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## The Gendered Impacts of Climate Change: Assessing Women's Roles in Adaptation and Community Resilience in Kilosa District, Tanzania

**Godlove Deodatus Rwekaza**

Department of Community Development: Tengeru Institute of Community Development, P.O Box 1006 Arusha, Tanzania

\* Corresponding Author: **Godlove Deodatus Rwekaza**

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### Abstract

In Tanzania climate change impact is manifested through the increase of disasters including droughts, flooding, and irregular distribution of rainfall patterns across the country, women have reported mainly being affected by climate change impact due to a combination of social, economic, and cultural factors that give them domestic responsibility. Specifically, the study assessed women's adaptation strategies to climate change and activities formulated by women's community groups to enhance community resilience to climate change that carried out in the Kilosa district. The study was carried out in Mbwade, Mabwegere, Ngaiti, and Twatwatwa villages of Kilosa district where by 104 respondents were selected for this study using simple random sampling. Data were collected using questionnaires and analyzed using SPSS version 28. The findings of the study revealed that in adapting to climate change women engaged in sustainable farming practices including home garden establishment and agro forest farming about 52% of respondents and also results found that through women community groups' women shared skills and knowledge regarding climate change adaptation. Furthermore, the study revealed that the application of smart cooking, solar energy, improved home water storage facilities and planting climate-smart resilient plants significantly influence adaptation to climate change at a 5% level of significance. Lastly, the study recommends that the National climate change mitigation strategy should incorporate gender-specific considerations to address the unique vulnerabilities faced by women by integrating the identified women's roles in climate adaptation.

**Keywords:** Women, Climate change and Adaptation

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### 1. Introduction

Climate change is widely recognized as a critical issue affecting many aspects of life on Earth, including ecosystems, human health, and socioeconomic stability (Abbass *et al.*, 2022) <sup>[1]</sup>. It also significantly impacts gender, deepening existing inequalities and creating unique challenges for individuals across the gender spectrum (Ampaire *et al.*, 2020) <sup>[2]</sup>. Women and girls are particularly vulnerable to climate shocks, which often amplify social inequalities (Andrijevic *et al.*, 2020) <sup>[3]</sup>. For the fact that many women are employed in climate-sensitive sectors, such as agriculture, fisheries, and forestry, typically in low-paid, insecure, and low-status roles the physical effects of climate change such as droughts, desertification, ocean acidification, and flooding reduce the income potential of these sectors compromising women's livelihoods and community food security. Moreover, in the aftermath of climate-related disasters, girls withdrawn from school and spend less time on their studies, either as a coping strategy or to take on household responsibilities such as water and fuel collection which become more time-intensive and fail to concentrate from schools as men do.

In Tanzania, extreme climate change-related events have been observed to increase in frequency and severity. More than 70% of climate change-related events in Tanzania are hydro-meteorological, resulting in crop failures, livestock losses, and infrastructure damage, all of which hinder women's income.

Among other Tanzania districts, currently, Kilosa district faces extreme climate change impacts (Kitasho *et al.*, 2020)<sup>[9]</sup>. The district is apparent in various climate variability including disruptions in local agriculture due to heavy rainfall which hinders women's livelihoods (Mang'anya, 2018)<sup>[11]</sup>. Yet, factors like land use changes, irregular establishment of settlements and deforestations catalyze climate change impacts in the Kilosa district (Joseph, 2022)<sup>[8]</sup>. As climate change leads to unpredicted rainfall patterns and increased droughts in Kilosa, women who are primarily responsible for food production and household sustenance face heightened workloads (Mang'anya, 2018)<sup>[11]</sup>. A study by (Edward, 2020)<sup>[5]</sup> indicates that despite diminishing agricultural yield by women due to climate variability, this shift places an additional burden on them as they must engage in multiple adaptation strategies to ensure food security for their households.

A study by Kitasho *et al.*, (2020)<sup>[9]</sup> revealed that in Kilosa, due to climate change the communities suffer from resources scarcity and the study recommends to find modality that can adapt for climate changes. And this give foundation for conduction of this study, therefore this study aim to analyzing women's roles in climate adaptation and community resilience so as to add knowledge in existing gap.

## 2. Methodology

The study was conducted in Kilosa district in 2024. Kilosa is among seven administrative districts of the Morogoro region. The district represents a unique area vulnerable to climate change impacts, with the major land use systems found in the country co-existing in the area (Liwenga, 2020)<sup>[10]</sup>. The district is categorized into three physiogeographic units namely mountains and upland, plateaus and flood plain (Ntumva, 2023)<sup>[13]</sup>. The mountains and upland which lie at an altitude of 2200 m consist of the Eastern Arc Mountains namely Ukaguru, Rubeho and Vidunda (Saruni, 2019)<sup>[15]</sup>. The plateaus lie at about 1100 m.a.s.l and are moderately fertile and have well-drained sandy soils which support intensive crop production and livestock keeping despite their being highly erodible (Kitasho *et al.*, 2020)<sup>[9]</sup>.

Four wards of Kilosa district were selected purposively for the study, where by the target population for the study from selected wards were women who are directly involved in farming, livestock rearing, and other natural-resource-dependent activities, the selection of the population for the study is due to facts that climate change often has immediate impacts on agriculture and resource availability and women in these roles are well-positioned to provide insights on

adaptation practices (Kitasho *et al.*, 2020)<sup>[9]</sup>. Next, one village from each ward was selected randomly giving a total of four villages (Mbwade, Mabwegere, Ngaiti, and Twatwatwa) used for sampling households for the study. A total of 104 households were randomly selected whereby 26 respondents "women" from each village were interviewed. It's argued that a sample size of between 80 and 120 respondents is suitable for rigorous statistical analysis.

Data were collected using questionnaires, and field observations. A household questionnaire was administered to women in households. Quantitative data were analyzed using the Statistical Package for the Social Sciences (SPSS). Descriptive statistics, including frequencies, means, and percentages, were computed. Additionally, binary logistic regression analysis was conducted to examine the relationship between the identified dependent and independent variables.

## 3. Results and Discussion

### 3.1. Women's Adaptation Strategies to Climate Change

Findings from the study revealed that, in adapting to climate change women in the Kilosa district, developing adaptive strategies were by findings shows about 52% of women engaged in sustainable farming practices including the home garden establishment and agro forest, and about 31% of women adapting to climate change by engaging in small scale businesses such as honey business as a result of beekeeping. This implies that women in Kilosa district rather than depend on the agricultural business which has directly affected by climate changes they decide diversity into others sources of their income for their survival, these results resemble with Seid (2021)<sup>[16]</sup> which revealed that Women often diversify their income sources to mitigate the risks associated with climate change by engaging in small-scale businesses such as trading activities to provide alternative income during adverse climatic conditions. Also, these findings are supported by the study of (Joseph, 2022)<sup>[8]</sup> which revealed that Mostly of communities women in families are primary caretakers of food and due to climate change effects they always choose alternative environmentally friendly activities to continue providing for their families. Furthermore, the study finds that about 17% of women were adapted a climate change reducing the number of livestock and adopting zero grazing. The results resemble to Mensah, *et al* (2021)<sup>[12]</sup> which revealed that Zero grazing allows for better management of livestock during periods of drought or forage scarcity, making it a viable adaptation strategy in regions affected by climate change.

**Table 1:** Responses of Respondents about Women's Adaptation Strategies to Climate Change

Characteristics	Category	Frequency	Percent
Does climate change impact your production activities	Yes	81	78
	No	23	22
What adaptive practices do you employ to adapt to climate changes	Sustainable farming practices including home gardens and agro-forestry	54	52
	Engaging in alternative Small-scale businesses such as honey production and business	32	31
	Reducing livestock numbers and adopting zero grazing	18	17

### 3.2. Contributions of women's community groups to climate change resilience.

Women's community groups act as a platform where women can meet discuss their issues and share different ideas concerning their development (Rao *et al.*, 2019)<sup>[14]</sup>. The

findings of the study show Majority of women agree that women's community groups help members in sharing ideas and knowledge concerning climate change about 85% of respondents, and in answering how women's groups catalyze in climate adaptation about 50% of respondents show that in

women's community groups, women can empower their economic status to afford other activities that are environmentally friendly like beekeeping rather than explore resources which ditter environment and bring climate change, and also 30% state the women via their community groups establish tree nurseries for both business purpose and planting around their home to make sure the beautiful of their

home places. While about 20% of respondents responded that women's community groups provide a chance for them to discuss and build their capacities concerning climate change. The results resemble the recommendation made by Singh, *et al.*, (2022) [17] which recommends that women's community groups are essential in building skills related to climate change.

**Table 2:** Responses of respondents on the contribution of women's community groups to climate change resilience (n =104)

Characteristics	Category	Frequency	Percent
Do women's community groups enhance community resilience to climate change	Yes	88	85
	No	16	15
How Women community groups enhance resilience to climate change	Providing income for environmentally friendly business	52	50
	Establishment of women's tree nurseries	31	30
	Sharing knowledge and skills about climate change impacts	21	20

### 3.3. Domestic practices in climate change adaptation.

Binary logistic analysis in which the dependent variable was domestic practices to climate change adaptation while the independent variable includes smart cooking, solar energy uses, improved home water storage facilities, and Planting climate resilient plants as specified in the data analysis section shows that Wald Statistics were non zero values which imply that there was the interaction between the

dependent and independent variables as it's stated by Norouis the non-zero Wald statistics values indicate the presence of a relationship between dependent and independent variables, therefore the findings of this study revealed that application of smart cooking, solar energy, Improved home water storage facilities and planting climate smart resilient significantly influence adaptation to climate change at 5% level of significance.

**Table 3:** Domestic practices as indicators to climate change adaptation

Variables	B	S.E.	Wald	df	Sig.	Exp (B)	95.0% C.I.for EXP(B)	
							Lower	Upper
Smart cooking	.019	.029	.653	1	.464	1.002	.997	1.007
Solar energy	-.002	.008	.056	1	.791	.998	.981	1.015
Improved home water storage facilities	-.013	.011	1.599	1	.206	.988	.969	1.007
Planting climate resilient plants	-.005	.007	.729	1	.389	.994	.980	1.008
Constant	1.781	.537	11.501	1	.000	6.636		

## 4. Conclusion and Recommendation

### 4.1. Conclusion

In a nutshell, this study indicates that women in the Kilosa district played a great role in adapting to climate change, it revealed that women engaged in sustainable farming practices including agro forest and home garden establishment as the adaptive approach to climate change and Furthermore, this study revealed that women community groups provide a mechanism where women can share knowledge and skills of climate change adaptation and mitigation, also it reveals that women community groups provide means of women economic empowerment to engage in environmental friendly economic activities such as beekeeping to adapt for climate change.

### 4.2. Recommendations

This study recommends that the National climate change mitigation strategy should incorporate gender-specific considerations to address the unique vulnerabilities faced by women. This includes recognizing women's roles and priorities their role, as well as involving women in decision-making processes to encourage more effective climate adaptation strategies that leverage their knowledge and skills.

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