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Rural women, climate change and information ecosystems in Kenya

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Introduction

This chapter presents findings from a collaborative research project between University of Nairobi and University of Leeds researchers conducted between 2019 and 2021. We sought to develop nuanced understandings of how local information ecosystems operate in rural Kenya in the context of intersecting threats to climate justice. Following the prescription of Malin and Ryder (2018: 4), and numerous others (Crawford et al. 2023; Mikulewicz et al. 2023), our research explores 'links between environmental inequities and relevant systematic social inequities' to better understand climate change adaptation in rural Eastern Africa. Kaijser and Kronsell (2014: 417) similarly urge researchers to examine 'how different individuals and groups relate differently to climate change, due to their situatedness in power structures'.

Through a multi-site quasi-ethnographic research approach, the researchers assessed how and where rural women in East, West and Coastal parts of Kenya get their climate information from and how useful this information is in enhancing their adaptive capacity. The research findings demonstrate how local information ecosystems operate to enable women in rural Kenya to combine Indigenous and externally sourced knowledge in their engagement with, and pursuit of, climate change adaptation.

We attempt to show that women are frequently key change agents in rural communities, yet their voices are often disregarded or relegated in pursuit of conventional information. From the findings, the mismatch between technocratic sourcing and the gendered, lived experiences of adapting to climate change for

women is responsible for maladaptation, and can be resolved by way of a hybridized information ecology. Women's voices should be at the centre of adaptation as opposed to relegating women as mere recipients or victims lacking agency.

Adaptation to intersecting challenges is, of course, an issue of climate justice in part due to Kenya's almost negligible contribution to causing global climate change. Kenya is largely an arid and semi-arid land with agriculture as the main source of livelihood. Agriculture is a major driver of the economy, contributing 54 per cent to the national gross domestic product (GDP) and accounting for 65 per cent of total export earnings. Kenya's GDP growth is highly correlated with the sector's performance, but its performance is highly volatile (Handjiski et al. 2016). Kenya's agriculture is 98 per cent rain-fed (USAID 2018). This renders it highly vulnerable to food supply disruptions and shortages caused by climate change.

Timely and accurate information on climate change is critical for climate change adaptation among rural communities in Kenya. There are different sources of climate information that circulate in urban and rural locations. Given rapid change in the nature and availability of information across Africa, in this project we were interested in establishing what sort of climate information is available to rural communities, the sources of this information and its utility in building resilience to climate change. Communities in rural contexts have for centuries developed indigenous modes of adaptation to reduce vulnerability, yet it is still unclear how 'local' or 'indigenous' knowledge might be interacting with conventional information flows to facilitate effective adaptation strategies.

Climate information services available in Kenya include immediate and short-term weather forecasts mainly from the Kenya Meteorological Department (KMD) and advisories and long-term information about new seed varieties, technologies and market development from different stakeholders. Climate information services are important in helping farmers to manage risks in an already exceptionally risky sector and to offset much of the uncertainty that so often constrains decision-making and innovation. Climate information is a relatively new area in extension service delivery in Kenya and several studies have shown that only a few farmers currently access climate information services provided by the Kenya Meteorological Department (Musembi and Cheruiyot 2016). Climate information is generated through monitoring and analysis of the behaviour of climate systems by meteorologists and climate scientists, the National Meteorological and Hydrological Service Provider and other public and private organizations (Wilkinson, Budimir, Ahmed, and Ouma 2015). We were interested in finding out if this information reaches the ultimate end users: small-scale farmers who are mostly women in rural areas in Kenya.

Gender and climate change adaptation in Kenya

Although climate change is a global problem, it is not gender neutral, hence affecting men and women differently. Gender therefore becomes an important driver of vulnerability to climate risks (Nyukuri 2016). Climate change intensifies the traditional inequalities between men and women, further deepening women's vulnerabilities to climate change (Dhanashri 2010). Across rural Africa, women are the primary providers of water, food and energy at the household and community levels, hence highly disproportionately impacted by any adverse effects of climate change (UNEP 2013, 2015; Smith et al. 2015; Campbell et al. 2017). Most small-scale farmers doing rain-fed agriculture in rural Kenya are women. Africa Development Bank (2011) and our research findings established that prolonged droughts, decreased rainfall and high levels of climate variability have led to loss of livelihoods for these women.

For rural women, their vulnerability is further exacerbated by the existing gender inequalities they face across social, economic, political and environmental systems (UNDP Kenya 2020). As discussed by Nyukuri (2016) and Henriksson et al. (2021) and as was evident from our findings, rural women face barriers in accessing information, technologies and financial services and this further exposes them to the vagaries of climate change. It has also been observed that Climate Information Systems (CIS) ignore gender-specific needs or fail to use gender-sensitive dissemination channels (Partey et al. 2020). Our findings show that women farmers do not have timely weather and climate information. This constrains their capacity to manage increasing climate risks.

To sustain adaptation among those who are most marginalized, there is a need to have a nuanced understanding of how women act and operate within the local information ecosystems and the resultant effects on local women's ability to combine indigenous and externally sourced knowledge in their engagement with and pursuit of climate change adaptation. We recommend that the focus of external climate change interventions should be on women's active participation in the entire climate information ecosystem since they are frequently vital change agents in rural communities but are often overlooked as such by mainstream climate change adaptation discourse and practice.

The findings we present here show that rural communities, and especially women, are generally information deprived due to the nature of information circulation. In this chapter, we argue that although women are disproportionately affected by climate change, they are not only victims of climate change but also contribute considerably to adaptation. Women's close

dependence on natural resources has positioned them well to understand and innovate livelihood strategies adapted to climate change and resulting food insecurity (Aoyagi et al. 2011).

Yet, despite being key change agents embedded within an existing 'information ecosystem', there persists a lack of consideration for women within the formal information process. Within formal spaces comprising processes tied to National Action Plans and stakeholders such as Meteorological Offices, there is a tendency to cast women as 'victims' of climate crisis rather than agents and holders of expertise who could and should be incorporated more inclusively in adaptation and mitigation efforts. Informal community information networks remain an important channel for ensuring access to crucial and relevant information. Furthermore, there is a need to reflect on the intersectional barriers that women face in accessing information and consider how these barriers are reflected in the proposals women make for improving the information ecosystem.

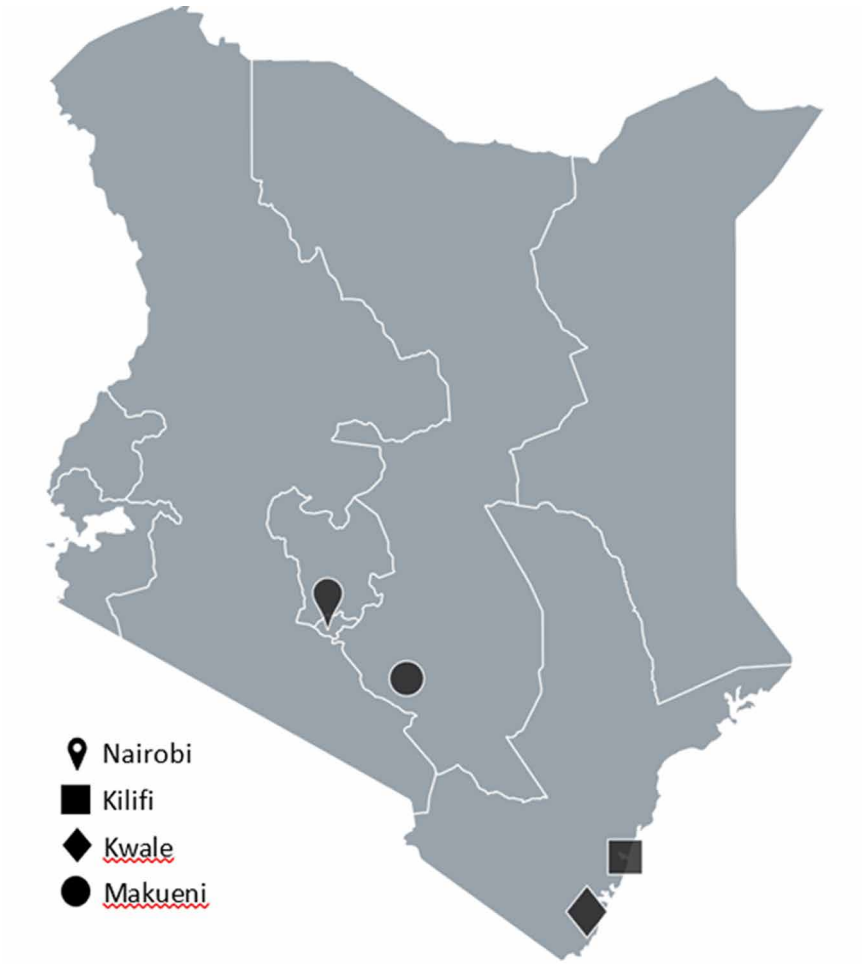
Methodological approach

To gather extensive and illuminating data on climate information flows in the select arid and semi-arid (ASAL) communities in Makueni, Kwale and Kilifi counties in Kenya, we adopted a multi-method qualitative approach of in-depth interviewing, focus groups and a varying extent of ethnographic observation (lasting from multiple days with families to weeks with communities). Our quasi-ethnographic approach enabled the researchers to gain exposure to a wide range of community members and observe the insertion of cultural and media products in the local reality and to locate the reception practices within a broader context (see La Pastina 2004). Indeed, it was only through days of intimate interaction with families that our researchers could provide the wider research team with detail of the effects of climate change on the most vulnerable women in our study communities, such as the frustrations of planting on the basis of inaccurate forecasts, only to lose those crops at great cost.

Focus groups with both male and female community members were conducted in ways that took account of local power hierarchies that may affect group interactions and helped further to determine critical sources of climate and weather information, how people engage with and understand the information available from different sources and how they translate their understanding into forms of usable knowledge that can underpin adaptation strategies. Triangulating

these methods was important to gain a more rounded picture of climate change adaptation and associated challenges in these communities.

The guiding research questions were: What is the nature, sources, flow, availability, accessibility and usability of climate change information among members of rural communities? How does the accessibility or inaccessibility of climate information affect women's capacity to build resilience and better adapt to climate change in rural Kenya? The research involved engaging women and additional stakeholders such as policymakers, journalists, meteorologists, district officials and other climate information curators within the local and regional information and media ecosystems.



The communities were selected based on the urgency of the climate change risk and cultural/contextual factors (gender, education, ownership of media such as TV or radio) that may affect their access to and use of climate change information. The study also sought to build an empirical understanding of diverse climatic challenges, notably trans-boundary geographies of climate/changing weather patterns, including how climate change is experienced across borders and on coastal areas, affecting both fishing and farming.

The three research sites were Makueni, which is one of the drought-prone ASAL regions in Eastern Kenya and is a small-scale farming community totally dependent on rain-fed agriculture. On the Coast, Kwale and Kilifi counties were selected. Kwale County is situated in the south-eastern part of Coastal Kenya. Subsistence farming accounts for 80.6 per cent of the average household income. The two sites chosen in Kwale captured the farming and fishing communities in the county. The Pongwe site represented the fishing community, while the Kikoneni site represented the farming community. Both sites are in Lunga Lunga Sub-county. Pongwe is prone to ocean erosion, while Kikoneni is prone to persistent drought. In Kilifi County, the chosen sites were Garash and Gochi, separated by the Galana River. In both sites, the community comprises smallholder farmers who practise subsistence farming, growing crops such as maize, cowpeas, green grams and fruit trees such as mangoes. Both areas are prone to droughts and flooding.

Manifestations and implications of climate change for women in Kenya

The findings show that there is a general understanding of climate change among community members explained through its impacts: prolonged droughts, flooding, coastal erosion, changes in rain seasons, increased temperatures and so on. The respondents observed that the most prevalent manifestations of climate change are seasonal and rainfall changes as well as extreme weather phenomena such as floods and droughts. While women in Makueni said that they mainly experience droughts due to the lack of rain, those in Kilifi faced flooding. Increased high temperatures, water scarcity and low soil fertility resulting in a poor or low harvest have led to acute food shortages in the research areas. Women as primary caregivers said that it was becoming almost impossible to feed their families due to high food prices which resulted from decreased yields (see Smith et al. 2015). Our respondents observed:

> The failure of rains means we don't get a harvest. The price of maize doubles, from around KSh twenty-five to KSh fifty. Larger families have bigger problems because of the many children. The children in more occasions go hungry. In classes teachers have reported learners sleeping a phenomenon associated with hunger. The best families can afford is one meal per day, supper (Dorothy,[1] Makueni).

> Unstable or no income results in a lack of money to pay for the children's school fees. A number of school-going girls are at home, and some have already fallen victim to early pregnancies (Rosemary, Kilifi).

The respondents in Kilifi commented that the soils close to the river have become infertile due to sand deposits on the land after flooding, while in Makueni, low soil fertility from poor farming practices has increased the dependence on chemicals (fertilizers). Women also observed that climate change has seen increased crop pests that were not common, and this has in turn meant using more pesticides which are harmful to human health.

Decreased crop yields and unpredictable starts of rain seasons have led to massive losses in sources of livelihoods, further intensifying the vulnerabilities of these women. From the findings, women's livelihoods and income security are affected in two ways. First, due to the changing environmental conditions, fewer crops grow, and therefore they have fewer goods to sell, resulting in a lack of income. Second, families with less overall income bought less, negatively affecting all women selling their crops. This loss of income leads to a greater dependence on men, most of whom have left for urban centres in search of job opportunities. According to one focus group respondent: 'When we used to get plenty of harvests, we would sell the food, get money and pay school fees for our children, buy livestock and clothes for our children; we never used to depend on our spouses for support' (Akeyo, Makueni).

In all the sites, our respondents identified the main causes of climate change as mainly human centred (anthropogenic) through charcoal burning, tree cutting, poor farming practices such as encroaching and farming on riverbeds, deforestation, clearing indigenous trees and replacing them with commercial trees that drain water levels, and air and environmental pollution. Some of the respondents also identified cosmic realities and metaphysical factors such as 'climate change is a result of God's wrath on us for disobeying Him'. Others observed: 'we have sinned against God and that is why all these changes are happening.'

[1] Pseudonyms have been used to protect respondents' anonymity.

Sources and types of climate information

Our findings show there is a wide range of sources of climate information ranging from traditional media such as radio and TV to chief's *barazas* (community meetings) as well as information from NGOs based in these communities. Although agricultural extension officers are the official link between the farmers and the government in regard to providing climate information and related services, it was observed that they are hardly available to offer these critical services. Radio emerged as the most popular source of climate information among women in rural set-ups, and mobile phones the least used source.

The most common type of information is seasonal weather updates about amounts of rainfall, delayed or diminished rainfall levels and sometimes on the best seed varieties to plant. Some international NGOs such as the Kenya Red Cross, Caris Foundation and Seaweed East Africa were identified as among those actively involved in providing climate information and capacity building to increase the adaptive capacity of women in the selected sites. For instance, most women in Kilifi and Kwale said they had received an SMS from Kenya Red Cross warning of floods.

Our respondents observed that they receive advice from community leaders and agricultural extension officials on when and what to plant from various sources based on the expected amounts of rainfall. They also receive guidance and training on how, for instance, to use fertilizers, pesticides and the right varieties to apply, among others. They observed that there were also calls to do massive reforestation, which, they were aware, increases and stabilizes rainfall patterns.

It emerged that climate information from the Kenya Meteorological Department was in the form of weather forecasts predicting the amount and timing of rainfalls, especially if expected rainfall amounts were below or above average. Regarding soil and water conservation, women were taught to build terraces and climate-smart agricultural practices such as digging Zai pits that retain water longer to sustain crop yields even with minimal rainfall. Some women observed that one-on-one communication through demonstrations was more practical than more conventional sources such as through the media.

It also emerged that due to their socio-economic status, most women in rural areas have less access to information services. Most of our informants reported not owning a radio, TV and/or smart phone. It is worth noting that Indigenous knowledge (IK) was one of the most common and trusted sources of climate information. All our respondents observed that traditional ways of

understanding climate and weather changes can be more reliable and accurate than scientific weather forecasts, with one respondent sharing, for instance: 'Yes sometimes we see some butterflies passing, and then we know it's about to rain … The butterflies are more reliable, sometimes we get information from the radio, but [it doesn't rain] the way they say it will rain' (Amina, Kwale). The following exchange between two women in a focus group in Makueni emphasizes that the reliability of information is key, where these women draw explicitly on IK to support their livelihoods-related adaptation efforts:

> Q: So if the weather people are not reliable are there other means (local) that you rely on to get weather/rainfall information?
> Lulu: Do you mean like the traditional ones?
> Q: Yes, Yes.
> Lulu: Yes, there are some trees which people usually check, like the old women usually depend on that tree called 'Kikwasu'; they usually say that they would only plant when that tree generates some leaves. They say when it generates red leaves, rains are near.
> Q: And when this tree generates the leaves does it usually rain?
> Lulu: Yes.
> Niara: There is also another plant which looks like sisal called 'Ngala atumia', which when it sprouts, then we know that rains are just about the corner. Even now it is there. There is also another bird which makes some certain noise just before rains come, and when I hear it, I just know that rains are about to come.

Respondents observed that there should be efforts to integrate traditional ways of knowing and scientific ways to make weather and climate information more useful. Observations emerging out of our other research (Paterson et al. 2023) highlight the indivisibility of how the rural Kenyan women that the research team met engaged with different 'knowledges'. In other words, there is no clear distinction made between 'official' scientific information shared by various authorities and indigenous knowledge and experience, which is itself imbued with various aspects of shared religious and cultural beliefs. The findings in our study would suggest that reliability is key and that narrow appeals to 'scientific rationality' may have limited success. In future research, we hope to examine more closely the role of women's perceptions of loci of control and self-efficacy. Such an understanding would enable a more informed appreciation of possible barriers to behaviour change communication and, as such, permit more bespoke messaging.

Usability of climate information

Some of our respondents observed that in most cases, the available climate change information from different sources empowers them to better adapt to climate change. They observed that accurate weather predictions (the expected amount and timing of rainfall as well as storm and flood warnings) can lead to changes in farming strategies. Most of the women reported planning and adapting their daily activities according to the weather forecast. Specifically, in the coastal regions women seem to rely on this information in deciding whether and when to smoke fish so that the humidity of the rainfalls would not result in spoilage. In Kilifi, due to the information about expected flooding, people moved to higher ground and were less heavily affected by the water.

Most of them, however, said the climate and weather information relayed by the meteorological department is sometimes 'unreliable, inaccessible, irrelevant and often impractical'. Our key informant interviews with Kenya Meteorological Department (KMD) officials established that this perceived unreliability of climate and weather forecasts is due to its generalized nature. This indicates the need for more localized forecasts. Respondents pointed out that most women in rural areas do not own either radio, TV or a smartphone, yet these are the key avenues through which forecasters communicate. Most of them reported that climate change information is only reliable if offered by experts and in local languages so that most women who are illiterate can understand.

The fact that most climate change information is given through the government bureaucracy headed by climate change experts, agriculturalists and meteorologists using the English language on this relatively new subject is a challenge. Women emphasize they find it helpful to listen to FM radio stations as they broadcast the information in the local language, preferring climate change information to be packaged in native or local languages for improved access and understanding.

Barriers and challenges to uptake of climate change information by women

While barriers to receiving information are considerable for all rural people, women generally face the greatest limitations. Firstly, one of the main issues for women across all regions was access to technology, particularly newer ones

such as smartphones and computers. Apart from lacking and broken devices which seem to be the most prominent technical issues preventing access to information, some women, especially in Kilifi, reported a lack of electricity. Secondly, we occasionally found a lack of self-belief preventing some from demanding a voice in information generation and sharing processes. This manifests as a sense that there was something inherent about 'being a woman' that limited their capacity to understand climate change itself and its causes: 'We women have a reputation of not taking up new information very fast' (Lucy, Kilifi).

This finding demonstrates the gendered nature of the information dynamics that places women at the bottom of knowledge hierarchies. Patriarchal norms can be disempowering in ways that women themselves internalize. The resultant perception creates a dual challenge insofar as women are not perceived as knowledgeable change agents, and the internalized sense of a 'lack of capacity' may prevent some women from demanding a voice in information generation and sharing processes.

Thirdly, illiteracy seems to hinder access to climate-related information. While men can often read, some women emphasized that they cannot and so they have to show written communication to their husbands or children. Thus, information distributed via text message was not helpful in many cases. Finally, women's workload and domestic obligations present barriers to receiving information. Women have primary responsibilities in the private, domestic sphere. They expect to look after the children, keep the house, cook and clean, in addition to outward-facing activities including managing the smallholder farms they own. Some are also involved in small-scale markets. Over and above managing their households, women can also be responsible for supporting the farms of extended family members if the need arises. These multiple responsibilities affect their engagement with climate information in two ways. First, their responsibilities mean that they are incredibly time poor. Their days are already packed, and opportunities to go to meetings, sitting down to watch news or listen to radio or access training (if they were invited) are correspondingly limited:

> Women's constant attention to family commitments takes away their patience and time to get climate information (Janet, Kilifi).

> Sometimes I can't go to the chief *baraza* or even listen to the radio because I get so busy on the farm, and sometimes only hear this information from neighbours (Naya, Kwale).

Second, the timing of climate information sometimes conflicts with farmers' schedules or routines. Women work outside the house most of the day, so they may not access information during the day: 'Time of audience is the biggest challenge, so the radio stations need to design specific programs on weather issues that they can broadcast in the evening when people are at home, even if it's for thirty minutes' (Penelope, Makueni).

Closely related to the timing is the tension between climate change mitigation and the needs and priorities of communities battling poverty. It is important to note that rural communities generally experience such challenges as livelihood insecurity. For instance, women refer to the tension between attending a group meeting and devoting time to providing food for their families. In addition, some women mentioned that the information is not accessible as it might not be distributed everywhere and to everyone or that people cannot afford public transport to a meeting. Access to better information is undoubtedly important, but efforts geared towards addressing material deprivation and time poverty are crucial dimensions to any discussions on climate adaptation.

Aside from the day-to-day responsibilities that women have, patriarchal structures also disadvantage women in terms of information uptake. First, men might not share climate-related information they received in meetings with their wives; secondly, it may be challenging for women to raise some questions in the presence of men; and, finally, some men refuse to let their wives attend meetings or training where climate information is disseminated, an issue recognized by one Kenya Met Office official who noted that 'women are the ones who do farming … and you know the land belongs to men. So everything that is to be done there, the man must give consent' (Peter, Regional KMD Office).

Notwithstanding the concerns around patriarchal disempowerment noted above, many women nonetheless demonstrate a strong desire for education, regardless of their literacy levels. For them, the 'difficulty' resides elsewhere, for example, in how information is communicated. Their comments show that they recognize the ways in which the gendered division of labour and the resultant unequal power dynamics in their communities affect their access to information and, thereby, their ability to make better-informed decisions about the ways they adapt to climate change. Far from being happy with being left uninformed and perceived as lacking ability, they argued strongly for more education: 'The information [via radio] is good … but if we can have someone who can visit farmers and educate us on how we should farm, it can be very helpful and would help us to get better harvest in our farms' (Imara, Kwale).

Powerful cultural norms around women's roles mean that even when efforts are made to address these barriers and make access to information and training more

equitable, success could be limited. While the Agricultural Extension Officers often recognized how gender played out in mixed meetings, they tended to put this down to women's acceptance of their roles and inherent shyness. Women speaking on the same issue, however, offered a different picture. For them, it was men's dismissal of their views that stopped them from speaking. The women also recognize a gendered difference in how they and men handle information of any kind, creating an additional barrier to their ability to access information.

Information-based solutions

With regard to information-based resources, women, for the most part, wish to receive more information on weather forecasts and farming advice. For the former, the exact timing and amount of rainfall were seen as crucial as this information affects the timing of sowing, the choice of seeds and the sowing location. In terms of farming advice, women wished to obtain more instruction on when, how and what to plant, how to take care of the crops and deal with pests, how to take care of the soil and conserve water, as well as further education about chemicals (pesticides and fertilizers).

Women suggested that information curators should increase the relevance of climate change information by providing it early enough to inform their actions: 'Let them continue giving information; if they can send us messages in our phone it will be good so that we get the information early enough' (Omari, Kwale). Additionally, they think there is a need to give more specific information than general information. It is found that women needed information tailored to their community contexts, meaning that only information that concerns them was necessary to avoid apathy. Women observe that most of the information on climate change was too general and emphasize that the information should mirror the contexts of their lives instead of information on disasters from other parts of the country or world.

Women agreed that receiving training and education through personal contact would be desirable, such as visiting their areas or undertaking practical farm demonstrations. Information distributed via mobile phones – despite limitations in phone access noted earlier – through calls and voice messages was seen as beneficial because women even received them when they were not at home, for example, while working on their farms, while the radio and television were only accessible at home. Calls and voice messages were preferable due to illiteracy or difficulties with reading. Some women proposed adding more information channels and multimedia tools to reach people through various means.

With reference to improving the general access to information, three ideas were identified: implementing a set broadcasting time, especially from well used community radio stations; the distribution of climate-related information, which goes hand in hand with establishing a designated climate program; and repeating the same information/programme on different days and times, especially in the evenings. In future iterations of our project, we hope to facilitate such radio programming in the areas we research. Lastly, there was a need to increase the number of agricultural extension services to promote women's understanding, involvement and participation. This can be done by putting women at the centre of activities through the recognition of women's agency, thus ensuring women are enabled to feel they are part of change processes rather than being mere targets.

Conclusion

Our research findings point to a weak information ecosystem with a top-down communication model where although the media or extension officers should avail reliable, timely and usable information to the small-scale farmers, they rarely do so. Our research also established that most women are knowledgeable about climate change, and they demonstrated an awareness of the information deficits that limit their agency and how these can be addressed. There is, however, a lack of 'listening infrastructure' picking up on women's voices. The top-down communication model ignores the vast body of knowledge that women hold, gained from their everyday lived experiences and close connection with their environment. There is also no systematic approach to ensure that information is reaching the community level (ultimate end-users), where the majority of subsistence or small-scale agriculture takes place. Extension officers who are ideally the link between the government and the farmers are not readily available.

Our findings also show that weather forecasts from KMD need to be further localized to ensure relevance while capturing local realities. This will rebuild trust in the reliability of such information. The communication of climate information in English or Kiswahili is a major hindrance to accessibility and usability of this information since a majority of the women are not able to access these languages and/or may not be literate. Climate information should therefore be disseminated through local languages for ease of access.

The general lack of ownership of technology such as smartphones, radio and TV also limits women's capacity to access climate information, and women's roles as caregivers and related domestic duties leave them with no time to

access information either from the media or experts. Finally, we observed that information curators, including meteorological agencies, must seek to improve the relevance of information to make it timely, reliable and disaggregated to ensure that it's relevant to the specificities of different communities.

We hope that this research demonstrates the value of placing intersectional analysis and gender at the centre of research into communication to support climate adaptation (Kajumba & Shakya 2021). Our close examination of power dynamics and structural barriers within rural communities has provided necessary context for research primarily focused on how and why knowledge of climate change is generated as it is. The larger challenge now is to incorporate improved understanding of the lived realities of rural Kenyans into efforts at the local, national and international level to facilitate adaptation at the sharp end of climate change. Ensuring that rural women are at the centre of adaptation efforts recognizes the work they already do and the knowledge(s) they have gained in these endeavours. More importantly, it is crucial to ensure that rural women, disproportionately facing challenging socio-economic circumstances and working to sustain rural communities through (gendered) labour in both public and private domains, are recognized as both agents and experts whose material and informational demands must be met if intersectional climate justice is to be achieved.

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