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Examining the Impact of Climate Change on Agriculture Products in the Province of Jawzjan (Case Study: Certain Villages in Sheberghan City)

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ABSTRACT

A region's weather and climate patterns are impacted by climate change over an extended period of time. Rising temperatures, altered precipitation patterns, rising sea levels and other modifications to meteorological conditions are some of these changes. Numerous facets of existence, including the environment, economy, and human communities, may be significantly impacted by climate change. Significant repercussions of climate change are possible, particularly in the agricultural sector. The production of food crops may be impacted by these changes because agricultural goods are dependent on local climate and weather. Pests and plant diseases may also become more prevalent due to climate change. Accordingly, higher temperatures and changed precipitation patterns can foster the growth of pests and illnesses, which will lower agricultural yields. Investigating how climate change affects agricultural products in Sheberghan City, Jawzjan Province, is the goal of this study. A questionnaire was used in fieldwork to perform this study. Six communities inside Sheberghan City—Toka, Qowchin, Jalalabad, Seshanba, Nokar Abad, and Afghan Tapa—were given 100 questionnaires in all. Four different types of questionnaires were produced and designed for the survey portion of this study. Of the 100 responders, 26 worked as farmers, 37 as gardeners, 8 as teachers, and 29 as traders in agricultural products. Using the SPSS26 program, the research was analyzed. The results showed that agricultural goods are significantly impacted by climate change, highlighting the significance of agriculture and agricultural products in the economy. The research findings indicate that the utilization of contemporary technology, such as smart irrigation systems and smart systems, can be one of the elements in growing agricultural products, and that the development of climate-adaptive agricultural methods can boost agricultural products. Farmers' interest can also be raised by government encouragement and assistance. The general conclusion that can be drawn from looking at the aforementioned elements is that agricultural products have been impacted by climate change and the creation of farmers' techniques for adapting to it.

Keywords- Products, Agriculture, Climate, Technology.

I. INTRODUCTION

On a global level, agriculture has largely met the challenge of addressing effective demand for food — albeit 815 million people remain food insecure. Predicting and estimating how long it will take for information technology (IT)—and new technologies in general—to become widespread is indeed difficult with so many major challenges and risks including climate change, environmental degradation, more intense competition for land and water, higher energy prices. Plants Grow Using Multiple Factors. Insofar as the region's terrain and geography are concerned, the physical features of this section emphasize the region's vital connections to the nation at large. Finding out if the climate and soil of the area are suitable for the planned production of livestock and agriculture is the primary objective. (Faiz, 2016, pp. 88-118).

Food Insecurity in Developing Nations Could Get Worse for Vulnerable Groups. It is estimated that by

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2030, the effects of climate change would cause a 2–3% decrease in grain output in African nations. Although the amount of chemical fertilizers and better seeds used to make up for this decline may be greater than what is required, this problem undermines all advancement attempts (Shokat Fadai and Korki Nejad, 1389, p. 277). Two factors that limit farming in the area are the kind and consistency of the soil. Even while a given region may have a climate that suits plants, the soil in that region might not be optimal for those plants. On long-, medium-, and short-term time scales, climate change occurs. (Hasani and colleagues, 1391, p.32) Short-term climatic changes are those that last less than a few years. The burning of fossil fuels, deforestation, urbanization, industrialization, and nuclear explosions that contaminate the atmosphere are some of the changes that occur in addition to those brought about by natural processes like solar radiation. It is anticipated that by 2080, the ability of emerging countries located in lower latitudes to produce wheat would have decreased by 15 to 45 percent.

(Azizi and Kandari, 1390, p. 115). A number of factors, including rising global temperatures, local and seasonal highs, less precipitation and snowfall, melting polar ice caps, and lengthening dry seasons, have had a substantial influence on farming practices (Hedlund et al., 2018). The study demonstrates the necessity of using climate-smart variety data. Forecasts show that variations in temperature and precipitation may have a substantial negative impact on agricultural productivity, particularly in semi-arid Mediterranean regions. (Bouras et al., 2019).

Studying how climate change and shifting climatic conditions affect agricultural yield and quality is crucial given the pressure from population growth. Reduced rainfall, higher temperatures, and changes in soil moisture regimes are the most prevalent direct consequences of climate change. New adjustments and modifications to farmers' practices, such as irrigation, crop rotation, planting dates, and soil tillage operations, are examples of indirect consequences of climate change (Hamidov et al., 2018).

1.1 Research Questions

Main Question:

1. How does climate change affect agricultural products?

Sub-questions:

1. What are the assurances that the implementation of contemporary technologies like hydroponic agriculture, wise watering systems, and smart systems will enhance the efficacy of agricultural goods and products?
2. In light of climate change, what steps should be implemented regarding agricultural products?

1.2 Research Hypotheses

Main Hypothesis:

1. Agricultural products seem to be significantly and positively affected by climate change.

1. The application of contemporary technology, including hydroponic farming, smart irrigation systems, and smart systems, appears to have a favorable and noteworthy effect on agricultural output.

II. METHODOLOGY

Achieving the correct answers to the research queries is a key objective of the study, and the approach employed to meet these objectives is referred to as the research methodology. In this study, questionnaires were dispersed in the field utilizing a random quantitative method. Through the utilization of the questionnaire for data and statistical collection, outcomes are acquired.

2.1 Statistical Population

The statistical population consists of one or more entities with at least one characteristic in common. The study centers on the effects of climate change on agricultural products in the villages of Sheberghan City, Jawzjan province, which comprise the population used for statistical purposes. Only six villages were included in the statistical population due to financial limits and time constraints.

2.2 Sample and Sampling Method

During this study, approximately 100 surveys were given out in six villages within Sheberghan city: Toka, Ghochin, Jalalabad, Seshanbe, Nokar Abad, and Afghan Tepa. The questionnaire included four different types of inquiries. The survey group of 100 participants was composed of 26 farmers, 37 orchardists, 8 educators, and 29 agricultural product vendors. The data collected was examined utilizing SPSS 26 software.

2.3 Data Collection Method

A systematic random distribution of questionnaires was used to gather data for the field study and library research in this study, taking the aims into consideration.

2.4 Data Analysis Method

A well-known statistical program called SPSS26 was used to evaluate the acquired data. Together with the commonly used Chi-Square Test for hypotheses involving ordinal variables, One-Sample Kolmogorov-Smirnov Test for assessing normal distribution, Cronbach's Alpha for internal consistency, and descriptive statistics (frequency and percentage frequency) were employed.

III. THEORETICAL FRAMEWORK OF THE RESEARCH

One of the important provinces in northern Afghanistan, Jawzjan is a second-degree province that shares a border with Turkmenistan. This province has a strong historical heritage and abundant gas resources. It is situated between latitudes 37°05'42" and 36°38'09" north and longitudes 65°49'58" and 18°66'05" east. Darzab district is the highest point at 1170 meters above sea level, while the province capital is elevated from sea

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level by 380 meters. At 253 meters above sea level, the Khwaja Do Koh district is the lowest point. Jawzjan lies to the north of Kabul, precisely 555 kilometers. Sar-e Pol province borders it to the south, Faryab province to the west, and Balkh province to the east. According to National Statistics and Information Authority's 2019 projections, the province is expected to be 11,291.5 square kilometers in size, with a population of 590,866. Summer temperatures can reach highs of 46 degrees Celsius, while winter lows plummet to minus 15 degrees Celsius, creating an extreme climate with scorching summers and freezing winters. Despite the temperature variations, the province enjoys stable temperatures throughout the year. Sheberghan, the province's capital, and ten districts—Khwaja Do Koh, Qarqin, Aqcha, Mardyan, Faizabad, Mingajik, Khanqa, Khwaja Do Koh, Qush Tepa, and Darzab—comprise Jawzjan's eleven administrative units. The province is home to various ethnic groups, including Uzbeks, Turkmens, Arabs, Tajiks, Pashtuns, Hazaras, among others. (Jawzjan Provincial Socio-Economic Profile, 2020, pp. 5-6).

3.1 The importance and impact of climate change on agriculture

Climate change significantly impacts agriculture and food supply, leading to a range of negative effects and necessitating shifts in farming practices. Changes in temperatures and rainfall patterns can significantly reduce agricultural yields and quality. In some areas, warmer and drier weather leads to droughts, lower yields, decreased farmer motivation, and higher consumer costs. (Khajehpour, 1378). climatic change has an impact on long-term changes in weather conditions and the climatic pattern of a place. Natural forces such as variations in solar activity and volcanoes can cause these changes, but human actions are currently the most powerful influencers of climate change. Climate change is exacerbated by activities such as the burning of fossil fuels such as oil and natural gas, as well as deforestation, land use change, and rising greenhouse gas concentrations. Climate change has far-reaching implications on the environment, the economy, and society. This encompasses increasing sea levels, melting polar ice caps, rising ocean temperatures, more frequent and intense storms and floods, a decline in biodiversity, altered rainfall patterns, and droughts. The health of both people and animals is significantly threatened by climate change, necessitating global cooperation to regulate and mitigate it. (Faez, 1395, pp. 124-125).

3.2 Solutions to climate change in agriculture

Recognizing that agriculture is affected by climate change in positive and negative ways, implementing appropriate strategies to adapt to these changes could improve agricultural productivity and increase resilience to it:

Management of water resources: Appropriate water management techniques combined with efficient use of available resources can help lessen the effects of climate change on agriculture. Additionally, very beneficial is the employment of innovative technologies like rainwater collecting and drip irrigation. Resilient seeds: Farmers can achieve improved outcomes by utilizing seeds that are better adapted and more resistant to climate change.

Adapting cultivation strategies: Enhancing agricultural performance may involve adjusting cultivation techniques in response to climate change. For example, cultivating crops that can withstand higher temperatures and identify optimal cultivation areas could be the most effective approach. Fertilizer and plant nutrition management: Utilizing chemical fertilizers can enhance agricultural yield and support plants in adapting to climate variations. (Faez, 1395, p. 137).

3.3 Research background

To enhance agricultural productivity, Eskandari (2008) examined the impact of climate on agricultural planning in Ramhormoz County, focusing on wheat. His research highlights the importance of considering relevant climate factors when assessing crop selection, growth patterns, reasons for yield variations, and establishing an irrigation timetable and agricultural calendar based on precipitation, evaporation, and plant water needs.

Ebrahimi (1392) used the results of the ECHO-G general circulation model for scenario A1 in comparison to the LARS-WG statistics model to assess the circumstances related to climate change in Mashhad city. The study's previous era, or statistics period, was defined as the years 1976–2005 AD, while the future period, or climatic period, was defined as the years 2010–2039 AD. The model's implementation findings show that Mashhad's temperature will not vary in the future from the statistical period, but the city's rainfall will increase by 6.1%. Then, they modified the agricultural calendar and ascertained the ideal wheat planting date for Mashhad city using the GDP formula and model output data for the upcoming season.

Jahantigh (1395) investigated the impact of climate change on the wheat growing schedule and water needs in Sistan and Baluchestan Province. They also explored how regulating planting dates could mitigate the negative effects of this global phenomenon.

The findings indicated that while delaying the planting date due to weather conditions will shorten the planting season by 12 to 25 days, it will increase the water requirement by 1.27% to 77%. The length of the growth period in different stages of wheat will decrease by 1 to 20 days as a result of temperature increases, reducing the water requirement of wheat by 0.03% to 7.42%. The findings show that controlling the wheat-planting schedule is a practical way to ensure sustainable agriculture in Sistan and Baluchestan Province's future climate.

Cook et al. (2005) examined Australia's agricultural product performance in the long term due to climate change. They found that using drought-resistant plants, developing new technology, and improving

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irrigation management are some strategies to tackle long-term climate change.

The impact of climate change on wheat yield in northwest Turkey was evaluated by Ozdakan (2011). As per the research, the influence of increasing atmospheric carbon dioxide on plant productivity would be positive and negligible under stable climatic conditions. Nevertheless, this advantage might not adequately counterbalance the adverse impact of altered precipitation and temperature on plant performance.

IV. RESEARCH FINDINGS

Table 1: Gender Frequency Percentage Valid Percentage Cumulative Percentage

		Frequency	Percentage	Valid Percentage	Cumulative Percentage
valid	male	100	100	100	100

Table 1 shows that the data obtained had 100 respondents, all of whom are male.

Table 2: Age

Age					
		Frequency	Percentage	Valid Percentage	Cumulative Percentage
valid	18-25	35	35.0	35.0	35.0
	25-30	25	25.0	25.0	60.0
	30-40	38	38.0	38.0	98.0
	40-above	2	2.0	2.0	100.0
	Total	100	100.0	100.0	

Based on the results, Table 2 demonstrates that 35 respondents, or 35% of the total respondents, were in the 18–25 age range. Of the total responders, 25 individuals, or 25% of them, were in the 25–30 age range. Of the total responders, 38 (or 38% of them) were in the 30- to 40-year-old age range. Of the total responses, two were older than 40 years old, making up 2% of the sample.

Table 3: Respondents by Education Level

Respondents by Education Level					
		Frequency	Percentage	Valid Percentage	Cumulative Percentage
valid	Illiterate	32	32.0	32.0	32.0
	Educated	40	40.0	40.0	72.0
	Bachelor's degree	18	18.0	18.0	90.0
	Master's degree	10	10.0	10.0	100.0
	Total	100	100.0	100.0	

The findings indicate those 32 respondents, or 32% of the sample as a whole, lacked literacy. Of all the respondents, 40 had an education, making up 40% of the total; 18 had a bachelor's degree, making up 18% of the total; and 10 had a master's degree, making up 10% of the total.

Table 4: Respondents by Occupation

Respondents by Occupation					
		Frequency	Percentage	Valid Percentage	Cumulative Percentage
valid	Farmer	26	26.0	26.0	26.0
	Gardener	37	37.0	37.0	63.0
	Student	8	8.0	8.0	71.0
	Trader	29	29.0	29.0	100.0
	Total	100	100.0	100.0	

The findings indicate that 37 respondents, or 37% of the total respondents, were gardeners, and 26 respondents, or 26% of the respondents, were farmers. Of the total respondents, 8 were students, making up 8% of the sample, and 29 were traders, making up 29%.

Table 5: Respondents by Family Size

Respondents by Family Size					
		Frequency	Percentage	Valid Percentage	Cumulative Percentage
Valid	3-5	18	18.0	18.0	18.0
	5-8	43	43.0	43.0	61.0
	8-10	9	9.0	9.0	70.0
	10-15	30	30.0	30.0	100.0
	Total	100	100.0	100.0	

The findings indicate those 18 respondents, or 18% of the sample as a whole, had families with three to five people. 43 of them, or 43% of all responders, had families with five to eight people. Thirty of them, or thirty percent of the total respondents, had family sizes between ten and fifteen people. Nine of them, or nine percent of the respondents, had family sizes between eight and ten members.

Table 6: Respondents by Marital Status

Respondents by Marital Status					
		Frequency	Percentage	Valid Percentage	Cumulative Percentage
Valid	Single	41	41.0	41.0	41.0
	Married	59	59.0	59.0	100.0
	Total	100	100.0	100.0	

The results show that 59 respondents, or 59% of the total, were married, whereas 41 respondents, or 41% of the total, were single

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Table 7: Does Climate Change Affect Crop Yields?

Does Climate Change Affect Crop Yields?					
		Frequency	Percentage	Valid Percentage	Cumulative Percentage
valid	Yes	77	77.0	77.0	77.0
	No	23	23.0	23.0	100.0
	Total	100	100.0	100.0	

The results indicate that 77 respondents, accounting for 77% of the total, believed that climate change affects their crop yields, while 23 of them, representing 23% of the total, disagreed.

Table 8: Have Your Agricultural Products Been Affected by Climate Change?

Have Your Agricultural Products Been Affected by Climate Change?					
		Frequency	Percentage	Valid Percentage	Cumulative Percentage
Valid	Yes	82	82.0	82.0	82.0
	No	18	18.0	18.0	100.0
	Total	100	100.0	100.0	

The results show that 82 respondents, or 82% of the participants, stated that climate change has affected their agricultural produce, while 18 respondents, or 18% of the participants, reported no impact on their products.

Table 9: **Have You Used Technology and Innovations Related to Agriculture to Increase Your Crop Yields?**

Have You Used Technology and Innovations Related to Agriculture to Increase Your Crop Yields?					
		Frequency	Percentage	Valid Percentage	Cumulative Percentage
valid	Yes	64	64.0	64.0	64.0
	No	36	36.0	36.0	100.0
	Total	100	100.0	100.0	

Based on the results, 64 participants, equivalent to 64% of the group, reported enhancing agricultural yields through technology and innovations, while 36 participants, making up 36% of the group, mentioned not doing so due to financial constraints.

Table 10: Can Climate Change Reduce Agricultural Crop Yields?

Can Climate Change Reduce Agricultural Crop Yields?					
		Frequency	Percentage	Valid Percentage	Cumulative Percentage
Valid	Very much	37	37.0	37.0	37.0
	Much	32	32.0	32.0	69.0
	Moderate	25	25.0	25.0	94.0
	Low	6	6.0	6.0	100.0
	Total	100	100.0	100.0	

According to the findings, 37 respondents, or 37% of the sample, strongly agreed that crop yields in agriculture might be lowered by climate change. Of them, 32 (or 32%) agreed with the statement. Six of them, or 6% of the total, agreed to a modest degree, while 25 of them, or 25% of the total, agreed significantly.

Table 11: Can climate change increase diseases and pests in agricultural products?

Can climate change increase diseases and pests in agricultural products?					
		Frequency	Percentage	Valid Percentage	Cumulative Percentage
Valid	Very much	23	23.0	23.0	23.0
	Much	28	28.0	28.0	51.0
	Moderate	36	36.0	36.0	87.0
	Low	7	7.0	7.0	94.0
	Very low	6	6.0	6.0	100.0
	Total	100	100.0	100.0	

According to the data, 23 respondents, or 23% of the sample, strongly agree. 28 respondents or 28% of the total express significant agreement. 36 responders, or 36% of the total, said they agree somewhat. Seven replies, or 7% of the total, agree somewhat. Six respondents, or six percent of the sample, strongly disagree.

Table 12: Can climate change reduce the diversity of agricultural plants?

Can climate change reduce the diversity of agricultural plants?					
		Frequency	Percentage	Valid Percentage	Cumulative Percentage
Valid	Very much	33	33.0	33.0	33.0
	Much	37	37.0	37.0	70.0
	Moderate	7	7.0	7.0	77.0
	Low	11	11.0	11.0	88.0
	Very low	12	12.0	12.0	100.0
	Total	100	100.0	100.0	

According to the data, 33 respondents, or 33% of the sample, strongly agree. Significant agreement is expressed by 37 responders, or 37% of the total. Seven responders, or 7% of the total, moderately agree. Eleven participants, or 11% of the total, expressed a modest agreement. Twelve out of the responses, or twelve percent, strongly disagree.

Table 13: Can climate change reduce the quality of agricultural products?

Can climate change reduce the quality of agricultural products?					
		Frequency	Percentage	Valid Percentage	Cumulative Percentage
Valid	Very much	43	43.0	43.0	43.0

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	Much	30	30.0	30.0	73.0
	Moderate	19	19.0	19.0	92.0
	Low	5	5.0	5.0	97.0
	Very low	3	3.0	3.0	100.0
	Total	100	100.0	100.0	

According to the data, 43 respondents, or 43% of the sample, strongly agree. Thirty responses, or thirty percent of the total, strongly agree. 19 responders, or 19% of the total, said they agree somewhat. Five replies, or 5% of the total, agree somewhat. Three people, or 3% of the total, strongly disagree.

Table 14: Does climate change affect soil quality?

Does climate change affect soil quality?					
		Frequency	Percentage	Valid Percentage	Cumulative Percentage
valid	Very much	27	27.0	27.0	27.0
	Much	39	39.0	39.0	66.0
	Moderate	22	22.0	22.0	88.0
	Low	5	5.0	5.0	93.0
	Very low	7	7.0	7.0	100.0
	Total	100	100.0	100.0	

The data shows that 27 respondents, or 27% of the sample, strongly agree. 39 respondents or 39% of the total express significant agreement. Twenty-two respondents, or 20% of the sample, moderately agree. Five replies, or 5% of the total, agree somewhat. Seven responders, or 7% of the total, strongly disagree.

Table 15: Can the performance of agricultural goods be enhanced by the application of contemporary technology like hydroponic farming, smart irrigation systems, and smart systems?

Can the performance of agricultural goods be enhanced by the application of contemporary technology like hydroponic farming, smart irrigation systems, and smart systems?					
		Frequency	Percentage	Valid Percentage	Cumulative Percentage
Valid	Completely agree	45	45.0	45.0	45.0
	Agree	34	34.0	34.0	79.0
	Undecided	12	12.0	12.0	91.0
	Disagree	3	3.0	3.0	94.0
	Completely disagreed	6	6.0	6.0	100.0
	Total	100	100.0	100.0	

Based on the data, 45 participants, or 45% of the group, completely agree. Thirty-four participants, or 34% of the total, agree. In total, 12 respondents, or 12% of the group, are uncertain. Three replies, or 3% of the total, disagree. Six responders, or six percent of the sample, strongly disagree

Table 16: Can agricultural sustainability be maintained by selecting crops that are more suitable for the existing weather conditions and adjusting cropping patterns?

Can agricultural sustainability be maintained by selecting crops that are more suitable for the existing weather conditions and adjusting cropping patterns?					
		Frequency	Percentage	Valid Percentage	Cumulative Percentage
Valid	Completely Agree	47	47.0	47.0	47.0
	Agree	41	41.0	41.0	88.0
	Undecided	7	7.0	7.0	95.0
	Disagree	5	5.0	5.0	100.0
	Total	100	100.0	100.0	

The findings indicate that 47 respondents, or 47% of the sample, fully concur. 41 people, or 41% of the total, said they agree. Seventeen respondents, or 7% of the total, are unsure. Five responders, or 5% of the total, are in disagreement.

Table 17: Can farmers ensure improved agricultural yields by utilizing best farming practices and effectively managing natural resources amidst climate change?

Can farmers ensure improved agricultural yields by utilizing best farming practices and effectively managing natural resources amidst climate change?					
		Frequency	Percentage	Valid Percentage	Cumulative Percentage
valid	Completely Agree	45	45.0	45.0	45.0
	Agree	47	47.0	47.0	92.0
	Undecided	6	6.0	6.0	98.0
	Disagree	1	1.0	1.0	99.0
	Completely disagree	1	1.0	1.0	100.0
	Total	100	100.0	100.0	

According to the data, 45 respondents, or 45% of the sample, fully agree. 47% of the respondents, or 47 people, indicated their agreement. Six responders, or 6% of the total, are uncertain of their response. One responder, or 1% of the total, disagrees. One respondent—one percent of the total—strongly disagrees.

Table 18: Reliability Statistics

Reliability Statistics	
Cronbach's Alpha	N of Items
.492	4

Table 18: The reliability command evaluates the internal consistency of questions for potential combinations. Findings show higher question compatibility, reflected in a Cronbach's alpha value of 0.492.

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Table 19: One-Sample Kolmogorov-Smirnov Test

One-Sample Kolmogorov-Smirnov Test		
		Can contemporary technologies such as hydroponic farming, intelligent irrigation systems, and other advanced systems ensure an improvement in the quality of agricultural produce?
N		100
Poisson Parameter[a,b]	Mean	1.9100
Most Extreme Differences	Absolute	.148
	Positive	.089
	Negative	-.148
Kolmogorov-Smirnov Z		1.481
Asymp. Sig. (2-tailed)		.025

To evaluate the presumed normality of variables for the population, one-sample Kolmogorov-Smirnov test is employed. In order to perform this test, the relative frequency distributions of the population and the observed relative frequency distributions in the sample are compared. In this case, the significance (sig) is 0.025, indicating that our distribution is normal, based on the program output.

Chi-Square Test Output Frequency from Chi-Square Test

What assurance is there that the use of modern technologies, such as hydroponic farming, intelligent irrigation systems, and smart systems, will improve the exceptional performance of agricultural products?

What assurance is there that the use of modern technologies, such as hydroponic farming, intelligent irrigation systems, and smart systems, will improve the exceptional performance of agricultural products?			
	Observed N	**Expected N**	**Residual**
Completely Agree	45	20.0	25.0
Agree	34	20.0	14.0
Undecided	12	20.0	-8.0
Disagree	3	20.0	-17.0
Completely Disagree	6	20.0	-14.0
Total	100		

The following table shows that the intended number is 20 for each choice, with the remaining values being 25, 14, -8, -17, and -14.

Hypotheses:

Chi-Square Test Statistics

The high performance of agricultural goods appears to be positively and significantly impacted by the employment of contemporary technology like hydroponic farming, smart irrigation systems, and smart systems.

Test Statistics	
	The high performance of agricultural goods appears to be positively and significantly impacted by the employment of contemporary technology like hydroponic farming, smart irrigation systems, and smart systems.
Chi-Square	68.500
Df	4
Asymp. Sig.	.000

The chi-square value is 68.500, which is higher than the predicted value, and its significant value is 0.000, which is less than 0.05, based on the given table.

Two-Way Test Descriptive Statistics

The effects of climate change on agricultural production appear to be both beneficial and substantial.

Descriptive Statistics					
	N	Mean	Std. Deviation	Minimum	Maximum
The effects of climate change on agricultural production appear to be both beneficial and substantia؟	100	1.2300	.42295	1.00	2.00

Two-Way Test Inferential Results

Binomial Test

The effects of climate change on agricultural products appear to be considerable and beneficial.

Binomial Test						
		Category	**N**	**Observed Prop.**	**Test Prop.**	**Exact Sig. (2-tailed)**
The effects of climate change on agricultural products appear to be considerable and beneficial.	Group 1	Yes	77	.77	.50	.000
	Group 2	No	23	.23		
	Total		100	1.00		

The significance level (sig) is below 0.05 or 5%, as per the Binomial Test results. Consequently, H0 is rejected in this case, while H1 is accepted. Hence, it can be inferred that agricultural products are positively and significantly influenced by climate change.

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V. CONCLUSION

The use of contemporary technologies, such as smart irrigation systems, hydroponic farming, and smart systems, can enhance the performance of agricultural products, according to research that takes into account the primary objective of the study, which is to comprehend the impact of climate change on agricultural products in Jawzjan province. 100 respondents were given questionnaires to complete in six villages of Sheberghan City: Tunke, Qochin, Jalalabad, Seh Shanbeh, Nokarabad, and Afghan Tapa. This study was carried out in the field. Four different types of questionnaires were created and prepared for the survey portion of this study. 26 respondents were nomads, 37 were farmers, 8 worked in education, and 29 were in the agricultural trade out of the 100 samples. Using statistical software (SPSS26), data analysis was carried out. The output data demonstrate that the hypotheses have the highest statistical population of 77% of the respondents, or 77 respondents, for the Cronbach's Alpha test for the final questions, the Chi-Square test, and the Binomial test. Evidence of the substantial effects of climate change on agriculture and agricultural goods suggests that these sectors play a vital role in the economy. The study's conclusions suggest that the creation of agricultural solutions that are compatible with the climate can boost agricultural output, and that one of the factors contributing to this output can be the adoption of contemporary technologies like smart irrigation systems and smart systems. Farmers' interests are further heightened by government encouragement and assistance. By looking at the aforementioned elements, it can be concluded, in general, that agricultural products are changing due to climate change, and that efforts to develop climate-compatible solutions to address this shift have been successful.

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