



Protocol

# Investigating Climate-Induced Vulnerabilities: The WAVES-CC Study Protocol for Understanding the Nexus between Environmental Stressors and Violence against Women and Girls in a Rural Coastal Kenyan Community

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**Abstract:** This protocol lays the groundwork for a community-centered investigation into the intersection between climate change and violence against women and girls. Providing a standardized framework, this paper will enable researchers to collect and analyze data on severe weather patterns and their potential impact on violence within communities. The interlinkage between violence and climate is an emerging field of research. There is a need for a comprehensive understanding of the intersection of these two issues focusing on the manifestations of violence, specific vulnerabilities, and coping strategies. This protocol outlines a qualitative research approach employed in Kilifi County, Kenya. The study will include key informant interviews with community leaders and policymakers, along with focus group discussions with women, adolescent girls, and men. Community engagement is a crucial component of this work as it will ensure that the research is conducted ethically and respectfully and ensure that the findings are relevant and applicable to the community being studied. This study will contribute to a deeper understanding of the complex dynamics between violence against women and girls and climate change, informing policies, interventions, and advocacy efforts and elevating the voices of women and girls to promote gender equity in the face of climate change challenges.

**Keywords:** gender-based violence; intimate partner violence; violence against women and girls; gender equity; climate change; severe weather; agriculture; community based participatory research; community engagement; qualitative research



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## 1. Introduction

To fully address the consequences of climate change, it is crucial to understand the nuances of lived experiences and the impacts of climate change on the individual quality of life. This protocol offers an intersectional approach to studying the nuanced impacts of climate change while promoting gender equality, resilience, and the rights of women and girls. Climate change refers to long-term shifts in temperatures and weather patterns. It has been well documented that climate change exacerbates environmental degradation, extreme weather events, and resource scarcity, leading to significant socioeconomic disruptions [1]. The consequences of climate change include severe weather events such as intense droughts, water scarcity, severe fires, rising sea levels, flooding, melting polar ice, catastrophic storms, and declining biodiversity [2]. Beyond the direct consequences of climate change related to environmental degradation, climate change can increase vulnerability to food security, human health, poverty reduction, and economic growth [1,3]. Climate change has contributed to widening the existing health inequalities between and within populations [3]. Table 1 describes the direct and indirect effects of climate change on human lives [1–3].

**Table 1.** Effects of climate change on human lives.

Climate Change Events	Direct Impacts of Climate Change	Indirect Impacts of Climate Change
<ul style="list-style-type: none"> <li>Increased frequency and intensity of extreme weather events such as hurricanes, floods, heatwaves, and droughts</li> <li>Changes in temperature and precipitation patterns</li> </ul>	<ul style="list-style-type: none"> <li>Erosion, flooding, and submergence of low-lying areas leading to coastal community displacement and cultural disintegration</li> <li>Heat-related illnesses and deaths, particularly in vulnerable populations</li> <li>Influencing the distribution of disease-carrying vectors, affecting the prevalence and geographic range of diseases like malaria, dengue, and Lyme disease</li> <li>Increased spread of pests and pathogens</li> <li>Water scarcity, poor sanitation, and increased risks of waterborne diseases</li> <li>Disruption of agricultural systems, leading to reduced crop yields and crop failure, thus increasing food insecurity and malnutrition</li> </ul>	<ul style="list-style-type: none"> <li>Health system strain: increased demand for healthcare services</li> <li>Prolonged exposure to climate-related disasters and uncertainties, contributing to stress, anxiety, and mental health issues</li> <li>Migration, population displacement, and challenges in resettlement</li> <li>Economic inequality: loss of livelihoods and economic losses; disparities in access to resources and opportunities</li> <li>Competition for scarce resources, such as water and arable land, can increase the risk of conflicts and insecurity, thus disrupting social stability</li> </ul>

Women and girls experience the greatest impacts of climate change, which amplifies existing gender inequalities and poses unique threats to their livelihoods, health, and safety. This is primarily due to their predominant representation among the world's most disenfranchised and their increased reliance on natural resources, which climate change is putting in jeopardy [4,5]. For example, weather-related chores that fall on women and girls have been shown to decrease the time spent in school and, as a result, limit women's and girls' educational and economic opportunities [6]. As the effects of climate change unfold, environmental stressors, resource scarcity, and displacement can exacerbate existing societal vulnerabilities. As women encounter barriers in accessing economic opportunities, food, education, and decision-making power, their resilience in the face of climate change is compromised [5,7,8]. Further, existing gender norms can increase women's vulnerabilities during climate disasters. Women are consistently paid less and have fewer social protections and fewer educational, employment, and occupational opportunities than men. Women are also disproportionately relegated to household chores and caregiving [9]. Given these predominant gender norms, women are often unable to secure alternative livelihoods, affecting their access to resources when traditional ones are threatened by environmental shifts [10,11]. This weakens resilience, limiting women's mobility, control over resources, access to justice, and decision-making power [12,13]. Increased environmental hazards, displacement, and uncertainty can also be detrimental to women's mental health, exacerbating tension, anxiety, and emotional distress. [14]

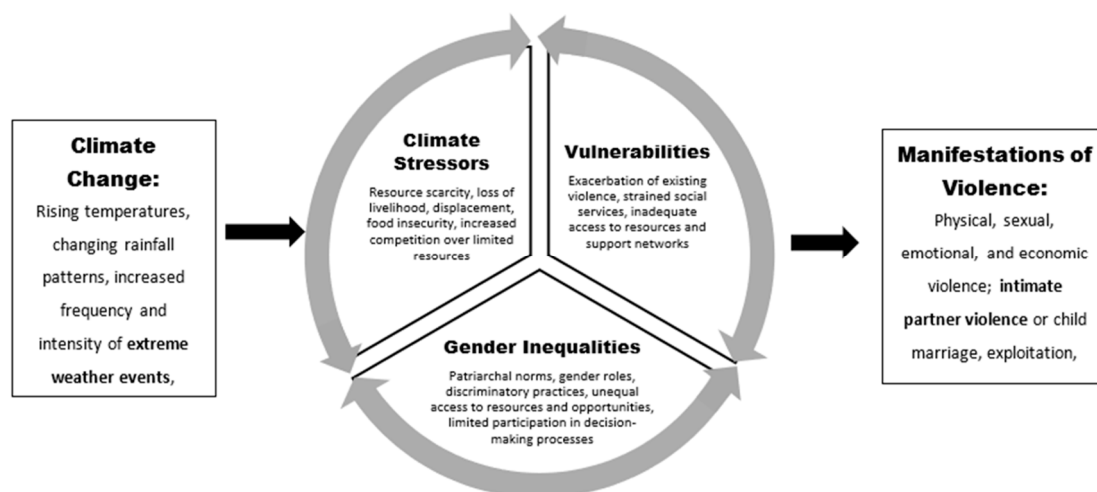
Climate change-induced severe weather events can intensify intimate partner violence and violence against women and girls, particularly in East Africa, where agricultural earnings are disrupted [15,16]. In areas affected by severe flooding or drought, women have reported higher rates of intimate partner violence [15–18]. Heightened stress levels, economic strain, and competition for limited resources may contribute to increased tensions within households, potentially escalating the risk of intimate partner violence [19]. Violence increases because climate change-induced disasters can exacerbate existing inequalities and power dynamics within relationships, leading to heightened levels of aggression and control [20]. Disruptions in access to basic needs such as food, water, and shelter can further exacerbate existing power dynamics within relationships, leading to an increase in violence against women and girls. Additionally, the breakdown of social support systems during these crises can further isolate victims and limit their ability to seek help or escape abusive situations [21].

Not only does climate change contribute to violence against women but it can also impact violence against younger girls. In many parts of the world, girls are responsible for collecting water and solid fuel. Droughts, deforestation, and floods can reduce supplies, forcing girls to walk further and thus increasing their risk of physical and sexual violence [21,22]. Moreover, when crops are destroyed and families struggle with income and food security, young girls are often pushed into early marriage or forced into transactional sex work [23,24]. This perpetuates a cycle of poverty and exploitation that disproportionately affects young girls in vulnerable communities.

The examples provided demonstrate how the impacts of climate change disproportionately affect women and girls, particularly in terms of violence, underscoring the need for deeper exploration. Understanding the experiences of women and girls is vital for developing ethical and effective interventions that acknowledge women's unique challenges in low-resource locations impacted by climate change. Thus, primary data collection focusing on women's lived experiences is crucial. Collecting personal narratives can provide critical insights into how women navigate climate related stressors, informing policies and programs that can effectively address the gender-specific impacts of climate change. By understanding the contextual nuances and systemic factors influencing women's access to economic resources, social support networks, and avenues for empowerment, we can inform the designing of tailored interventions that promote gender-responsive economic and social empowerment while addressing the heightened vulnerabilities to violence exacerbated by climate change.

An effective response to the intersection of climate change and violence will rely heavily on local and community partnerships. These partnerships are crucial for gathering primary data and ensuring that research and interventions are grounded in the realities of those most affected. Engaging with communities and leveraging local expertise is critical to conducting ethical and relevant research in low-resource settings [25–27]. Existing studies predominantly offer global or regional perspectives, and there is a scarcity of research that delves into the nuanced and community-specific aspects of these issues in communities affected [28]. A community-led approach will ensure the study's accuracy and cultural sensitivity and foster community ownership and empowerment in addressing these challenges [29,30].

Our protocol paper aims to lay the groundwork for a community-centered investigation into the intersection between violence against women and girls and climate change. By addressing existing gaps in knowledge and emphasizing the need for a localized approach, the paper sets out clear objectives, guiding a subsequent study to identify the specific ways in which climate change impacts the manifestation of violence against women and girls. This work is based on the conceptual framework of Climate Change and Manifestations of Violence [16] (see Figure 1). The ultimate goal is to contribute nuanced insights that inform targeted interventions, policies, and advocacy efforts. In this paper, we describe the conceptual development process and the final study protocol for the research study "Understanding Women's and Girls' Agency, Gender-Based Violence, and Environmental Stressors in the Context of Climate Change in Kilifi County, Kenya" (WAVES-CC).



**Figure 1.** Conceptual framework of Climate Change and Manifestations of Violence.

## 2. Study Design

### 2.1. Overview

This study aims to conduct ethical qualitative research in low-resource settings, focusing on community engagement and expertise. This research seeks to fill the gap in primary data regarding the intersection of climate change and violence, particularly their impact on women and girls. This will involve engaging with local communities, understanding their perspectives, and ensuring their voices, which are central to the research process. Collaboration with local experts and stakeholders is vital to ensuring the research is grounded in the realities of the community and respects local norms and values. Such a study must be designed to minimize potential harm to participants, ensuring confidentiality, informed consent, and sensitivity to climate change and violence. The goal is to produce research that is not only academically rigorous but also meaningful and beneficial to the communities it seeks to understand. By emphasizing the need for ethical research practices and deep community involvement, the study aims to provide insights that are directly applicable and beneficial to the communities studied, ensuring their voices and experiences are at the forefront of any findings and subsequent interventions. The primary objectives of this research study are to (1) examine the nature and manifestations of violence against women and girls in the context of climate change in rural Kilifi and (2) understand the underlying factors and mechanisms linking climate change and violence against women.

The research will be conducted in two rural areas of Kilifi County, Kenya: Magarini and Ganze. These two regions were deemed ideal for exploring this association as both have agrarian-based economies. Ganze experiences extreme droughts while Magarini lies in a flood-prone area. The contrasting environmental conditions in Ganze and Magarini provide a unique opportunity to study the impact of climate variability on agricultural productivity by examining how these communities adapt to their respective challenges. Also, gender-based violence is prevalent in Kilifi County. In 2022, approximately eight percent of women aged 15–49 reported having experienced violence in the previous 12 months [31]. Community-based participants in the qualitative components of this study will be enrolled using the purposive sampling approach based on the inclusion criteria, the purpose of the study, the participants' knowledge of the subject matter, their availability, and their willingness to participate. This will ensure that the study adequately represents women's and girls' experiences. The sampling of key informants (policymakers, local government officials, and representatives from Non-Governmental Organizations (NGOs) working on gender and climate change) will be based on their professional roles in current or past decision-making bodies related to climate change responses and gender equality initiatives and on their unique knowledge or influence in the study domain.

## 2.2. Study Target Population and Sampling Strategy

This study will take a feminist approach, bearing in mind that women and girls are affected disproportionately by the effects of climate change. Our primary target population will comprise adolescent girls aged 14 to 17, younger women aged 18 to 30, older women aged 31 and above, younger men aged 18 to 30, and older men aged 31 and above. Additionally, we will mobilize policymakers and key stakeholders interested in gender equality and involved in decision-making and coordination of climate change adaptation, mitigation, and response at the county level. These will include select county representatives from county government representatives from relevant line ministries, departments, or agencies; community leaders including religious leaders, traditional elders, or influential community members; local government officials, such as chiefs, councilors, or county administrators; NGO representatives; and women-, youth-, or gender equality-focused organization representatives. We believe that the recruited cohorts of the above target population will provide illustrative examples and enable the research team to obtain diversity in the experiences of those affected by climate change based on their variation in socioeconomic vulnerabilities.

## 2.3. Ethical Approval

Research approval was received from local and institutional ethics committees, ensuring compliance with local and international research standards. Specifically, ethical approval was obtained from the University IRB (P#1930) and AMREF Ethics and Scientific Review Committee (approval number: ESRC PI488/2023), which conducts ethical reviews and scientific evaluations of research proposals, ensuring adherence to ethical standards, participant protection, and compliance with national and international regulations. Post obtaining the research approval, a research permit was obtained from the National Commission for Science, Technology, and Innovation (license number NACOSTI/P/23/29586), which ensures that the research conducted adheres to ethical standards and contributes to national development. County-level approval was also sought from the Office of the Gender and Affirmative Action Director to ensure that the research activities conducted within the two select sub-counties in Kilifi County and the community engagement plan aligned with the local regulations, priorities, and ethical standards.

## 3. Materials and Equipment

### *Study Instruments*

The study team has developed a focus group guide. The broad focus of the discussion is to co-develop the definitions of the intersectionality between climate change and violence and to gain a deep understanding of the experiences of violence against women and girls related to extreme weather. This focus group guide will be crucial in gathering insights from diverse perspectives and ensuring inclusivity in our research. By involving community partners, we can tap into their expertise and local knowledge to ensure that the guide addresses the specific challenges faced by communities affected by climate change and violence. The central questions will be open-ended, allowing participants to share their unique experiences and perspectives and providing a rich and comprehensive understanding of the intersectionality between climate change and violence. Additionally, by incorporating open-ended questions, we can uncover unexpected insights and potential solutions that may not have been previously considered.

We have created questions for key informant interviews with several policy and decision-makers from Kilifi County to explore any gender-responsive planning, budgeting, and program implementation related to violence against women and girls and climate change. These questions have been designed to understand the challenges and opportunities decision-makers face in implementing gender-responsive strategies, ultimately informing our recommendations for more effective and inclusive approaches.

We have also developed a demographic intake questionnaire to enhance its overall validity and applicability, allowing us to interpret and contextualize our findings. The intake questionnaire will collect demographic characteristics such as age, gender, education,

family composition, water drinking source, and house structure. This information helps researchers identify patterns, variations, and potential influences on participants' perspectives and experiences. Moreover, demographic data contribute to the nuanced analysis of findings, allowing researchers to explore how various factors may shape or influence participants' responses.

#### 4. Detailed Procedure

##### 4.1. Data Collection

We will utilize two methods of data collection: focus group discussions and key informant interviews. Focus group discussions with women, men, and adolescent girls from the rural community will be conducted to provide insights into the nature and manifestations of violence against women and girls in the context of climate change. Discussions will explore their lived experiences, perceptions, attitudes, and strategies for coping with climate-related violence. Topics may include their specific vulnerabilities, community dynamics, resource access, and barriers to seeking support or justice. The discussion will explore their understanding of the interlinkages, notions of masculinity, social norms, and potential roles and responsibilities in addressing and preventing violence against women and girls and promoting well-being.

Key informant interviews will be conducted with policymakers, local government officials, and NGO representatives to explore their understanding of the intersection between climate change and violence against women and girls from the perspectives of those with influential roles within the community. Topics of discussion will include the policies, programs, and services in place to address climate change-related violence against women and girls and any challenges or gaps in implementation. We will explore the roles of local administrators in community development and advocacy, promoting gender equality, influencing behavior change, ensuring access to justice, and collaborating with relevant stakeholders to mitigate the impacts of climate-related violence. See Table 2 for the summary of our data collection methods.

**Table 2.** Data collection matrix.

Objective	Population	Data Collection Method
1. To examine the nature and manifestations of violence against women and girls in the context of climate change in rural Kilifi	Adolescent girls aged 14–17	Four focus group discussions (8–10 participants in each)
	Younger women aged 18–30	Four focus group discussions (8–10 participants in each)
2. To understand the underlying factors and mechanisms (climate-related stressors, gender inequalities, power dynamics, and social norms) linking climate change and violence against women	Older women aged 31+	Four focus group discussions (8–10 participants in each)
	Younger men aged 18–30	Two focus group discussions (8–10 participants in each)
3. To explore coping strategies, resilience mechanisms, and support systems that women and girls employ to mitigate and overcome the impacts of climate-related violence against women and girls	Older men aged 31+	Two focus group discussions (8–10 participants in each)
	Community, religious, woman, and youth leaders and local administration	Six key informant interviews
	County gender, youth, agriculture, and climate sector representatives	Four key informant interviews

Community members participating in the focus group discussions will be reimbursed KES 500 for transport to and from the focus group discussion and key informant-interview data collection points. Key informants (policymakers, technical experts, community leaders) will be reimbursed KES 1000.

All qualitative data collection topic guides (for key informant interviews and focus group discussions) will be open-ended, allowing for flexibility in the probes based on the



participants' responses. These qualitative methods will be adequate for this study because we will be able to explore, in granular detail, the experiences and perspectives of the listed stakeholders.

#### *4.2. Data Management*

Audio recordings of key informant interviews and focus group discussions will be transmitted daily and stored on encrypted devices or password-protected digital platforms. All digital audio recordings, field notes, and transcripts will be uniquely coded to ensure that there will be no direct identifiers (i.e., proper names, addresses, and phone numbers) or indirect identifiers (i.e., contextual information that can be used, often combined with other information, to identify a participant).

All digital recordings from focus group discussions and key informant interviews will be transcribed verbatim in Microsoft Word™ [32] after data collection, regardless of how intelligible each transcript is when it is read back. Where necessary, interviews conducted in any other language will be translated into English by a bilingual research team skilled in language translation. A sample of the translated material will be back-translated to Kiswahili by an independent skilled translator to check for accuracy and consistency. Once the transcription and translation are complete, the audio recordings will be listened to again against the transcripts and the following will be conducted as part of quality assurance: corrections of any spelling or other errors; anonymization of the transcript so that the participant cannot be identified from anything that is said (e.g., names, places, significant events); insertion of notations for pauses, laughter, looks of discomfort; insertion of any punctuation, such as commas and full stops (periods); and inclusion of any other contextual information that might have affected the participant.

Field notes, observations, and debriefing sessions will also be listed as data collected for analysis. Data transcription and translation will occur immediately following data collection with a continual review of data collected, exploring and analyzing emerging themes, similarities and differences, and new areas requiring further exploration. The anonymized transcripts will be uploaded into NVivo™ for open, axial, and selective coding and analysis [33]. The first step in the analysis will be data familiarization. The research team will listen to the audio recordings and continuously read and review all qualitative data gathered (including transcripts, interview notes, and observation data). The research team will develop a single coding framework for all qualitative data collected, informed by the study objectives. The research team will meet to discuss and agree on the generated themes. At least two expert qualitative researchers will proceed with coding, charting, mapping, and interpreting transcripts. Similar emerging issues will be combined into single categories through consensus discussions. The qualitative data collection involving the diverse population will allow for data triangulation from the different study participants.

#### *4.3. Engagement of Research Assistants*

The recruitment process for research assistants will focus on identifying individuals who possess the necessary qualifications, skills, and cultural sensitivity to engage with participants in the rural community of Kilifi effectively. Research assistants will have at least 5 years of experience in qualitative research and proficiency in at least one of the local languages of the study areas to conduct the interviews and discussions. During training, research assistants will receive comprehensive instruction on research ethics, confidentiality, and the study's objectives and research questions. They will be trained in qualitative data collection techniques, such as conducting interviews, facilitating focus group discussions, and using observation and note taking effectively. The training will also emphasize the importance of building rapport, active listening, and maintaining a non-judgmental and inclusive approach during data collection. Additionally, research assistants will receive specific guidance on ethical considerations, such as on obtaining informed consent, ensuring the privacy and confidentiality of participants, and addressing any potential risks or sensitive topics that may arise during data collection. Cultural sensitivity training will be

provided to promote understanding and respect for local customs, traditions, and gender dynamics prevalent in the rural community of Kilifi. Senior researchers from the local NGO will conduct the training.

#### *4.4. Dissemination Plan*

Following the completion of the study, comprehensive stakeholder engagement workshops will be undertaken to formulate recommendations derived from the study's data analysis collaboratively. These workshops will serve as a platform for the collective synthesis of insights, ensuring that the diverse perspectives of stakeholders are integrated into the resulting recommendations. This participatory process will culminate in a final workshop where stakeholders will actively contribute to the development of policy briefs, manuscripts, and advocacy materials. The goal of this collaborative effort will be to translate research into tangible policy actions that address the unique challenges faced by the Kilifi community, creating a sustainable and mutually beneficial framework that amplifies the impact of research on both academic discourse and local policy initiatives.

### **5. Collaborative Framework and Community Involvement**

#### *5.1. Research Partnership*

This work will utilize a community-based participatory research approach in which all aspects of the study will be conducted jointly between investigators from LVCT Health and St. Catherine University, referred to as the study team from here forward. This partnership in the study team is the foundation of this project, creating a comprehensive and impactful research collaboration. Including both local NGO and university investigators enhances research methodology and applicability. Local NGOs provide a nuanced understanding of the local context, ensuring cultural sensitivity and ethical considerations in research design and execution. The organization's established community relationships will foster trust, encouraging active community participation and engagement throughout the study. University team members will contribute academic expertise, methodological rigor, and a broader research perspective that enriches the study's design and execution. Their role will include ensuring the scientific validity of the research, employing rigorous methodologies, and providing in-depth data analysis. Additionally, the university's involvement will enhance the credibility and academic standing of the study, fostering greater recognition and dissemination of findings within the broader academic community. Our objectives were collaboratively developed, ensuring alignment with the needs and realities of Kilifi County. Both partners have developed specific research objectives, ensuring they align with the overarching goal of understanding the intersection of climate change and violence against women and girls in Kilifi County. The objectives have been refined several times to encapsulate the multifaceted nature of this issue.

#### *5.2. Local Partnership*

The study team has also collaborated with local stakeholders in Kilifi County. To ensure that our research outcomes aligned with the programming priorities of local policy and climate change and violence against women and girls, it was necessary to establish collaborative ties with policymakers. Continuous engagement with Kilifi County policymakers in the gender, agriculture, and climate change sectors was prioritized to enhance the ownership of study findings and facilitate their translation into policy and practice. The team conducted an inception meeting, inviting critical stakeholders from Kilifi County. The purpose of this meeting was to facilitate open communication with local stakeholders, obtain buy-in, and revise the research protocol based on local expertise. Additionally, this inception meeting secured the study's necessary permissions, logistics, and security arrangements.

At the inception stage, the research team revised their protocol and piloted their data collection tools. Piloting the tools ensured that they could effectively capture the relevant data and were well suited for the study's objectives and the specific cultural and social



context of Kilifi County. It was essential to assess the instruments' feasibility, clarity, and effectiveness before full-scale implementation. The research team administered the data collection tools to a small sample of participants representing the intended study population. Based on the findings from the pilot, the study team revised the data collection tools.

In partnership development, a foundational step involves a deliberate stakeholder mapping analysis. This strategic approach encompasses identifying diverse stakeholders to ensure a comprehensive understanding of the broader ecosystem surrounding the research domain. By systematically identifying and assessing the interests and potential impacts of stakeholders, this analysis lays the groundwork for meaningful and inclusive collaboration. The mapping process in this study will consider community representatives, local community-based organizations, academic institutions, advocacy groups, and technical experts. They will be mobilized primarily from ministries, departments, and agencies at the county and sub-county levels that deal with the gender, agriculture, water, environment, fishery, and climate change sectors, as well as representatives from civil society and community-based organizations that implement any climate-related interventions in the study area. This strategic alliance aims to foster a two-way communication channel wherein policymakers provide insights into community needs and researchers provide academically robust findings that aid in evidence-based decision making for translating evidence from the study into policy and practice. The continuous engagement with these stakeholders will enhance all stakeholders' ownership of the study findings.

### *5.3. Community Engagement*

The implementation of the study on the intersection between violence against women and girls and climate change hinges on the active involvement and collaboration of the community of focus. Community engagement is a fundamental principle guiding our research ethos. Community approval will be obtained from focal persons in the study area before the study commences. Focal persons are trusted individuals, intimately connected within the local community, and serve as integral liaisons between the research team and community members. In Kilifi County, our focal persons include county authorities, chiefs, elders, and compound heads. They have played a vital role in identifying potential participants who meet the inclusion criteria and have valuable insights related to the research objectives. The focal persons helped establish rapport and trust with potential participants, facilitating recruitment. This approach allows for a more organic and community-centered recruitment process, ensuring that the study will include diverse voices and experiences from the rural community. By fostering meaningful partnerships at the community level, we aim to ensure that the research process respects local perspectives, incorporates community insights, and contributes to the well-being of the community members. The research team will invest in the continuous engagement of communities from inception to the dissemination stage. Good participatory practice guidelines will guide the engagement of community members to ensure transparency, the sharing of best practices, a mutual understanding of study objectives, and accountability.

The community engagement process commenced with an introductory meeting with the local administration and sub-county-level state officers in the gender, education, health, and climate change sectors. The meeting was designed to establish an open and collaborative dialogue with the community members. This initial gathering served as a platform for building trust and sharing the purpose of our study; key project team members introduced themselves, emphasizing the transparent and participatory nature of the research. The session involved a detailed presentation outlining the study's objectives, the potential impact on the community, and the importance of their active involvement. Moreover, it provided a forum for addressing apprehensions or misconceptions, reinforcing the research's ethical considerations.

In response to community feedback, adjustments to the research plan were discussed collaboratively, and questions were welcomed. The introductory meeting set the tone for a dynamic and inclusive community engagement process. It laid the foundation for ongoing

communication channels, ensuring that the community would remain informed, empowered, and actively involved throughout every phase of the research on the intersection between violence against women and girls and climate change.

## 6. Expected Outcomes

Upon the completion of this study, we have four expected outcomes: (1) an enhanced understanding of the intersection between violence and climate change, (2) knowledge to inform gender-based-violence interventions, (3) knowledge to inform local policy change, and (4) the elevation of the voices of women and girls.

Focus group discussions and key informant interviews constitute a rich format that will provide an enhanced understanding of the intersection between climate change and violence against women and girls. Though there is documented research suggesting that climate and gender-based violence are connected, studies have been based on population level data [15,16,21,22] and thus have not provided the nuances of people's lived experiences. This study will explore not only the manifestations of violence as a result of climate change but also the mechanisms by which violence is occurring. Qualitative methods, including focus group discussions and key informant interviews, will offer nuanced insights into participants' experiences, perceptions, and the broader contextual factors influencing the intersection between climate change and violence. This level of understanding will strengthen the existing body of literature surrounding climate and violence and will allow investigators to delve into further areas of research.

Results from this study will constitute a first step in providing data to inform intervention design. Interventions should be sensitive to the local context and engage local leaders, building their capacity to advocate for gender-responsive climate change and gender policies at the local level. The qualitative data from this study can provide a platform for intervention design as they will provide an onus for study participants that will help drive community-specific interventions. Thus, this work will lay the foundation for designing community-led interventions addressing the nuanced intersection of climate change and violence against women and girls. By engaging key stakeholders, including local authorities, women's organizations, and community leaders, we aim to build sustainable networks and leverage existing resources to support long-term intervention development, implementation, and scalability.

Knowledge gained from this study can facilitate the development of policies that are specifically tailored to the requirements of these communities. The active participation of community members in the collection and analysis of data will foster confidence and a sense of ownership, which will ultimately result in the development of more sustainable and efficient strategies to alleviate the effects of adverse weather events on individuals who are victims of violence. By employing a participatory approach, the data acquired are guaranteed to be pertinent and culturally sensitive. This, in turn, will foster community resilience and improve the practicality of the findings informing policy recommendations. Furthermore, this will cultivate a feeling of proprietorship and self-empowerment within the community, enabling the development of customized remedies that target particular vulnerabilities and requirements. Through knowledge translation and dissemination, we will seek to influence policy discourse and promote gender-responsive approaches to climate change adaptation and intimate partner violence at local and national levels. We aspire to catalyze transformative change by applying the holistic approach, contributing to broader efforts toward a more equitable and sustainable future.

Finally, and perhaps most importantly, this work will elevate the voices of women and girls who, though most impacted, have historically been ignored. Women are frequently excluded from decision making despite being among those most vulnerable to its effects [34,35]. As a result, they cannot make changes that would enhance their survival, safety, and well-being. Various laws and activities aimed at addressing environmental issues frequently overlook or even injure women and other underprivileged people [22]. This exclusion of women from decision-making processes not only perpetuates gender

inequalities but also undermines the effectiveness of environmental policies. This study will highlight the unique perspectives and experiences of women and girls. Qualitative research will allow us to not only develop a deeper understanding of the issues but also use the voices of the women and girls themselves to enhance our knowledge. Thus, their words will be forever documented.

We would like to acknowledge the limitations of this protocol. Though this study can be reproduced in other parts of the world, it is designed specifically for those living in rural farming communities. Moreover, the study populations depend on subsistence farming rather than industrialized agriculture. Future investigators should consider modifying elements of this protocol to fit other geographical settings.

## 7. Conclusions

In order to conduct a comprehensive investigation of the impacts of severe weather phenomena on violence against women and girls, it is imperative to utilize a multi-methodological approach. This necessitates a community-driven and inclusive data collection procedure that collaborates with community leaders, local organizations, and survivors of violence. By utilizing qualitative research methods, including focus groups and interviews, one can gain significant knowledge about the daily experiences of people who have been affected by acts of violence and severe weather phenomena. These insights should be representative of diverse experiences, ethical considerations, and cultural sensitivity. Moreover, constructive contributions from community members can provide significant insights into the unique vulnerabilities and dynamics that arise in the aftermath of severe weather incidents. By providing a standardized framework, this protocol paper will enable researchers to collect and analyze data on climate patterns and their potential impact on violence within communities. It will also guide the identification of key variables and methodologies needed to assess the relationship between climate change and various forms of violence, contributing to a more comprehensive understanding of this complex issue.

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