

## **Exploring the Socio-Economic Condition of Gram's Farmers and Bottlenecks to Rural Development in Barani Thall (Rainfed) Areas of District Bhakkar, Pakistan.**

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### **Abstract**

Gram (Chickpea) is a major pulse crop of Pakistan mostly grown in the Thall desert Districts of the Punjab Province. All social, cultural, and economic activities of the farming population are mostly dependent on the income from this crop. The present descriptive study deals with the socio-economic condition of Gram's Farmers and reveals the major reasons behind the low yield of crops. The data was collected from a sample of 100 Gram cultivating farmers taken from 4 Tehsils of District Bhakkar using a convenient sampling technique. The researchers used an Interview schedule for data collection. Findings showed that 83 percent of the total sampled population use 100 % proportion of their land only for gram cultivation and 91 % of farmers were cultivating the gram crop under the Rain-fed irrigation method. The 56 % of respondents were suffering from the low yield of crops for about last 6-7 years and the majority 88 % said that the major reason behind low yield is less and uncertain rains in the area due to climate change. The net income from 2020-21 crops was less than the farmer's expenses. The present study confirmed the relationship between climate uncertainty & poor socio-economic condition with a low yield of crops resulting in poor rural development.

**Keywords;** - Chickpea, Gram crop, Barani Thall Desert, District Bhakkar, Climate change, Climate uncertainty, Rural Development, Sprinkler Irrigation

### **1. Introduction:**

Sustainable agriculture is the main vehicle for rural development. The agriculture sector plays its role as the main hub of Pakistan's economy contributing 25% to GDP, providing employment to 44 percent of the total labor force of the country, and accounting for nearly 65% of the country's export earnings directly or indirectly. Gram is a major pulse crop of Pakistan, covering nearly 72% of the total pulse area and about 77% of total pulses production in the country. Punjab province is the major contributor with about 86% share in total area and production in the country. Four key districts of Punjab, Pakistan, Bhakkar, Khushab, Layyah, and Jhang contribute nearly 88% of the total area and production of a gram in Punjab. (Government of Pakistan, 2007) Gram is cultivated from ancient times both in Europe and in Asia as one of the oldest pulses. The Mediterranean or Himalayas region is supposed to be the

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origin of Gram. Now it is cultivated in Pakistan, Australia, Italy, India, the United States, Argentina, North Africa, Spain, Egypt, Russia, Turkey, and many other countries of the world.

Gram has importance due to its nutritional values of seeds as it contains high protein contents about 25 – 28%. Gram's seeds are eaten fresh as green vegetables, roasted, boiled, and fried; as a snack food, sweets, and condiments; seeds are ground and the flour can be used as soup and to make bread; prepared with pepper, salt, and lemon it is served as a side dish as well as Dal chana is very popular and it is also known as a cash crop.

Gram is an important Rabi crop of Pakistan mainly sown in September-November and harvested in February. Crop duration is 90-120 days. This crop accounts for 15 percent of the entire world pulses production. In Pakistan, two common types are sown i.e. Desi Channa (Gram) and Kabuli/Farmi Channa. Desi Channa has a thick coat and is small in size as compared to Kabuli. This type is cultivated about 80-85 % of the total gram crop. Whereas, Kabuli/Farmi Chana has a thin coat and large size. In Pakistan, especially in District Bhakkar, its production entirely depends upon the intensity and distribution patterns of Rainfall.

The agriculture sector has become extremely vulnerable to climate change. During recent years, the production of all crops has been affected by the climatic change including pulses e.g. the production of grams has been badly affected in severe drought season as its production depends upon the rainfall (Zahid Baig in Business Recorder, 2018). The irregular rainfall due to climatic improbability in the Thal desert is the main hindrance in crop production under rain-fed conditions. During the drought periods, there is absolutely no produce and even the farmer has no seed to sow in the next coming year. Major reasons for the low yield of gram crops are poor sandy soils, erratic rainfall patterns, uneven rainfall distribution, smallholdings, less or no access to quality seed, conventional agronomic practices, and a poor marketing system. (Arid Zone Research, Institute Bhakkar). Gram is the most important crop grown both for home consumption and marketing but the productivity of gram is very low due to the use of traditional varieties and poor quality seeds mainly produced at their farms for many years that are defenseless to diseases.

The main obstacle of crop production under Rain-fed conditions is climatic uncertainty due to irregular rainfall in the Thal desert. During the drought periods, all the produce is wiped out and even most of the farmers have no seed to sow for the next year. There is a serious lack of knowledge on farmers' part about seed management information they give little attention to their home-produced seed and have no difference in grain and seed. Farmers did not distinguish between varieties of irrigated and Rain-fed areas. (Nisar Ali Shah (2007)). The per-hectare yield is too much low as compared to the other countries. The national average yield of Gram is a little over 400kg per hectare, whereas in two main Gram producing countries i.e. India and Australia is high as 800 kg and 1,500-2,000 kg respectively. This low-yield practice demands imports and every year hundreds of millions \$ are consumed to fulfill the country's requirements according to the Federal Committee of Agriculture in FY 2013, the production of grams fell to less than 36 thousand tonnes. (Mohi-ud-din Aazim, April, 2017). The production of Gram in 2015-16 was 227,000 tonnes against the annual target of 600,000 tonnes. The country's consumption requirement of about 600,000 tonnes was met through imports. (Muhammad Anwer Baig, Punjab Crop Reporting Service). In the year 2015-16 this crop was grown on an area of 945 thousand hectares with the production of 312 thousand tons showing a decreasing trend of 17.7 percent compared to last year. Overtime productivity of chickpea decreased from 439 to 330 kg per hectare during 2001-2015.

Constant decline in the yield of gram has focused on the requirement to identify the reasons guilty for its short production. The foremost constraints faced by pulses sector in Pakistan like farmers are getting lower prices for their yields due to this farmers are swapping to another crop for their livelihood, the role of middlemen, lack of modern technology, machinery, improper harvesting, improper sowing, delay or early sowing of seeds, non-certified seeds, less resistant varieties of pulses, lack of interest of Government or improper Government policies and lack of research on pulses to increase productions. (Iqra Junejo 2016).

## **2. Research Question**

This study was conducted to identify the foremost factors which contribute to the low yield of Gram crop, the reason behind why the farmers do not adopt the artificial irrigation methods and to reveal the major problems of farmers mostly face to attain their sustainable livelihoods and in Rural development

## **3. Objectives of the Study**

1. To know about the socio-economic profile of the Gram's Farmers.
2. To find out the average yield of gram crop for the year 2020-21.
3. To investigate the intensity of major factors which contribute to the low yield of gram's crop (Agro- Climate factors, Uncertain or fewer rains, Traditional cultivation practices, labor, and marketing problems )
4. To reveal the reason why farmers are not adopting the artificial irrigation methods and why they are relying on the barani (Rainfed) irrigation methods.
5. To give some practical suggestions to promote the production of Grams through capacity building of farmers.

## **4. Research Methodology**

The present exploratory study is survey research using the quantitative method. For this purpose, the researchers selected Barani (Rain-fed) areas from 4 Tehsils of District Bhakkar. The reason behind selecting mentioned areas was that almost 95% of the total land is used for Gram cultivation. In the present study, 100 Gram farmers were selected as a sample using a convenient sampling technique. For the use of convenient sampling the researchers first selected the province of Punjab and from 36 Districts of the Punjab, District Bhakkar was selected. A sample of 25 respondents from each Tehsil was taken using a convenient sampling technique. The data was collected with the help of an interview schedule after pre-testing on 15 respondents. The data was collected by individual face-to-face interaction. The researchers asked questions in the local language for the workability of the interview. Special Package for Social Sciences (SPSS) was used to describe the frequencies on a pie chart, to calculate the mean values of farmer's expenses and net income from 2020-21 Gram's crop. Paired sample t-Test was used to measure the difference between expense and net income. Spearman's rho Correlation test was used, which showed a relationship between the low yield of gram crop and socio-economic + agro-climate reasons.

## **5. Results**

This research was done to explore the Socio-economic condition of Gram's farmers and why the low yield of gram crop is prevailing and what are the constraints that the Gram's farmers are facing in Rural Development. After analysis of collected data, some of the following major

results were found.

## 6. Demographic Information

The demographic information presented in Table-1 reveals that the majority of the respondents have a large size of the family in the selected rural area as 48 % of respondents' families consist of 6-10 persons. Respondents were asked about the source of income to meet their social and cultural activities and it was found that the majority 84 % were depending only on the income gained from the Gram crops. When respondents were asked about how much proportion of the total land they use for Gram cultivation than majority 83% respondents were found using 100 % proportion of their land for gram cultivation and majority 91 % respondents were depending on the Barani (Rain-fed) irrigation and only 9 % were found using some kind of artificial irrigation like tube well. From the studied population, it has been found that 69 % of respondents said that they sell their products to the local level market. The respondents were also asked about loan getting mechanism and it was found that the majority 88 % of the sampled population get loans from different types of banks i.e. Agriculture Development Bank Pakistan (ZTBL), National Bank of Pakistan, and other Microfinance banks. The majority 66 % of respondents said that they return through the income from their crops.

**Table1.**

*Frequency distribution of respondents about their demography and Socio-Economic condition of Gram's Farmers*

<b>Demography and Socio-Economic Condition of Gram's Farmers</b>			
<b>Questionnaire Items</b>	<b>Measurement</b>	<b>Frequency Distribution</b>	<b>%age</b>
<b>Tehsil wise Distribution of Respondent's sample</b>	Bhakkar	25	25 %
	Darya Kahn	25	25 %
	Mankera	25	25 %
	Kallurkot	25	25 %
<b>Family size of the Respondents</b>	Up to 5 persons	31	31 %
	6 to 10 persons	48	48 %
	11 to 15 persons	16	16 %
	above 15	5	5 %
	<b>Source of Income</b>	Gram crops	84
Livestock		5	5 %
Employment		5	5 %
Business		6	6 %
<b>The proportion of land used for gram cultivation</b>		up to 20% of the total land	2
	40 % of the total land	5	5 %
	70 % of the total land	10	10 %
	100 % of total land	83	83 %
<b>Irrigation Methods</b>	Barani (Rain fed) irrigation	91	91 %
	Artificial irrigation	9	9 %
<b>kind of Seed used for gram cultivation</b>	Personal stored seed	71	71 %
	Purchased from a local merchant	24	24 %
	Purchased from Punjab Seed	5	5 %

	Corporation, Pakistan		
<b>Kind of market approached by the respondents for selling of their crops</b>	Local market	69	69 %
	Tehsil level market	18	18 %
	District Level Market	9	9 %
	Other Big cities	4	4 %
<b>Loaning mechanism</b>	Banks	88	88 %
	Local Merchant	7	7 %
	From Relatives	5	5 %
	Through agricultural income	66	66 %
<b>Sources of Loans Returning</b>	By getting other loans	24	25 %
	By selling property	4	4 %
	Through Business	6	6 %

### Average Yield 2020-21

The farmers were asked about their average yield of gram's crop for the year 2020-21. The histogram shows that the mean crop yield for the year 2020-21 was **70.87 Kilogram** per acre (8 Kanal).

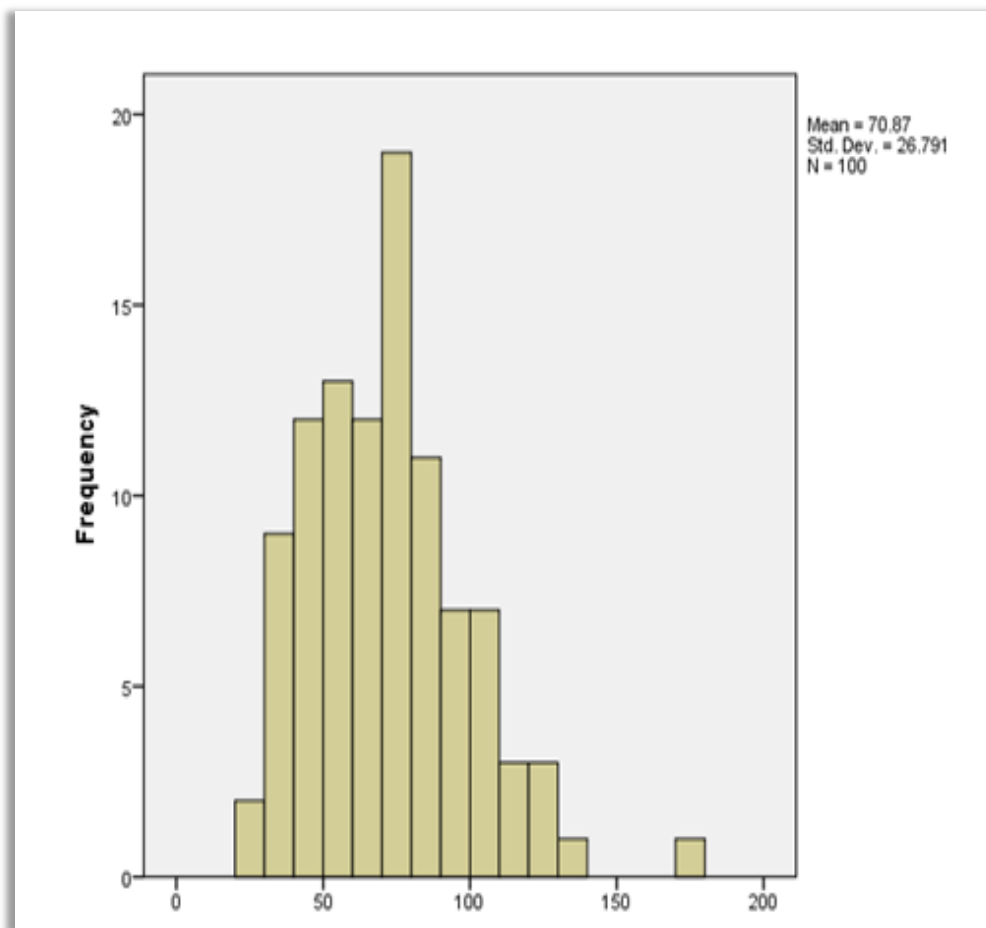


Figure-1:- Histogram, showing Mean Value of crop's yield for the year 2020-21

### Reasons behind Low production

The researchers measured the respondents' behavior about different factors/reasons behind the

low productivity of Gram's crop. From the data collected it was found that the majority of 88 % of respondents were strongly agreed about the fewer rains before and during the crop season. Moreover, 47 % were strong that the low-income level is also a major factor of productivity because due to financial limitations, the crop can't be managed properly. The respondents showed neutral behavior about the low educational level, low quality of seeds, and low quality of land were 39 %, 47 %, and 39 % respectively. Table no.2 displays the frequency distribution of the respondents in detail according to their behavior about the factors/reasons behind low productivity.

**Table No 2.**

*Frequency distribution of respondents according to their response about factors/reasons behind low yield of crops*

Factors/Causes of Low yield of Gram's Crop	Measurement on Likert Scale				
	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Low Educational Level	7	13	39	31	10
Low Income level	47	24	15	10	4
Less Rains	88	9	1	1	1
Low Quality of Seeds	14	29	47	7	3
Low Quality of land	6	19	39	21	15

### Reasons behind relying on Rainfed irrigation

The researchers also measured the respondents' behavior about different factors/reasons behind relying on Rain-fed irrigation methods, the result shows that the majority 71 % of respondents strongly agreed about the unawareness of the artificial irrigation methods, 51 % strongly agreed that Rain-fed irrigation is more convenient and affordable. 44 % of respondents stated that the artificial techniques of irrigation are very costly. Moreover, the table no.3 displays the frequency distribution of the respondents in detail according to their behavior about the reasons behind depending on rain-fed irrigation methods

**Table No 3.**

*Frequency distribution of respondents according to their response about factors/reasons behind low production of crops*

Reasons behind relying on Rainfed irrigation	Measurement on Likert Scale				
	Agree	Agree	Neutral	Disagree	Strongly Disagree
Rain fed irrigation is convenient	51	19	5	9	6
Believe on fate	1	11	19	18	51
Unawareness about artificial irrigation techniques	71	11	4	5	9
Artificial irrigation techniques are very costly	44	40	14	2	3

### Years of Facing Low Yield

It was also inquired from the respondents that since how long they are facing low yield of Gram's crop. The data in Pie-chart reveals that from the total sampled population 03 %

respondents were facing during the year 2020-21, 05 % belongs to the group who were facing low production for the last 1-2 years, and 39 % respondents stated that they were facing low yield output since last 3-4 year. The majority 51 % respondents were facing the phenomenon of low production for the last 5-6 years and the remaining 2 % said that they are facing this for more than 6 years.

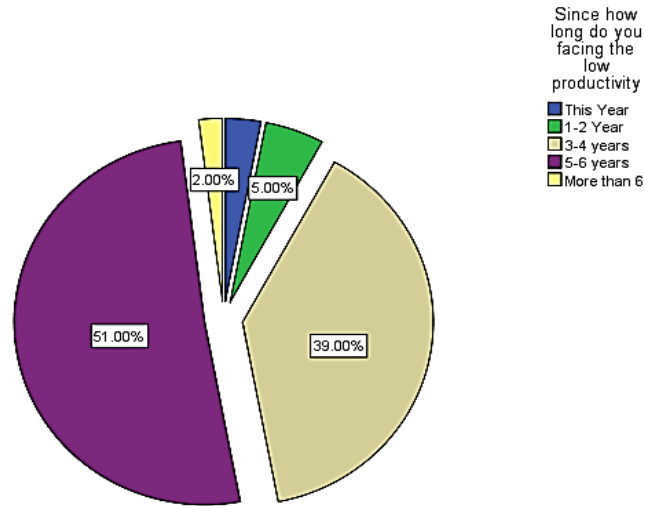


Figure-2:- Pie-Chart, showing Years of Facing Low Yield

### Expense and income from 2020-21 Crops

The farmers were also asked about the expense and income from the 2020-21 crops. The data from the histogram shows that the mean value of farmer's expense on Gram's crop for the year 2020-21 is **Rs.695.02** per one Kanal of land and the income is **Rs. 606.97** from one Kanal of land.

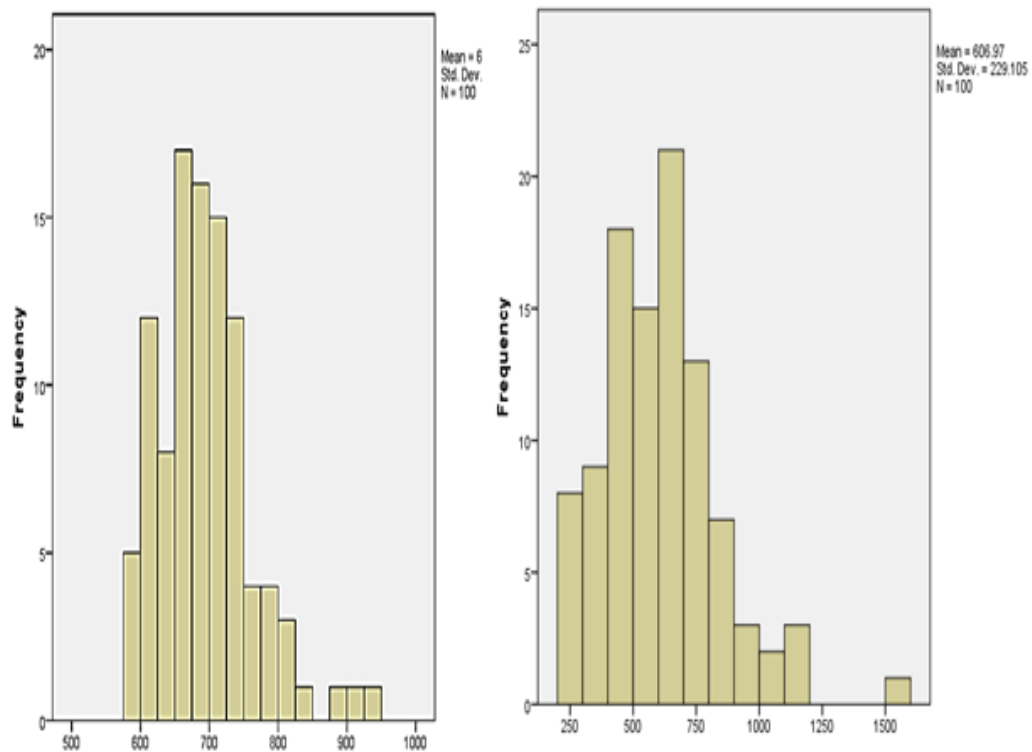


Figure-2:- Histogram, showing Expenditure and income from 2020-21 Crops.

## 7. Discussion

The results of the collected data were according to the literature review. Findings of data matched with the previous research. The result of data collected indicates that the majority of the people in the Barani (areas) i.e. Tehsil Mankera, District Bhakkar depends totally on agriculture, and in the agriculture sector, they only cultivate Gram's crop. They mostly depend on Gram's crop from their livelihoods to all social and cultural activities. From the sampled population it has been found by the researchers that a very minimum proportion of the population has another source of income like employment, livestock, business, etc.

Nisar Ali Shah in his study "Economics of Chickpea Production in the Thal Desert of Pakistan", stated that the productivity of gram was very low due to the use of traditional varieties that are vulnerable to diseases, climatic uncertainty due to erratic rainfall in the Thal desert and serious lack of knowledge on farmers' part about seed management information are the main obstacles of crop production under Rain-fed conditions. In the present study from the total sampled population majority were found complaining the low productivity due to low educational level, low-income level, low and traditional quality of seeds, and specifically majority strongly agreed that the fewer rains are the major cause behind low productivity. The findings are also the same with the Arid Zone Research, Institute Bhakkar which identified the reasons for low yield of grams like poor sandy soils, erratic rainfall pattern, uneven rainfall distribution, smallholdings, less or no access to quality seed, conventional agronomic practices, and poor marketing system.

The majority of farmers are unaware of the modern artificial irrigation system like the sprinkler irrigation method. The respondents who have awareness about this to some extent, have reservations that these systems are out of approach not only in terms of economically but also to install and manage in the sandy lands of Thall desert which shows their behavior just like that



they are very rigid to adopt any change and ready to keep the conventional methods.

One another problem that has come to the notice of the researchers is the respondent's loans. The majority of the respondents get loans for their basic needs of family and marriages and only a few farmers get loans for the agriculture development these loans are gotten from microfinance banks that have very costly debt criteria. The payment of the loan is returned by the farmers through selling the crops or getting any other loan. In this way, the farmer is confined only to the loan getting and returning process for a prolonged period destroying their agriculture sector's poor rural development.

## 8. Conclusion

From the present study, the researchers has come to the conclusive point that the majority of the respondents in the understudied area are dependent only on the income from gram's crop, they use 100 % proportion of their land only for gram cultivation by rain-fed irrigation. The income level of farmers is very low so they approach the banks to get loans for the fulfillment of the basic needs of the family and the cause of social and cultural activities. They return the payment through their crop's income which is already very less than their expenses on the crop. The major reasons for low production are fewer rains followed by traditional low-quality seeds and the quality of the land. The low production of Gram's crop has also a strong relationship with the socio-economic positions of farmers. The educational level of farmers of the studied population is almost graduation but the majority still do not has awareness about the artificial irrigation system. If the gram's farmers adopt sprinkler irrigation then there will be prosperity of farmers. The average demand for grams in Pakistan will be fulfilled and there will be also a stage when despite importing the gram from other countries, Pakistan will export its best quality Gram.

## 9. Suggestions

- ❖ Govt. should pay keen interest in these Rural areas of Barani Thall, especially for the improvement of gram's yield.
- ❖ There is a need to change the behaviors of farmers and make them aware so that they should adopt advanced methods of irrigation.
- ❖ The rates of gram should be managed moderately so that farmer and consumer both don't feel the burden
- ❖ Interest-free loans should be given to the farmers, and these will only be given for the installation of solar tube wells and sprinkler irrigation so that farmers can irrigate the crops cheaply.
- ❖ There is a need for welfare and advocacy-based organizations in these areas so that the farmer should get help in the shape of information, guidance, and technical assistance.
- ❖ Drought-resistant varieties should be provided so that crops can suffer the dry condition of weather and can give a satisfactory yield.
- ❖ For the management of harm full weeds, there is an extreme need to introduce pesticide/herbicides.

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