International Journal of Agriculture Sciences
ISSN: 0975-3710 & E-ISSN: 0975-9107, Volume 14, Issue 9, 2022, pp.-11619-11621.
Available online at https://bioinfopublication.org/pages/jouarchive.php?id=BPJ0000217

Research Article

CONSTRAINTS IN ADOPTION OF WHEAT PRODUCTION TECHNOLOGIES PERCEIVED BY AFGHAN AND INDIAN FARMERS

MUKHTARZAI A.R., CHAHAL P.K., GHANGHAS B.S., ROHILLA A.K. AND MUKTESHWAR R.
Department of Extension Education, Chaudhary Charan Singh Haryana Agricultural University, Hisar, 125004, Haryana, India
*Corresponding Author: Email - pardeepchahal46@gmail.com

Received: August 28, 2022; Revised: September 26, 2022; Accepted: September 27, 2022; Published: September 30, 2022

Abstract: The field study was conducted in Haryana and Punjab states of India and Herat and Nangarhar provinces of Afghanistan purposively. The research was conducted under GRAIN project sponsored by USA. Hisar (Haryana), Mansa (Punjab) districts from India, Injil (Herat) and Behsood (Nangarhar) districts from Afghanistan were selected purposively because these are the major wheat growing districts in both the countries. Keeping in view the number of wheat growers, a convenient sample size of 15 farmers from each village was selected randomly. So, a total number of 180 wheat growers were selected to constitute a sample of the study. In Afghanistan, the wheat growers, faced constraints of input and production constraints with the mean score 2.16, technical constraints with the mean score 2.20, marketing constraints with the mean score 1.79, regarding financial constraints, the mean score was 1.82 and overall constraints' mean score was 1.99. The technical constraints obtained highest mark (weighted mean score 2.20 with rank I), followed by input and production ranked II, financial III and marketing constraints ranked IV. But in India, input and production constraints' mean score was 1.07, technical constraint's mean score was 1.04 and marketing constraint's mean score was 1.04. For financial constraints, mean score was 1.29 and overall constraints' mean score was 1.11. The financial constraints obtained highest score (weighted mean score 1.29 and ranked I), followed by input and production ranked II, marketing and financial constraints ranked III. This showed a high degree of constraints in Afghanistan than India, which were the major reasons for low wheat production in Afghanistan. Association between independent variables and constraints were found positive to negative and non-significant correlated in Afghanistan, while negative and highly significant at the 0.01 level of probability in India.

Keywords: *Input and production constraints, Technical constraints, Marketing and Financial constraints, Correlation, Association*

Citation: Mukhtarzai A.R., *et al*., (2022) Constraints in Adoption of Wheat Production Technologies Perceived by Afghan and Indian Farmers. International Journal of Agriculture Sciences, ISSN: 0975-3710 & E-ISSN: 0975-9107, Volume 14, Issue 9, pp.- 11619-11621.
Copyright: Copyright©2022 Mukhtarzai A.R., *et al*., This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution and reproduction in any medium, provided the original author and source are credited.
Academic Editor / Reviewer: Dr Ruchi R Gangwar, Sushree Purabi Panigrahi

Introduction

On a global basis, wheat provides better nourishment than any other cereal food crop. The incorporation of dwarf genes in wheat created new varieties that changed the scenario of wheat cultivation all over the world. Hybrid wheat cultivars hold some promise for increasing yield and deserve further studies and refinements in the application. As a food group, grains provide Americans more than half their daily intake of iron, thiamine and folate nutrients, wheat are essential for energy and good health. Wheat is grown in near about 218.54 million hectares with a production of 771.71 million tons of grain all over the world [1]. In Haryana state of India 2.6 million hectares land is under wheat cultivation with a total production of 11.55 million tonnes having productivity of 4410 kg. In Punjab state of India 3.5 million hectares land is under wheat cultivation with a total production of 16.44 million tones and per-hectare production is 5032 kg.

Like India, wheat is one of the main cereal crops for Afghan farmers because wheat is a staple food for Afghanistan. In Afghanistan, there are seven agricultural regions; the key states involved in the cultivation of wheat are in plains of Helmand, Herat, Ghazni, Kundoz, Takhar, Baghlan, Nangarhar and Kandahar. The Herat province, located at the west zone, where 134.2 thousand hectares land is under wheat cultivation, contributes the total production of 384.7 thousand metric tons and an average production measuring 2870 kg/ha. In the province of Nangarhar, lying in the East, the wheat crop is cultivated in an area of 54.8 thousand hectares, and this province contributes the total production of 165.2 thousand metric tons and an average production of 3020 kg/ha. In Afghanistan, 1.63 million hectares area is under wheat cultivation and average production is 2210 kg/hectare and total annual production is 3.61 million metric tons. Afghanistan faces annually around 2.4 million metric tons shortage of wheat which is compensated by importing wheat from other countries [2-5].

Material and Methods

The study was conducted in Haryana and Punjab states of India and Herat and Nangarhar provinces of Afghanistan purposively under GRAIN project sponsored by USA. Hisar (Haryana) Mansa (Punjab) districts from India, Injil (Herat) and Behsood (Nangarhar) districts from Afghanistan were selected purposively because these are among major wheat growing districts in both the countries. Three villages were selected randomly namely, Ramgar, Phuluwala Dogra and Daska from Mansa district and Madha, Daulatpur and Ladwa from Hisar district of India.However,Banaghar, Chaharmisrh and Benigah from Behsood district and Naween-Olia, Qula-e-Faraeeha and Sirasiabmukhtar from Injil district of Afghanistan. A total of twelve villages were selected randomly for the data collection. Primary data was collected by applying purposive and systematic random sampling procedures for the selection of respondents. Finally, fifteen (15) wheat growers were selected randomly from each selected village for the data collection. Forty-Five wheat growers from each state were selected for the study. Thus, a total no of respondents from both the countries (India and Afghanistan) were 180. In the present study, the interpretation of input and production, technical, marketing and financial constraints were analyzed on the basis of wheat production technology to compare their constraints level. The data were collected with the help of a well-structured and pretested interview schedule comprising the items for assessment of their constraint's assessment. The constraints' levels were computed with the statistical measures like frequency score, percentages, mean, weighted mean score, ranks, correlation were used to analyse the data to draw the tangible inferences from the study [6-9].

The dictionary meanings of constraints are confinement the exercise to force to determine or confine action, bound, faltered condition and restriction of liberty or free of action.

Table-1 Distribution of overall constraints perceived by Afghan and Indian wheat growers

SN	Constraints categories	Afghanistan				India			
		Very serious (3)	Serious (2)	Not so serious (1)	Total	Very serious (3)	Serious (2)	Not so serious (1)	Total
1	Input and production constraints	1.13	0.81	0.22	2.16	0.03	0.11	0.94	1.07
2	Technical constraints	1.16	0.86	0.19	2.20	0.02	0.06	0.96	1.04
3	Marketing constraints	0.66	0.69	0.43	1.79	0.01	0.05	0.97	1.04
4	Financial constraints	0.76	0.64	0.43	1.82	0.07	0.49	0.73	1.29
5	Overall average	0.92	0.75	0.32	1.99	0.03	0.17	0.90	1.11

Table-2 Correlation coefficient between independent variables of the respondents and constraints about wheat production technology (n=180)

SN	Independent variables	Correlation coefficient 'r' value	
		Afghanistan	India
1	Age	-0.026^{NS}	0.110^{NS}
2	Education	-0.089^{NS}	-0.083^{NS}
3	Land holding	0.129^{NS}	-0.215*
4	Socio economic status (Family type, size and Occupation)	-0.277**	0.015^{NS}
5	Social participation	-0.063^{NS}	-0.298**
6	Extension contacts	0.033^{NS}	-0.143^{NS}
7	Mass media exposure	-0.075**	-0.055^{NS}
8	Scientific orientation	-0.121^{NS}	-0.259*
9	Farm implement	-0.238*	-0.372**
10	Irrigation facilities	-0.027^{NS}	-0.159^{NS}
11.	Annual family income	0.009^{NS}	-0.288^{NS}
12.	Trainings received	0.077^{NS}	-0.119^{NS}
13.	Source of information	0.093^{NS}	-0.362**
14.	Marketing channels	-0.113^{NS}	0.157^{NS}
15.	Risk orientation	0.053^{NS}	-0.392**
16.	Change proneness	-0.014^{NS}	0.096^{NS}

*Note: * Significant at 0.05 level of probability, ** Significant at 0.01 level of probability, NS : Non-significant*

In simple language constraints can be described as any condition or situation which impedes restricts or limits the adoption of any programme or activity. To find out the probable constraints such as constraints 1) input and production constraints 2) technical constraints 3) marketing constraints and 4) financial constraints purposively were selected for the comparative study which hinders the adoption of wheat production technology. An inventory of constraints was prepared on the basis of available literature, personal experience, discussion with experts and wheat growing farmers. Either it was very serious, serious, or not so serious. The scores given to these response categories were 3, 2 and 1, respectively. Aggregate total was calculated for each constraint separately and based on calculated score, mean score was obtained and rank order was assigned to each constraint according to their maximum to minimum mean score for assessing the seriousness of constraints.

Category (constraints)	Score		
	Very serious (3)	Serious (2)	Not so serious (1)
Input and production constraints			
Technical constraints			
Marketing constraints			
Financial constraints			

Results And Discussion

The results along with relevant discussion have been presented in this research article. The constraints faced by the respondents, categorised as; input and production constraints, technical constraints, marketing and financial constraints and the association between independents variables and constraints' seriousness faced by the wheat growers was calculated with the help of correlation coefficient.

Constraints perceived by the respondents in adoption of wheat production technology

In the light of the objectives of the study, it was imperative to determine the constraints encountered by farmers in the adoption of wheat production technology. To measure the constraints, an interview schedule on following observations was developed:

1. Input and production constraints
2. Technical constraints
3. Marketing constraints
4. Financial constraints

Overall constraints seriousness perceived by the farmers in adoption of wheat production technology

It was reported from the [Table-1] that in Afghanistan, mean score of constraints' seriousness was, technical constraints (2.20) and ranked I, mean score of input and production constraints' seriousness was 2.16 and ranked II, financial constraints' mean score was 1.82 and ranked III, marketing constraints' mean score was 1.79 ranked IV and overall average constraints' seriousness was 1.99. But in India, contrary to Afghanistan, financial constraints' seriousness was ranked I with the mean score 1.29, input and production constraints' seriousness was ranked II with the mean score 1.07, technical and marketing constraints' seriousness was ranked III with the mean score 1.04 and the mean score of overall constraints' seriousness was 1.11. It shows a huge difference of constraints between Afghanistan and Indian farmers faced in wheat production technology.

Association between the personality traits of farmers and their constraints level

In order to find association between personality traits and constraints level of wheat growers, statistical analysis was computed as correlation. The results of analyses have been given asunder.

Correlation between independent variables of the respondents and constraints about wheat production technology

It is revealed from [Table-2] that in Afghanistan, out of 16 independent variables, like socio economic statues (family type, size and occupation) (r=-0.277) and farm implement (r=-0.238) showed negative and highly significant and significant correlation with the constraints level of the respondents about wheat production technology at 0.01 and 0.05 level of probability, respectively, while, land holding (r=0.129), extension contact (r=0.033), annual family income (r=0.009), trainings received (r=0.077), source of information (r=0.093) and risk orientation (r=0.053) showed positive and non-significant correlation with the constraints level of the respondents, followed by age (r=-0.026), education (r=-0.089), social participation (r=-0.063), mass media exposure (r=-0.075), scientific orientation (r=-0.121), irrigation facilities (r=-0.027), marketing channels (r=-0.113) and change proneness (r=-0.014) showed negative and non-significant correlation with the constraints level of the respondents about wheat production technology.

While in India, out of 16 independent variables like social participation (r=-0.298), farm implement (r=-0.372), annual family income (r=-0.288), source of information (r=-0.362) and risk orientation (r=-0.392), showed negative and highly significant

correlation with the constraints level of the respondents, followed by land holding (r=-0.215) and scientific orientation (r=-0.259) showed negative and significant correlation with the constraints level of the respondents about wheat production technology at 0.01 and 0.05 level of probability. while, age (r=0.110), socio-economic status (family type, size and occupation) (r=0.015), marketing channels (r=0.157) and change proneness (r=0.096) showed positive and non-significant correlation with the constraints level of the respondents, but education (r=-0.083), extension contact (r=-0.143), mass media exposure (r=-0.055) irrigation facilities (r=-0.159) and trainings received (r=-0.119) showed negative and non-significant correlation with the constraints level of the respondents about wheat production technology. The study conducted by Kumhare *et al* (2011) [101], Singh *et al* (2012) [11] and Samota *et al* (2017) [12] also strengthened this piece of article.

Conclusion

The findings revealed that regarding overall constraints level, majority of the respondents had high level of overall constraints in Afghanistan, then Indian about wheat crop production technology. Out of 16 independent variables like scientific orientation, mass media exposure and farm implement showed negative and highly significant correlation of the respondents with their constraints level of the independent's variables. While age, education social participation, socio economic statues, irrigation facilities, marketing channels and change proneness showed negative and non-significant correlation with the constraints level of the respondents about wheat production technology, while land holding, extension contact, annual family income, trainings received, source of information and risk orientation showed positive and non-significant correlation with the constraints level of the respondents about wheat production technology. While in India, regarding overall constraints, majority of the respondents had low level of overall constraints than Afghan wheat growers about wheat production technology. Out of 16 independent variables like social participation, farm implement, source of information, risk orientation, scientific orientation and land holding showed negative and highly significant and significant correlation with the constraints level of the respondents about wheat production technology. While, marketing channels, change proneness, socio-economic status and age shows positive and non-significant correlation with the constraints level of the respondents about wheat production technology. Though, education, extension contact, mass media exposure, irrigation facilities annual family income and trainings received showed negative and non-significant correlation with the constraints level of the respondents about wheat production technology.

Application of research: The production and productivity of wheat crop in the study area by minimizing/restricting the constraints in wheat production technologies

Research Category: Extension Education

Acknowledgement / Funding: Authors are thankful to Department of Extension Education, Chaudhary Charan Singh Haryana Agricultural University, Hisar, 125004, Haryana, India. Authors are also thankful to GRAIN project, USA for financial support

****Research Guide or Chairperson of research: Dr P.K. Chahal**
University: Chaudhary Charan Singh Haryana Agricultural University, Hisar, 125004, Haryana, India
Research project name or number: MSc Thesis

Author Contributions: All authors equally contributed

Author statement: All authors read, reviewed, agreed and approved the final manuscript. Note-All authors agreed that- Written informed consent was obtained from all participants prior to publish / enrolment

Study area / Sample Collection: Hisar, Haryana and Mansa, Punjab

Cultivar / Variety / Breed name: Wheat

Conflict of Interest: None declared

Ethical approval: This article does not contain any studies with human participants or animals performed by any of the authors.
Ethical Committee Approval Number: Nil

References

[1] Anonymous (2017) *Published by the Food and Agriculture Organization (FAO) STAT. www.fao.org.*
[2] Anonymous (2018) *Progress Report of All India coordinated Wheat and Barley Improvement project 2017-18, Director's Report, Ed. G.P ICAR-Indian Institute of Wheat and Barley Research, Karnal, India*.
[3] Anonymous (2018) *Republic of Afghanistan Ministry of Agriculture, Irrigation and Livestock, Department of Agricultural statistic and data arrangement*, 4, 7-8.
[4] Kumar D. (2010) *Doctoral dissertation, Indira Gandhi Krishi Vishwavidyalaya, Raipur, India*.
[5] Mane N.P., Sarap, S.M. and Ingale S.N. (2015) *Indian Agriculture Update*, 10(4), 294-299.
[6] Meena B.S. (2012) *Agriculture Update*, 7 (3/4), 283-286.
[7] Rajbhar A.K., Jha K.K. and Yadav S.R. (2017) *Plant Archives*, 17(2), 895-900.
[8] Sabi S., Natikar K.V. and Pati S.L. (2014) *Karnataka Journal Agricultural Sciences*, 27(4), 485-488.
[9] Saxena A., Upadhyay T., Rai D., Varshney A.C. and Saxena M.J. (2019) *Kaushambi*, 6(1), 24-40.
[10] Kumbhare N.V. and Singh K. (2011) *Indian Research Journal of Extension Education*, 11(3), 41-44.
[11] Singh K., Singh P. and Lakhera J.P. (2012) *Rajasthan Journal of Extension Education*, 20, 112-116.
[12] Samota S.D. and Dangi K.L.(2017) *Agriculture Update*, 12(4), 559-563.