



WOMEN AND THE WEATHER A MINI-REVIEW: GENDERED DIMENSIONS OF CLIMATE ADAPTATION IN RURAL GEOGRAPHIES

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ABSTRACT:

Background: Rural communities are disproportionately affected by climate change, with women often facing increased vulnerabilities due to socio-cultural, economic, and institutional barriers. Women's livelihoods, which often depend on natural resources such as farming, water collection, and firewood gathering, are particularly vulnerable to the impacts of droughts, floods, and other climate change-related events.

Objectives: This paper explores the gender-specific aspects of climate adaptation in rural settings. This review study highlights the intersection of gender, the gendered impacts of climate change, highlighting how women in rural areas face disproportionate vulnerabilities due to their reliance on natural resources, limited access to decision-making, and socioeconomic constraints.

Materials and Methods: Comprehensive literature searches were conducted using databases such as Google Scholar, the National Center for Biotechnology Information (NCBI), Web of Science, ProQuest Social Sciences Databases, Public Affairs Information Services (PAIS), and PubMed to identify pertinent articles published between 2010 and 2024. The studies range from 2010 to 2024 were taken for this review.

Results: There have unexplored areas related with rural women and climate conditions. As women play a crucial role as active agents of climate resilience through traditional knowledge, food security management, and community leadership. Women are vital to household and agricultural adaptation, their efforts are frequently impeded by limited land rights, restricted mobility, and unequal labor responsibilities.

Conclusion: This study advocates for the implementation of gender-responsive climate policies, and the enhancement of women's leadership in climate governance. By emphasizing gender in climate resilience frameworks, this research contributes to more inclusive and effective adaptation strategies for rural communities facing increasing climate risks.

KEYWORDS:

RURAL COMMUNITIES, CLIMATE CHANGE, GENDER VULNERABILITY, CLIMATE ADAPTATION, ECONOMIC CONSTRAINTS, WOMEN'S LEADERSHIP.

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INTRODUCTION

Women in rural geographies are disproportionately climate change affected, and existent inequalities are exacerbated, as are new vulnerabilities (Ashrafuzzaman et al., 2022). Women in many developing countries are dependent on natural resources for their livelihoods (Huyer et al., 2024) – which involves farming, collection of water and firewood and care for families. Droughts, floods, and other impacts of climate change can lead to lower agricultural yields, contamination of water sources, and more occurrences of vector diseases which damage women as well as their

livelihoods and well-being. Above all, climate change effects are not gender neutral; women are more vulnerable to the impacts of climate change as their socio-economic roles, livelihoods, access to resources, norms around mobility and gendered control over economic resources all relatively increase their vulnerability to various impacts of climate change (Tanjeela et al., 2018, Tywman et al., 2014). This could, for example, result from women's lower asset positions, insecure tenure arrangements on land that restricts their access to land, and social restrictions on the

land available to them, so that they have to work on more marginal land that is subjected to higher climate related risks (Singer, 2018). The unfettered access to education and information of women add to their vulnerability to climate change in that it limits their ability to acquire know how and necessary skills to cope with changing environmental conditions. Although women have polluted less than men and indirectly accelerate the increase in greenhouse gas emissions, they are affected more severely by the impact on climate change (Alonso-Eplde et al, 2024).

GENDERED VULNERABILITY TO CLIMATE CHANGE

While women are disproportionately vulnerable to climate change, it is important to remember women's agency and resilience in the face of it. Women are not just climatic change victims, they are effective agents of climate change, having valuable knowledge, skills and experiences that can help in effective climate change adaptation strategy. Women's traditional roles as caregivers, natural resource managers and community organizers may make them important actors to recognize climate risks, coping mechanisms and sustainable solutions (Yadav & Lal, 2017). In designing climate-resilient agricultural systems or protecting natural resources, women's local ecosystem knowledge, farming and water management skills can be most valuable. Additionally, women's social networks and community-based organizations could really contribute in disseminating information, mobilizing resources, in building on collective action in order to deal with climate challenges (ULIMWENGU, n.d.). Although, many policies and initiatives to address environmental issues fail to take into consideration or even harm women and other marginalized communities' participation in these processes, these (Munala et al., 2023). As women are included in decision making roles, policies and initiatives can more readily account for women's particular experiences and needs, and this produces more equitable, as well as better, results. As a result, there is a greater need to promote women's empowerment and address gender inequalities in relation to climate resilience and sustainable development within these rural geographies. Analogues of Gendered Vulnerability to Climate Change A complex combination of socio-economic, cultural and environmental factors which amplify existing inequalities and this opens up for new challenges for women in rural areas (Nizami & Ali, 2017) play a role in the gendered dimensions of climate vulnerability. Climate change is a 'threat multiplier' that increases the negative impact of existing gender disparities in regard to resource access, decision making and social protection, hence producing differentiated impacts on men and women (Nizami & Ali, 2017). Women depend heavily on natural resources to earn their livelihoods, which puts them at greater risk of the impacts of climate related shocks on their ability to make a living. This makes women highly susceptible to the impact of climate change on essential resources such as water, food and fuel in most rural societies where the main

role of women is food production, for the household, water collection and fuel gathering. Women's limited access to owning, getting credit for, and technology for land also hampers their ability to adapt to climate change and diversify their livelihoods. In addition to this, women's mobility and access to information and ability to participate in decision making processes are constrained by cultural norms and social expectations which do not allow her to respond to climate risks and articulate her needs. However, in most patriarchal societies, women's participation in rural politics, and making decisions related to them, is greatly checked off, thereby denying them the means to influence climate adaptation policies and programmes (Chapter 1 Introduction, n.d.). Recognizing these gendered vulnerabilities is important to developing ways to make climate adaption processes effective and equitable with women's specific needs and priorities in rural geographies [Enhancing Women-Focused Investments in Climate and Disaster Resilience (2020)] Women are also vulnerable to climate change in part because they play caregiver and household manager roles that can cause additional burdens in the period and aftermath of climate related emergencies. Women often assume the additional role of ensuring safety and wellbeing of their family during extreme weather events i.e. children, old, sick; putting their lives at greater risk. Disruption of essential services, including healthcare, water supply, sanitation, among others disproportionately affect women who are most responsible for household hygiene and sanitation. However, climate related displacement and migration can cause more work on women as they are left to take care of households and farm as male family members are missing. Beyond that, climate change can also add to the psychological, emotional stress that particular impacts on women disproportionately - anxiety, depression, gender based violence. (Cooper et al., 2021). Cultural constructs compound women's health vulnerabilities and increase risk in a regional manner (Sorensen et al., 2018). Consequently, the assessment of resources and vulnerabilities of both men and women should be thoroughly done before every project in the development or adaptation, i.e., transportation, disaster risk reduction, finance, communication, water management, technology transfer, agriculture and health (Sorensen et al., 2018). Compounding this vulnerability is the situation that women have less access to resources, services and decision making processes, as a result, it is harder for women to cope with the impacts of climate change. To address these gendered vulnerabilities, multiple roles and responsibilities of women in rural communities and the provision of targeted support for women to strengthen their resilience to climate change is necessary.

WOMEN AS ACTIVE AGENTS OF CLIMATE RESILIENCE

While women are vulnerable to the effects of climate change, they are not only passive victims, but results and recognised actors of change, bringing climate resilience to

the household, community and landscape levels (Goldin et al., 2019). Traditional women's knowledge of natural resource management, agriculture and water conservation is indispensable for developing climate resilient practices and technologies (Shahjalal, 2021). Many rural communities, where the majority of the world's food is grown, have women as the main custodians of traditional seeds, crops and farming techniques that are adapted to local climate and able to increase food security in the context of climate change. They are able to find and adapt strategies that suit their towns' needs and the local ecosystems, weather patterns and natural resources in which they live. For example, in arid regions, women farmers have come up with creative water harvesting techniques like rainwater harvesting and water efficient irrigation to respond to water scarcity and enhance agricultural productivity. In addition, women are engaged in the promotion of sustainable land management practices, including agroforestry and soil conservation, for reducing land degradation and increasing ecosystem resilience. While women's knowledge, experience, and skills are not often included in climate change planning and policymaking, this participant notes their importance in the development of climate adaptation plans. Women's role in household food security and nutrition make them essential to constructing climate resilient food systems. Women are often also primary caregivers and food providers responsible for ensuring that their families are able to access nutritious and affordable food in the face of climate related shocks. They are important for the diversification of household diets, promoting the consumption of locally produced and climate resilient crops and reducing food waste. Community based food production initiatives, such as community gardens and farmers' markets, are women led and women's involvement in these help to increase their food security and access to nutritious food. Furthermore, women's knowledge on food processing and preservation skills can stretch the longevity of food and reduce post harvest losses and hence leads to the availability of food all year around and even mostly during dry and flooding season (ULIMWENGU, n.d.). Empowering women to participate in and lead food security initiatives allows us to create more resilient and egalitarian food systems that can weather climate change adjustment (Shir et al., 2024). Women's social networks and community leadership positions allow them to encourage communities to take collective action around the promotion of climate resilient practices. Informal groups, cooperatives, and community based organizations are often important venues through which women form strong social networks and share information, exchange resources, and collectively respond to climate related problems. Climate information, support to adopt climate-resilient technologies, and advocacy for appropriate policies and programs to enhance climate adaptation can be significantly addressed through these networks. In this way, women's leadership in community organizations and local governance structures can be a guarantee for climate change adaptation initiatives to be

inclusive, participatory and compliant to the needs of the most vulnerable members of the community. In addition, women's collective action and social cohesion helps build community resilience to climate shock and stress. When proactively investing in initiatives that build resilience, there will be a subsequent decrease in susceptibility to the resulting decline in economic stability for people at the greatest risk (ULIMWENGU, n.d.).

STRATEGIES FOR ENHANCING WOMEN'S CLIMATE RESILIENCE

Women need to be empowered towards participating in climate change adaptation but this has to be done from a gendered perspective that helps to identify their particular vulnerabilities and build on their particular strengths and knowledge. It also includes access to education, training and information about the impacts and adaptation strategies to climate change; which are all essential elements for women to have in order to increase their understanding of climate change issues and their sensitivity to natural risks. Women can further their comprehension of climate dangers, further their ability to take a shot at climate option rehearses, and further their contribution in climate change adaptation decision making processes through education and training (Wray et al., 2023). Providing women access to information about climate resilient technologies, sustainable agriculture techniques, disaster preparedness, and education will give more information to them in pursuance of making life decisions or proactively safeguarding themselves and their families against climate induced risks. Furthermore, opening opportunities for women to access extension and agricultural advisory services will ensure that they are supported technically to implement the climate resilient farming practices. A critical requisite for further enhancing women's resilience against climate change is to ensure women's access to financial resources, land ownership and other productive assets. In many cases women face barriers in access to credit, insurance and any other financial service, and this restricts their ability to invest in climate resilient technologies and practices. By giving women access to microfinance and grants as well as other financial resources, they can adopt climate smart agriculture, use water efficient irrigation, and diversify their livelihoods. Women's land rights should be strengthened and they should be allowed access to land ownership and control to empower them as agents of long term investment in sustainable land management and climate adaptation. In addition, taking measures to promote women's access to technology and infrastructure, including renewable energy, water harvesting systems, and climate resilient housing may help increase women's adaptive capacity and reduce their vulnerability to climate change impacts (ibid). In order to ensure that women's needs and priorities are taken to account, women need to be promoted to participate in decision making processes about climate change adaptation at all levels, the household up to the national level. Climate change adaptation is not functional or equitable when women's

voices get marginalized in climate change planning and policy making. Engendering access of women to community consultations, planning processes, and development dialogues can assure that their views are brought to bear on the design and implementation of climate change adaptation programs. Supporting women in community organizations, local government and national institutions will enable women to advocate for climate resilient policies and programs that support women and their community. Moreover, encouraging gender responsive budgeting and planning by providing funds for climate change adaptation shall help direct investments to address women and girls' specific needs and vulnerabilities.

CASE STUDIES: WOMEN AS AGENTS OF CHANGE IN CLIMATE ADAPTATION

There are so many examples across the globe that show how women are critical to the process of climate change adaptation. In arid and semi arid Africa, it is women who are promoting water conservation and sustainable land management practices. Women are implementing the techniques of rainwater harvesting, soil conservation and agro forestry to ensure availability of water, soil fertility and increase agricultural productivity in the face of climate change (Hussein et al., 2024). Women in coastal Asia communities are playing an active role in mangrove restoration, coastal protection and other projects. Women's participation in mangrove restoration also helps protect their community from the impacts of climate change (Ajani et al., 2013), since mangrove forests act as a natural buffer against storm surges and coastal erosion. women in Latin America are adopting drought resistant crops, diversifying their farming systems, and also switching to water efficient irrigation methods (Gumucio & Rueda, 2015). In addition, women are actively involved in promoting sustainable forest management and diminishing deforestation since they reduce climate change and protect biodiversity (Enhancing Women-Focused Investments in Climate and Disaster Resilience, 2020; Lee & Zusman, 2018). These case studies illustrate the variety of ways women are showing leadership in climate change adaptation work and show the significance of valuing and supporting women's roles as change agents. Our participation in climate change adaptation can be made more effective and sustainable as we empower women to join in the cause of ensuring that communities are resilient and equitable. Women struggle to access resources and participate in decision making processes as a result of existing gender imbalances and sociocultural norms hence it is important to recognize that. (Reinman, 2015). Overcoming these barriers is necessary to tap into the full potential of women as agents of change on climate adaptation. ****Challenges and Barriers to Women's Participation in Climate Adaptation**** Although women have a critical role in climate change adaptation, they encounter various barriers and challenges which prevent them being involved highly in the process. Among these challenges are few resources to command, restricted

decision making power, and socio cultural norms which limit their possibilities. Due to the fact that women have much lesser access to land, credit, technology, and information as compared to men, they often have a deficient access to climatic resiliency, as well as restricted access to diverse livelihoods, (Marlina et al. 3, 2021). Women cannot participate in decision making around climate change adaptation in many communities, or their needs and priorities are not recognised. Gender stereotypes and socio cultural norms can also limit women's mobility, access to education and training and participation in the public life, which in turn restrict women's access to adapt to climate change. Overcoming these challenges calls for policy reforms, institutional changes and community level interventions. Government and organization policies need to encourage gender equality and women's participation in climate change adaptation. Building women's adaptive capacity requires that women have equal access to land, credit, technology, and information. An important step toward this end is strengthening women's participation in decision making processes at household, community, village, local, provincial, and national level. In addition, education and awareness campaigns aimed at challenging detrimental socio-cultural and gender stereotypes can create a more enabling environment for women's participation in climate change adaptation.

POLICY RECOMMENDATIONS FOR GENDER-RESPONSIVE CLIMATE ADAPTATION

Policymakers must take a gendered approach to adaptation to climate change taking into consideration the gendered vulnerabilities and capabilities of women and integrating gender considerations in all elements of climate change policy and planning. This entails carrying out gender impact assessments of climate change policies and programmes to make sure that they do not unintentionally increase already existing gender inequalities (Awumbila & Momsen, 1995). The importance of investing in gender disaggregated data collection and analysis to better understand the impacts that climate change has on women and men, specifically, to guide the adaptation programming activities. Empowering and enhancing women's leadership and participation in climate change decision making processes from the local to the national levels and in all its instruments, to ensure that their voices are heard and their issues are addressed. In addition, capacity building is needed to integrate gender issues in climate change policy and planning. Training and resources can be given to government officials and other key stakeholders on gender responsive climate change adaptation in order to ensure integration of gender in all fronts of research, policy and planning on climate change. Gender mainstreaming can be promoted among government agencies and other institutions through establishment of gender focal points within those agencies and institutions. Assisting research and sharing knowledge on gender and climate change adaptation can contribute to an enhanced gendered knowledge base for gender

responsive climate change policies and programs. Therefore, in order to be successful, climate policies also have to tackle the underlying causes of vulnerability, of which gender inequity is one (Daalen et al., 2020). After the Paris Climate Agreement of 2015, African countries are turning to international and national climate change adaptation and mitigation strategies (Nyasimi et al., 2017). Therefore, it is imperative that climate change adaptation and mitigation policies and strategies are not concocted in such a way that they aggrandize inequality (Nyasimi et al., 2017). The main objective is that national Adaptation Plans integrate climate change adaptation in a coherent way into relevant new and existing development policies, plans and programmes, all relevant sectors and at all levels considered appropriate, in a country driven, gender sensitive, participatory, and transparent manner (Nyasimi et al., 2017). Accordingly, the mainstreaming of women's needs in climate change has been receiving momentum (Nhamo 2014). Regarding gender inequality and social exclusion, women and children will be included in the true participatory policy processes (Chevallier, 2023; "National Adaptation Plans," 2019).

CONCLUSION

A nuanced understanding of how the gendered dimensions of climate change adaptation take place in rural geographies is revealed in the discourse showing the dual identities of women as vulnerable subjects and active agents of change. Existing gender inequalities exacerbate women's vulnerability to climate change by constraining access to resources, decision making power and opportunities. Women's knowledge, skills and experiences are not redundant in addressing climate adaptation; however, women are not merely passive victims of climate change. Recognizing the gendered dimensions of climate change adaptation is critical for adaptation efforts to be effective, equitable, and sustainable. If women are empowered and gender inequalities addressed, they can become agents of change and more robust and long term communities can be built which are resilient to the impacts of climate change (Enhancing Women Focused Investments in Climate and Disaster Resilience, 2020). Adaptation and mitigation strategies can be utilized in order to address climate change impacts (Nalau et al., 2015). Adaptation and mitigation are two measures that helps to minimise the negative impacts of climate change, in a sense that, while adaptation limits the undesirable effects of climate change, mitigation reduces greenhouse gas emissions (Akinbami et al., 2019). More recently, it has become known that climate change affects human well being and economic growth so that it is essential to integrate adaptation objectives in development policies (Mogelgaard, Neckowitz, and Wermskog, 2018). Based on some of the studies, climate change mitigation has attracted more attention compared to climate change adaptation (Mthembu & Nhamo, 2022). In situations where the effects of climate change are already felt in certain areas, however, adaptation measures are necessary (Ingcamu, 2023). Adaptation measures are particularly

required in developing countries. It is only with a mix of economic development, conflict resolution and social support that the issue can be addressed (ULIMWENGU, n.d.). Conflict can affect livelihoods, result in people being displaced and increase their vulnerability to climate change impacts. To build resilience to climate change, it is essential to address the root causes of the conflict; poverty, inequality and resource scarcity (Darwish et al., 2023). Social capital building and promoting community based adaption mitigates climate change impacts.

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