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The Effects of Climate Change on Rural Areas of Kandahar Province, Afghanistan

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ABSTRACT

Climate change is a global worst phenomenon that causes a long-term change in the weather, which results in drought, increased temperature, lack of water and other adverse events, affects food security and has a negative impact on human life. A field study was conducted and the data was collected through questionnaires, 52 respondents were chosen based on Krejcie and Morgan's 1970 table once the study population reached 60 respondents through an accurate count and analyzed by (SPSS26). In addition to the analytical techniques' frequency, average and percentage, the Friedman test was also performed for accurate calculation of data analysis. It was found that climate change had negatively affected agricultural products, rural opportunities, as well as water resources. It is stated that the farmers are facing a series of challenges such as adapting to the climate change and have not been taken an appropriate practical measure to adapt to the climate change in the study area. The research results also demonstrated that climate change has affects the lives of the villagers, reduces their income, as well as effected rural areas.

Keywords: Adaptation, Climate Change, Kandahar, Livelihood, Rural Areas

INTRODUCTION

Climate change is related to long-term changes in weather conditions that are characterized by changes in resources or changes in variability (Pokhrel *et al., 2021*). On the other hand, climate variability is related to natural climate variations (FAO, 2012). Intergovernmental agencies related to climate change refer the word climate change to any changes that occur to the climate over time, whether the origin of the change is natural or as a result of human activities (Sharma, & Ravindranath, 2019). Climate change is advancing in most areas of the world, in ways that feature increasing storm intensities, shifting rainfall patterns, melting glaciers, rising sea levels, and other manifold alterations (Parry, 2007). The precise boundaries of climate change vulnerable groups are indeterminate; a common catalogue includes: rural smallholder farmers, pastures that damaged by pests and droughts and even prone to collapse, wage employees, urban poor, refugees, destitute groups. In addition to livelihood groups, individuals may be particularly vulnerable, including widowed, divorced or separated women, malnourished children, the infirm and handicapped, and the elderly (Bohle *et al, 1994*). Climate change has an impact on people's lives, the quality of life and well-being (Alfaro & Cortés, 2020), however rural households' livelihoods are resilient to climate change (Yari Hesar & Amani Kalarijani, 2023). Countries with climates characterized by a large number of degree-months enjoy significantly lower levels of life satisfaction (Maddison & Rehdanz, 2011). Climate changes is most important impact on migration, water quantity, future expectancy, social conflicts and job insecurity (Kavianpoor *et al., 2019*). Climate change should be incorporated into the planning process at a local level and associated local institutions in order to improve livelihood formation processes of households (Nsubuga *et al., 2021*).

People in Kandahar province are using traditional practices in agriculture and social life, have not enough knowledge about climate change, and to some extent willing to have suitable weather for their social life and agriculture. The experiences of the last decade showed that climate change affected the study area for instance the temperature increased, the precipitation is limited, the water table gone very deeper and so forth. The people of the research area have not access to clean water and many more facilities so this study was compile a list of effects on people life in the 8th district of Kandahar province. Therefore, this is the first research in the study area that discussing the topic under climate change and the objective the study is as to determine the effects of climate change on rural areas of Kandahar province.

MATERIALS AND METHODS

Study Area: This research was conducted in the rural areas of 8th district of Kandahar province, Afghanistan on 2023, which is survey and field research. For the data collection the main villages in 8th district of Kandahar province (Kokran, Shami and Bagh-e Pul) were selected.

Sample Collection: In this research, the data collected through questionnaire, questionnaire had several parts, which the most important were Livelihood and income, Effect of climate change on agriculture, Water resources, and Community resilience and adaptation. In each part of the questionnaire there were many questions that were asked from the respondents. All the respondents of the current study were the original residents the villages in the study area, after an accurate count of the population the study population reached to 60 respondents so according to Krejcie and Morgan 1970 table 52 respondent was selected for the study, and then all the respondents are contacted through face-to-face interview and mobile phone.

Statistical Analysis: The research data was analyzed using (SPSS26) software, in the very first step, the Cronbach alpha test was performed on the data, which obtained the desired coefficient. Then frequency, average, percentage and other preliminary analysis, Friedman's test was also performed for accurate calculation.

RESULTS

It was found that most of the respondents were men, married and their average age was around (45) years, and the farming was profession of all villagers, their level of education was not satisfactory.

Effect of climate change on Agriculture

Climate change that caused drought, increased in temperature, wind and other events are greatly affects agriculture stated in Table 1.

Table 1. Effect of climate change on Agriculture

Items	Arithmetic Mean	Std. Deviation	Rank average	Ranking
How has climate change affected crop yields?	4.1154	0.98327	2.68	1
Have farmers in your region faced challenges in adapting to changing climate conditions?	3.5000	1.16316	2.26	2
Have you observed any changes in agriculture due to climate change?	1.0000	0.00000	1.06	3

The results show in the above table that climate change has a greater impact on agriculture, which affects agricultural products in the first step, and then in the second step, farmers face many challenges and problems to adopt climate change. The results also show in the table above that all the farmers believe that there is a change in agricultural yields due to climate change in the research area.

Livelihood and Income: The results of Table 2 show the life of the rural people and their incomes are also greatly affected by climate change.

Table 2. Effects of climate change on livelihood and Income

Items	Arithmetic Mean	Std. Deviation	Rank average	Ranking
Has climate change affected your livelihood?	3.8654	1.01032	1.66	1
Have you experienced any changes in employment opportunities due to climate change?	3.3462	1.21888	1.34	2

It was found that the climate change has affected the lives of the villagers' that affected their income, they could not easily get their basic necessities of life, and it has also exaggerated their job opportunities.

Water resources

Table 3. the Impact of climate change on water resources

Items	Arithmetic Mean	Std. Deviation	Rank average	Ranking
Have you observed changes in water availability in your area?	4.0769	1.20206	1.57	1
Have droughts affected water availability for agricultural use?	4.0192	.93914	1.43	2

It was found that the climate change has greatly affected the water reserves of the villagers and affected their agriculture and cultivation, and also the availability of sufficient water for the agriculture of the villagers has been affected by the climate change.

Community Resilience and Adaptation

Table 4. The community resilience and adaptation against climate change

Items	Arithmetic Mean	Std. Deviation	Rank average	Ranking
How well-prepared is your community to handle the impacts of climate change?	1.9423	1.05558	2.05	1
Are there any ongoing programs to build resilience in your community?	1.9231	1.06359	2.05	2
Have any adaptation measures been implemented in your community to mitigate the effects of climate change?	1.7308	.79497	1.90	3

In the analysis of the data in the above Table 4, the results show that the effects of climate change have not been controlled by the villagers in this area. In order to adopt the climate change, there no facility and have not held any practical approach yet. In the third step, the necessary measures against the challenges of climate change have not been taken in this area yet in order to reduce the effects of climate change on rural community.

DISCUSSION

Climate change has a negative impact on agriculture and agricultural farms, reduces agricultural yields and production, farmers are facing series of problems in adaptation with climate change and cannot easily adapt the climate change it is similar to results of -Piao *et al* (*2019*) in this case. Climate change is affecting the lives of rural people, reducing rural job opportunities.

There is a shortage of water in rural areas, the water table is decreasing day by day as well as there is lack of water for agriculture use, so the farmers and villagers can meet their needs through agriculture and livestock, the researcher Huang *et al.*, 2016 also found the same results.

CONCLUSION

The results of the research showed that climate change has a negative impact on agriculture, that most rural people are engaged in agriculture and livestock farming that has a negative impact on their income and livelihood. The analysis of research data showed that climate change reduces rural job opportunities. In addition, the amount of water in rural areas decreases, the water level under the ground decreases, which makes it difficult to live in these areas. The results showed that the farmers are facing challenges in adopting to the climate change. However, the necessary practical measures have not been taken against the adverse effects of the climate change in the rural area.

Rural development policy makers have to place water dams and reservoirs, appropriate irrigation systems for agriculture in their policies to adapt to climate change, and the results of this research suggest the need for further researches.

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