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Measuring Gender Sensitive Climate Adaptation in Agrifood Systems for Climate Finance

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Introduction

Climate change disproportionately affects women, who often face greater exposure to shocks and stressors and have less capacity to adapt to its negative impacts. This is particularly acute for those reliant on exposed livelihoods, such as in agrifood systems (AFS). Although there are strong global commitments for the integration of gender in climate action, there are few frameworks that measure and track gender equality in climate adaptation.

There is a need for clear and flexible national-level frameworks to help countries identify their progress towards gender integration in climate adaptation. Gender-sensitive frameworks would also help strengthen gender considerations when determining climate financing and steer potential financing to accelerate progress towards gender equality. Without such frameworks, it becomes difficult to direct climate finance strategically to women in the AFS and to systematically track the adaptation outcomes associated with the funds they receive.

This brief draws on a literature review of existing policies and frameworks and key informant interviews (KIIs) with experts in designing gender-informed national-level frameworks conducted by researchers at the International Food Policy Research Institute (IFPRI) under the Gender, Climate Change, and Nutrition (GCAN) Integration Initiative and the CGIAR Climate Action Science Program. In this brief, we summarize the need for clear and applicable national-level frameworks to measure gender integration in climate change adaptation strategies and how such guidance could be used to direct climate financing to address gender equality.

Gender Issues in AFS Climate Adaptation

While globally, women account for 36% of all workers in AFS, they are the main source of women's employment in many low- and middle-income countries (LMICs). This includes South Asia, where 71% of women in the labor force work in AFS, compared to 47% of men; and in Sub-Saharan Africa, where AFS account for two thirds of women's employment compared to 60% of men's employment (FAO, 2023).

Across global AFS, women are disproportionately affected by the negative impacts of climate change, driven by gender disparities in access to necessary resources, unequal gender norms, and unfavorable enabling environments (Lecoutere et al., 2023; Bryan et al., 2024). Women often have limited access to resources such as land and agricultural assets, reduced access to services like climate information and climate finance, and face social norms that restrict their mobility and livelihood opportunities (Bryan et al., 2024). They also typically have less decision-making power and occupy fewer leadership roles than men at all levels (national, sub-national, community, and household), limiting their influence over potential adaptation and mitigation strategies (Theis et al., 2019). This difference in exposures is particularly acute in regions with higher climate-associated risks, where women's livelihoods are especially climate-sensitive and where gender inequality is more pronounced (Lecoutere et al., 2023).

And while extensive evidence demonstrates that gender disparities in global AFS drive unequal exposure and adaptive capacities between men and women (Bryan et al., 2024; Bryan et al., 2016), research also shows that women's empowerment and active engagement in climate action contribute to more resilient, equitable, and sustainable systems (De Pinto et al., 2020).

Strengthening gender equality in AFS is both a moral imperative and a strategic pathway to promoting stronger adaptation strategies and achieving the Sustainable Development Goals

(SDGs), particularly SDG 2 on Zero Hunger, SDG 5 on Gender Equality, and SDG 13 on Climate Action. There is a need to capture efforts addressing gender in climate change adaptation through consistent and comparable measurement frameworks. Yet to date, such measurement frameworks remain too limited to yield actionable and comparable insights.

Financing Climate Change Adaptation

Even though AFS generate around one third of all greenhouse gas emissions, employ the majority of the population in LMICs, and are essential for humanity's survival, the sector continues to be neglected by climate finance. The neglect has resulted in rapidly increasing AFS emissions; regional and global slowdowns and even contractions of agricultural productivity growth—especially in Total Factor Productivity (TFP) growth; heightened destitution among smallholder farmers, particularly women; and more volatile and elevated global prices for food and other agricultural products.

The most recent Landscape of Climate Finance for Agrifood Systems report (CLIC, 2025) notes that while financial flows to AFS doubled from 3.6% to 7.2% of global climate finance, to USD 95 billion by 2021/22, most of this additional finance stems from domestic sources in China and Europe and not in the LMICs that are least able to cope with climate change impacts. Importantly, only 14% of this climate finance supports climate change adaptation, mostly from grant financing. Sub-Saharan Africa, at USD 9 billion, received only 8% of total climate finance, but most adaptation finance is directed toward this region (CLIC, 2025).

The majority of climate finance continues to support mitigation, generally investments in biomass and agrivoltaics, which receives climate finance from three funding streams: government-supported debt, national development banks and private-sector equity financing, largely for energy projects.

However, a further portion of climate finance simultaneously supports dual-benefit interventions, that deliver both mitigation and adaptation outcomes, for example, agroforestry and improved grazing projects. Arguably, many agricultural energy projects that are classified as mitigation finance are also dual-purpose interventions, for example, solar-powered irrigation technologies. Dual-purpose finance was estimated at USD 37 billion in 2021/22.

Both domestic and private capital remain absent in Sub-Saharan Africa as well as in Latin America. CLIC (2025) suggests that this is due to weak enabling environments, real and perceived risks, and a lack of risk-reduction tools and instruments. Moreover, the study calls for gender-sensitive interventions, including targeted finance for women-led farming initiatives, to improve equity in AFS but stops at suggestions of how this could be achieved, despite the high payoffs of directing climate finance at women in AFS.

Using climate finance to close the gender gap in farm productivity and the AFS wage gap could increase global gross domestic product by nearly USD 1 trillion; reduce global food insecurity by about 2% and the number of food-insecure people by 45 million. Similarly, financing small-scale farmer projects that empower women, an additional 235 million people would have greater resilience to climate change and conflict. Despite this, only 6% of bilateral finance projects, including those without adaptation intention, treat gender as fundamental, while more than half of the interventions "mainstream" gender (FAO, 2023).

With women making up more than half of the agricultural labor force in many countries in Sub-Saharan Africa, climate-change induced changes in farming practices, water access and fuelwood resources particularly affect women and girls who are expected to cook food, and to procure water and domestic fuel for their families. But finance for climate-smart agriculture has

not adequately considered the gender gap in access to agricultural and other resources (Wong, 2016).

A key contributing challenge to poor alignment of climate finance and improvements in women's climate change adaptation is the lack of means to measure gender integration in adaptation efforts through adequate frameworks at national level.

Challenges to Measure Gender Integration in National-Level Climate Change Adaptation in AFS

There are global frameworks, such as the UNFCCC's Enhanced Lima Work Programme on Gender and its Gender Action Plan, that call for gender-responsive policies and inclusive decision-making across adaptation, mitigation, and finance. Moreover, several adaptation frameworks at national, sub-national and project level support measurement of indicators that assess how adaptation efforts reduce climate vulnerability and support socio-economic development. Examples of such frameworks include the Global Environment Facility (GEF) Results Measurement Framework Tracking Tool (GEF, 2022); Tubiello and Rosenzweig (2008)'s climate change impact and adaptation metrics; CCAFS Multilevel Framework (Bonilla-Findji et al., 2021); the Gender Assessment and Monitoring of Mitigation and Adaptation (GAMMA) (Gender CC, 2021); and the MAP-Norway monitoring and evaluation systems (Gutierrez-Montes et al., 2020). However, these frameworks vary in their level of measurement and integration of gender. Some do not consider gender (Tubiello and Rosenzweig, 2008) whereas others embed gender considerations into each indicator (Bonilla-Findji et al., 2021) or the framework itself (Gender CC, 2021). However, they tend to focus on project-level assessments.

Frameworks that consider the integration of gender equality into climate adaptation strategies and those that are operational at national level are lacking. Such frameworks could enable assessment of whether climate policies and finance successfully reduce gender disparities in AFS and improve well-being outcomes and could strengthen the accountability that private-sector and commercial investors are seeking.

Drawing on a literature review and KIIs, we find that the development and application of national-level frameworks face significant challenges that limit their ability to provide clear and comparable insights. Specifically, while participatory approaches can generate rich, context-specific insights—such as how women and men perceive climate risks, access resources, or benefit from adaptation interventions—that strengthen the legitimacy of metrics by reflecting lived experiences, their highly localized nature makes it difficult to aggregate findings across regions or countries, limiting their usefulness for national or global reporting.

In turn, national household and agricultural surveys provide standardized, comparable data that can be disaggregated by sex and tracked over time, but this often comes at the cost of losing the nuanced, context-specific perspectives that shape how women and men experience climate risks and adaptation benefits. Perception-based surveys offer a middle ground by capturing subjective experiences of vulnerability and adaptive capacity, yet they face challenges related to survey design, response biases, and the resources required for repeated data collection.

It is also difficult to develop gendered climate change metrics that consider both climate change adaptation and mitigation. This is, however, important as dual benefit investments represent a larger—and growing—share of total climate finance compared to

adaptation-focused finance. The complexity lies in smallholder farmers—especially women—primarily adopting practices for adaptation rather than mitigation, while many adaptation actions have unintended trade-offs or unmeasured co-benefits for mitigation; similarly, many mitigation investments, such as those for biomass and agrivoltaics in the AFS space, also support adaptation action. Monitoring systems must therefore also capture these overlaps and address gendered barriers to ensure equitable and accurate tracking of outcomes (Akinyi et al., 2021; Nassif et al., 2025).

Not only is it difficult to aggregate and compare adaptation indicators beyond the project level due to local specificities, but it is also challenging to design development indicators—such as those measuring progress in health, diets, or education—since it is often unclear whether improvements are the result of adaptation practices or broader development processes (FAO, 2017). Key informants, moreover, noted that both vulnerability and adaptation needs are constantly evolving because of a changing climate and an array of different hazards that represent different risks. Effectively measuring adaptation progress would involve measuring evolving targets considering not only social and economic changes but also evolving climatic shocks and stressors.

The Way Forward

Even with these challenges, there is a need for a framework that could be consistently applied and yield comparable insights across countries to meaningfully inform gender-sensitive climate finance efforts. Climate change metrics and frameworks that provide reliable data on men and women's exposure, resilience capacities, and responses to climate change can help countries design and finance adaptation and mitigation strategies that effectively address the needs of both women and men.

Improving adaptation tracking begins with systematically taking stock of existing adaptation efforts and sources of finance across governments, the private sector, donors, and civil society, including initiatives affecting women and other marginalized groups. Establishing a comprehensive database—particularly in sectors like AFS—would support more consistent measurement of climate risks, development outcomes, and gender-differentiated impacts, in line with the UNFCCC Global Stocktake's call for robust, gender-responsive monitoring and evaluation (UNFCCC, Decision 1/CMA.5).

Adaptation metrics can be further strengthened by leveraging existing national and international data systems or by integrating gender-sensitive indicators into current surveys, offering a feasible and cost-effective way to identify broad patterns of vulnerability and resilience despite limited ability to capture local-level dynamics.

The GCAN Initiative is developing a new flexible, national-level framework that builds upon these lessons learned and provides guidance to stakeholders to meaningfully measure gender integration in climate adaptation efforts and support gender-responsive climate finance in AFS. The framework draws on lessons learned from existing global action plans to guide climate change adaptation and gender mainstreaming priority areas (UNFCCC M&E Framework, UNFCCC Gender Action Plan), gender integration into AFS (Njuki et al., 2023), gender and nutrition integration in climate policies and investments (Theis et al., 2019), women's empowerment in agriculture frameworks and indicators (Alkire et al., 2013; Malapit et al. 2019), and women's empowerment in governance measures (Ragasa et al., 2022).

Table 1 presents a checklist of key questions by domain, drawn from the framework under development, to guide practitioners in making informed decisions on gender integration in climate change adaptation and associated climate finance.

Table 1: Gender Considerations in AFS for Adaptation Financing

Domain	Key questions	Gender integration
Enabling Environment	*-To what extent do national-level climate and agricultural policies align with national gender policies? Do national adaptation plans and/or Nationally Determined Contributions (NDCs) explicitly reference considerations for gender and women's empowerment?* *-Are national-level ministries employing and training staff to focus on gender integration, and/or providing capacity-sharing resources on gender?* *-Do climate adaptation [and dual-purpose] budgets earmark, allocate, and track resources for gender integration?* *-Do domestic climate finance instruments address the specific and distinct needs of women and men farmers and other marginalized groups and are demands placed on international instruments to do the same?* *-Do national-level M&E systems track gender-responsive indicators?* *-Are social institutions promoting equal gender norms?*	○ *Gender-blind* ○ *Gender-aware* ○ *Gender-responsive* ○ *Commitment to equity /gender transformative*
Exposure to Disturbances	*-Do vulnerability assessments identify differentiated climate risks for women, men, youth, and other marginalized groups?* *-What is the overall share of men and women employed in AFS?*	○ *Gender-blind* ○ *Gender-aware* ○ *Gender-responsive* ○ *Commitment to equity /gender transformative*
Decision-making context	*-To what extent are women and marginalized groups involved and represented in national-level decision and planning bodies for climate adaptation?* *-Are adaptation programs focused on addressing root causes and gender-based barriers (including unequal gender norms)?* *-Are sex-disaggregated data collected and used for adaptation monitoring?*	○ *Gender-blind* ○ *Gender-aware* ○ *Gender-responsive* ○ *Commitment to equity /gender transformative*
Resilience Capacities	*-How do women access and use extension and climate information services; climate finance mechanisms; natural resources (land, water, forests); climate smart-agricultural approaches; and market and economic opportunities compared to men?*	○ *Gender-blind* ○ *Gender-aware* ○ *Gender-responsive* ○ *Commitment to equity /gender transformative*

Importantly, gender integration is best understood as a continuum, rather than a single, fixed outcome. At the most basic level, no mention of gender reflects a *gender-blind* approach. The

next step is to be *gender-aware* by explicitly acknowledging gender and by analyzing how gender relates to issues such as climate change and climate finance, including recognition of women as both vulnerable groups and agents of change. *Gender-responsive* climate finance goes further by stating gender equality and women's empowerment as clear objectives indicating gender intentionality in resource mobilization, while *gender-transformative* investments commit to gender equality as primary adaptation finance objective with detailed, resourced plans with defined actions, timelines, responsibilities, and measurable targets.

Conclusion

Efforts to strengthen gender-sensitive adaptation metrics in AFS are advancing, but substantial gaps remain in data availability, institutional capacity, and the ability to meaningfully capture gender-differentiated climate risks and outcomes. No single approach will meet the needs of all countries; rather frameworks require flexible tools to reflect diverse contexts while grounded in shared principles for transparency, comparability, and feasibility.

We highlight key domains and guiding questions that operate as a starting point for this consistent, yet flexible approach. Strengthening adaptation measurement systems in AFS will help ensure that adaptation strategies better reflect the lived realities of women and men and support countries in meeting their commitments to addressing climate change, food security and nutrition, and equality. This framing aims to also guide more effective climate financing by emphasizing the need to consider gender-intentional approaches when making climate finance decisions and to prioritize resource allocation that most effectively accelerates climate adaptation and gender equality efforts.

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References

Alkire, S., Meinzen-Dick, R., Peterman, A., Quisumbing, A. R., Seymour, G., and Vaz, A. (2013). The Women's Empowerment in Agriculture Index. *World Development, 52*, 71–91. https://doi.org/10.1016/j.worlddev.2013.06.007

Akinyi, D.P., Ng'ang'a, S.K., and Girvetz, E.H. (2021). Trade-offs and synergies of climate change adaptation strategies among smallholder farmers in sub-Saharan Africa: A systematic review. Regional Sustainability, 2(2), pp.130–143. https://doi.org/10.1016/j.regsus.2021.05.002

Bryan, E., Alvi, M., Huyer, S. and Ringler, C. (2024). Addressing gender inequalities and strengthening women's agency to create more climate-resilient and sustainable food systems. *Global Food Security,* 40:100731. https://doi.org/10.1016/j.gfs.2023.100731

Bryan, E., Bernier, Q., Espinal, M., and Ringler, C. (2016). Integrating Gender into Climate Change Adaptation Programs: A Research and Capacity Needs Assessment for Sub-Saharan Africa. CCAFS Working Paper no. 163. Copenhagen, Denmark: CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS). https://hdl.handle.net/10568/72482

CLIC (2025). Landscape of Climate Finance for Agrifood Systems 2025. Available at: https://climateshotinvestor.org/publications/landscape-of-climate-finance-for-agrifood-systems-2025

Bonilla-Findji O., Eitzinger, A., and Andrieu, N. (2021). Implementation Manual: CCAFS Climate-Smart Monitoring Framework: Tackling uptake of CSA options and perceived outcomes at household and farm level. Wageningen, the Netherlands: CCAFS. https://hdl.handle.net/10568/113498

De Pinto, A., Seymour, G., and Bryan, E. *et al.* (2020). Women's empowerment and farmland allocations in Bangladesh: evidence of a possible pathway to crop diversification. *Climatic Change* 163, 1025–1043. https://doi.org/10.1007/s10584-020-02925-w

FAO. (2023). *The status of women in agrifood systems.* Rome.

FAO. (2017). *Tracking Adaptation in Agricultural Sectors: Climate Change Adaptation Indicators.* Rome: Food and Agriculture Organization of the United Nations.

GEF. (2022). Guidelines on the implementation of the GEF-8 results measurement framework. Washington, DC: Global Environment Facility. Results_Framework_Guidelines_2022_06_30.pdf (thegef.org)

GenderCC. (2021). The Gender assessment and monitoring of adaptation and mitigation (GAMMA) methodology: a practical handbook on gender and urban climate policy. Gender CC Women for Climate Justice. https://www.gendercc.net/fileadmin/inhalte/dokumente/8_Resources/2021-gendercc_GAMMA-vers1-1.pdf

Gutierrez-Montes, I., Arguedas, M., Ramirez-Aguero, F., Mercado, L., and Sellare, J. (2020). Contributing to the construction of a framework for improved gender integration into climate-smart agriculture projects monitoring and evaluation: MAP-Norway experience. *Climatic Change*, *158*, 93-106.

Lecoutere, E., Mishra, A., Singaraju, N., Koo, J., Azzarri, C., Chanana, N., Nico, G. and Puskur, R. (2023). Where women in agri-food systems are at highest climate risk: a methodology for mapping climate-agriculture-gender inequality hotspots. *Frontiers in Sustainable Food Systems,* https://doi.org/10.3389/fsufs.2023.1197809.

Malapit, H. J., Quisumbing, A. R., Meinzen-Dick, R. S., Seymour, G., Martinez, E. M., Heckert, J., Rubin, D., Vaz, A., and Yount, K. M., Gender, Agriculture, and Assets Project, Phase 2 (GAAP2) Study Team. (2019). Development of the project-level Women's Empowerment in Agriculture Index (pro-WEAI). *World Development, 122*, 675–692. https://doi.org/10.1016/j.worlddev.2019.06.018

Nassif, G., Ringler, C. and Bryan, E., 2025. Gender-just mitigation in the agrifood systems sector: potential and pitfalls. *Annual Review of Resource Economics*, 17, pp.11.1–11.19. https://doi.org/10.1146/annurev-resource-112923-094228

Njuki, J., Eissler, S., Malapit, H., Meinzen-Dick, R., Bryan, E., and Quisumbing, A. (2023). *A review of evidence on gender equality, women's empowerment, and food systems*. In J. von Braun, K. Afsana, L. O. Fresco, & M. H. A. Hassan (Eds.), *Science and Innovations for Food Systems Transformation* (pp. 165–189). Springer.

Ragasa, C., Kyle, J., Kristjanson, P. M., and Eissler, S. (2022). *Conceptualizing women's empowerment in agrifood systems governance: A new framework* (IFPRI Discussion Paper No. 2153). Washington, DC: International Food Policy Research Institute.

Theis, S., Bryan, E., Choufani, J., Ringler, C. and Meinzen-Dick, R. (2018). Building Resilience for All: The Gender and Social Dynamics of Resilience. GCAN Policy Note 11. Accessed here: https://gcan.ifpri.info/files/2018/11/GCAN-Note-11_Resilience_finalDraft_web-1.pdf

Tubiello, F. N., and Rosenzweig, C. (2008). Developing climate change impact metrics for agriculture. *Integrated Assessment Journal*, *8*(1).

Wong, S. (2016). Can Climate Finance Contribute to Gender Equity in Developing Countries? *Journal of International Development*, 28(3), 428–444. https://doi.org/10.1002/jid.3212

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