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Socioeconomic Factors Influencing Food Security in a Climate Change Context: A Case Study of Gujar Khan, District Rawalpindi

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Abstract

This research shows the impact of socioeconomic conditions on the outcomes of food security, which comes under the climate change in the agricultural community of Gujar Khan, which is in the District Rawalpindi. Based on qualitative data, which was collected through interviews with local farmers, the research recognizes that farmers face a lot of challenges, including poor access to markets, low prices of crops, and limited access to fertilizers, seeds, and pesticides. Due to changes in the climate, crop failures were a very common issue that was noticed by the farmers in Gujar Khan. There is a need to provide resources and awareness to the farming community for the better production of crops. The study shows that surviving methods are very few. While some farmers adopt some small changes, which is a systemic approach that is supported by some policy, infrastructure is lacking.

Keywords: Food Security, Socioeconomic, Fertilizers, Crop Failure

Introduction

Nowadays, climate change is a rising issue across the world, which affects the local community, especially in agricultural areas where the production of food depends on natural weather patterns. In Pakistan, rural societies face more irregular changes in climate conditions, due to delays in rainfalls and dry periods becoming increasingly common. It is increasing in

socioeconomic vulnerabilities, specifically among small-scale farmers, who usually do not have the capabilities to adapt.

Food security and socioeconomic stability are closely connected to each other in Gujar Khan, District Rawalpindi, where the source of income mainly depends on agriculture. Unpredictable weather conditions, increasing price rates, and limited



access to modern methods create challenges for the farmers. There is a need to understand this relationship to develop locally suitable solutions that can enhance strength and lead to sustainable production of food.

Climate change is one of the most multifaceted and important challenges that is basically affecting food production globally. In Pakistan, small-scale farmers face many issues in the production of crops because they do not have many resources to utilize and benefit from them. Small-scale farmers, such as those in Gujar Khan, are particularly weak due to dependency on rain-based agriculture, rising production costs, and limited capacity to adapt to environmental shocks.

Some of these factors affect farmers' livelihood. Irregular rainfall patterns, droughts, and heatwaves directly affect planting schedules and yields. Moreover, some of the past studies have shown that climate-induced events like floods and prolonged droughts not only threaten food supply but also destabilize rural economies.

This risk becomes increasingly likely when farmers lack access to basic information related to agriculture, affordable agriculture-based technologies, and effective services. Exploring these dynamics in Gujar Khan provides a deep insight into understanding national challenges, and it helps for the betterment of the small, scaled farmer community in designing new interventions that are culturally and economically relevant.

Climate change is a big problem for farmers worldwide. In Gujar Khan, the source of income for most families is the crops that they grow in their fields. But due to changes in weather patterns, their source of income is disturbed because their crops can not grow properly. Sudden changes in rainfall patterns, high temperatures, and dry weather are affecting farming badly, and these factors are disturbing their schedule of sowing seeds and their harvesting time. Moreover, when farmers can not grow their crops, it affects their financial condition badly, and they face difficulties in managing their basic necessities of life, like clothing, education, and health facilities. Due to a lack of assistance, people of Gujar Khan are facing a lot of challenges.

Food security is having enough safe and pure food for the whole family. However, people of Gujar Khan are struggling for this safe and pure food due to low productivity of crops and rising costs of seeds, pesticides, and fertilizers. Families find it hard to deal with these issues.

Problem Statement

In the Gujar Khan District, Rawalpindi, Food security is increasingly being affected by the changes in weather patterns, which are caused by changes in the Climate. In this region, a lot of families depend on farming for their survival, but due to the rise in temperature, irregular pattern of rainfall, and long period of dry seasons, it is becoming very hard to grow proper crops. This issue is made worse by socioeconomic problems such as Poverty, Lack of education, poor access to farming tools and technologies, and limited support of the government. Farmers of the small-scale level can not afford better seeds, fertilizers, and water-saving tools, which are essential to face the issues developed by the change in climate. Moreover, most people have no access to markets where they can sell their crops at a reasonable price. Women also play an important role in farming, but they also face a lot of social and financial issues. These factors leave most of the families vulnerable to the shortage of food and the rise in prices. While climate change is a global issue, its local impact depends a lot on how strong or weak the resources of the community are. Therefore, it's important to understand how social and economic conditions in Gujar Khan affect the ability of people to grow, and access to food is important. Without understanding these factors, it will be very difficult to create helpful and suitable policies and programs to protect the security of food in the face of Climate change.

Research Objectives

1. To find out how socioeconomic factors affect food security in Gujar Khan.
2. To see how climate change affects food security in Gujar Khan.

Research Question

1. How do people's income, education, and jobs affect their access to enough food in Gujar Khan?
2. How is changing weather (like more heat or less rain) making it harder for people in Gujar Khan to get enough food?

Significance of the Study

This study focuses on the people in Gujar Khan, examining how people of Gujar Khan manage their livelihoods, which are affected badly by changes in climate conditions. There is a need to understand the experiences and struggles of farmers of Gujar Khan, which will provide a deep insight into the issues of this community related to food security, so that it can help create solutions to address these challenges. The study is important because it helps us to understand how the lives of people of Gujar Khan are being affected by both Climate Change and social and economic problems. Most of the families in this area depend on farming for their food and income. When the weather becomes too hot and rain becomes irregular, and the productivity of crops fails, it affects the ability of farmers to feed their families. The findings of this study will help to create better plans for the farmers and can improve the supply of food. This study is not only about gathering the facts, but it is also about finding the real solutions that can improve the daily lives of the people of Gujar Khan, who are struggling to grow food in tough times.

Research Approach

The research was performed in Gujar Khan, a rural village of District Rawalpindi, Punjab. Data collection was done by using the method of in-depth interviews. The data was collected from 30 local farmers, some experts in farming and agriculture, because of their direct engagement with agriculture, which has seen many noticeable changes in the outcome of farming in recent years. The Research aims to understand the influence of climate and economic change on the security of food.

The qualitative method was used in this research to understand the lived experiences of farmers. The interviews encouraged farmers to describe how changes in weather affect the daily routines of the farmers and their families, the productivity of crops, and their decision-making process.

Review of Literature

Studies highlight that Food security has become one of the most concerning global issues of the 21st century, mostly for developing countries like Pakistan, where agriculture and farming are the backbone of the economy. Research shows that changes in Climate through a rise in temperatures, unpredictable rainfall, droughts, and extreme weather events have a direct negative impact on cereal yields, including wheat, rice, and maize. This results in the insecurity of food, which is due to a sudden increase in population, conversion of land, and socio-economic inequalities. Moreover, international organizations like FAO (2022) emphasize that merely increasing food production is not enough; there is also a need to focus on equitable access, climate-resilient crops, efficient use of water, and investment in climate-smart agriculture to ensure the long-term sustainability of farming and agriculture (Ahmed et al., 2025).

Studies highlight that the Climate in Pakistan is making farming harder and harder day by day. Rise in temperatures, irregular pattern of rainfall, and more droughts and floods are harming the productivity of crops, especially affecting staple foods like wheat and rice. Studies show that climate shocks reduce both the availability and access to food, which increases the risk of Malnutrition and undernutrition (Abid et al., 2016).

Studies show that climate change is one of the biggest problems affecting food security in Pakistan. The country has been influenced by a lot of disasters like droughts, floods, extreme heat waves, and sudden changes in rainfall patterns. These issues are creating a lot of difficulties in the growth of crops, and as we know, the economy of Pakistan depends a lot on Agriculture. The study explains that more than half of the population faces malnutrition, and around 20%

face food insecurity. As greenhouse gases continue to rise, these problems are expected to get worse in the future. Poor people, especially in rural areas, are facing more challenges because they do not have enough resources to deal with these changing weather conditions. Researcher suggests that Pakistan urgently needs strong and well-planned policies to protect the security of food, such as introducing climate-resistant crops, improving energy resources, and building better infrastructure. Without these steps, the situation could become more dangerous, putting millions of lives at risk. Their research strongly highlights the need for action before it's too late (Tabasam et al., 2022).

A study by Naz, Iqbal, and Begum (2024) explains how climate change is making the security of food challenging day by day. The country is already facing the issue of a growing population, limited land for farming and agriculture, and a rise in hunger. The study shows that changes in temperature, irregular rainfall, and extreme weather such as floods and heatwaves are directly affecting the productivity of crops, water supply, and even livestock health. These problems are making it harder for poor families to get enough food, especially in rural areas. Researchers highlight that areas in Baluchistan, KPK, and Sindh are facing serious insecurity of food. There is a need for urgent action, including better farming techniques, improved water management, and insurance of crops. Their findings make it clear that fighting hunger in the era of climate change requires immediate, smart, and local-level strategies that can reduce the difficulties of small-scale farmers.

Study highlights that there is a need to focus on how change in climate affects the production of wheat in both irrigated and rain-fed areas of Punjab, Pakistan. Researchers found that changes in temperature and rainfall patterns have a direct influence on how much wheat is grown. In irrigated regions, minimum temperatures during February and November help wheat to grow better, but high temperatures during the months of January and November reduce the yield. On the other hand, in rain-fed areas, rainfall during March harms wheat crops, while wheat area and minimum temperature

during March have a positive effect. The study also showed that if temperatures keep rising, the amount of wheat available per person could drop from 198 kg in 2012 to just 84 kg by 2050. This sharp decline could make it very hard to achieve food security, especially with the rising population. The researchers suggest that farmers need support through better seeds and farming methods to reduce the negative effects of climate change. Their work highlights the importance of planning ahead to secure future food supplies in areas like Gujar Khan, which share similar farming conditions (Hassan et al., 2014).

Studies highlight that Pakistan has higher rates of poverty, and most of the people of rural areas depend directly on farming and agriculture for their lives and source of income. When there is a scarcity of water or floods destroy fields, small-scale farmers lose income and cannot buy food for themselves and their families, which makes them more insecure about food (Ahmed et al., 2011).

Researchers highlight that climate change has a strong and negative impact on global food security. Studies show that rising temperatures, sudden decreases in rainfall, and extreme weather events are reducing the productivity of crops in many regions, especially in Africa and South Asia. These changes threaten the production of food and can increase the frequency of hunger and malnutrition among vulnerable populations. Farming systems are very sensitive to even small temperature increases, and sea level rise could further damage the land of farming, especially in coastal regions. Researchers argue that simply increasing the productivity of food is not enough; there is a need to improve food access, storage, and equal distribution, and to invest in adaptation strategies like better farming techniques, drought-resistant crops, and efficient usage of water. Proper change in climate mitigation and adaptation is necessary to achieve global goals like ending hunger (SDG 2) and protecting many livelihoods (Ait El Mokhtar et al., 2023).

Most of the researchers have studied the problem of global food loss and its linkage to the security of food, environment, and economy. Studies show that about one-third of all food produced worldwide is lost or

wasted before it reaches consumers. This food loss not only reduces the amount of food available but also wastes valuable resources like land, water, fertilizers, and energy that were used to grow and transport it. Food loss is a major contributor to greenhouse gas emissions, which harm biodiversity and increase climate change risks. Research also highlights that low-income countries face higher losses in food, especially during farming, harvesting, and storage stages, because of poor techniques, lack of technology, weak infrastructure, and limited access to electricity. Fruits, vegetables, roots, and tubers are lost the most because they spoil faster (Chrisendo D et al., [2023](#)).

Materials and Methods

- *Site:* Gujar Khan, District Rawalpindi
- *Sample Size:* 30 farmers
- *Respondents:* Male and female smallholder farmers in the local community actively involved in crop production. Some farming experts were also involved in the data collection process.
- *Methodology:* Exploratory research methodology
- *Method:* In-depth interview
- *Tool:* Interview guide

Research Methodology

In-depth, narrative-based data were gathered from Gujar Khan farmers using a qualitative research methodology. The main technique that was used in this study was an interview guide that was designed to talk about how farmers understand climate change, how it affects agriculture, and the socioeconomic problems they face. This made it possible to comprehend local experiences and adaptability from a people-centered perspective. Pre-testing the guide made sure the participants understood the questions and that they were culturally appropriate.

Results and Discussion

Most farmers face problems selling their crops due to poor market access and low prices. Many experience food shortages during crop failures, though some manage with savings or support. Fertilizers and seeds

are often too costly, and access to loans is limited. Farmers reduce meals, borrow, or rely on aid to cope during hard times.

Farmers have noticed changes in rainfall and believe climate change is affecting their crops. They respond by adjusting planting times, saving water, and using simple methods like mulching. However, crop failures from weather issues are still common. Due to a lack of resources, some farmers take no action. All things considered, they require additional assistance to control the effects of climate change and enhance farming.

Climate change is posing significant issues for farmers. Their crops are suffering because they are receiving less rain. This is especially true for crops like wheat and pulses. High fertilizer prices and limited credit are also making it hard for them to grow crops. Many farmers are trying to adapt by growing crops that need less water or using old methods to save soil.

Women are doing a lot of work on farms and at home, but they don't have much say in how things are done. Due to the lack of jobs in rural areas, young people are moving to cities in search of employment. Families are finding it more difficult to deal with this.

Farmers need more support to deal with these problems. They need help to manage the effects of climate change and improve their farming practices. This will help them grow more crops and make a better living.

Conclusion

The research concludes that food security in Gujar Khan is highly susceptible to the twin pressures of climate change and socioeconomic disadvantage. Erratic rain, input costs beyond the reach of farmers, and restricted access to agricultural knowledge are strongly curtailing farmers' capacity to sustain productivity. Climate change is not an environmental problem but a fundamentally social problem, and solutions need to be grounded in the local realities of farming communities.

The study finds that climate change makes existing social and economic problems worse. Because of this, many farming families struggle to get enough food

and meet the daily needs of survival. To solve this, we need plans for the farmers to adapt themselves according to the climate, reduce poverty, improve the education system, and educate women to know their basic rights.

Recommendations

- **Training and Extension Services:** Offer farmers frequent workshops and access to agricultural extension agents.
- **Subsidized Inputs:** Government schemes should help lower the price of fertilizers, seeds, and insecticides.
- **Climate-Resilient Crops:** Establish drought-resistant seed varieties and encourage their adoption.
- **Community Awareness:** Launch community-led awareness campaigns on climate resilience and adaptation in sustainable farming.
- **Gender Inclusion:** Engage women in farm decision-making to enhance household resilience.

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