

The Impact Of Climate Change On Food Security In Balochistan

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Abstract:

Climate change has a rigorous impact on humans and other animals on earth. There is a strong and consistent global trend regarding the effects of climate change on crop productivity, which may have implications for food availability. Balochistan is one of the most vulnerable provinces in Pakistan to climate change, which challenges its food security. The primary effects have been identified as: reduced agricultural production; changes in the suitability of land for crop production; changes in patterns of rainfall; an increase in temperature could lead to a longer growing season; increased irrigation; planting and harvesting changes; decreased arability; more pests; a risk to fisheries; and undernutrition. In Balochistan, there is no proper planning or attention given to climate change and adaptation practices. This research study investigates the negative impacts of climate change on food security in Balochistan and the ignorance of the government on this alarming issue. With the changing climate, there may be food security in Balochistan in the near future. To handle the situation and execute accepted and suitable policies and programs, it needs more successful, useful, and adaptable strategies. This study recommended that the government of Balochistan, together with all the stakeholders, use and adopt immediate actions and systematic solutions to reduce the negative impacts of climate change on food security in Balochistan.

Keywords: Balochistan, Climate Change and food security; lack of a Plan.

I. Introduction

Climate change is currently widely known because the main environmental issue facing the world and justly thus, given the significance of this development in terms of its calculated unfavorable consequences on human lives. Climate change has become one in all the leading risks to food security, with droughts, floods and hurricanes expected to lead to production and value volatility. The rising hazard from

changeable climate models and the ensuing unpredictability in costs raise the chance of farmers investment less in agricultural production and square measure also threatening food production levels.

The current reports on climate change and food security are to be intimidating the world (Baldos, & Hertel, 2014). According to Pingali, (2001) the climate changes and increasing the climatic unpredictability might demand the world to adapt alternatives techniques to reduce its risks.

Climate change directly and indirectly leaves negative impacts in human lives such as food security, mostly in the agricultural and livestock. According to the WFP (2009), agriculture is the key source of income and nearly 80 % of the world's live in rural areas. However, the livestock field also contributes a vital role to climate change, even as additionally being a prime reason of soil and water pollution.

The developing countries, especially South Asian countries are more at risk to the impacts of climate change, the reasons are climatic conditions, high temperature, dependent on agriculture, geographical location and the weakest point is capacity to the change in climate (Ahmad & Farooq, 2010). Additionally, the country which are highly affected by climate change because of the three key reasons: (1). nearly above 70 percent of the population depends on rain fed agriculture, (2) low GDP, and (3) diverse geographical locations (WFP, 2014). Thus, a large part of the population is affected by persistent and temporary food insecurity which is cause food shortage and scarcity. The key alarming challenge that the world is facing in the current times is to secure food security due the impact of climate change. Commonly, the shortage of food directly and indirectly related to agriculture, soil, water management and etc.

Pakistan is an agricultural country. The majority of population depends on agriculture. Pakistan agriculture sector is very much vulnerable due to the weather and climate. Therefore, the weather and climate conditions have a direct and indirect relation to the food security. The agriculture sector in Pakistan is the most sensitive zone and food insecurity and hunger increases the element of defenselessness of the increasing population. A large number of populations of Pakistan depend on small agriculture for their livelihoods.

Pakistan is the most affected country in world by the impacts of climate change. Repeated natural

disasters, for example floods in 2010 and 2012 and extended famine in Balochistan and Sindh multiplied poverty for the most vulnerable. The climate change creating challenges for livelihoods and impacts the whole economy, most importantly agriculture field. According to the Pakistan statistic (2017) nearly 67 percent labour force and 43 percent of workforce is linked with agriculture. The climatic shocks mostly affected the agriculture and increasing food shortage among affected areas and communities. This makes food security a serious concern for Pakistan.

2.Problem statement of the study

Climate change is becoming a common phenomenon in the world. The issue to climate change and its impacts on food security are rapidly increasing throughout the world including Balochistan. Balochistan is one of the most vulnerable province or regions to climate change. The climate change has a number of impacts on crops, water which finally affects food security. According to Sarfaraz and Siraj (2019), Balochistan is the most vulnerable province in Pakistan in context of water and food shortage because it is located in a very poor fertile area. Balochistan main source of water is seasonal rainfall, but due to the climate change, the last two decades showed that a downward of water table (Shah.et al,2002).

Therefore, the situation is becoming worst and due to this Balochistan food security is deteriorating day by day. According to the Balochistan relief commissioner (2000), the drought spells an assessed (29 percent), a number of people affected and the livestock sector was badly affected.

Food security is becoming worse in Balochistan, where in the last three decades availability of food was heavily affected. The primary effects have been identified as: reduced agricultural

production; changes in the suitability of land for crop production; changes in patterns of rainfall; an increase in temperature could lead to a longer growing season; increased irrigation; planting and harvesting changes; decreased arability; more pests; a risk to fisheries; and undernutrition. In Balochistan, there is no proper planning or attention given to climate change and adaptation practices. This research study investigates the negative impacts of climate change on food security in Balochistan and the ignorance of the government on this alarming issue. With the changing climate, there may be food security in Balochistan in the near future. To handle the situation and execute accepted and suitable policies and programs, it needs more successful, useful, and adaptable strategies. Therefore, this research study is an attempt to find out the major impacts of climate change on food security and interface between climate change and food security in Balochistan.

Evidence suggests that climate change has caused food crises in some regions of the world and has also triggered security difficulties in some environments as a result of the consequent friction caused by the struggle for control of limited agricultural resources. According to some academics, Balochistan is a site where the crisis complexes related with climate change are playing out with no meaningful steps in place to minimize the effects. According to the Food and Agricultural Organization (FAO) 2019 report, the key causes of global food insecurity include climate change, national economies, and conflict. With this context in mind, the purpose of this

study is to assess the extent to which climate change has impacted food security in Balochistan.

3.Objectives of the study

- To identify the food security situation in Balochistan;
- To identify the effects of climate change of food security in Balochistan
- To provide recommendations to policy makers to improve adaptive capacity and reduce climate-related food insecurity among the most vulnerable communities in Balochistan.

4. Methodology

The data were collected through primary and secondary method. The secondary data were collected from various sources such as books, reports, government websites and etc. Researcher collected the data on the particular parameters, such as temperature levels, trends of livelihood and etc, which were an important source of knowledge for data analysis. An online survey was conducted to investigate the impacts of climate change on food security in Balochistan. A sample of 100 students from four districts namely, Turbat, Gwadar, Quetta and Zhob were selected by using a convenient sampling technique. This research provides details on the many diverse aspects in which climate change impacts food shortage in Balochistan. The table. No 1 shown the demographic details of the respondents.

Table.No.1

Demographic details of the respondents	Categories	Numbers	Percentages
Gender	Male	50	50 %
	Female	50	50 %
Districts	Quetta	25	25%
	Turbat	25	25%

	Gwadar	25	25%
	Zhob	25	25%
Age	25-30	20	20%
	31-35	30	30%
	36-40	30	30%
	Above 40	20	20%

4.1. Data collection & analysis

The data were collected at the second week of November 2022. The questionnaire was sent via WhatsApp and email to respondents. The collected data were analyzed by using frequency and percentages for close-ended questions and open-ended ones. The open-ended questions were analyzed using content analysis.

5. Literature review

5.1. Climate Change

The research facts show that the sea points are rising, glaciers are diminishing, rainfall are rapidly changing and the world is getting warm day by day. According to the report of international panel on Climate Change (2001), the present rate of greenhouse gas discharges is probable to cause normal temperatures to rise by 0.2°C per decade, reaching by 2050 the threshold of 2°C above pre-industrial levels. The present facts recommend even extra fast change, which will very much, and in some cases permanently, affect not just human, but also other species (Patz, J. et al.).

Climate change is considered a serious treat and risk and which could undo hundred years of development struggle. It is a challenge for the world which gives negative impacts to the earth and its impacts can be felt by deprived and poor people. They have no capacity to manage their lives because their lives are dependence on natural resources (Mccarthy, et al, 2001).

Because of climate change the human, animal and crops will be affected and this affectation leads risks for food shortage and human health (Kumar and Parikh,2001). It results might be negative and positive, resulting from the complex interactions of temperature and precipitation (UNEP, 2007)

Oceanic processes (such as oceanic circulation), biotic processes, variations in solar energy received by Earth, plate tectonics and volcanic eruptions, and human-induced alteration of the natural environment all contribute to climate change. These later effects are currently responsible for global warming. (Causing ice to melt in the Arctic and Antarctic areas) and "climate change" is frequently and primarily driven by human-induced factors.

The threat that climate change poses to agricultural productivity is one of the primary reasons why it has remained a global concern. (Rashid Ali, Dr. Siraj Bashir & Kinza Farooq,2022). Empirical investigations have showed that higher and variable temperatures and rainfall patterns observed in Balochistan over the last decade are gradually disrupting the traditional agricultural output pattern in the province. The recurrence of adverse weather disasters such as drought and flooding has thrown the agricultural productive system into disarray. (Ghulam Murtaza, Dr. Siraj Bashir and Abdul Khaliq, 2021) Some academics have focused on the relationship between climate change. and food security, given the importance of food sufficiency in human life.

5.1. Impact of climate change global

Climate change is increasing day by day and intensity of natural vulnerability in the world. From famines to floods, natural disaster, crops, livestock and food supplies. The climate change reduces water tables and make it difficult for the overall population to access markets and damage the efforts to improve agricultural productivity. Climate change extremely effecting people lives, who are before now at risk of poverty and hunger. Without proper planning and management natural disasters will affect people and due to this human will face extreme food and nutrition crisis.

Due the change in climate the unabated increase in greenhouse gases and will effects on resources, water ,floods and famines. It is known one of the world challenge , however its negative impacts are extremely spreading in the developing nations such as Pakistan, Indian, due to this the vulnerabilities to alleviate the consequences of climate change. The most developing countries like Pakistan and Afghanistan are agriculture-based economies, their most sectors particularly, agriculture is affected the most (Spash,2007) . Consequently, the key impact of climate change is on agriculture and food.

Climate change basically impacts food security of people. The climate change can impacts on food supply, food quality, use and security and livelihoods in general (Nayak,2017). The poor communities will be affected more and due to this the families cannot be able to get healthy and nutritious diets. The high temperatures affects the shortage of crops that leads to loss in food protection and water shortage (Panda,2009).

5.2. Impact of climate change in Pakistan

Climate exchange has been making itself felt in Pakistan over the past 20 years, contemplated in

a steady upward push in temperatures and the form of rainfall. As in distinctive additives of Asia, weather patterns are an growing wide variety erratic. Less rain falls along Pakistan`s coasts and arid plains, prompting extended intervals of drought. Year on year, the monsoon season is delayed in Japanese Pakistan, with severe implications for agriculture. In 2012, document monsoon rains unleashed the worst wave of flooding to hit the use of America in residing memory, affecting 22 million people and causing foremost structural and financial damage. The unprecedented frequency and scale of weather-related screw ups are jeopardizing food and nutrient security. (Gautam & Sharma,2012).

The weather is turning into hotter and warmer each year, and therefore the average temperature of the town is increasing apace. The condition of food security in West Pakistan is extremely poor from the previous few decades. West Pakistan is graded as eleventh country of the planet that is facing the condition of food security. within the case of West Pakistan, third of the population lives below the personal income. folks of West Pakistan don't seem to be capable to fulfill up their basic needs. Rural areas have a comparative high impoverishment rate (35 percent) as compared to urban areas. One third of the \youngsters below five years elderly ar scraggy a nd conjointly starving (Mahmood, Sheikh, Mahmood, & Malik,2000)

Pakistan may face food shortages because of water scarceness. 48 % of the population of Asian country is food insecure, as access to food is uneven and deficiency disease is widespread. additionally, food production depends greatly on irrigation, as well as the employment of considerable volumes of water from already stressed aquifers. A continuation of

current trends leads to nearly a doubling of the groundwater use. there's uncertainty within the magnitude of temperature change impacts, however temperature change could additional exacerbate matters It is calculable that, by 2025, the deficit of water needs will be 29%, which can cause food shortage of 60 million tons. Recent estimates counsel that temperature change and siltation of main reservoirs can cut back the surface water storage capability by half-hour until 2025. (Mahmood , Ahmad, & Bakhsh,2012).

5.5. Food security and Pakistan

There are many studies analyzing food security issues at the national level in Pakistan. Mahmood & Shaikh (1991) investigated factors that contributed to poor food security, low literacy rates, large households, and low purchasing power. Another study by Ahmed & Siddique (1995) analyzed Pakistan's food security situation and found that steady population growth, various forms of income distribution, and greater urbanization are impacting food needs. I found. On the other hand, lack of machinery and rising irrigation costs are also reasons for low agricultural production. Schichting and Ahmadi-Esfahani (2004) ,we used household-level data to investigate the relationship between food security and income in northern Pakistan. Their results show that nutritional demands are highly dependent on income levels. People cannot buy groceries because of their low income.

Pakistan`s financial system is primarily based totally on agriculture. At present agriculture of Pakistan is dealing with very severe issues like irrigation water scarcity and much less rainfall because of weather extrude . Certain vegetation are weather-touchy in Pakistan consisting of rice, vegetables, cereals, spices, and different grains. Rising temperature and converting rainfall effects with inside the shape of scarcity of water, which

in addition ends in the issues of meals safety because of low productiveness in particular with inside the cropped meals sector. Food lack of confidence is a critical and extra dilemma to the social and monetary improvement of the united states of America and desires essential clinical inquiry, and the concept of viewing this trouble in phrases of weather extrude includes with it a multipronged method to cope with the difficulty seriously. (Ahmed, Henna and Chaudhry,2008).

5.6. Climate change and food security in Balochistan

Pakistan had been struggling through sugar crises even in advance than the floods damaged or destroyed round 80,000 hectares of sugar cane crop valued at \$600 million. This August, it had already imported over 500,000 lots of sugar, and will now have to shop for masses more. The country`s annual name for white sugar is 4.2 million lots. Before the onset of the floods, the following crop end up anticipated to offer 3. 8 million lots of white sugar. Pakistan`s food ministry expects the output of diffused sugar to fall through manner of method of at the least 1/2 of a million lots this season after the floods destroyed a large amount of the crop. Sugar is the primary item of food consumption, in Pakistan, at the side of through manner of method of the poor. This elegance includes small farmers, nine-town masses, and internally-displaced people. To this in the meanwhile are introduced the over 20 million.(Sharif, Farooq, and Bashir, 2000).

The province has specific physiographic, the bulk of which capabilities hard terrain with a aggregate of mountainous tracts and plains which might be frequently divided into basins of various heights. Due to those capabilities, the ecology of the province has distinct - and numerous specific - ecosystems together with mountain ranges, deserts, and dry-lands, inland water bodies, forests, woodlands, grasslands and savannas, and the coastline with related ecosystems.

The incredible surges in Balochistan, that have achieved round 500 and dislodged nearly 05 million, have likewise antagonistically affected the meals deliver chains. About 3 million sections of land of evolved cropland has been misplaced to surges even as the lack of domesticated

animals may want to likewise be in millions (POSDB, 2005).

6.Results

6.1.What is the impact of climate change on food security in Balochistan

Table.# 2 Impact of climate change on food security

Impacts	Frequency	Percentage
Positive	10	10%
Negative	90	90%
Total	100	100%

Data analysis and interpretation

A total of 90 (90%) respondents said that the climate has negative impact on food security in Balochistan ,and 10 (10%) said that there will not be any impact on food security. The findings of the study showed that the impact of climate change is a great treat for food security

in Balochistan. Therefore, all stakeholders should take immediate actions to decrease the impact of climate change on food security in Balochistan.

6.2. What are major causes of impact of climate change on food security in Balochistan

Table.# 3 causes of impact of climate change on food security

Causes	Frequency	Percentage
Lack of planning	51	51%
Lack of people interest	16	16%
Low rain	14	14%
The raise of temperature	19	19%
Total	100	100%

Data analysis and interpretation

No. 3 focused on the causes of climate change on food security in Balochistan. Results have shown that nearly, 51% respondents said that there is no proper planning and due to this the impact of climate change increases to food security, nearly 19% respondents mentioned that due to the raise of high temperature the impact of climate change affects on food security in Balochistan, hence, 16% respondents told that people don't take

interest and 14% said that due to the low rain in Balochistan the food security problem is increasing day by day. According to the UNO (2018), the impact of climate change on food security is very high, if government of Pakistan doesn't take immediate actions the situation will be much critical.

6.3. What major actions should be taken to overcome the impact of climate change on food security in Balochistan

Table.# 4 Recommendations to solve the impact of climate change on food security

Recommendations	Frequency	Percentage
Proper planning	36	36%
Plant more trees	14	14%
Reduce water wastage	20	20%
New programs to defect climate change	30	30%
Total	100	100%

Data analysis and interpretation

The table no.4 is about the recommendations to solve the impact of climate change on food security in Balochistan. The majority 36% of respondents suggested that government of Balochistan and non-government organizations should make better planning to reduce the impact of climate change on food security. 30% said that new programs should be implemented to defect the negative impact of climate change on food security, hence, 20% said that we should use proper techniques to control water wastage while 14% said that we should plant more trees to solve our earth.

Discussion

The growing value of climate alarms throughout Balochistan financial system has affected food productiveness in several ways- each immediately and circuitously. Important changes with inside the manufacturing cycle and the rural eco-machine are the not unusual place through influences of such weather variations. On the other hand, the impact at the require of crops, impacting the monetary increase may be appeared as an oblique impact. Agricultural charges have a prime oblique impact because of climatic shocks, now no longer handiest in Balochistan however globally. In line with those outcrops and rising buckle in climatic constancy, there was up stress on the rural areas of Pakistan, specifically in Balochistan. With the bulk of the

Balochistan populace dwelling on the poverty line, such the upward thrust in agricultural costs because of climatic shocks poses a grave undertaking for the Balochistan Province to make certain meals safety for its heaps.

Agriculture paperwork a prime supply of livelihood for round 70 percentage of the agricultural populace in Balochistan. Small and marginal farmers own about eighty three percentage of the landholdings in rural areas. With developing doubt in food production because of modifications in the climatic conditions, the bad sections of the society end up the maximum prone in the Balochistan economy. A examine achieved through the authorities of Balochistan, (2018) predicts that Balochistan could be laid low with extreme droughts in the years to come, main to acute food and water shortages

In addition, industrialization and the rising trust of the producing region on agriculture have ended in a extreme shift from food crop manufacturing in the direction of coins crop manufacturing throughout the Balochistan economy. This constantly growing strain of the economic region on agriculture for coins plants with the immediate upward push in terrible externalities from industrialization is any other primary motive force of food lack of confidence in the rural in addition to city areas. According to USDA and FAO, Balochistan will be afflicted by a food deficiency in 2026.

All of the direct and indirect effects of climate shocks defined above, combined with the results of regression analysis, underscore the reverse relationship between India's climate change and food productivity. Analysis of this study shows that there is a negative correlation between maximum temperature and the overall agricultural productivity of the culture under consideration. If you increase the maximum temperature by 1%, the total productivity will be 0.382 ° C. Fluctuations in rainfall and rising temperatures can reduce soil transpiration and productivity.

In addition, due to severe and unsuitable weather conditions Domestic conditions are more likely to infertile soil leading to reduction quantity and quality of the harvest. Research shows that the increase in temperature is expected to increase the risk of soil degradation, rendering the land unsuitable for agriculture manufacture. All of these factors as well as the inverse relationships identified by the study have Greater implications for the issue of "FOOD SAFETY" in Balochistan.

7. Conclusion

Studies show that climate change is a global trend that can be observed in almost every area of Pakistan, especially in Balochistan province, where the majority of individuals and households are entirely on the environment and other natural resources due to their existence and prosperity. Depends on. This has a direct and significant impact on their food security. Climate change is certainly a major source of concern, and therefore there is an urgent need to take drastic action to offset its harmful effects. This is very important because the greater the impact of climate change on the survival potential of a home, the more effort will be made to rely on certain accessible natural resources such as trees. Of course, such a situation leads to greater climate uncertainty and turmoil, which only gets worse. Therefore, it is important to educate people to understand the

origins, signs, and possible alternatives to climate change problems. Climate change needs to be discussed more seriously. If we can find a way to solve this problem, we need to do it in more forums and public debates. More importantly, those who have such discussions need to know the facts and not mislead people.

8. Recommendations

- Climate change has been a serious problem these days. To avoid that danger, it Communicate and raise awareness among people. People are not awarded about the importance to climate change. By using a media strategy inform the public that the "do nothing" option is risky. subject Target groups for this purpose are civilians, farmers, fishermen, Vulnerable communities, youth, people with disabilities, school children, decision makers, opinion leaders, researchers, officials, businesses.
- Local awareness needs to be raised about the changes caused by climate Also changed at the base. With a participatory decision-making approach other improvements in the municipality will facilitate the use of knowledge and tools to manage the social impacts of climate change and other developments overall requirements.
- Improve the ability of agricultural research institutes to recognize Plant growth and the impact of appropriate climate change adaptation measures.
- Good governance is at the heart of the problem, and all possible solutions are feasible only if the government designs and forms feasible and competent decisions. Adaptation and alleviation measures should be prioritized and implemented by letter and courage.

- More dams should be constructed to address the water problems in Balochistan. It is essential to improve the life of people of Balochistan.
- Balochistan should review its present policies at all levels in order to get the better and feasible food policy. The well-organized use of natural resources specially water and land is needed to improve the manufacture possible of key food supplies.
- Food security basically depends on four key factors: food availability, food availability, food use and stability, all of which are directly affected by climate change. As a result, strategies, policies and measures to overcome the impact of climate change on food security must be coordinated based on these aspects.

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