lack of farmer awareness about pulses producing technologies are all obstacles to pulses production. In addition to this crop, profitability in Pakistan's irrigated zone has been dropping due to rising costs. Small farms, which comprise the majority of Pakistan's agricultural output are particularly vulnerable to insect infestation because they are unable to endure any type of financial risk (Lal, 2017).

In world total area under pulses cultivation 85.6 million ha and production is 77.6 million tons in 2014. In the of list SAARC, India's share is 92% in production while Pakistan's share is 4% (Paudel, 2016).

A project by the Punjab government in Pakistan called "promotion of pulses cultivation project in Punjab" in 2014 to enhance pulses cultivation in the region. The four most significant pulses in Punjab province are lentil, chickpea, mash and mung by the Directorate of Agriculture (Ext. and AR Wing) are encouraged to cultivate under this project (Govt. of Punjab, 2016).

Pulses are crucial to the nutritional security of a huge number of individuals all over the world. Pulses are a vital and low-cost source of plant-based protein, vitamins and minerals for people all over the world, particularly those living in poverty (Green *et al.*, 2016).

The country's economic growth is critically based on agricultural sector for job, food security furthermore poverty reduction, especially in rural areas. It contributes 19.2% to GDP and provide employment about 38.5 percent of the population. 65-70% population depends on agriculture for livelihood. The rate of agricultural growth has been slowed by decreasing arable land, water scarcity, climate

change, population and labor shifts on a vast scale from the countryside to the city (Usman, 2016).

Pulses are a key source of protein for vegetarians. They provide proteins, vitamins, minerals and critical amino acids to supplement the staple grains in their diets. They contain 22–24 percent protein, which is roughly twice that of wheat and three times that of rice. Pulses have been shown to lower the risk of various noncommunicable diseases, including cardiovascular disease and colon cancer. Pulses can be grown in a variety of soil and climatic conditions. Pulses play a key role in crop rotation, mixed and intercropping, soil fertility maintenance through nitrogen fixation and the release of soil-bound phosphorus, all of which contribute to the long-term viability of farming systems (Gowda *et al.*, 2013).

Pulses are particularly nutrient dense foods that are essential for a balanced diet and relevant to problems with chronic diseases like obesity, diabetes, heart disease and cancer. However, more easily accessible, appetizing pulse-based food items that satisfy modern consumers' needs are required in order to expand the consumption of pulses. It is possible to have an impact on consumer demand and the food industry's interest in creating pulse-based food items by enhancing the body of high-quality research that supports future health benefits of pulses (Curran, 2012).

Due to a lack of water, the most significant and revenue commodities of Thal" were pulses crops, which covered 96 percent of the farmed land of "Thal," where no other crops could be grown due to the semi-arid climate and weak sandy soils. The rain-fed system, which covered 88 percent of total pulses area and used to grow pulses as a solitary crop or as an intercrop. As a result, farmers' livelihoods were inextricably linked to pulses crops (Yazdani, 2007). Pakistan's economy is mainly based on agriculture. Legumes are very important part of our food. Pulses are rich source of protein. Protein is compulsory for constructing human body masses. Specific end goal is to find out the reasons, why farmers are not giving the importance to grow pulses. Even pulses are on demand and Pakistan import them. Pulses in Pakistan are cultivated on just 5% of entire cultivated land. This research will be beneficial for researchers as well as farmers. Researchers will produce new compatible varieties for our environment with increased production by keeping the concerns of farmers in their mind. Farmers will grow that varieties trustfully

so, they can earn more profit for the betterment of their lifestyle and support country's economy.

METHODOLOGY

Age of the respondent (years)	f	%
up to 25	5	4.0
26-35	9	7.3
36-45	38	30.6
46-55	60	48.4
above 55	12	9.7
Total	124	100.0

The current study focused on farmers' perceptions regarding pulses cultivation in tehsil Faisalabad. The researcher should follow and keep in mind some important points for obtaining solid and reliable data regarding the problem under investigation, such as appropriate research area population, selection of respondents in the study area, socio-economic characteristics of respondents and selection of appropriate statistical methods for data analysis. The current study was carried out in Tehsil Faisalabad of District Faisalabad. There are six tehsils in district Faisalabad, named as Faisalabad city, Faisalabad Sadar, Jaranwala, Samundri, Chak Jhumra and Tandaliawala. Research was conducted in tehsil Faisalabad (Sadar). All general farmers of Tehsil Faisalabad (Sadar) served as population for the present study. From tehsil Faisalabad (Sadar) 4 villages were selected conveniently by keeping in view time and resources. Study was conducted in Faisalabad. There are six tehsils in district Faisalabad, named as Faisalabad city, Faisalabad Sadar, Jaranwala, Samundri, Chak Jhumra and Tandaliawala. Research was conducted in tehsil Faisalabad (Sadar). From tehsil Faisalabad (Sadar) 4 villages have been selected conveniently by keeping in view time and resources. All the general farmers of selected villages had population of 712 according to the lists obtained from (Number-dar and AO) the villages. Sample size was calculated by using online website (www.surveysystem.com) keeping confidence level 95% and confidence interval 8 which is 124. Proportionate random sampling was used for the selection of respondents for data collection. Sample was drawn by using www.randomizer.org. In order to collect the data, a well-structured interview schedule was developed into consideration the specific objectives of the study. For data collection researcher personally met

with respondents in their houses and also on farms. Researcher interviewed the respondents individually and in group according to the situation. For making sure the reliability and validity of the interview schedule it was pre-tested. Interview schedule was pre-tested on ten respondents which were other than sample. After pre-test necessary amendments were made and finalized it for further proceedings. The data were collected by using the validated interview schedule. In order to obtain the data from respondents were approached by the researcher. The process of interviewing was completed by face to face type of interview. The researcher visited the respondent at their homes and farms. In interview questions were asked in local language of respondents. After data collection the whole data was put on Microsoft Excel sheet to get the answers to the questions. Then Statistical Package for Social Sciences (SPSS) was used for data analysis. Frequency, percentage, standard deviation, mean, weighted scores and rank order were calculated. Descriptive research design was used to describe the collected data.

RESULTS AND DISCUSSIONS

4.1 Socio-Economic Characteristics of the Respondents

Socio-economic characteristics of Individuals, such as age, land holding size education and tenure ship, have a significant impact on attitude (Qayyum *et al.*, 2008). Data on demographic variables such as age, education, tenancy status and land holding size were collected which are presented and discussed.

Age

Age means the total number of years completed by the respondents at the time of the interview. It is generally considered that as an individual becomes mature, he or she becomes ethically and mentally mature and makes rational decisions. As a result, age can be one of the factors influencing respondents' perceptions and attitudes in the studied area (Amir *et al.*, 2003). The age of the respondents was included in the study considering the above-mentioned factors.

Table 1: Distribution of respondents based on their age

Education Level	f	%
Illiterate	16	12.9
Primary	6	4.8
Middle	31	25.0
Matriculation	48	38.7
Intermediate	15	12.1
Bachelor	6	4.8
Masters	2	1.6
Total	124	100.0

f = Frequency, % = Percentage

Table 1 reveals that more than one third (30.6%) of the respondents were aged 36-45 years. While near to half (48.4%) of the respondents fell under the age group of 46-55 years. 7.3% respondents were in age group of 26-35 years. The remaining (4%) of respondents were in age group of (up to 25 years). 9.7% respondents were in age group of (above 55) years. The findings of study are nearly similar with the study of Okunlola *et al.* (2011) who stated that 45 % of participants were in the intermediate age range (35-50 years), while 25.5 % and 29.5% were young and old, respectively.

Educational level

It is observed a collection of all the processes and activities that result a change in human behavior (Khan *et al.*, 2006). Education gives knowledge as well as other distinguishing traits in human social behavior and professional life. It is regarded as an effective way of enhancing and improving human behavior. It can be considered a necessary component of human development. People in rural areas typically do not educate their children and live illiterate lifestyles (Anwar *et al.*, 2013). Education has become quite necessary to adopt new farming technology and advancements. Due to the mentioned facts, it was very important to probe out the educational level of respondents of the study area.

Table 2 Distribution of respondents based on their educational level

f = Frequency, % = Percentage

Table 2 depicts that about 38.7 % of the respondents had matriculation education. About 12.9 % people were found illiterate. 4.8 % of the respondents had education up to primary level. 25 % of respondent had education up to middle level. The respondents had education up to Intermediate were 12.1%.

Whereas 4.8% and 1.6% respondents had bachelor and master’s level education respectively. The results are similar with Ogboma (2010) revealed that 25.8% of the individuals were illiterate among the literate, 14.6 percent had education up to primary level, 18.9% had education up to middle level and 19.3% and 21.3% had education up to matriculation and above intermediate level, respectively.

Awareness about pulses production

Pulses contribute in food security, environmental sustainability and human health by providing beneficial nutrients. Pulses have good impact on soil as well. Due to these benefits with the collaborations with agricultural scientists and growers in Indonesia are increasing their production of pulses that are high in protein and profiting financially (Rachaputi, 2011). Given data was collected to check the awareness level of respondents regarding benefits of pulses in study area.

Table 3 Mean, standard deviation, weighted score, and ranked order of awareness level of respondents regarding benefits of pulses

Benefits of Pulses	Mean	S.D.	Weighted Score	Ranked Order
Are Pulses good for health?	4.53	0.692	562	1
Pulses are beneficial for soil?	3.85	1.044	477	2
Are Pulses beneficial crop?	2.24	1.935	278	3

In table 3 according to the respondents’ response, pulses are good for health ranked 1st with mean value 4.53 and standard deviation 0.692 followed by pulses are beneficial for soil ranked 2nd position with mean value 3.85 and standard deviation 1.044. Whereas pulses are beneficial crop ranked at 3rd with mean value 2.24 and standard deviation 1.935.

Rizkalla *et al.* (2002) stated that advantages of eating pulses, for health. Potentially, nutritional factors have a significant impact on both health and disease. A low-fat and high-carb diet is frequently suggested as a component of a healthy way of life. Pulses are beneficial crop.

Kumar and Bourai (2012) stated the pulses crops in the Assam Valley where the majority of farmers

(57%) are economically effective and the other 43% are inefficient from an economical perspective is pigeon pea cultivation. Lal (2017) stated that pulses can increase soil fertility and increase crop productivity when they are included in the rotation cycle.

Table 4 Mean, standard deviation, weighted score and ranked order of respondents’ knowledge regarding basic production technology of pulses

Production technology provides information on the efficient use of the water, soil and nutrient management strategies. The farming community should focus on the wise use of seed and sowing techniques, including land preparation, irrigation methods, fertilizer application, pest attack, intercultural operations, major diseases and their treatments, as well as post-harvest operations, along with other things, in order to increase yield (Mushtaq, 2002).

Awareness about pulses production	Mean	S.D.	Weighted Score	Ranked Order
Required irrigations	3.10	1.73	384	1
Post-harvest handling	2.87	1.896	356	2
fertilizers	1.94	1.912	240	3
Diseases protection	1.88	1.63	233	4
Soil preparation	1.81	1.656	224	5
Time of sowing	1.77	1.54	220	6
Seed rate	1.77	1.432	219	7
Varieties	1.49	1.36	185	8
Seed treatment	1.44	1.39	179	9

Table 4 according to the respondents’ how many irrigations are required by pulses ranked 1st position with mean value 3.10 and standard deviation 1.73. Weighted score was 384 for respondents’ knowledge about the required irrigations for pulses cultivation. Followed by post-harvest handling of pulses crops with 356 weighted score ranked 2nd position. Post-harvest handling of pulses crops’ mean value was 2.87 and standard deviation was 1.896.

Which fertilizers are important for pulses ranked 3rd position with weighted score 240, mean value 1.94

and standard deviation 1.912. According to repose how to protect pulses crops from different disease ranked at 4th position with weighted score 233, mean value 1.88 and standard deviation 1.63. Whereas, soil preparation ranked at 5th with weighted score 224. Soil preparations' mean value was 1.81 and standard deviation was 1.656. After that time of sowing ranked 6th with weighted score 220, mean value 1.77 and standard deviation 1.534. Seed rate of pulses ranked at 7th with weighted score 219 mean value 1.77 and standard deviation 1.432. Verities of pulses ranked at 8th with weighted score 185 mean value 1.49 and standard deviation 1.36. Seed treatment of pulses ranked 9th with weighted score 179 mean value 1.44 and standard deviation 1.39.

Rizwan *et al.* (2019) stated respondents were asked about the level of their knowledge of seed and sowing. The findings indicated most respondents increased their level of knowledge about seed and sowing. According to the respondents, their level of awareness regarding seed preparation and seed rate has improved to 100%. The vast majority of respondents (98.28%) then indicated that their knowledge about high yielding varieties had increased, followed by 97.41% who indicated that their knowledge of the proper time to sow had increased as well as 95.69% who indicated that their knowledge of seed treatment and selection had increased. In addition, it was determined that 65.52% and 10.34% of farmers, respectively, were knowledgeable about manual and automated sowing techniques.

Improved production techniques of crops

Agricultural information service is a vital part of modern agriculture systems, as well as a necessary and fundamental supporter of agriculture development that assists farmers in improving their livelihoods. Farmers require a wide range of agricultural information, although variables such as farmers and sources of information have limited the use of agricultural information that helps farmers improve their livelihood. The lack of sources of information in rural areas is the main factor limiting farmers' efforts to boost agriculture production and revenue. Improving agricultural information availability in rural areas could effectively cover the knowledge gap, allowing farmers to improve their productivity and livelihood (Yaseen *et al.*, 2016). Information sources are quite necessary to adopt new farming technologies and advancements. Due to the

mentioned facts, it was very important to probe out which information sources are available to the farmers regarding improved production techniques of crops to the respondents of the study area.

Table 5 Mean, standard deviation, weighted score and ranked order of sources of information available to the farmers regarding improved production techniques of crops

Sources	Mean	S.D.	Weighted Score	Ranked Order
Fellow Farmer	4.03	1.57	500	1
Pesticide Agent	3.80	1.582	471	2
Computer	1.8	1.63	223	3
Extension Worker	1.77	1.619	219	4
Newspaper	1.57	1.308	195	5
Television	1.52	1.383	188	6
Facebook	1.46	1.29	181	7
You Tube	1.44	1.34	179	8
Whats App	1.42	1.33	176	9
Agriculture Help Line	1.40	1.229	174	10
Mobile App	1.40	1.22	173	11
Website	1.31	1.197	162	12

According to the respondents' response, fellow farmers as information source ranked at 1st position with mean value 4.03, weighted score 500 and standard deviation 1.597. Followed by pesticide agent ranked 2nd position with weighted score 471, mean value 3.80 and standard deviation 1.582. Computer as a source of information ranked at 3rd with weighted score 223, mean value 1.80 and standard deviation 1.633. Followed by extension worker ranked 4th position weighted score 219, mean value 1.77 and standard deviation 1.619. Newspaper ranked at 5th with weighted score 195, mean value 1.57 and standard deviation 1.308. Television ranked at 6th with weighted score 188, mean value 1.52 and standard deviation 1.388. Followed by Facebook ranked at 7th with mean value 1.46, weighted score 181 and standard deviation 1.29. You tube ranked at 8th with weighted score 179, mean value 1.44 and standard deviation 1.34. Followed by WhatsApp ranked at 9th with mean value 1.42, weighted score 176 and standard deviation 1.33. Agricultural help

line ranked at 10th with weighted score 174, mean value 1.40 and standard deviation 1.22. Mobile App ranked at 11th with weighted score 173, mean value 1.40 and standard deviation 1.22. Followed by website ranked at 12th with mean value 1.31, weighted score 162 and standard deviation 1.197. The results are more or less similar to Obidike (2011) who reported rural farmers in Nsukka used posters with mean 3.39, radio with mean value 3.61, television has mean 3.61, mean value of booklets are 2.95, extension workers and Agriculture organizations of the state and local government agents 2.60 and 2.52 respectively for obtaining agricultural information as sources of information by the respondents in the study.

Constraints in the adoption of pulses cultivation

Constraints in the adoption process are those elements that make it difficult. In this study, researcher probe out certain issues that were hindering the adoption of better pulses farming methods. The researcher asked questions on these characteristics while keeping in mind the importance of the restricting factors.

Table 6 Mean, standard deviation, weighted score and ranked order of the factors that create hindrances in the adoption of pulses cultivation

Constraints	Mean	S.D.	Weighted Score	Ranked Order
Costly fertilizer	4.38	1.025	543	1
Middleman monopoly	4.32	1.200	536	2
Lack of interest on the part of farmers	4.23	1.120	525	3
High cost of pesticides/ fungicides/ insecticides	4.02	1.310	499	4
High cost of electricity for tube well irrigation	3.98	1.243	493	5
Costly machines	3.85	1.275	477	6
Less command on pulses production technology	3.75	1.166	465	7
Lack of basic awareness about pulses crops	3.56	1.450	442	8
Lack of Govt. Policies	3.43	1.135	425	9

Lack of interest on the part of extension staff	3.38	1.857	419	10
Lack of technical knowledge on the part of extension staff	2.99	1.915	371	11
Preferences given to progressive farmers	2.98	1.857	370	12
Lack of improved varieties	2.68	1.585	332	13
Costly seed	2.54	2.116	315	14
Less area for cultivation	2.23	1.913	277	15
Non-availability of pure seed	2.08	1.733	258	16
Lack of communication skills	1.91	1.243	237	17
Lack of credit	1.89	1.634	234	18
Variation in cost benefit ratio	1.79	1.537	222	19
Lack of basic input facilities	1.74	1.503	216	20

According to the respondent's response, costly fertilizer ranked at 1st with weighted score 543 mean value 4.38 and standard deviation 1.025. Middleman monopoly ranked at 2nd with weighted score 536, mean 4.32 and standard deviation 1.200. Lack of interest on the part of farmers ranked 3rd with weighted score 525, mean 4.23 and standard deviation 1.120. Followed by High cost of pesticides/ fungicides/ insecticides ranked 4th position with weighted score 499, mean value 4.02 and standard deviation 1.310. High cost of electricity for tube well irrigation 5th position with weighted score 493, mean value 3.98 and standard deviation 1.243. Followed by Costly machines ranked at 6th position with weighted score 477, mean value 3.85 and standard deviation 1.275. Less command on pulses production technology ranked 7th position with weighted score 465, mean value 3.75 and standard deviation 1.166. Lack of basic awareness about pulses crops 8th position with weighted score 442, mean value 3.56 and standard deviation 1.450. Followed by Lack of Govt. Policies at 9th position weighted score 425, mean value 3.43 and standard deviation 1.135. Lack of interest on the part of extension staff ranked 10th position with weighted score 419, mean value 3.38 and standard deviation 1.857. After that Lack of

technical knowledge on the part of extension staff ranked at 11th position with weighted score 371, mean 2.99 standard deviation 1.915. Preferences given to progressive farmers ranked 12th position with weighted score 370, mean value 2.98 and standard deviation 1.857. Lack of improved varieties ranked 13th position with weighted score 332, mean value 2.68 and standard deviation 1.585. Costly seed ranked 14th position with weighted score 315, mean value 2.54 and standard deviation 2.116. Less area for cultivation ranked 15th position with weighted score 277, mean value 2.23 and standard deviation 1.913. Followed by non-availability of pure seed ranked 16th position with weighted score 258, mean value 2.08 and standard deviation 1.733. Lack of communication skills ranked 17th position with weighted score 237, mean value 1.91 and standard deviation 1.243. After that Lack of credit ranked 18th position with weighted score 234, mean value 1.89 and standard deviation 1.634.

Variation in cost benefit ratio ranked 19th position with weighted score 222, mean value 1.79 and standard deviation 1.57. Lack of basic input facilities ranked 20th position with weighted score 216, mean value 1.74 and standard deviation 1.503. These findings are more or less similar with Shahzad (2015) ranking of the issues facing farmers, which placed preferences for progressive farmers, variations in cost-benefit ratios, preferences for literate farmers, a lack of education among farmers and unfriendly extension field staff (EFS) at the top, second, third, fourth and fifth positions, respectively. Following EFS's lack of motivation, which was placed sixth, came EFS's lack of commitment, which was rated seventh. Following that, moong growers were placed in eighth, ninth, tenth and eleventh positions, respectively, due to low market demand, rapid price fluctuations, a lack of money and a lack of cooperation. Similar to this, lack of knowledge of EFS was ranked in 12th place, followed by a lack of proficiency with production technology in 13th place, a lack of good communication in 14th place, contact of EFS with locals in 15th place and unfavorable responses from growers in 16th place. The lack of motivation on the part of Extension Field Staff was ranked at 19th position, followed by farmers' lack of interest, which was ranked at 20th position and finally time-consuming was ranked at 21st position. Next, inadequate transportation was ranked at 17th position, followed by the middleman's

role in price fluctuation, which was ranked at 18th position.

Conclusion

It is concluded from the results; majority of respondents have good level of awareness regarding pulses benefits for health. However, most of farmers said pulses are not economically beneficial crop as compared to major crops like wheat or maize. Few respondents said they have grown pulses in past years to fulfill the needs of their own family but they have poor knowledge about recommended varieties of pulses. Although, mostly respondents have knowledge about seed rate but had poor knowledge about seed treatment for pulses. In case of soil preparation and fertilizer requirements for pulses, majority of respondents did not have idea. Even though, respondents have good knowledge about postharvest handling of pulses crops and most of respondents get information about their agricultural issues from fellow farmers. Private companies also play an important role through their pesticide agents as a source of information and most of respondents uses this source. Extension workers also provide information to farming community. According to large number of the respondents, lack of government policies, lack of marketing facilities, variation in cost benefit ratio, costly machines, middleman monopoly, non-availability of pure seed and high cost of pesticides/fungicides/insecticides are the main restraints which were creating hindrances in the adoption of pulses cultivation techniques. To sum up, findings of the study emphasized that more extension education campaigns should be launched, provision of machinery on subsidy, availability of inputs at subsidized rates and provision of certified seed on equality basis from agriculture department, extension staff should be trained in latest production technology of pulses and proper marketing facilities should be provided to farmers for the betterment of pulses production.

Recommendations

The following recommendations were made for the betterment of pulses cultivation to boost yield, resulting the improvement in the farmers' standard of living.

- There is an eagerly need to shift the farming community's attention towards pulses production through the development of new initiatives or

technology, because farmers are still reliant on their major crops and have not paid attention to pulses.

- Machinery should be provided on subsidy to promote the production of pulses.
- Extension staff should be trained in latest production technologies on pulses production.
- Proper marketing facilities should be provided to assist farmers by government.
- The availability of inputs on an equitable basis will promote pulses cultivation.
- Awareness should be provided about improve production technologies to the farmers through campaigns.
- To promote pulses production, agriculture department should introduce new improved varieties of pulses seed.
- Government should minimize the cost of fertilizers, pesticides, herbicides and fungicides to promote pulses production.

By doing so, the demand for pulses in country can be fulfilled which reduce the rates and also helps in improving the country's economy by exporting.

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