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**Measuring Gender-Responsive Climate Change
Adaptation in Agrifood Systems**

A Country-Level Framework

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ABSTRACT

Efforts to strengthen climate change adaptation in agrifood systems increasingly recognize the importance of addressing gender-differentiated vulnerabilities and resilience. Yet, monitoring and evaluation (M&E) systems still struggle to capture how women and men experience and are coping and adapting to climate change. This paper reviews existing climate change metrics frameworks across project, local, and national levels and assesses their approaches to gender integration. Drawing on a literature review of eleven adaptation metrics frameworks and six key informant interviews with experts involved in climate M&E system development, we identify persistent challenges related to data availability, attribution, standardization, institutional capacity, and the dynamic nature of climate risks. Building on these insights, the paper proposes a flexible, national-level framework designed to assess gender integration in adaptation efforts within agrifood systems. By highlighting both lessons learned and practical entry points for action, this paper aims to support governments, development partners, and practitioners in designing gender-responsive adaptation metrics in agrifood systems.

Keywords: Monitoring & Evaluation systems, gender, adaptation metrics, climate change, agrifood systems

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ACRONYMS

AMAT	-	Adaptation Monitoring and Assessment Tool
COP	-	Conference of the Parties
GCAN	-	Gender, Climate Change and Nutrition Integration Initiative
GEF	-	Global Environment Facility
GESI	-	Gender Equality and Social Inclusion
IFPRI	-	International Food Policy Research Institute
KII	-	Key Informant Interview
KI	-	Key Informant
LMIC	-	Low- and Middle-Income Country
MDD-W	-	Minimum Dietary Diversity for Women
M&E	-	Monitoring and Evaluation
MEL	-	Monitoring, Evaluation, and Learning
NAP	-	National Adaptation Plans
NDC	-	Nationally Determined Contributions
PMERL	-	Participatory Monitoring, Evaluation, Reflection and Learning
SDG	-	Sustainable Development Goals
SIGI	-	Social Institutions and Gender Index
TAMD	-	Tracking Adaptation and Measuring Development
UAE	-	United Arab Emirates
UNFCCC	-	United Nations Framework Convention on Climate Change
USAID	-	United States Agency for International Development
WEAI	-	Women's Empowerment in Agriculture Index
WEMNS	-	Women's Empowerment Metric for National Statistical Surveys

INTRODUCTION

It has been well documented that gender disparities in agrifood systems result in women and men experiencing different levels of vulnerability to climate change and gender gaps in adaptive capacities (Bryan et al. 2024; Bryan et al. 2016; Koo et al. 2022; Md et al. 2022). There is a need to develop standardized metrics to track how interventions, policies, and approaches strengthen adaptive capacities, increase resilience of those most vulnerable to climate change impacts, and reduce men's and women's vulnerabilities to climate change. Such frameworks have been developed to an extent, but there does not yet exist a national-level framework tailored to agrifood systems that helps governments or practitioners track gendered adaptation capacities and vulnerabilities. In this paper, we examine the challenges and lessons learned in developing standardized adaptation metric frameworks in agrifood systems, with a particular focus on gender integration. Our aim is to support the development of national-level metrics that enable governments, policymakers, and development partners to track progress in gender-intentional climate action within agrifood systems.

Background

Women are disproportionately affected by climate change, particularly in regions with high exposure to climate risks, strong dependence on climate-sensitive livelihoods, and persistently high gender inequality (Lecoutere et al. 2023; Sitko et al. 2024). Their adaptive capacity is often constrained by limited access to land, assets, climate information, finance, and other services, as well as by restrictive social norms that limit mobility, participation, and livelihood opportunities (Bryan et al. 2024). Although men and women may hold different preferences for climate action, women's reduced decision-making power and limited opportunities for leadership further restrict their ability to shape adaptation strategies. As a result, climate change can exacerbate preexisting gender disparities in well-being outcomes, including food security and nutrition (Lee et al. 2021; Theis et al. 2019).

Evidence demonstrates that when women are empowered and actively engaged in climate governance, they contribute to more resilient, equitable, and sustainable food systems (De Pinto et al. 2020). Strengthening gender equality in agrifood systems is therefore both a moral imperative and a strategic pathway to achieving the Sustainable Development Goals (SDGs), particularly SDG 2 on Zero Hunger, SDG 5 on Gender Equality, and SDG 13 on Climate Action. Addressing gender disparities enhances food security, climate resilience, and sustainable development outcomes simultaneously (FAO, NRI, AWARD 2025; Sitko et al. 2024). As such, there is a need to examine reliable data that tracks and monitors efforts to reduce gender disparities. Climate change metrics and frameworks that generate reliable data on gendered vulnerabilities, resilience levels, and adaptation responses are essential for informing strategies that effectively address the needs of both women and men. They also enable policymakers to assess whether climate policies and programs are reducing and/or potentially exacerbating gender disparities in agri-food systems. Without strong accountability mechanisms, climate actions risk overlooking or worsening gendered impacts, particularly as climate hazards intensify.

Recognizing this, international and national frameworks increasingly emphasize the importance of gender-responsive climate action. For a country-level example, Nigeria's National Climate Change Policy (2021–2030) includes explicit commitments to women's equal participation and leadership in climate governance (Ragasa et al. 2023). At the global level, the United Nations Framework Convention on Climate Change's (UNFCCC) Enhanced Lima Work Programme on Gender and Gender Action Plan calls for gender-responsive policies and inclusive decision-making across adaptation, mitigation, and finance. The Sendai Framework for Disaster Risk Reduction (2015–2030) likewise underscores the need to integrate gender perspectives into disaster risk management. According to the UNFCCC synthesis of 168 Nationally Determined Contributions (NDCs), 79 percent of Parties reference gender in their submissions

and 33 percent explicitly commit to integrating gender considerations during implementation. Many Parties describe gender as a cross-cutting element across adaptation and mitigation, with 40 percent incorporating tools such as gender analyses, indicators, sex-disaggregated data, and gender-responsive budgeting (FCCC/PA/CMA/2023/12).

Despite this growing recognition, few monitoring and evaluation (M&E) systems are equipped to assess gender-differentiated impacts of climate adaptation and mitigation in agriculture. Few also sufficiently address or integrate considerations related to nutrition. For example, Chile's National Adaptation Monitoring and Evaluation Framework provides standardized indicators across sectors to monitor implementation, evaluate effectiveness of adaptation actions and support climate finance decisions, but it does not integrate gender or nutrition as key components. Bullock et al. (2025) presented a comprehensive review of 88 climate and gender-related toolkits, manuals, and institutional resources to assess gender integration in climate adaptation tracking processes. They found only 14 percent (n=12) of the 88 identified resources considered gender with climate adaptation. The remaining resources considered gender as the main focal point or climate and adaptation as the main focal point, separating the integration of gender with climate as a key entry point to address gender-sensitive climate adaptation strategies.

Additionally, a recent comparative study of nine countries (Njuguna et al. 2024) finds that although national monitoring, evaluation, and learning (MEL) systems for climate adaptation are emerging, major gaps remain. Data availability is limited, baseline information is often missing, and fragmented or externally sourced data weaken the coherence of national monitoring systems. In addition, technical and financial constraints hinder implementation, digital tools are underdeveloped, and MEL systems rely largely on quantitative data, with limited integration of qualitative information on gender equality and social inclusion (Njuguna et al. 2024). FAO and UNDP (2023) show that while some countries, such as Colombia, Guatemala, and Viet Nam, have advanced adaptation M&E frameworks that have included gender-disaggregated indicators, persistent challenges, such as unclear institutional mandates, fragmented data systems, and resource limitations, constrain full operationalization.

This fragmented landscape has prompted global efforts to develop more coherent and standardized adaptation indicators. The UNFCCC established the Global Goal on Adaptation under the Paris Agreement (COP21) in 2015 to guide countries' adaptation and resilience-building efforts and promote both collective and local action. To advance this agenda, the UAE–Belém Work Programme on Indicators was launched at COP28 as a two-year initiative to create a globally applicable set of indicators aligned with the UAE Framework for Global Climate Resilience. Building on the Glasgow–Sharm el-Sheikh work programme and formalized through decision 2/CMA.5, this effort sought to strengthen MEL systems for adaptation. Throughout 2024 and 2025, technical experts refined a preliminary list of up to 100 indicators, incorporating inputs from Parties and observers and drawing on global frameworks such as the SDGs.

At COP30, this preparatory work culminated in [CMA/2025/L.25](#), the draft decision text adopted under the CMA that sets out the final Belém Adaptation Indicators. The framework ultimately comprises 59 indicators intended to support national approaches for tracking adaptation progress. The decision clarifies that these indicators do not create new obligations, benchmarks, evaluation criteria, standardized methodologies, data-collection requirements, or compliance frameworks, and must not prejudice national positions or conflict with Parties' national circumstances or with the principles of the Convention and the Paris Agreement. Instead, CMA/2025/L.25 underscores that adaptation is inherently context-specific and should be interpreted through contextual information, including optional disaggregation categories determined by each Party. It further emphasizes that no single adaptation approach should be considered universal or superior, highlighting the importance of nationally led, diverse, and context-appropriate pathways. The decision also recalls earlier mandates and reinforces key cross-cutting considerations such

as gender, human rights, intergenerational equity, social justice, and the meaningful participation of marginalized and underrepresented groups. Finally, it establishes the Belém–Addis vision on adaptation, a two-year policy-alignment process supported by additional technical work to guide operationalization of the Belém Adaptation Indicators.

At the same time, the [Belém Gender Action Plan](#), also adopted at COP30, places considerable emphasis on the need for robust accountability and gender-responsive monitoring and evaluation efforts so that implementation of global commitments can be tracked. The flexibility embedded within CMA/20205/L.25 enables Parties to integrate locally-relevant gender dimensions into adaptation monitoring. By emphasizing context-specific implementation, optional disaggregation, and national determined approaches, the decision provides a framework for gender-responsive and locally led indicators to be developed and embedded into national monitoring frameworks. These can then further reflect the different adaptation experiences, capacities, and priorities of women and other marginalized groups. However, developing standardized adaptation metrics remains inherently complex due to diverse national contexts and methodological approaches; integrating gender-sensitive metrics adds additional layers of complexity, particularly around data availability, contextual relevance, and incorporation into existing MEL systems.

This paper draws on a literature review and key informant interviews (KIIs) to examine the challenges and lessons learned around developing gendered adaptation metrics to support the creation of a national-level framework that allows stakeholders to track progress on gender-intentional climate actions in agri-food systems. We present a literature review of existing adaptation metric frameworks and then integrate insights from six KIIs with climate change metrics experts. We analyze frameworks developed at project, local, and national levels, each with varying scope and applicability. The paper is organized as follows: the next section outlines the methods used, followed by results presented in two parts—a summary of existing climate change metrics frameworks and an analysis of the challenges associated with developing and implementing adaptation and mitigation metrics. The final section proposes a new flexible framework for integrating gender-sensitive climate change metrics with guidance on its operationalization.

METHODS

We conducted a literature review of existing M&E frameworks at the global, national, and project-levels that assess climate adaptation and mitigation actions. The purpose of this literature review was to identify and summarize existing climate adaptation metrics and frameworks to glean challenges, lessons learned, and useful metrics. We complemented this literature review with targeted KIIs with experts who have led or participated in initiatives to develop and implement climate change M&E systems in LMICs. Using learnings from these two exercises, we propose a new, flexible framework to assess gender integration in climate adaptation actions at the national level.

Literature Review

We conducted a literature review using Google and Google Scholar literature search mechanisms to identify existing climate adaptation metrics and frameworks. Targeted key words were employed in the search (see Table 1). We split the search into two: first focusing on searching climate M&E frameworks broadly, and the second focusing on searching gender-sensitive climate M&E frameworks. We included both peer-reviewed journal articles and institutional reports that were relevant to the search terms.

Table 1 Key words used in the literature search

Key words to search M&E frameworks	Key words to search gender and M&E frameworks
“Climate change” AND “Adaptation” AND/OR “Mitigation” AND “Monitoring & evaluation – M&E”	“Gender” AND “climate change” AND “Gender” AND “Adaptation” AND/OR “Mitigation” AND “Gender” AND “Monitoring & evaluation – M&E”

In total, eleven frameworks were identified and reviewed (see Annex A). Frameworks were included if they met the following criteria: (i) the document described or applied an M&E framework for climate change adaptation and/or mitigation; (ii) it provided information on indicators, metrics, theory of change and; (iii) it referred to implementation in Low- and Middle-Income Countries (LMICs) or had potential applicability in those contexts. Documents were excluded if they focused solely on climate science, climate finance, project design without monitoring components, or unrelated environmental assessments. The eleven frameworks included those at the national, project-level, and community-based frameworks, as well as some that specifically incorporated gender-sensitive indicators.

Key Informant Interviews (KIIs)

We identified and invited climate experts from international and national non-governmental organizations (NGOs) and academia to voluntarily participate in a remote KII. Interviewees included climate adaptation, monitoring and evaluation (M&E), and climate finance experts involved in developing and implementing climate adaptation metrics and frameworks. They represented academia, international research organizations, foundations, and multilateral climate finance institutions.

Key informants were selected through purposive sampling based on:

1. demonstrated expertise in climate change adaptation metrics or national M&E systems;
2. experience advising or working within government institutions, international organizations, or research centers; and,
3. involvement in developing or testing adaptation/mitigation metrics or frameworks.

In 2023, six remote KIIs were conducted after receiving informed consent for participation.

Interviews followed a semi-structured questionnaire designed to gather insights on:

- challenges in developing and operationalizing climate change metrics;
- approaches used to integrate gender into frameworks;
- lessons learned from national and subnational implementation;

- feasibility of standardized versus context-specific indicators; and,
- data constraints, capacity gaps, and political economy considerations influencing metrics.

Interviews were conducted by the lead author and lasted between forty-five and sixty minutes. Notes were taken during each interview, and discussions were summarized immediately afterward. Data from KIIs were analyzed using a thematic coding approach, with themes corresponding to recurrent issues such as data availability, aggregation challenges, gender integration, institutional capacity, and stakeholder engagement.

Limitations

We acknowledge that this paper has a few limitations. The literature search and purposive selection of key informants may have excluded some unpublished, non-English, or under documented initiatives, and may not fully capture all regional or institutional perspectives. Additionally, variation in the purpose and structure of existing frameworks, as well as limited availability of gender-sensitive indicators, constrained the depth of systematic comparison and gender analysis.

OVERVIEW OF CLIMATE CHANGE METRICS: SELECTED FRAMEWORKS AND CHALLENGES

This section synthesizes insights from a range of climate change adaptation M&E frameworks—both general and gender-sensitive—reviewed for this study. Rather than describing each framework in detail in the main text, we provide a consolidated assessment of each in Annex A. Herein, we draw out the common patterns, design features, and types of indicators that emerge across frameworks developed at project, local, and national levels. Building on these aggregated insights and on findings from the literature review and KIIs, we then identify key challenges in developing and operationalizing climate change adaptation and mitigation M&E metrics in agrifood systems, including gender-responsive approaches. While not exhaustive, this synthesis offers a snapshot of prevailing practices and highlights the opportunities and gaps that shape current efforts to measure climate change adaptation and mitigation actions and integrate gender-sensitive indicators in such measurements.

Frameworks Assessing Climate Change Adaptation Efforts

Multiple frameworks have been developed to guide the design and measurement of indicators that assess how adaptation efforts reduce climate vulnerability and support socio-economic development. Eleven frameworks (Annex A) were assessed for their scale, types of indicators, implementation status, target country or region, and whether gender was considered.

Gender Integration

Approaches to including gender-sensitive indicators vary considerably across the reviewed frameworks. Some frameworks build gender in from the start, using sex-disaggregated data and indicators that look at participation, decision-making, and who has access to resources. For example, the Integrated Climate-Smart Agriculture Multilevel Monitoring Framework (Bonilla-Findji, Eitzinger & Andrieu, 2021) employs strong gender integration that includes sex-disaggregated indicators, gender-specific outcome metrics, and protocols requiring interviews with both male and female adults in the same household. The GAMMA – Gender Assessment and Monitoring of Adaptation and Mitigation (GenderCC – Women for Climate Justice, 2022) employed the strongest gender integration of all reviewed frameworks as gender was the core focus of the framework itself. It uses gender-disaggregated data, gender impact assessments, and gender scorecards for assessing and monitoring adaptation and mitigation approaches. The Participatory Monitoring, Evaluation, Reflection and Learning (PMERL) Framework for Community-Based Adaptation (CARE, 2014) explicitly integrates gender by requiring sex-disaggregated data, monitoring of gender gaps, and indicators on gender dynamics and access/control of resources. And UN Women’s Gender Equality and Climate Policy Scorecard utilizes 50 indicators across six gender dimensions to track progress on gender-responsive climate action and rate member countries’ revised NDCs.

Other frameworks integrate gender via requiring sex-disaggregated data and some attention to gender related outcomes. The GEF LDCF/SCCF Results Measurement Framework & Adaptation Monitoring and Assessment Tool (AMAT) includes core indicators that require beneficiaries to be sex-disaggregated and many projects include gender-responsive adaptation outcomes. The newest version of this tool mandates gender inclusion. The MAP-Norway Gender-Integrated CSA Monitoring Framework (Gutierrez-Montes et al., 2018) also includes sex-disaggregated indicators plus qualitative empowerment outcomes.

Others leave room for gender to be added, but do not define it as a central element. The Tracking Adaptation and Measuring Development (TAMD) (Karani, Kariuki & Osman, 2014; Brooks, Fisher et al.

2014) is one such example. Gender is not a core component of the indicator list, but it is integrated through the embedded theories of change and context-specific indicators. Sex-disaggregation is possible in the framework, but it is not systematically nor explicitly required.

And several frameworks are essentially gender-neutral, offering no specific guidance on how to capture gendered differences nor explicitly consider gender. Such examples include ND-GAIN Country Index (Chen et al., 2024) and the Farm Household-Level Adaptation Metrics for Agriculture and Water Sectors (Nambi et al., 2015), which do not require sex-disaggregated data, nor do they consider gender as a domain or cross-cutting theme across the framework.

As a result, gender sensitivity ranges from strong and intentional to minimal or optional across the different approaches to measure climate adaptation and mitigation reviewed for this discussion paper. This finding aligns with other similar types of reviews, where comprehensive gender integration in climate change adaptation tracking tools and resources was relatively low (Bullock et al. 2025).

Level of Frameworks

In general, indicators developed at different levels—project, local, and national—present distinct opportunities and challenges for measurement and use. Project-level indicators often allow for more detailed and context-specific tracking, and as such, project-level frameworks developed by donors are implemented more consistently. Those tools are used to assess whether project activities align with defined goals and targets and whether funds are effectively allocated (e.g., the GEF Results Measurement Framework Tracking Tool). And while more consistently applied, they are generally limited in scope, focusing primarily on outputs (e.g., number of beneficiaries, hectares covered, or trainings delivered). As a result, they provide little information on the longer-term outcomes and impacts of adaptation efforts, such as sustained improvements in resilience, food security, or gender equality once project funding ends.

Donors have played an important role in pushing for project-level metrics that ensure resources are well spent and results achieved, with many frameworks incorporating gender-sensitive indicators. Yet, experts interviewed for this paper stressed that gender-sensitive frameworks and metrics should go beyond simply counting women’s participation to examine barriers, quality of engagement, and whether women’s priorities are influencing decisions and funding allocations.

“We need to go beyond the measurement of gender inequality by only comparing ‘number of women’ and ‘number of men’. The choice of indicators also needs to consider what the government is capable of and has the funds to measure, otherwise, they will not be measured.” (Gender and M&E specialist)

“Metrics on what is happening on the ground are relevant regardless of how advanced the policy environment in the country is.” (Gender and Environmental specialist)

Local-level metrics often draw on community perceptions, lived experiences, and contextual knowledge. These approaches can reveal how women and men experience climate risks differently and how local institutions shape adaptation outcomes. However, while such methods provide rich qualitative insights, they can be difficult to standardize or aggregate at higher scales. They typically rely on participatory tools—such as scorecards, structured interviews, or gender analyses—that surface social norms, decision-making dynamics, and differences in vulnerability or access to resources. Additionally, these typically require and rely on intensive primary data collection, stakeholder engagement, and localized analysis, making them resource- and time-intensive to implement at scale and sustain over time.

National-level metrics, by contrast, tend to draw on institutional data systems or household surveys, which allow for broader coverage and cross-country comparability. Yet these systems frequently lack the granularity needed to capture gender-specific climate impacts unless indicators and data collection tools are intentionally designed to do so. Many national approaches focus on tracking the strength of institutional arrangements, climate risk management processes, and progress in building adaptive capacity. In turn, they often struggle to capture gender-differentiated outcomes or changes in the resilience of specific population groups.

Types of Indicators

The reviewed frameworks prioritize different types of indicators, including those related to institutional and policy, broader development (i.e., well-being), and project-level outputs and outcomes. Each type of metric serves a different purpose: institutional indicators track enabling environments and policy progress, project-level indicators monitor implementation and results, and development indicators measure longer-term impacts.

Institutional progress is often tracked through scorecard indicators, which assess the strength of laws, policies, and institutions as well as the extent of women's participation in policy development and implementation processes. Scorecards are valued for their flexibility, simplicity, and low cost, as well as their ability to combine expert input, participatory processes, and external assessments. The TAMD and GAMMA frameworks are examples of those that have used scorecards to assess the gendered impacts of climate policies.

Developing indicators to measure adaptation actions is difficult. While it remains important to assess and monitor the enabling environment, indicators must also capture what is happening on the ground, which such adaptation indicators aim to do. There is no universal definition of adaptation and resilience, often resulting in monitoring systems emphasizing processes over outcomes. And it is increasingly difficult to monitor if and how adaptation actions have influenced vulnerabilities or capacities at the local level. Adaptation outcomes occur over long time periods and are multi-dimensional, making monitoring and attributing such outcomes to specific actions or interventions challenging. Additionally, adaptation actions are highly context-specific, as required interventions in one locale may differ in another locale, making results extremely difficult to appropriately and meaningfully aggregate. Examples of indicators of adaptation progress in agriculture are the number of farmers adopting climate-resilient crop varieties and practices, changes in crop yields under climate stress, and the percentage of agricultural land managed sustainably.

Some frameworks also use well-being indicators to link adaptation to long-term impacts, such as health outcomes (e.g., incidence of climate-sensitive diseases) and nutrition outcomes (e.g., child wasting). These can be measured through single indicators or composite indices, such as the ND-GAIN framework, which allow for aggregation and cross-country comparison. However, differing definitions of adaptation, varying scales of measurement, group-specific vulnerabilities, and the challenge of attribution—determining whether observed changes result from adaptation actions or broader development efforts—limit comparability across contexts.

Finally, several frameworks emphasize the importance of integrating indicators capturing values and perceptions. Communities' views on adaptation progress, disaster management, and gender equality provide valuable insights into how interventions are experienced and sustained at a local level. KI experts mentioned that perception-based surveys can help establish baselines, track changes over time, and ensure that adaptation strategies align with local priorities and values. However, perception-based climate data also entail limitations, since perceptions of experiences can be influenced by memory, expectations, and

social norms (i.e., whose views are prioritized in the household or community) and may not fully align with observed changes.

Implementation Level and Sustainability Across Frameworks

Most of the reviewed frameworks have been piloted or applied in limited contexts, while only a small subset demonstrates continuity, institutional uptake, or long-term implementation. Frameworks such as TAMd (piloted in six countries) and the CCAFS CSA Monitoring Framework (piloted and rolled out across “climate-smart villages” between 2017–2020) provide evidence of real-world application but do not show documented continuation beyond the specific project cycles in which they were embedded. Some others offer conceptual or diagnostic guidance but lack evidence of systematic or ongoing operational deployment. Overall, the landscape shows that while piloting of adaptation metrics frameworks is common, long-term institutionalization and sustained implementation are the exception rather than the norm.

In contrast, only a few frameworks exhibit sustained, ongoing use. Examples include ND-GAIN, which is updated annually using secondary national datasets and the GEF Results Measurement Framework, which is applied continuously because it relies on project-level reporting, including funding, activities, and performance data required of all GEF-supported projects. At a national level, the UN Women Gender Equality and Climate Policy scorecard was first published in 2025 and applied to 32 revised NDCs submitted under the Paris Agreement. While nascent in its application, this tool shows promise for ongoing uptake and institutionalization as it was designed as a living monitoring tool to be applied as countries revise NDCs.

Across all levels, issues of data availability and consistency, and institutional capacity remain key constraints, which must be considered when designing scalable and meaningful gender-sensitive adaptation frameworks. As a result of these interconnected challenges, most of the reviewed adaptation frameworks have been implemented only once—or not at all. This is particularly the case for frameworks aiming to assess both institutional progress and changes in resilience and development outcomes.

Challenges

This review reveals several key challenges of designing and implementing frameworks that assess climate change adaptation actions. Designing and implementing adaptation metrics requires balancing using standardized indicators with the need for those that are context-specific, addressing issues of attribution, and ensuring that indicators are comparable and aggregable across countries. Developing integrated approaches and monitoring systems that are sustainable beyond initial funded projects poses additional challenges.

And when gender is incorporated into such measurement frameworks, these challenges become even more complex, as frameworks must also account for greater complexity, considering gender norms, intra-household dynamics, and differential access to resources and decision-making. Political and institutional constraints, along with evolving climate risks and social dynamics, further complicate efforts to measure meaningful progress towards gender-sensitive adaptation actions.

Balancing Standardization and Context in Adaptation Metrics

The impacts of climate change on people and communities differ depending on local factors and, as such, the pathways through which desirable outcomes can be achieved will be different (Christiansen and Martinez 2018). In other words, effective adaptation actions must be designed to tackle context-specific and often cross-sectoral needs in a highly localized manner. As a result, efforts to develop adaptation assessment frameworks face the challenge of being generic enough to ensure indicators allow for standardization and aggregability while also including more meaningful, context-specific metrics (Christiansen and Martinez 2018, Leiter et al. 2019, Stadelmann et al. 2011). Incorporating a gender-lens to such frameworks adds another layer of complexity as men and women face varying challenges and have different adaptation needs and preferences across contexts.

“So far, there has not been successful efforts to measure adaptation at the ground level and then aggregate results.” (Adaptation specialist).

KIs emphasized that meaningful cross-country comparisons are often limited by differences in reporting systems, indicators used, and data quality, highlighting that needed data are either not available or not comparable. On the other hand, experts emphasized that national-level snapshots often have limited utility as they may obscure important local contextual nuances and variations in vulnerability. KIs reinforced that developing indicators that go beyond the project level remains difficult, particularly when trying to capture systemic changes or long-term adaptation impacts.

Integrating Mitigation, Adaptation, and Gender in Climate Metrics

Frameworks to measure climate actions face additional challenges in proposing a set of indicators that capture an integrated approach to measuring both mitigation and adaptation actions which accounts for synergies and tradeoffs across these goals. This is particularly complex given that smallholder farmers—especially women—primarily adopt practices for adaptation rather than mitigation, and many adaptation actions have unintended trade-offs or unmeasured co-benefits for mitigation. For example, smallholder farmers facing frequent droughts may adopt groundwater irrigation technologies that use diesel-powered pumps to maintain crop productivity and reduce climate-related losses. Although this adaptation action enhances the farmers’ livelihood resilience and food security, it may also increase fossil fuel consumption and greenhouse gas emissions, generating a trade-off between adaptation and mitigation goals. Monitoring systems must therefore attempt to capture these overlaps, while also addressing gendered barriers to ensure equitable and accurate tracking of outcomes (Akinyi et al., 2021; Nassif et al., 2025).

Similar to integrating gender considerations in adaptation measurements, the relationship between gender equality and climate change mitigation is highly context-dependent, shaped by differences among groups of women and men in terms of access to resources, decision-making power, and exposure to climate risks. Women face even greater barriers in adopting mitigation strategies and benefitting from financing provided for mitigation given that these practices are often implemented at a large scale and require ownership of assets, such as land and livestock, to access (Nassif et al., 2025). As efforts intensify and more financing becomes available for mitigation, it is important to monitor the extent to which such efforts contribute to reducing or exacerbating gender disparities in agri-food systems. This underscores the need for monitoring and evaluation systems that account for gendered impacts and contextual dynamics (Eissler et al., 2025; Rainard et al. 2023; Lau et al. 2021).

Challenges Around Attribution

Not only is it difficult to aggregate and compare adaptation indicators beyond the project level due to local specificities, it is also challenging to include development indicators—such as those measuring progress in health, diets, or education—in adaptation frameworks since it is often unclear whether improvements are the result of adaptation practices or broader development processes (FAO 2017). Adaptation actions may overlap with good agricultural practices or broader development actions, and as such, it can be difficult to draw the line between adaptation and development or to attribute positive changes directly to adaptation actions. This further complicates the selection of indicators intended to measure adaptation actions and their effectiveness. Experts emphasized this concern during interviews and discussed whether it is necessary or even feasible to separate the two.

Considering Evolving Climate Risks and Compounding Shocks and Stressors

In addition to the challenges mentioned, KIs reinforced that both vulnerability and adaptation needs are constantly evolving considering a changing climate and an array of different hazards posing different levels of risks. Effectively measuring adaptation progress would involve measuring evolving targets and considering not only climatic shocks and stressors but also social, economic, and geopolitical changes. A farm-level adaptation practice, for instance, that is working well under regular conditions might still not achieve the desired result due to a severe climate or other type of shock. Adaptation actions may suffer a significant setback if farmers are faced with an input price shock such as the one currently occurring with the rapid rise in fuel and fertilizer prices following the 2026 war in the Middle East.

“To say that there is going to be a sustainable impact of incremental adaptation over time longer than a decade is to deny what climate science is telling us. Adaptation performance can be better understood by identifying the levels of adaptation investments that have been made and where adaptation efforts are while measuring climate risks and development outcomes in a systematized way.” (Adaptation specialist).

“How can you measure resilience in a changing climate? A program that is doing well might face a setback if faced with an extreme event such as a drought.” (Adaptation and M&E specialist).

Moreover, the socio-economic impacts of climate change, such as increased poverty and migration levels, higher nutritional deficiencies, school evasion and other impacts are also driven by multiple factors and underpinned by evolving gender dynamics (Asfaw and Maggio 2016; Gonda 2016). As such, a framework measuring adaptation outputs (e.g., higher productivity) and outcomes (e.g., food security) in the agricultural sector would have to constantly adapt to consider the multitude of evolving risks and external shocks and stressors. These include new climatic and agronomic risks, evolving gender dynamics, ongoing geopolitical pressures and their impacts, and new socio-economic pressures. Comparison across countries can be further complicated as countries, regions, and areas have differing levels of exposure and sensitivity to climatic and other types of shocks and stressors, all of which need to be accounted for in the development and application of a national-level framework.

Political and Institutional Implementation Challenges

According to KIs, the implementation of existing frameworks for measuring climate change adaptation has also faced a different set of challenges related to lack of institutional and political support. Donor-supported M&E systems in developing countries are often discontinued once projects end. KIs mentioned that some national governments have developed M&E systems primarily to meet donor requirements, leading to what was described as a “climate change for money” problem. This reflects a lack of national ownership, with systems often poorly designed, underfunded by domestic resources, and unsustainable in the long term. Given recent shifts in the global funding landscape since 2025, with considerable declines in official development assistance, low- and middle-income countries may be incentivized to invest more of their own resources in implementing and tracking climate action, which increases national ownership of the process. On the other hand, as development assistance resources become increasingly constrained, national governments facing multiple competing crises—including climate change, geopolitical conflicts, and the lingering socioeconomic impacts of COVID-19—may have limited capacity to prioritize climate adaptation monitoring and tracking.

“Countries see donors as a source of money and monitoring systems as a ‘donors’ investigation’... Donors often create a parallel structure to monitor projects but that does not help governments to mainstream adaptation. If the money becomes more channelized through the government, the M&E systems within government will be strengthened.” (Adaptation finance specialist)

Even when policies and institutions are in place, effective implementation is hindered by weak coordination among government bodies responsible for gender, nutrition, and climate change. Limited technical capacity was also cited as a barrier, particularly when implementation falters after international consultants exit. These observations made by KIs resonate with findings from a recent study in Kenya, which reveals that, despite the country’s comparatively robust institutional landscape, critical gaps in climate policy M&E remain. Challenges include the absence of a functioning national system, limited county-level capacity, and fragmented data reporting (Magalhaes et al., 2025). Moreover, women leaders and women’s organizations are often insufficiently involved in policy processes, further limiting inclusive and effective climate action.

KIs further observed that the absence of visible socio-economic gains from adaptation initiatives reduces the motivation of governments to pursue and track these efforts, thereby reducing the political support necessary for long-term adaptation planning. Additionally, establishing and sustaining long-term data collection efforts poses challenges, both technically and financially, especially in contexts where national statistical systems are underdeveloped, limited, or inconsistent. Therefore, differences in countries’ starting points, capacities, and exposure to climate risks complicate the interpretation of metrics.

The Way Forward

Despite the challenges raised above, a range of stakeholders, including international donors, development agencies, national governments, and multilateral climate funds, continue to promote the use of standardized adaptation metrics to improve understanding of adaptation interventions and guide the allocation of limited adaptation finance. Different methods and frameworks for collecting and analyzing data to measure adaptation progress offer complementary strengths but also face limitations. Participatory approaches can generate rich, context-specific insights—such as how women and men perceive climate risks, access resources, or benefit from adaptation interventions—and strengthen the legitimacy of metrics by reflecting lived experiences. However, 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 possess adaptive capacities. 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. New frameworks to measure climate actions should build on lessons from previous efforts, identifying what has worked and what remains challenging. Box 1 provides examples of successful implementation of frameworks that measure women’s empowerment through perception surveys and provides useful lessons to leverage in the development of new frameworks for measuring climate action.

Box 1. Applying Lessons from Empowerment Measurement Frameworks to Climate Adaptation Monitoring

Tools outside the climate change realm have long used perception-based surveys to assess women’s empowerment, offering useful lessons for adaptation metrics. The [Women’s Empowerment in Agriculture Index \(WEAI\)](#), for example, measures progress toward women’s empowerment and gender equity and contributes to tracking SDG 5. Since its launch, versions of the WEAI have been implemented in more than 70 countries by over 280 organizations, demonstrating that perception-based survey modules can be scaled and integrated across diverse contexts. Complementing WEAI, the newly developed [Women’s Empowerment Metric for National Statistical Systems \(WEMNS\)](#) is designed for use in large-scale, multitopic surveys administered by national statistical offices, helping embed gender-responsive indicators within official data systems. In addition, a new **WEAI add-on module for climate change** is under development, aiming to capture gender-differentiated constraints and adaptive capacities in the face of climate shocks. Evidence from WEAI applications shows that perception surveys can yield meaningful insights into the constraints and opportunities faced by women and men in rural sectors and can support monitoring of a wide range of gender equality and development objectives. Related efforts, such as the [WEAGov](#) tool, extend this measurement to women’s participation and influence within agrifood system governance.

As with any survey-based framework, however, several issues must be considered to ensure the quality and long-term sustainability of new metrics. These include securing adequate and predictable funding; aligning measurement efforts with national policy priorities to ensure institutional uptake; designing surveys that are rigorous yet not overly burdensome for respondents, especially farmers; and ensuring that gender and nutrition dimensions are appropriately integrated. Together, these considerations highlight both the potential and the practical challenges of using perception-based tools to monitor adaptation progress and gender outcomes.

A good first step toward improving adaptation tracking is for countries to take stock of existing adaptation efforts led by governments, the private sector, donors, and non-governmental organizations, including initiatives that explicitly target or affect women and other marginalized groups. Establishing a comprehensive database of adaptation interventions in the agricultural sector would help consolidate this information while also enabling more systematic measurement of climate risks, development outcomes,

and gender-differentiated impacts. This approach supports the aims of the UNFCCC Global Stocktake, which identifies substantial gaps in the implementation and assessment of adaptation efforts and emphasizes that robust, gender-responsive monitoring and evaluation systems are essential for tracking progress and improving the effectiveness of adaptation action (UNFCCC, Decision 1/CMA.5).

Adaptation metrics can also be strengthened by leveraging data already collected through national statistical systems and international surveys, or by integrating new, gender-sensitive indicators into existing household or agricultural survey instruments. Although this strategy may not capture the fine-grained, ground-level processes that shape local adaptation dynamics—particularly for women and other groups whose experiences are often less visible—it can still provide valuable insights into broader patterns of gendered vulnerability and resilience across populations. Relying on existing data systems also enhances feasibility, comparability, and cost-effectiveness, which is especially critical in contexts with limited resources for dedicated, gender-responsive climate monitoring.

The next section presents a flexible framework designed to translate these broader insights on adaptation metrics into a tool that countries can use in practice. It outlines key domains and indicators for assessing how gender is integrated into national adaptation efforts, while allowing users to adapt the indicators to their specific context and data availability.

Proposed Framework

Draft Framework to Assess Gender Integration in Adaptation Measures at the National Level

Here we propose a broad framework to illustrate how gender integration in national-level climate change adaptation efforts in agriculture could be measured and scored by country (Table 2). We draw from existing frameworks that aim to assess climate change adaptation (UNFCCC M&E Framework, UNFCCC Gender Action Plan), gender integration into agrifood systems (Njuki et al. 2023), gender and nutrition in climate change (Theis et al. 2018), women's empowerment in agriculture (Alkire et al. 2013; Malapit et al. 2019; Malapit et al. 2023), and women's empowerment in governance (Ragasa et al. 2022) to develop this broad assessment framework designed to be flexible and useful across contexts. While nutrition was not the focus of this review, we also draw from previous frameworks to integrate consideration towards nutrition as an important dimension to highlight in the context of adaptation of the agrifood system. These domains include the enabling environment, the decision-making context, and resilience capacities to understand how countries are addressing key areas for gender mainstreaming and responsive programming and policy implementation around climate change adaptation, with some consideration towards nutrition.

As previously described, national-level assessment frameworks are difficult to develop in ways that can be compared across contexts as climate change adaptation efforts are highly context-specific. To circumvent this challenge, we propose a framework that offers key domains with associated dimensions that are measured using key illustrative, but flexible indicators. We propose these domains drawing on existing frameworks that help us measure key components of climate action, but with a gendered lens. In particular, we use the domains of the Gender, Climate Change and Nutrition (GCAN) conceptual framework (Theis et al. 2018) as the basis for organizing the indicators. These domains include the enabling environment, exposure and sensitivity to hazards, the decision-making context, resilience capacities, and climate actions to understand how countries are addressing key areas for gender mainstreaming and responsive programming and policy implementation around climate change adaptation, with some consideration towards nutrition. Taken together, these domains reflect the pathways through which gender shapes climate adaptation, from the enabling environment and exposure to climate-related disturbances, through decision-making and resilience capacities, to the actions undertaken and their resulting outcomes. They capture the structural and contextual factors that shape who can adapt, how they can adapt, how adaptation decisions are made, and whether climate actions reduce or reinforce gender inequalities. Users of the framework can adjust the illustrative indicators to reflect the country context and select more appropriate questions serving as a metric under each dimension. This framework proposes data source(s) from existing repositories, such as public policy documents, to reduce the need for primary data collection. In some cases, targeted stakeholder consultations (via KIIs) may be useful to fill data gaps. Following the framework, we present instructions for users on how to operationalize this framework.

Table 2 Proposed Assessment Framework

Domain	Illustrative Guiding Indicators	Data Source(s)
Enabling Environment		
Objective: Assess the extent to which national climate and agricultural policies, budgeting, and data processes mainstream gender equality and/or consider nutrition-sensitive climate actions.		
Policy commitments and coherence	Do national adaptation policies explicitly reference considerations for gender and women's empowerment? Do nationally determined contributions explicitly reference considerations for gender and women's empowerment? Do national gender policy(ies) align with climate and agricultural strategies? Do national adaptation policies reference nutrition? Do nutrition policies consider the impacts of climate change?	National-level policies National-level commitment documents NDCs, NAPs
Institutional capacity	Do climate/environment and agricultural ministries have public gender and/or women's empowerment strategies and/or action plans? / and/or nutrition strategies or action plans? Do climate and agricultural ministries have gender focal points operating with defined mandates? Do ministries and national institutions train staff on gender? / on nutrition? Are tools (check lists, guidelines, guidance, how-tos) available for staff to use when integrating gender and/or nutrition into adaptation planning processes?	National-level staffing charts National-level policies National planning documentations KIIs (potential)
Gender-responsive budgeting / Nutrition-sensitive budgeting	Do climate adaptation budgets reference or earmark resources for gender-related activities or considerations? / for nutrition-related activities or considerations? Do climate adaptation budgets allocate and track resources for gender-related activities or considerations? / for nutrition-related activities or considerations?	National budget documentation Global Stocktaking (Biennial Transparency Reports)
MEL	Does the country have an operational national adaptation M&E system? If so, are gender-responsive indicators / nutrition-responsive indicators integrated in national adaptation M&E systems? Are there requirements to report on gender-related results in adaptation programs? / nutrition-related results in adaptation programs? Are lessons learned on gender / nutrition integration documented and used to inform future policies or programming?	National-level M&E frameworks National policy and programming guidance documents National programming documents Adaptation communications (Global Stocktaking) Technical Assessment Reports
Gender norms	Are social institutions promoting equal gender norms?	Social Institutions and Gender Index (SIGI)

Exposure and Sensitivity to Disturbances		
Objective: Assess the extent to which gender-sensitive / nutrition-sensitive data is used to determine differing exposure and sensitivity to climate shocks and stressors.		
Vulnerability assessments	Do vulnerability assessments identify differentiated climate risks for women, men, youth, and other marginalized groups? Do vulnerability assessments integrate nutritional status as a component of adaptive capacity?	Adaptation policy documents Vulnerability assessments NAPs Adaptation Communications KIIs (potential)
Economic empowerment	What is the overall share of men and women's employment in agriculture, forestry, livestock, and fishing to total employment? In off farm jobs? To what extent does the regional data show deviations from the national average? What is the informal employment rate by sex in agriculture? What is the share of or use of insurance mechanisms (by sex) in agricultural employment? What share of the population accesses social protection?	ILO STAT or national level surveys
Decision-Making Context		
Objective: Evaluate whether adaptation planning and decision-making processes in agrifood systems are inclusive, gender-sensitive, and/or nutrition-sensitive.		
Inclusive participation	Are women's organizations and women farmers' groups represented in adaptation planning and implementation processes?	Planning documentation KIIs (potential)
Influence and decision-making	Are women involved and represented in national-level decision-making and planning processes for climate adaptation? Sub-national and/or local-level decision-making and planning processes for climate adaptation? Are indigenous women involved and represented in national-level decision-making and planning process for climate adaptation? Sub-national and/or local-level decision-making and planning processes for climate adaptation?	National staffing KIIs (potential)
Program design	Are gender analyses used to inform climate change adaptation policies and programs? Are adaptation programs broadly addressing barriers faced by women (i.e., access to finance and credit, access to land, access to extension services)? Are adaptation programs designed to address unequal gender norms and other structural inequalities? Are adaptation programs promoting nutrition-sensitive adaptation options?	Program design documents KIIs (potential)
Adaptation knowledge and data	Are sex-disaggregated data collected and used for adaptation monitoring?	National-level surveys Staffing and stakeholder consultations

	Are local and indigenous women's knowledge acknowledged or integrated into adaptation planning processes?	KIIs (potential)
Resilience Capacities		
Objective: Assess the extent to which women and men can equally access and use key resources to strengthen adaptive capacities.		
Extension and advisory services	Are sex-disaggregated extension and climate information service use data collected and reported? To what extent do agricultural extension services and/or climate information services, technology and training reach women compared to men? To what extent are extension services designed and delivered in ways that are accessible to and relevant for women? To what extent do women use climate information services to inform livelihood and adaptation decisions compared with men?	National-level surveys Technical Assessment Reports
Access to finance	Compared to men, how are women accessing climate finance mechanisms (i.e., credit, insurance)? Do policies or programs exist to promote women's access to climate finance mechanisms?	National-level surveys Financial institute data Policy and programming documents
Access to land and natural resources	Do policies and programs exist to promote women's equitable access to land, water, and forests? Do policies exist that limit women's equal access to land, water, and forests compared to men's access?	Policy and programming documents
Access to climate smart technologies	Compared to men, how do women access climate-smart agricultural technologies (i.e., improved crop varieties)?	Programming documents National-level agricultural surveys
Market participation	Do policies exist that limit women's ability to participate in market and economic activities compared to men?	Policy and programming documents
Climate Actions		
Objective: To assess the extent to which women – compared to men – are able to adopt climate actions.		
Use of climate smart technologies	To what extent do women use climate smart agricultural technologies (i.e., improved crop varieties) compared to men?	Programming documents National-level agricultural surveys
Migration	Are sex-disaggregated climate-induced migration data collected and reported? To what extent are women engaged in climate-induced migration compared to men?	National-level surveys Technical assessment reports
Labor	Are sex-disaggregated labor force surveys collected and reported? Compared to men, to what extent are women shouldering labor burdens?	National-level labor force surveys National-level time use surveys

Additionally, users may be interested to track key outcomes associated with gender-sensitive climate adaptation measures. We present an optional outcomes domain (Table 3) for users interested in tracking such outcomes associated with gender-sensitive climate adaptation measures. However, this domain should be considered optional. Many factors influence and contribute to these outcomes and, as such, they

are not a direct measure of gender-sensitive climate adaptation measures. Yet they can provide insights for countries to understand how key outcomes are changing over time.

Table 3 Optional Domain to Track Key Outcomes

Outcomes		
Objective: Assess the extent to which countries are making progress towards gender equality via key outcomes reported at the national level.		
Nutrition	What are national-level minimum dietary diversity for women (MDD-W) outcomes for women?	National-level surveys
Food Security	What are national level gender gaps in food insecurity?	National-level surveys
Livelihoods	What are reported gender gaps in income levels by key sector (agricultural, informal, non-agricultural)?	National-level surveys
Political Empowerment and Decision-Making	What are current gender gaps in political representation at the national level?	World Economic Forum Gender Gap Reports National-level representatives

Process for Operationalization

To operationalize this framework, we propose the following methods to use, score, and track progress towards gender-sensitive climate change adaptation efforts at the national level. This method should be piloted, iterated, and refined to ensure an inclusive, collaborative, and rigorous process is used to score these domains and determine the extent to which a country is making progress towards gender-responsive climate change adaptation vis-à-vis stated goals or other country efforts. We propose the following steps to implement this process:

Landscape Assessment: When deciding to apply the framework at a national level, researchers should conduct a landscape analysis to identify relevant data sources (international, national or sub-national policies; national surveys; and/or other available data sources), key stakeholders, actors, and organizations in the country’s agrifood and climate sectors. This assessment should list potential stakeholders (individuals, agencies, and/or organizations) to invite to participate in the process OR identify those who may be essential key informants to support the evidence base. Key relevant policies or databases should be identified and later presented as a potential evidence base in the country.

Convene Stakeholders: After an initial landscape assessment, key stakeholders should be convened to ensure those with the appropriate and requisite background and experience are participating in the process to adequately apply the framework. Stakeholders must include those with gender, nutrition, and climate expertise at the national level, those working on public policy related to agriculture, climate, nutrition, and/or women’s empowerment at the national level, civil society and non-governmental representatives working in the agriculture/climate/gender space at the national level. It is essential that participating stakeholders include those from public and private sectors and have experience working on gender-related issues in the agriculture and/or climate space.

Stakeholder Co-Design Session: Prior to piloting the framework at the national level, a stakeholder co-design session should be convened to determine the appropriate indicators and data sources for each dimension. The key policies and databases identified during the Landscape Assessment can be presented here. During the co-design session, the stakeholders should review each dimension to determine the appropriate question(s) to ask as key indicators and identify the potential data sources for each.

For the “Policy Commitments and Coherence” dimension, stakeholders should determine which of the key policies driving climate action should be reviewed under the indicators. It is possible some countries

include many policies addressing climate and/or agriculture actions, but only the main policies should be considered for this dimension. The stakeholder co-design session should determine the final list of policies to assess.

For the other dimensions, stakeholders should carefully assess each potential indicator to ensure it applies to the country's context (i.e., if the country separates agriculture, livestock, forestry, and fisheries into separate ministries or sectors, or if the country combines these into one sector) and to clarify the indicator language to reflect the country's context. The stakeholders should also review the available data sources for key indicators and should adjust these indicators based on what is feasibly available.

Once the stakeholders iterate and agree on the final indicators and their language, the assessment team should move on to the next step: collecting evidence.

Collect Evidence: Using identified data sources from the stakeholder co-design workshop, the assessment team should collect the evidence to appropriately score each domain by reviewing existing policies, budgets, national-level survey data, national communications, technical assessments, or other sources. The evidence should be collected, cleaned, and presented under each indicator. For the most part, secondary data should be leveraged to inform each indicator. In some cases, primary data may need to be collected to fill data gaps. These should remain as targeted, key informant interviews with purposively sampled individuals based on their role and/or experience to fill an acute data gap. This process should be clearly documented when applied, and all global standards for research ethics should be followed when collecting primary data. Once all evidence is collected and organized, the assessment team should move on to the next step: scoring domains.

Score Domains: The assessment team should reconvene the stakeholders who participated in the initial stakeholder co-design workshop to validate scores for each domain. The assessment team should present the existing evidence for each domain, iterate on available evidence, and collaboratively determine the appropriate score for each dimension (see an example score card below). For policy related indicators, scoring guidance presented in Table 4 should be followed to ensure consistent application of scores.

Table 4 Scoring Guidance for Policy-Related Indicators

Level	Description	Details
0	Gender blind	No mention of gender in the policy document
1	Mention of gender and the relationship to climate change and/or nutrition	Some analysis of the linkages between gender and climate change and/or nutrition. Note whether women are viewed as a vulnerable group and/or agents of change.
2	Intention to mobilize resources to address gender-related objectives and actions	Clear statement that gender equality and women's empowerment outcomes should be improved and are stated as objectives, with some context on plans, policies or programmes to target this
3	Commitment to mobilizing resources and with distinct plans to achieve gender-related objectives	In-depth plans targeting objectives to address gender inequality, with details on execution, e.g., funding, timeline, baseline, targets, lead agencies

For data examining gender gaps, scores should reflect progress towards parity. For example, if scoring an indicator asking about the percentage of land owned by men compared to the percentage of land owned by women, if the split is equal, then a score of 3 should be applied. The greater the gap, the lower the score should be applied.

Table 5 presents an example of a score card to be used when finalizing scores for each domain. The scoring could rank each domain between 0 and 3: 0 = no evidence, 1 = some evidence / emerging, 2 = moderate evidence / progress made, 3 = strong evidence, fully integrated. The country's total score would average the scores across each domain. Stakeholders should then document the process for arriving at each score and ensure to consolidate and mark the evidence-based decisions leading to each score. Finally, the evidence base supporting each domain score should be documented clearly.

Table 5 Score Card Example

Domains	Dimension	Evidence + Data Source	Score	Interpretation
Policy and Institutions			1	
	Policy commitments and coherence	<i>[insert evidence collected with associated data source from the data collection exercise]</i>	1	<i>[explain reasoning for score based on interpretation of the evidence]</i>
	Institutional Capacity	<i>[insert evidence collected with associated data source from the data collection exercise]</i>	2	<i>[[explain reasoning for score based on interpretation of the evidence]</i>
	Gender-responsive budgeting	<i>[insert evidence collected with associated data source from the data collection exercise]</i>	0	<i>[[explain reasoning for score based on interpretation of the evidence]</i>

*A proposed scoring frame is to score each domain based on a set of key indicators.

Summarize Progress: Finally, after the scores have been applied, the assessment team should track areas in which a country is making progress to address gender-integration in climate change adaptation efforts and where gaps exist. Country report cards can highlight areas that are lacking to focus on low-scoring domains for improvements.

CONCLUSION

In conclusion, efforts to strengthen gender-sensitive adaptation metrics in agrifood systems are advancing, but substantial gaps remain in data availability, institutional capacity, and the ability to meaningfully capture gender-differentiated climate risks and outcomes. The review of existing frameworks and expert insights underscores that no single approach will meet the needs of all countries. However, effective monitoring tools that are flexible enough to reflect diverse contexts while grounded in shared principles for transparency, comparability, and feasibility and allow for use of existing, standardized data are needed to help countries monitor progress towards gender-responsive climate adaptation actions.

The framework proposed in this paper aims to offer such a balance. By drawing on existing data systems, policy processes, and institutional structures, it provides a practical entry point for countries seeking to track progress on gender-responsive adaptation and identify areas where additional effort, coordination, or investment is needed. Strengthening these systems will help ensure that adaptation strategies better reflect the lived realities of women and men, guide more effective resource allocation, and support countries in meeting their climate and development commitments.

Next steps under the IFPRI GCAN project will focus on applying and refining this framework in the Kenya context. This will involve adapting the framework to country-specific institutional, policy, and data realities, followed by a participatory workshop with national stakeholders to validate the approach, identify gaps, and incorporate practical feedback. Insights from this process will be used to strengthen the framework's relevance, usability, and potential for broader application in other country contexts.

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ANNEX A. ASSESSMENT OF IDENTIFIED FRAMEWORKS

Framework (authors, year)	Scale of framework	Summary of types of indicators used	Target country/region	Gender dimension included?
Tracking Adaptation and Measuring Development (TAMD) — <i>Karani, Kariuki & Osman (2014); Brooks, Fisher et al. (2014)</i>	Multi-level / multi-scale: national, sectoral, county, ward, community, household; also applicable globally	Track 1 (CRM indicators): institutional climate risk management capacity (policies, early warning systems, coordination, planning, budgeting, DRR integration, climate information use). Track 2 (Resilience & wellbeing indicators): resilience outcomes (adaptive capacity, reduced vulnerability, livelihood security), development outcomes (health, food security, income, education), plus climate trend indicators. Indicators are tailored locally through theory of change.	Kenya (Isiolo County) for the feasibility study; framework is global and piloted in six countries ; designed for any country context	Partially. Gender not a core component of indicator list, but gender is integrated through theories of change and context-specific indicators. Some pilots (e.g., Pakistan) explicitly used a gender lens and tracked effects on women/girls (e.g., reduced water-collection labor, school attendance). Sex-disaggregation possible but not systematically required.
GEF LDCF/SCCF Results Measurement Framework & Adaptation Monitoring and Assessment Tool (AMAT) (<i>GEF Secretariat, 2011–2018</i>)	Project-level → Portfolio → Global. Applied at project level for all LDCF/SCCF-funded adaptation projects; aggregated to portfolio and global reporting under GEF-8.	AMAT indicators include: project-level <i>output and outcome indicators</i> (e.g., climate-resilient infrastructure, early warning systems, livelihood resilience, ecosystem restoration), <i>capacity indicators</i> , <i>reduced vulnerability indicators</i> , and <i>development co-benefits</i> .		Yes. GEF-8 core indicators require <i>sex-disaggregated beneficiaries</i> . Many projects include gender-responsive adaptation outcomes. Earlier AMAT versions allowed but did not require disaggregation; newest RMF makes gender mandatory.

Framework (authors, year)	Scale of framework	Summary of types of indicators used	Target country/region	Gender dimension included?
Climate Change Impact Metrics for Agriculture (Tubiello & Rosenzweig, 2008)	Multi-scale: national, regional (supra-national), global. The article states the metrics are intended mainly for <i>national to regional (supra-national) and global</i> assessment, while acknowledging potential local relevance.	Biophysical metrics: crop yields, biomass, climate extremes, CO ₂ effects on crops, drought/flood exposure. Agronomic system metrics: land use, irrigation, water availability, livestock/crop system characteristics. Socio-economic metrics: agricultural GDP, food security, number of people at risk of hunger. The paper explicitly proposes a “set of metrics... for analysis of impacts on agricultural systems”.	Global framework. Examples referenced include Africa and Sardinia (Italy), but these are illustrative modelling examples rather than applications in real-world adaptation programs.	No. Gender, sex-disaggregation, or gender-specific vulnerabilities are not referenced anywhere in the framework or indicators.
Integrated Climate-Smart Agriculture Multilevel Monitoring Framework (Bonilla-Findji, Eitzinger & Andrieu, 2021)	Household and farm level, within community/Climate-Smart Village (CSV) sites; applied across multiple regions; flexible multilevel design.	CSA Uptake indicators (7): CSA adoption, area under CSA, access/use of climate info, dis-adoption, enabling factors and barriers. CSA Outcome indicators (10): effects on yield, income, food access/diversity, vulnerability to shocks, changes in practice from climate information, gendered outcomes. Extended indicators: enabling environment, food security (HFIAS/HFIAP), coping strategies, climate-shock impacts, livelihood security, finance and credit, training, CSA knowledge. Farm-level metrics: caloric ratio, fodder ratio, cost–benefit, biodiversity index, water/nutrient balances, GHG emissions.	Global / multi-country application across Latin America, West & East Africa, South Asia, and Southeast Asia.	Yes. Strong gender integration: sex-disaggregated indicators, gender-specific outcome metrics, and protocols requiring interviews with both male and female adults in the same household.
GAMMA – Gender Assessment and Monitoring of Adaptation and Mitigation (GenderCC – Women for Climate Justice, 2022)	Urban / municipal level (city governments, local institutions)	Qualitative gender-responsive indicators: institutional capacity; gender mainstreaming; participation; gender-disaggregated data systems; access to services; gendered impacts in mitigation sectors (transport, buildings, energy, waste) and adaptation sectors (DRR, water, housing, ecosystems); gender dimensions (norms, resources, care work, safety, income, decision-making).	City-level applications in India, Indonesia, Mexico, South Africa (designed for global use).	Yes — fully integrated. Gender is the core of the framework; uses gender-disaggregated data, gender impact assessments, and gender scorecards.

Framework (authors, year)	Scale of framework	Summary of types of indicators used	Target country/region	Gender dimension included?
MAP-Norway Gender-Integrated CSA Monitoring Framework (Gutierrez-Montes et al., 2018)	Household; organizational; territorial/governance	Quantitative & qualitative gender indicators on household decision-making; women's participation in organizations (membership, leadership roles); gender-sensitive statutes and recruitment; integration of gender equity in governance documents; indicators on empowerment, workloads, access/control of resources, gender awareness	Central America (Mesoamerica: Nicaragua, Guatemala, Honduras, El Salvador)	Yes—sex-disaggregated indicators and qualitative empowerment measures
AMME Framework – Adaptation Metrics Mapping Evaluation (Schultz & Forte, 2021)	Multi-scale (applicable across project, sectoral, national, and cross-sector/global levels)	Process-oriented metrics across five aspects: purpose, stakeholder engagement, stakeholder capacities, data & information, evaluation & good practice; uses diagnostic, mapping, and evaluative indicators rather than sector-specific outcome indicators	Global (not country-specific; designed for use across sectors and regions)	Not explicitly; gender is not integrated as an indicator category and sex-disaggregation is not included
Farm Household-Level Adaptation Metrics for Agriculture and Water Sectors (Nambi, Bahinipati, Raghunath & Nagendran, 2015)	Household level (farm households across multiple agro-climatic zones)	Multi-criteria indicators evaluating adaptation options using Analytical Hierarchy Process (AHP); four criteria: effective awareness, economic viability, individual & institutional compatibility, flexibility & independent benefits; performance scores for specific adaptation measures (e.g., micro-irrigation, resistant crops, crop insurance, bio-fertilizers, community-based efforts)	Tamil Nadu, India (five agro-climatic zones across five districts)	No; gender is not included in metrics and no sex-disaggregated indicators are used
ND-GAIN Country Index (Chen et al., 2024)	National (182 UN countries); can be downscaled sub-nationally	45 indicators across vulnerability (36) and readiness (9); includes exposure, sensitivity, adaptive capacity (food, water, health, ecosystem services, human habitat, infrastructure) + economic, governance, social readiness	Global (182 countries; 10 with readiness-only scores)	No; indicators are not sex-disaggregated and gender is not included as a dimension

Framework (authors, year)	Scale of framework	Summary of types of indicators used	Target country/region	Gender dimension included?
Participatory Monitoring, Evaluation, Reflection and Learning (PMERL) Framework for Community-Based Adaptation (CARE, 2014)	Community, household, local institutional; designed for local CBA project level	Participatory, qualitative and quantitative indicators developed locally: outcome indicators, behavior change indicators, access/quality of services/resources, climate trend/context indicators; includes monitoring of activities, outcomes, and contextual factors	Fully implemented, widely used across CARE's CBA projects; revised manual (2014) reflects implementation learnings; applied in Nepal, Africa ALP, and other CARE CBA initiatives	Yes—gender is explicitly integrated; requires sex-disaggregated data, monitoring of gender gaps, and indicators on gender dynamics and access/control of resources
Gender Equality and Climate Policy Tool (UN Women and Kaschak Institute for Social Justice for Women and Girls, 2025)	National level application of member country NDCs under the Paris Agreement	Assesses the extent to which national climate policies integrate gender equality using 50 qualitative policy indicators across six domains: economic security, unpaid care work, gender-based violence, health, women's participation and leadership, and gender mainstreaming. Indicators evaluate whether policies recognize gender-specific climate risks, include concrete commitments and implementation measures, promote inclusive governance, and establish institutional mechanisms for accountability, monitoring, and sex-disaggregated data.	Applied to 32 revised NDCs and designed to be applied to newly revised NDCs as they are submitted	Yes – gender is explicitly integrated throughout each indicator and domain

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