



EVIDENCE EXPLAINER

Making climate information services more accessible and useful for women farmers

authored by

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Key messages

- *Despite improved climate monitoring, most climate information systems in low- and middle-income countries still lack the partnerships and mechanisms needed to translate forecasts into localized, actionable advisories for smallholder farmers—especially women.*
- *Effective climate information systems must engage women from the outset, using a mix of low-tech and peer-led delivery methods, bundle climate information systems with training and services to ensure relevance, accessibility and usability.*
- *Advisories need to move beyond their focus on staple or high-value crops managed by men, and include women's crops, post-harvest roles, market activities and seasonal decision-making timelines.*

- *Scaling gender-responsive climate information systems requires institutional coordination, cross-sector partnerships and gender-responsive monitoring and accountability frameworks.*

Addressing gendered barriers to help women navigate climate vulnerabilities

Reliable and timely access to climate information services (CIS) can significantly enhance mitigation and adaptation (<https://www.researchgate.net/publication/285588454>) efforts in response to climate change. Despite its potential, many farmers—especially women (<http://www.ccafs.cgiar.org/>) and those from vulnerable groups—face structural challenges in accessing and using CIS for informed decision-making. Gendered differences (<https://doi.org/10.1007/s10584-022-03445-5>) in access, needs, preferences and CIS usage are frequently overlooked during service design and delivery. Overlooking gendered accessibility and usability can exacerbate climate vulnerabilities for women, who are typically disproportionately affected within agrifood systems.

To identify gendered barriers to accessing and usability of CIS, we conducted a scoping review, with a focus on low- and middle-income countries (LMICs). Through a systematic search strategy, we selected 36 empirical studies for the review. Of these, 30 studies focused on Africa, followed by 5 studies. Only one study was from South America.

Translating forecasts into localized advisories remains a gap

Our review highlights that many LMICs have strengthened climate-data infrastructure, including components that collect, process, store, analyze and disseminate climate-related information. However, turning forecasts into actionable, location-specific advisories that guide people on actions they should take in the light of the forecast remains a challenge. For example, seasonal forecasts often miss the localized indicators smallholder farmers need, such as dates of rainfall, expected dry spells and intra-seasonal rainfall distribution, to help guide planting and risk management decisions.

It is important to coordinate between national meteorological services, agricultural extension services, and community intermediaries who can translate forecasts into

usable advice. Promising innovations are emerging and NGOs are playing a key role in piloting and scaling context-specific advisories and dissemination that prioritizes co-design and usability.

Promising approaches include participatory tools such as the Participatory Scenario Planning Tool (PSP) (<https://ccafs.cgiar.org/resources/publications/guide-participatory-scenario-planning-psp-experiences-agro-climate>), Participatory Integrated Climate Services for Agriculture (<https://research.reading.ac.uk/picsa>) (PICSA) and Climate Smart Villages (<https://ccafs.cgiar.org/climate-smart-villages>) (CSVs). NGOs are increasingly working in partnership with meteorological agencies, agriculture ministries and community organizations to combine scientific forecasts with local knowledge and participatory design. As a result, these tools are able to offer context-specific CIS that better reflect the realities of rural farmers, especially women farmers who have limited time, literacy or access to resources. However, scaling these innovations and sustaining their impact requires systematic institutional collaboration and coordination.

CIS content often fails to reflect women's agricultural roles, crops and decision-making timelines

Most CIS in LMICs primarily focus on staple or high-value crops typically managed by men. Women are often responsible for cultivating crops such as cassava, vegetables and legumes, yet advisories relevant for these crops are rarely included in climate advisories. As a result, many forecasts are less relevant, or entirely unusable, for women farmers.

Additionally, seasonal patterns influence women's agricultural roles and decision-making. In some farming systems, men control decisions during the main (long rain) season when staple crops are grown. Women have more autonomy during the short rain season (<https://doi.org/10.1016/j.crm.2017.03.002>), often managing lower labor demanding crops. CIS models rarely account for these seasonal dynamics in gendered decision-making and focuses on major staple crops grown in the main season. As a result, the information has limited utility for women.

Women also play key roles in post-harvest handling, food processing and selling in local markets. However, CIS content tends to only focus on production, neglecting off-farm weather forecasts for market and post-harvest planning. For example, in Ghana (<https://doi.org/10.1016/j.ciser.2021.100275>) women farmers report that sudden rainfall disrupts their drying and trading activities, which directly affects their incomes and food security. Similarly, in the Philippines (<https://hdl.handle.net/10568/111447>) farmers emphasized that they are less concerned with the forecast itself and more with what it implies for their ability to harvest and sell wet rice (*basang palay*) at a fair price, even during rainy periods. These examples highlight the need to expand CIS beyond

production to include weather-informed guidance for post-harvest and market planning, which are critical for women's livelihood strategies.

These content gaps are compounded by gender norms and structural inequalities that limit women's access to information, resources and decision-making autonomy. Intersectional barriers, such as age, literacy, intra-household power dynamics and geographic isolation further hinder women's ability to access and act on climate information. In Senegal (<https://doi.org/10.1175/WCAS-D-15-0075.1>) for instance, younger or lower-status women in extended households often lack the authority or tools to respond to advisories in a timely way, making CIS even less effective for those with the least power.

Together, these limitations highlight the need for gender-responsive CIS content that reflects the full range of women's agricultural responsibilities and decision-making contexts, including crop diversity, seasonal agency and post-harvest needs.

Inclusive design and low-tech, peer-led delivery are key to equitable CIS

Gender-responsive CIS models work best when women farmers are engaged from the beginning— not just as users, but as co-creators. This early involvement improves the usability, trust and adoption of CIS products. To address the multiple barriers women face, such as limited control over ICT tools, low literacy, mobility restrictions and time poverty, CIS must be delivered through hybrid, multi-channel approaches. These approaches should combine methods such as community meetings and radio with flexible, low-tech digital formats such as Interactive Voice Response (IVR), Unstructured Supplementary Service Data (USSD) codes and local language radio. These tools allow women to access information asynchronously, on demand and in culturally relevant formats.

When delivered through trusted, peer-led networks, such as women's groups, cooperatives, Dimitra Clubs (<https://www.fao.org/evaluation/highlights/detail/dimitra-clubs/>), and listening groups, these tools are more credible, context-specific and accessible. These networks reinforce perceived credibility and understanding of the information in order to know what it means for their activities and actions, and be able to make appropriate, climate-informed decisions. These mechanisms also help overcome exclusion from male-dominated extension services. Bundling CIS with complementary services, such as training, finance, drought-tolerant varieties of crops and post-harvest technologies, further enhances usability, especially for women managing non-staple crops under constrained time and resource conditions.

Crucially, these delivery innovations must be embedded within institutional systems. Empowering peer networks to serve as part of agricultural extension and feedback

structures can support long-term learning and accountability, while advancing inclusive agricultural knowledge systems overall.

Embedding CIS in policy, partnerships and gender-responsive accountability is important for scaling

Sustainable and scalable CIS that work for women farmers requires more than improving content and delivery models. Gender-responsive CIS must be embedded into national climate and agricultural extension policies and supported by long-term financing. This work should be supported by cross-sector collaboration among national meteorological agencies, agriculture ministries, local intermediaries and women's organizations. Crucially, monitoring and accountability mechanisms, such as gender indicators, participatory feedback loops and adaptive learning systems, are essential for tracking equity outcomes. Without these systemic enablers, even well-designed CIS models risk fragmentation and limited long-term impact.

You can read this article at <https://gender.cgiar.org/news/making-climate-information-services-more-accessible-and-useful-women-farmers> or frame the following QR Code with your mobile phone camera:



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