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Youth Perspectives on Food Security Challenges under Climate Change: A Case Study of Attock

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Abstract

Pakistan, a country well known for its rich cultural background and ethnic history. Its economy majorly depends on agriculture sector and around 70% of the population is associated with agriculture. In the globalized world, Pakistan is trying to develop effectively, locally tailored solutions to ensure sustainable agricultural adjustments and resilient communities. This research study aims to explore the experiences and perceptions of Pakistani youth regarding food security issues in the times of climate change particularly in the District Attock of Punjab province. Using a quantitative research, online surveys from 50 respondents and interview guide as a tool, this research investigates the impact of climate change on agricultural yield, food availability, and access to nutritious food from the young's minds perspective. The research findings highlights the need of weather-resilient agriculture, diversified patterns, and initiatives as perceived by youth in regard to the food security challenges. The results figure out the implications for researchers, practitioners, policy makers, and stakeholders that aim at seeking support in sustainable food systems and ensure food security in the Attock region.

Keywords: Food security; Resilient agriculture; Climate change; Youth-led initiatives; Attock

Introduction

Pakistan, a nation formed on the World's map in 1947. A land well known for its diverse culture and fertile land. Where all four seasons are observed. From the mineral- rich mountains of Gilgit Baltistan to the Coal generating soul of Baluchistan and a hub of trade i.e Gwadar Port, the country prevails its economy. Pakistan is an agricultural country and major portion of economy is derived from the agricultural production. The agriculture plays a pivotal role in the national economy with a significant portion of the labor force and promotes substantially to the country's national income. Agriculture is considered the backbone of Pakistan's development and rural economy, with both (Rabi, Kharif) crops grown at large scale wheat, cotton, rice, tobacco, sugarcane, and maize. Livestock is also a crucial component, with cattle, buffalo, sheep, goats, and poultry being significant contributors to the agricultural sector. Attock, formerly known as Campbellpur, is a District of Punjab Province .It was initially founded by the Mughal emperor Akbar. It's situated in the Potwar Plateau near the Indus River. The city has a mix of urban and rural Populations, with many engaged in agriculture and small scale industries. This research highlights the major challenges regarding food Security and the concerns and perspectives of local youth residents in this regard. The total population residing in this region in accordance of the Pakistan Bureau of Statistics is 2,170,423. The district has 353,973 households.

The Indus River system (largest river from major other minor rivers are extended) is considered the lifeblood of Pakistan's agriculture, that supports crop production and livestock farming. Whereas, the agriculture and irrigation sector are subjected to number of challenges, that include climate change, seed quality, poor management, water scarcity, and soil degradation, which threaten the sustainability and productivity of the yield. Climate change, in particular, poses significant risks to agriculture in Pakistan, with rising temperatures, changing precipitation patterns, and increased frequency of extreme weather events impacting crop yields and farmer livelihoods. Despite challenges, it is evident that agriculture is a vital sector in Pakistan, providing food and income for millions

of people. Pakistan has significant potential for agricultural growth and development, with opportunities for improving crop yields, enhancing water management, and promoting sustainable agricultural practices. For recognition of this issue, Pakistan needs to invest in agricultural research and development, improve irrigation infrastructure, and promote policies that support farmers and the agricultural sector. The significance of agriculture in Pakistan cannot be overstated. Agriculture is a great source of food and income for the rural population but also an important contributor to the country's exports. The agricultural sector's activities has a direct impact on the country's economy, food security, and poverty levels. Hence, it is important to consider agriculture a priority in future development plans and policies for the nation, this helps in ensuring that the agricultural sector receives the support and investment it deserves to develop. Furthermore, agriculture is an important sector in Pakistan that provides sustenance and livelihoods for millions of people. While the sector faces significant challenges, there are also opportunities for growth and development. By investing in agriculture, promoting sustainable practices, and supporting farmers, Pakistan can ensure food security, reduce poverty, and achieve economic growth. The country's agricultural sector has the potential to drive economic development and improve the lives of its citizens, making it an essential area of focus for policymakers and stakeholders.

Healthy eating also impacts largely on food Security as the concern of balanced diet and nutritious foods amongst youngsters develops, they are most focused towards different fruits and vegetables. Different opinions of what healthy eating actually means are likely to have different implications for eating behavior. Indeed, it is argued that the influence of norms can only ever be understood in the context of subjective perceptions [1]. It is significant in relation to health behavior as youth's health concerns depart substantially from those of health professionals [2]. One of the reasons explained is the manifestation of the ill-effects of unhealthy behavior in later life and to the different meanings and functions of risk-taking behavior in adolescence, but also to the relative salience and importance of other social and personal issues at this time (Coleman & Hendry). However, although adolescents' understandings of healthy eating cannot be assumed to match parents' or professionals' views, few studies have set out to examine young people's own views. Climate change poses significant threats to global food security, particularly for vulnerable populations. Youth, as a demographic group, play a crucial role in addressing food security challenges. This literature review explores the intersection of youth perspectives, food security, and climate change, with a focus on the context of Attock, Pakistan. Global food insecurity had already been rising, due in large part to climate phenomena. Global warming is influencing weather patterns, causing heat waves, heavy rainfall, and droughts. Rising food commodity prices in 2021 were a major factor in pushing approximately 30 million additional people in low-income countries toward food insecurity. From November 2024 to March 2025, 10.99 million people faced Crisis or Worse (IPC/CH Phase 3 or above) conditions in Pakistan, reflecting 22% of the analyzed population. (Global Alliance for Food Security) Simultaneously, modern ways and technological advancement of food production are again a problem. It has been estimated that the food system of world is responsible for 1/3rd of greenhouse gas (GHG) emissions second only to the energy sector; it is the number one source of methane and biodiversity loss [3].

Sustainable Agriculture Practices, Value Chain Development, Technology Adoption, Nutrition Education could be some possible solution rising amidst food Security challenges in Attock. Through Empowerment of youth and initiative supporting, Attock can build resilience against food insecurity and promote sustainable development. Food security is a pressing global issue, amplified by climate change, which threatens agricultural productivity and livelihoods. In Attock, Pakistan, young people play a vital role in agriculture, but their perspectives on food security challenges under climate change remain underexplored. This study aims to investigate the experiences, perceptions, and coping strategies of youth in Attock regarding food security in the face of climate change. Through exploration of the intersection of youth, food security, and climate change, this research seeks to contribute to the development of targeted interventions and policies that support sustainable agriculture and food systems in the region.

Research gap

The paper aims to fill the research gap developed during previous publications through focusing on one of the remote areas of Pakistan and highlighting the local residents' perceptions without considering a macro approach. Also it provides recommendations to sort out the concern through their assumptions.

Objectives

1. Examine the awareness and perceptions of youth in Attock City regarding the impact of climate change on food security.
2. Explore the role of local cultural and socio-economic factors in shaping youth perspectives about food security challenges under climate change.

Review of Literature

The paper aimed at highlighting the perceptions and assumptions of youth from the district Attock regarding the rising concern of food security especially in the third world countries such as

Pakistan. For the further exploration, secondary data have been retrieved from various sites that summarize that the recent era of global warming and Climatic change affects food security through changing weather patterns, increased frequency of extreme events including droughts, flooding and disturbed rainfall patterns, contributing to the altered growth seasons for particular crops (IPCC, 2013). It has also been observed that gradual increase in global and regional temperatures coupled with the altering rainfall patterns highly effects the crop yields, quality, and distribution [4]. Unfortunately, the remote areas of Pakistan, climate change have vulnerable affects leading to increased food insecurity [5]. Having a macro approach at global level, it is observed that estimated 1.12 billion (48%)children globally do not afford a balanced diet, Save the Children , releasing new data on the eve of the Nutrition for Growth (N4G) summit in Paris (Save the Children).

In accordance to the Youth, the crucial stakeholders in addressing food security challenges, this paper highlights their perspectives. The perspectives and experiences of youth can help address the practical and implemented solutions [6,7]. Research highlights the importance of involving youth in agricultural development and food security initiatives Youth's knowledge, skills, and innovation can contribute to climate-resilient agriculture and food systems [8]. In Attock, Pakistan, climate change has significant impacts on agriculture and food security. Rising temperatures, changing precipitation patterns, and increased frequency of extreme events affect crop yields and farmers' livelihoods [9]. Youth in Attock face challenges in accessing education, employment, and resources, exacerbating their vulnerability to climate-related shocks [10]. Climate change is posing a serious threat to global food security and subsequently to the fundamental human rights that ensure access to healthy, sufficient, and safe food. Extreme weather events threatened the four pillars of food security which are availability, stability, access, and utilization. These changes drastically disrupt the agricultural system by decreasing the crop yield, livestock production and affecting the fisheries, and the food supply infrastructure. Consequently, the decrease in production leads to higher food prices, making it unaffordable and inaccessible to the vulnerable population.

Youth-led initiatives can address food security challenges under climate change. Examples include

1. Climate-smart agriculture practices [11]
2. Youth-led agricultural innovation and entrepreneurship [7]
3. Community-based adaptation and resilience-building initiatives [12]

Theoretical Framework

The theoretical framework for addressing the issues of climate change on food security can be understood by the following philosophical perspectives

Vulnerability Theory: emphasizes the susceptibility of individuals, communities, and systems to harm or loss due to climate-related stressors that can help understand how climate change affects food security, particularly for vulnerable populations.

Sustainable Livelihoods Framework: focuses on the capabilities, assets, and activities required for a sustainable livelihood that analyzes how climate change impacts food security and livelihoods, and identify strategies for building resilience.

Risk Society Theory: highlights the role of risk and uncertainty in shaping modern society that can help understand the risks and uncertainties associated with climate change and food security. Transform government functions and give full play to its role, and improve the food policy system. Food security is the.

Political Ecology: This theory examines the relationships between politics, economy, and environment that can be used to analyze the power dynamics and structural factors that influence food security and climate change.

Capability Approach: The capability approach emphasizes the importance of individual freedoms and capabilities in achieving well-being that can help understand how climate change affects food security and human well-being, and identify strategies for enhancing capabilities.

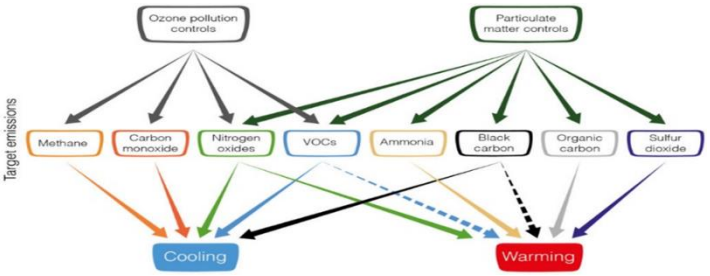

Figure 1: *IPCC 2013 Climate Change.*

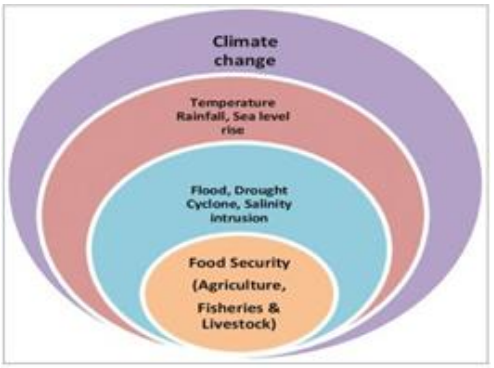

Figure 2: *Some gases are also discussed that contributes in these processes.*

Conceptual Framework (Figure 1)

Inter-governmental Panel on Climate Change, addresses some key aspects of increasing Climate change globally. Over years there has been a gradual increase in global Climate resulting in adverse effects. This flowchart describes the reasons why Earth heats up and what reasons are there to cool down the temperature. Some gases are also discussed that contributes in these processes (Figure 2).

Challenges of Climate change on Food Security (Figure 3)

Relationship among global climate change and food sufficiency. This figure is endorsed from
Rahman.

This figure is an excellent illustration of describing climate change at three levels i.e. Micro-Meso-macro.

- Micro level, the strategy of "storing grain with technology" should be implemented to improve quality and efficiency
- Meso-level, strategy of "storing grain in the property" and pay attention to ecological construction
- Macro level market leadership and policies provide institutional guarantee for food security.

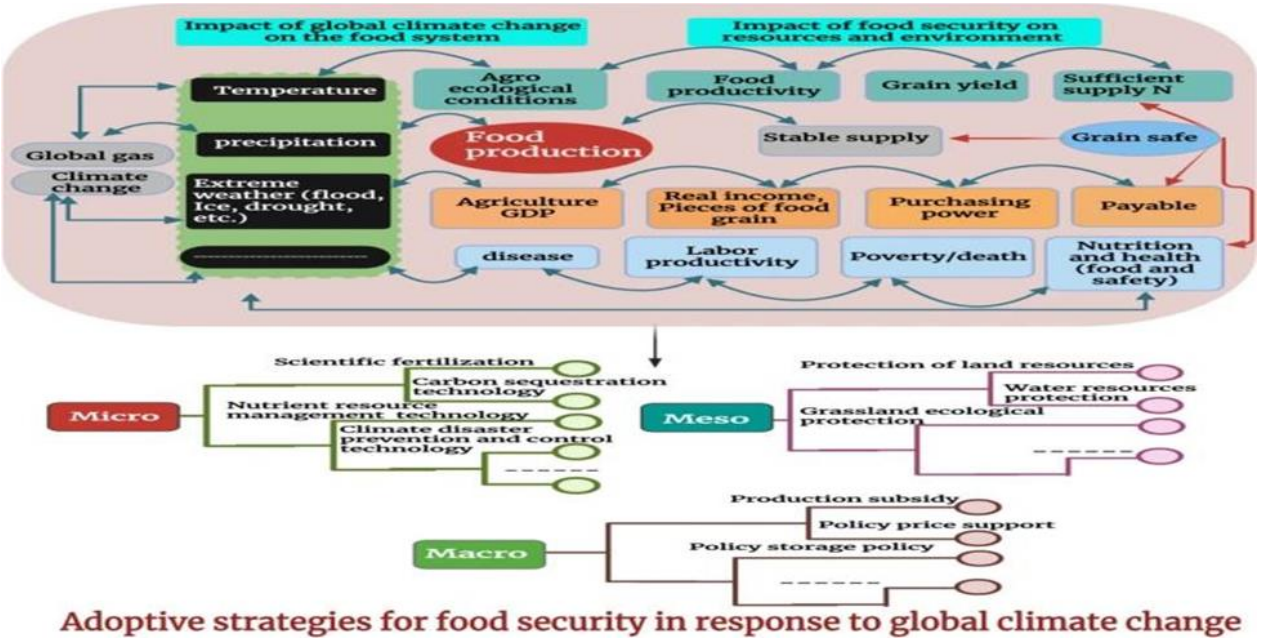

Figure 3: *Adoptive Strategies for food security in response to global climate change.*

Methods and Methodology

The aim of this study was to highlight impact of climate change on agricultural yield, food availability, and access to nutritious food from the young's minds perspective. For this purpose, a Descriptive methodology had been employed while keeping in-depth unstructured (open- ended) interviews and online surveys. This paper also explored the views of youth regarding food choices and nutritious eating. Interpretive approach was used to have a deep insight of the research topic under consideration. For the collection of Primary data, In-depth interviews from the 50 local residents of District Attock through questionnaires and a focus group discussion (FGD) including the nominal of the region were conducted with the youth (male and female)residing in District Attock. Whereas some already published research papers by the scholars had also been consulted. The locale of this study is Attock City located in Punjab, Pakistan. It's situated in the Pothohar Plateau near the Indus River. The city has a mix of urban and rural populations, with many engaged in agriculture and small scale industries. The economy is primarily based on agriculture, with crops like wheat, cotton, and sugarcane. Attock City has a rich history dating back to the ancient Gandhara civilization. Today, it's a significant cultural and economic hub in the region. Descriptive methodology will be used in this study. Descriptive survey as a method in this study, which will based on structured questionnaire to collect information from youth. This research will use quantitative methods to collect data. The main tool that will be used in this study are Questionnaires. The sample size will be 50 respondents. Random sampling will be used to ensure fairness. The sample will include equal numbers of males and females and cover different education levels and income groups [13-18].

Results

Based on the online surveys with 50 youth participants in Attock, the study highlights the impact of climate change on food security from the perspective of youth. The findings reveal that participants expressed concerns about changing weather patterns, crop failures, and shifts in growing seasons affecting food availability and access, highlighting their vulnerability to climate-related stressors. These experiences of food insecurity, arising from limited access to nutritious food and livelihood impacts, underscore the susceptibility of communities to external shocks, as posited by vulnerability theory. The theory suggests that vulnerability is a function of exposure, sensitivity, and adaptive capacity (1). In this context, youth's experiences demonstrate the need for adaptive strategies to mitigate climate-related risks. Youth proposed climate-resilient agriculture practices, diversified livelihoods, and community-based initiatives to further address the issue, showcasing their potential to enhance adaptive capacity. Key factors influencing food choices include family and peer influence, international food trends, and price fluctuations, which can exacerbate vulnerability. The study emphasizes the need for policy support, training, and resources to empower youth in promoting sustainable agriculture and healthy eating practices, thereby reducing vulnerability to food insecurity. These findings highlight the importance of considering youth perspectives in addressing food security challenges under climate change and provide insights for policymakers, practitioners, and stakeholders to support sustainable food systems in Attock.

Recommendations

1. Enhancement of seed quality and better fertilizers to ensure increased crop production
2. Reliance on new and advanced technology
3. Introducing modern ways of farming
4. Training of farmers
5. It is observed that manual storage and packaging reduces the product Up To 15%. Hence machines should be introduced for storage and packaging of crops.
6. Environment protection Agencies should work together to create a better sustainable environment helping reduce adverse effects of climatic change.
7. All institutes must come on the front and start working together in partnership to enhance food security at all micro and macro levels.

Conclusion

This paper focuses the potential approaches and opinions of youth that help cope up with the issue of food security in era of climate change. From the primary data collected through interviews and insights into the already published research papers, it is inferred that considering youth as the future leaders and decision-makers, their opinions and perspectives on food security must be prioritized to make sure a sustainable and equitable food system for the future generations. Also energy and innovation could be harnessed to transform Pakistan's food systems to ensure national food security. A consistent connecting mechanism amongst seed quality, fertilizer subsidies, grain prices, and the cost of grain production factors will surely help boost up a better grain production, leading to an increase in farmers' incomes, resulting in achieving the goal of ensuring food security. It is also considered that youth's perceptions of food security are modified by their experiences and it a need for policymakers to act upon accordingly. The paper also aimed at highlighting the significance of considering youth perspectives significant to address affectively the food security challenges under climate change. In Attock, Pakistan, it is viewed that youth face significant challenges regarding climate change, food insecurity, and limited access to resources. Youth-led initiatives and solutions can contribute to building resilient food systems and addressing food security challenges. This paper discussed youth perspectives on food security challenges under climate change in Attock that are helpful in provision of insights for effective policy and programmatic interventions [19-23].

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