OPEN ACCESS Int. J. Agr. Ext. 10 (01) 2022. 233-239 DOI: 10.33687/ijae.010.01.3633

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Available Online at EScience Press

International Journal of Agricultural Extension

ISSN: 2311-6110 (Online), 2311-8547 (Print)

https://esciencepress.net/journals/IJAE

ANALYSIS OF CONSTRAINTS FACED BY GRAM GROWERS REGARDING IMPROVED GRAM PRODUCTION PRACTICES IN SOUTHERN REGION OF PUNJAB, PAKISTAN

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ARTICLE INFO

Article History

Received: May 28, 2021

Revised: November 15, 2021

Accepted: January 12, 2022

Keywords

Constraints

Gram production

Technical constraints

Gram growers

Physical constraints

ABSTRACT

This study explored different constraints being faced by the gram growers in Thal and Barani region of Punjab, Pakistan. For this purpose, two districts from each region were selected and 30-gram growers from each of the selected district were selected purposively, thereby making a sample size of 120 farmers. Data were collected using a structured and validated interview schedule and collected data were analyzed using Statistical Package for Social Sciences (SPSS). Constraints were grouped in to (i) technical (ii) physical and (iii) and financial constraints. Among technical constraints, fertilizer management, less awareness about recommended practices and weeds management were prominent constraints. Non-availability of labour, water shortage and costly labour were leading physical constraints. Lack of finance, credit and limited access to inputs due to inadequate finance were some prominent financial constraints. All the constraints had adverse impact on the production of gram in study area. This study concludes that gram production cannot be enhanced unless the constraints are not removed through synergistic working of agriculture and allied departments to facilitate the gram growers.

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INTRODUCTION

Pakistan is known for its vigorous agriculture which adds 19.3% to the national GDP and absorbs 42.3% of labour. Around 66% of the rural population is directly or indirectly dependent on agriculture for their livelihoods (Government of Pakistan, 2020). Major crops such as wheat, cotton, rice maize, sugarcane pulses are widely grown across the country covering 5% of the total cropped area of Pakistan (NARC, 2017). More than half of the total production of Pulses in Pakistan are being consumed within the country on households' level (Rehman *et al.*, 2018). In Pakistan, pulses are widely grown in Thal desert and Barani region where production is mainly dependent on rain water (PCRWR, 2020). Pulses in Pakistan are highly categorized as one of the main ingredients of human diet being enriched with protein. Pulses contribute about 33% to total dietary requirement of humans around the globe (Ullah *et al.*, 2020). The average consumption of pulses in Pakistan is considerably less than the world (Ullah *et al.*, 2020). Pulses mainly grown in Pakistan are gram, mungbean, lentil, mash bean, moth bean and common bean etc. (NARC, 2017). Current status of Pulses grown in Pakistan is given in Figure 1.

Figure 1. Gram production in different parts of the country (adapted from Ullah *et al.* (2020).

According to Government of Pakistan (2020), gram is the largest seedling of Rabi pulses, representing major share in total pulses production in Pakistan. Area and production of Gram during the last 5 years is given in Figure 2.

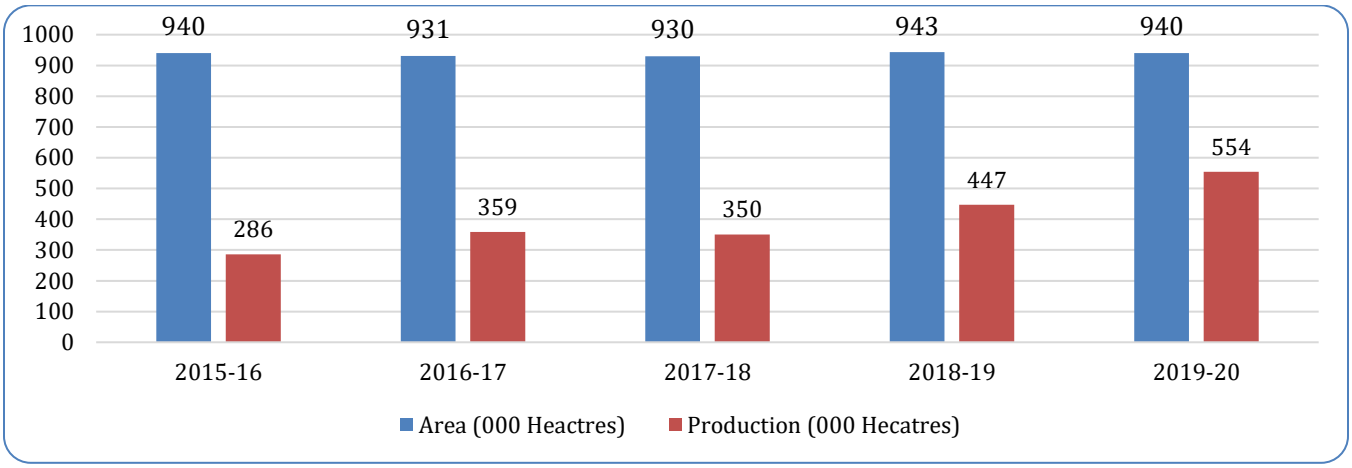

Figure 2. Area and production of Gram during the last 5 years (adapted from Government of Pakistan (2020).

Gram is a very important crop of rabbi season in Pakistan, which mainly grown in rainfed areas. Arable desert fields of Cholistan are suitable for chickpea production and 96% of the area is under cultivation of grain and pulses (Jamil *et al.*, 2000). In Thal areas, no other plant grows very well except gram which is considered progressive crop in Thal area (Asghar *et al.*, 2003).

Gram has tremendous nutritional value and is used in many food products, such as bread, pepper, bran, kebab, and many others (Hassan and Khan, 2007). Gram seeds are also used in both dry and fresh forms of various products, usually flour (roasted), roasted and crushed (Merga and Haji, 2019). Gram contains less than 1% fatty oil. In Pakistan, Gram is often grown in rain-fed conditions and enhancing the yield is a major challenge for the growers. However, introduction of new machinery or new practices have made the difference in production but still the average production is way lower than the potential. In comparison to other countries, gram production in Pakistan is low as compared to other countries of the world. For instance, Khan *et al.* (2017) viewed that the production of gram was low in Thal areas due to less rainfall. Less production is associated with numerous other constraints including agronomic, biological, physical, socio-economic and institutional constraints (Malik *et al.*, 2015).

Pakistan is the 2nd largest importer of pulses in Asia, recently it has imported 1.23million tons to meet the local need (Pakistan Bureau of Statistics, 2020). But

research emphasizing on exploration of constraints lowering the gram production is scanty. Therefore, this research gap needs to be bridged. In order to improve the gram production, it is indispensable to first explore the constraints faced by the gram growers.

METHODOLOGY

Present study was conducted in the Punjab province. Gram growers of Thal and Brani regions were purposively selected as the population of the study. The purposive selection of Thal and Brani region was made because these regions have favorable environment for cultivation of pulses in the Punjab Pakistan. Thal region comprises of five districts namely Jhang, Bakhar, Khushab, Mianwali and Layyah, and Barani region also comprises of five districts namely Attack, Chakwal, Jhelum, Rawalpindi and Narowal. From each production region two districts were randomly selected as the targeted research districts. The map of the research districts is given in Figure 3.

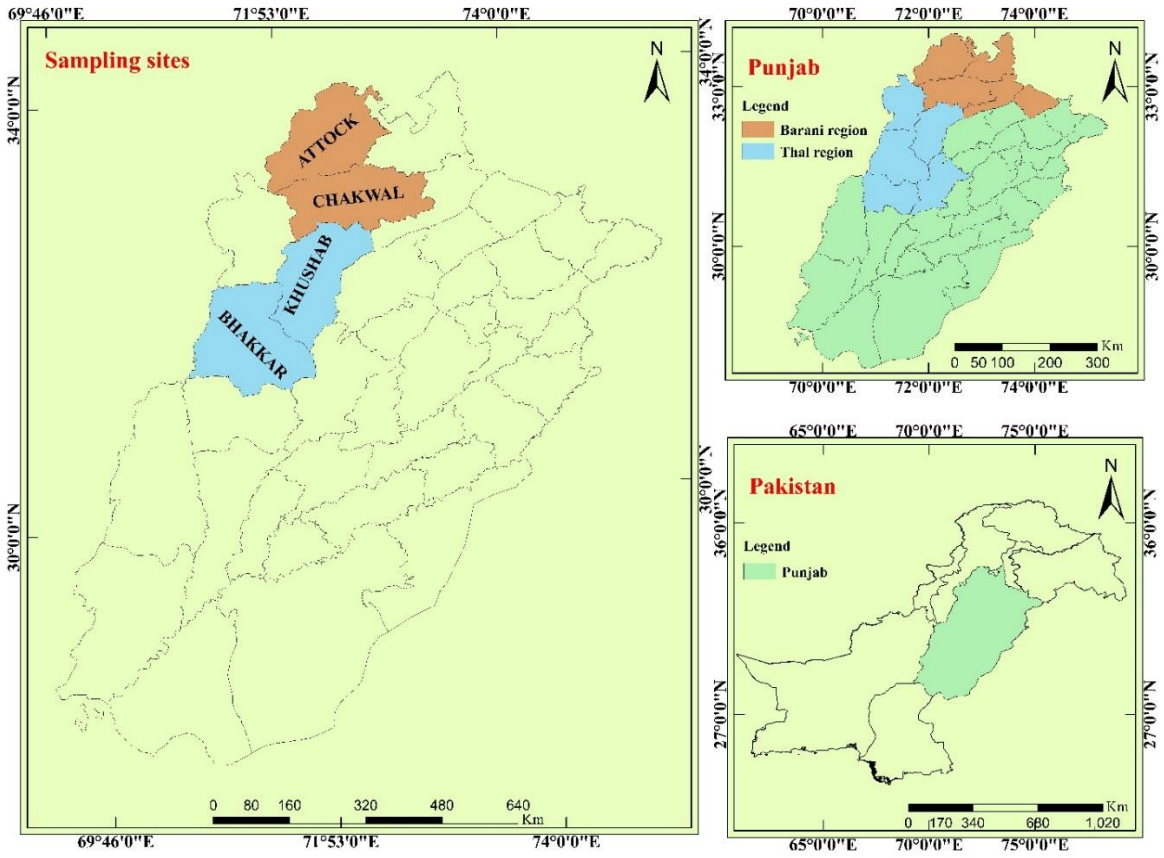

Figure 3. Map of the research districts (Developed by author using ArcGIS 10.8).

From each of the selected districts (Bakhar, Khushab, Attack and Chakwal), 30-gram growers were purposively selected thereby making a sample size of 120 respondents. Selected respondents were interviewed face to face data collection. Structured interview schedule was prepared keeping in mind the specific objectives of the study and used as data collection/research instrument. Cronbach's Alpha test was used to check the reliability of interview schedule. The value of Cronbach's Alpha computed through SPSS was 0.75. The collected data were coded into Microsoft Excel and statistical analysis was performed by the application of SPSS. Five Point Likert type scale was used to find the level of constraints being faced by gram growers in the research districts.

RESULTS AND DISCUSSION

Socio-economic characteristics of respondents

In adopting new agricultural technologies/innovations, socio-economic characteristics of farming community play a significant role. The data regarding socio-economic profile of respondents were collected and presented in Table 1.

Table 1. Distribution of respondents according to their demographic profile.

Demographic attributes	Frequency	Percentage
Age (years)		
Up to 30	19	15.8
30-50	54	45.0
More than 50	47	39.2
Education		
Primary	39	32.5
Middle	27	22.5
Matric	15	12.5
Intermediate	39	32.5
Size of Land Holding (acres)		
Up to 12.5	11	9.2
12.5-25	53	44.2
More than 25	56	46.7
Income source		
Farming of crops only	43	35.8
Farming of crops and rearing of livestock	43	35.8
Agriculture and job	28	23.3
Private business only	6	5.0
Total	120	100.0

Table 1 shows that 15.8% of respondents were aged less than 30 years followed by 45% of respondents falling in age bracket of 30-50 years. Of the total respondents, 39.2% were aged more than 50 years. This can be concluded from the data that farmers with the middle age were prominent among all respondents. As for as education was concerned, 32.5% of respondents had primary level of education. Slightly more than one fifth (22.5%) of respondents had middle level of education. Out of total respondents, 12.5% were matriculate and 32.5% had intermediate or above level of education. Distribution of respondents according to their land size indicate that 9.2% of farmers had less than 12.5 acres followed by 44.2 and 46.7% of respondents having 12.5-25 acres and more than 25 acres of land respectively. Results indicate that for 35.8% of respondents crop farming was the key income source followed by 35.8% of respondents who had reliance on crop farming and livestock farming altogether. Around one fourth (23.3%) of respondents had income generation from agriculture and job followed by 5% of respondents who had involvement only in private business to generate income.

Constraint faced by the respondent in the adoption of improved gram production practices

Constraints are divided into three major categories as technical, financial, and physical. The data concerning to these constraints were collected from the respondents using five-point Likert type scale (1=Strongly Disagree, 2=Disagree, 3=Undecided, 4=Agree and 5=Strongly Agree) and presented below.

Technical Constraints

Table 3 shows that fertilizer management was the leading technical constraints faced by the respondents ($\bar{x}$=2.76). Farmers have poor acquaintance with the recommended fertilizers, application and management of fertilizer for the potential production of gram. Having inadequate awareness about the recommended production practices was second leading constraint ($\bar{x}$=2.71), endorsing the fertilizer management as a constraint because fertilizer management is also one of the recommended production practices of gram. Findings are endorsed with those of Jat *et al.* (2017) as they found a gap in the gram production due to lack of technical knowledge. Pertinent to inadequate knowledge farmers were unable to perform required operations timely. Obidlike (2011) had the same thoughts that due to inadequate technical knowledge and understanding farmers were not able to adopt innovations in a true spirit. Weed management ($\bar{x}$= 2.61) and lack of technical knowledge ($\bar{x}$= 2.47) among farmers was perceived as a technical constraint as well.

Physical Constraints

Table 4 shows that non-availability of labour was the

foremost constraint faced by the respondents ($\bar{x}$=2.67) whereas water shortage was the second leading constraint faced by the gram growers ($\bar{x}$=4.02). The problem of water shortage was much serious and due to non-availability of irrigation water the production of gram decreased significantly. Sometimes, due to water shortage and occurrence of no rainfall the complete crop of gram was deteriorated. Especially, when the area is rainfed the vulnerability of gram towards crop failure increases. Farmers perceived that labour was costly ($\bar{x}$=3.81), adoption of innovation was poor ($\bar{x}$=3.05) followed by the marketing problems ($\bar{x}$=2.85). Findings are endorsed with those of Khan *et al.* (2019) as they found that expensive inputs, illiteracy among farmers, prevailing poverty, and limited resources were they leading constraints hindering the adoption of improved agricultural practices. Farmers perceived climate change as a constraint, although the severity of climate change was rated close to medium level. Farmers further perceived lack of innovations especially for the gram growers. Still the farmers are practicing traditional technique of gram cultivation. Rani *et al.* (2020) was of the view that due to low and high temperature the production of gram was decreases due to reduced pollen viability and poor pod set.

Table 3. Technical constraint faced by respondents.

Technical constraint	Mean ± SD
Fertilizer management	2.76±0.767
Less awareness about recommended practices	2.71±0.854
Weeds management	2.61±0.759
Post-harvest handling	2.59±0.912
Insect-pest management	2.56±0.818
Lack of technical knowledge regarding plant protection	2.47±0.925

Table 4. Physical constraint faced by respondents.

Physical constraint	Mean± SD
Non-availability of labour	4.37±1.10
Water shortage	4.02±1.025
Costly labour	3.81±1.162
Less adoption of innovation	3.05±0.906
Marketing problems	2.85±0.752
Climate change	2.83±1.032
Lack of innovation	2.67±0.803

Table 5. Financial constraints faced by respondents.

Financial constraint	Mean ± SD
Inadequate access to farm implements and inputs due to finance shortage	3.23 ± 1.016
Lack of access to credit	3.12 ± 1.001
Lack of finance	3.08 ±1.017

Financial Constraints

Table 5 indicates that inadequate access to farm implements and inputs due to finance shortage was perceived as leading constraint by the farmers ($\bar{x}$=3.23). Findings are consistent with those of Jalal-ud-Din (2011) as he found that lack of access to information and non-availability of credit facilities were the key obstacles faced by the farmers. Farmers had limited access to the credit facility ($\bar{x}$=3.12) and had finance shortage ($\bar{x}$=3.08). The finance shortage had adverse impacts on the awareness and adoption of agricultural innovations and site-specific technologies. Couple of studies such as Yigezu *et al.* (2018) and Ruzzante *et al.* (2021) had reported that due to financial shortage farmers had poor inclination towards the adoption of different site specific and latest technologies. Elahi *et al.* (2018) suggested that financial assistance to the farmers can help them to make their farming profitable and economically good.

Strategies syggested by farmers

A number of strategies are suggested by different researchers to enhance the level of adoption of improved gram production practices in Pakistan. Responses were collected on a three-point likert type scale (1= Disagree, 2= Neutral and 3= Agree). Data in this regard are presented in Table 6.

Table 6. Suggestions made by respondents to enhance adoption of gram production practices.

Strategies	Mean ± SD
Provision of effective extension services	2.98±1.170
Provision of better marketing facilities	2.69±0.977
Provision of timely need-based information	2.61±1.140
Provision of inputs at subsidy rate	2.39±0.910
Provision of interest free loan	2.19±1.110
Provision of authentic prices of farmers commodities	2.19±0.748
Reduction of oil/ fuel charges	1.74±0.865
Reduction of extra taxes	1.46±0.849

Table 6 present that farmers strongly agreed ($\bar{x}$=2.98) that farmers should be provided with the effective public and private sector extension services. Extension Field Staff of the public and private extension services should interact with the gram producers for the technical assistance. Respondents further asked for the better marketing facilities ($\bar{x}$=2.69), timely access to need-based information ($\bar{x}$=2.61), subsidies on inputs ($\bar{x}$=2.39) and provision of interest free loans ($\bar{x}$=2.19).

CONCLUSION AND RECOMMENDATIONS

This study was mainly concerned with exploring the constraints faced by the gram farmers and this study grouped constraints into three major categories (i) technical (ii) physical and (iii) financial constraints. The constrains had varied level of impact on decreasing the gram production. Fertilizer management, non-availability of labour, ineffective marketing, poor economic conditions of farmers and inadequate access of farmers to technologies due to finance shortage were the leading hindering factors. Water shortage and climate change were key obstacles especially in the study area where gram cultivation is purely dependent on rain water. Farmers urged Extension Field Staff (EFS) of the public and private extension services should interact with the gram producers for the technical assistance. Effective marketing facilities, timely access to need-based information, subsidies on inputs and provision of interest free loans to the farmers could help them to make decisions regarding adoption of recommended production practice.

REFERENCES

Asghar, R., T. Siddique and M. Afzal. 2003. Inter and intra-specific variation in SDS-PAGE electrophoregrams of total seed protein in chickpea (Cicer arietinum L.) germplasm. Pakistan Journal of Biological Sciences, 6: 1991-95.

Elahi, E., M. Abid, L. Zhang, S. Ul Haq and J. G. M. Sahito. 2018. Agricultural advisory and financial services; farm level access, outreach and impact in a mixed cropping district of Punjab, Pakistan. Land Use Policy, 71: 249-60.

Government of Pakistan. 2020. Economic Survey of Pakistan, Finance Division Islamabad, Pakistan. Place Published.

Hassan, G. and I. Khan. 2007. Post emergence herbicidal control of Asphodelus tenuifolius in Desi chickpea (Cicer arietinum L.) at Lakki Marwat, Pakistan. Pak. J. Weed Sci. Res, 13: 33-38.

Jalal-ud-Din, M. 2011. The socio-economic problems of small farmers in adopting new agricultural technology: A case study of three villages in district Mardan. Sarhad journal of agriculture, 27: 299-304.

Jamil, F., N. Sarwar, M. Sarwar, J. Khan, J. Geistlinger and G. Kahl. 2000. Genetic and pathogenic diversity within Ascochyta rabiei (Pass.) Lab. populations in Pakistan causing blight of chickpea (Cicer arietinum L.). Physiological and Molecular Plant Pathology, 57: 243-54.

Jat, S., K. Dangi and B. L. Kumhar. 2017. Constraints in adoption of improved cultivation practices of black gram. International Journal of Current Microbiology and Applied Sciences, 6: 1820-24.

Khan, A., Z. A. Khan, U. Pervaiz and M. Iqbal. 2019. Extension agents perceptions regarding constraints to adoption of improved agricultural practices by farmers. Sarhad journal of agriculture, 35: 342-48.

Khan, O., A. Naseer, M. Shahbaz, S. Akhtar, M. Faisal and K. Mushtaq. 2017. Accessing the factors affecting the yield of Chick-pea in Thal, Punjab. Pakistan. J. Innov. Bio-Res, 1: 46-51.

Malik, W., M. A. Abid, H. M. N. Cheema, A. A. Khan, M. Z. Iqbal, A. Qayyum, M. Hanif, N. Bibi, S. Yuan and A. Yasmeen. 2015. From Qutn to Bt cotton: development, adoption and prospects. A review. Cytology and Genetics, 49: 408-19.

Merga, B. and J. Haji. 2019. Economic importance of chickpea: Production, value, and world trade. Cogent Food & Agriculture, 5: 1615718.

NARC. 2017. National coordinated pulses programme NARC, Islamabad.

Pakistan Bureau of Statistics. 2020. Food imports in the previous fiscal year 2019-20". . Place Published.

PCRWR. 2020. Project; "Participatory National Integrated Water Management Programme". Retrieved from; https://bit.ly/3jCfxF8 Place Published.

Rani, A., P. Devi, U. C. Jha, K. D. Sharma, K. H. Siddique and H. Nayyar. 2020. Developing climate-resilient chickpea involving physiological and molecular approaches with a focus on temperature and drought stresses. Frontiers in plant science: 1759.

Rehman, A., Farooq M., Ozturk L., Asif M. and S. K. H. 2018. Zinc nutrition in wheat-based cropping systems. Plant and Soil, 422: 283-315.

Ruzzante, S., R. Labarta and A. Bilton. 2021. Adoption of agricultural technology in the developing world: a meta-analysis of the empirical literature. World Development, 146: 105599.

Ullah, A., T. M. Shah and M. Farooq. 2020. Pulses production in Pakistan: status, constraints and opportunities. International Journal of Plant Production, 14: 549-69.

Yigezu, Y. A., A. Mugera, T. El-Shater, A. Aw-Hassan, C. Piggin, A. Haddad, Y. Khalil and S. Loss. 2018. Enhancing adoption of agricultural technologies requiring high initial investment among smallholders. Technological Forecasting and Social Change, 134: 199-206.